EIZO

Color Matching – Begin with the Basics

EIZO's Guide to \a Further/ Enjoyment of Digital Photography

As the use of digital cameras spreads, there are many more ways to enjoy digital photos!

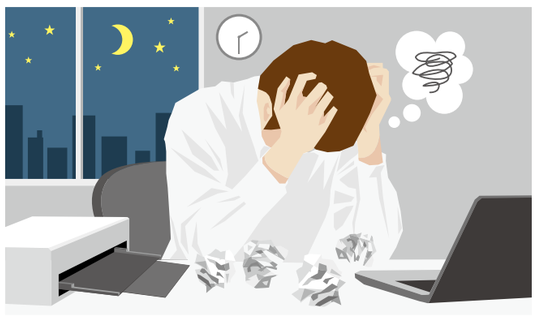
Print them out at home and make a photo book

Post them on a photo sharing site or on your blog

View them in a digital photo frame or on a TV

But if you don’t use a monitor suited for displaying digital photos…

The colors of photos you took so much trouble to retouch will not be viewed by others as you intended.



You won't be able to print photos in the colors you want, and have to try again and again, thereby wasting time.

It's actually important.

Which monitor you use to display digital photos

To enjoy digital photography \more/...

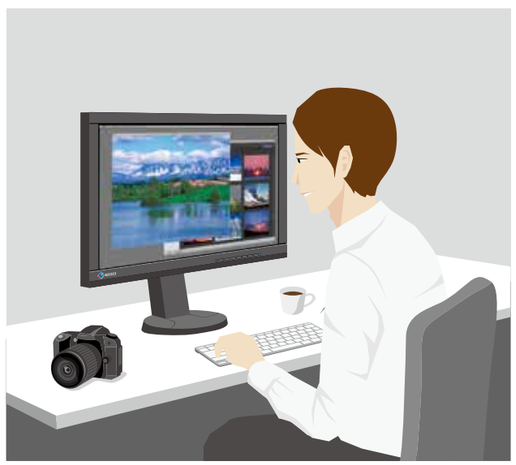
It's important to use a monitor that is suited for displaying digital photographs.

- ☑ Achieve the colors you want in photos
- ☑ Finely retouch photos in the correct colors
- ☑ Make the colors displayed on the monitor match those in the printed photo

When printing digital photos at home...

If you can print photos that match the image you see, digital photography will be \more/ enjoyable!

Print without doing multiple proofs



Retouch with confidence

Photo displayed on screen　　Photo printed out on an inkjet printer

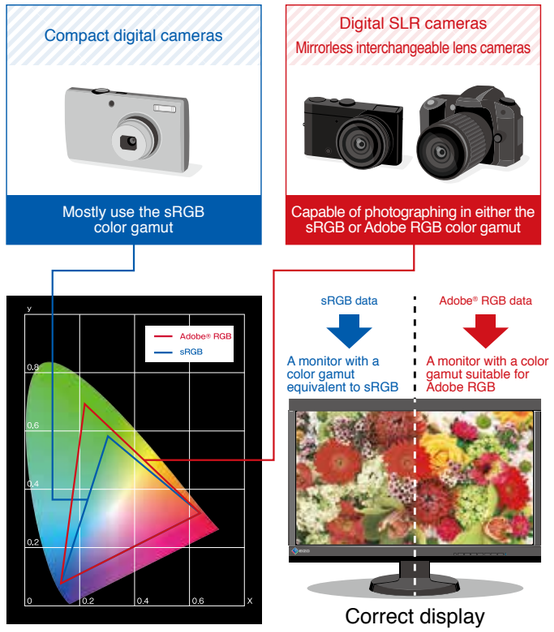
Color matching between on-screen photos and inkjet printouts reduces wasteful reprinting costs, saves the time and labor that repeated retouching takes, and leads to higher quality printed images.

What does a monitor need to display correct digital photo images?

1 The correct color gamut

There are two types of digital cameras in terms of color space: those with which you shoot using the sRGB color space and those with which you can choose to shoot using the sRGB color space or the even broader Adobe® RGB color space. With Adobe RGB, you can shoot emerald-green oceans and brilliant yellow flowers, but if you are using a monitor with a color gamut not suited to Adobe RGB, the images will not be displayed correctly. On the other hand, while the reproducible color space for sRGB is narrower, color management is easier because it is meant for general use.

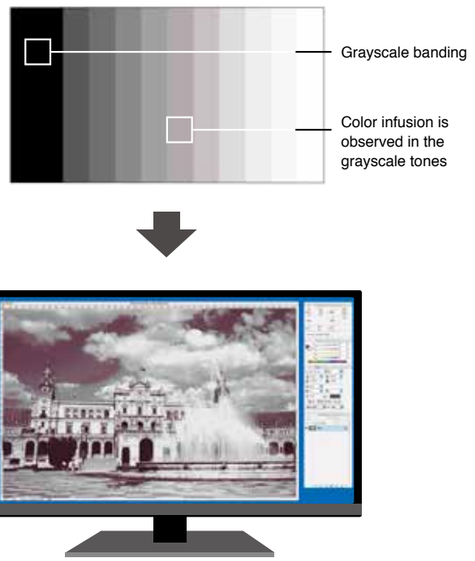
It is necessary to select a monitor depending on your color management method – Adobe RGB or sRGB.



2 Smooth gradations

Gradation is used in photo data to express color shading and a sense of depth. A monitor with color infusion or color omission issues is unable to correctly display important elements of photographic data.

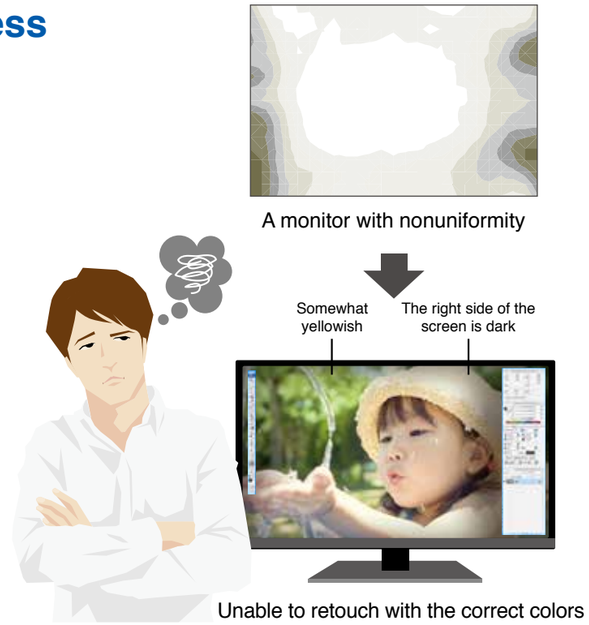
To correctly display photographic data, it is necessary to use a monitor that is capable of clearly displaying gradations in monochromatic images, including low gradation areas, with no color infusions or omissions.



3 No unevenness in brightness or color on screen

There are many recorded pixels in photo data, and because they do not all fit in window displays, most retouching takes place on a full screen. Monitors with poor accuracy to start with or monitors whose color display has changed after long periods of use may have dark patches or color infusion in sections, leading to nonuniformity.

For displaying digital photos, the most suitable monitor is one that has been adjusted in advance to correct uniformity errors. You are even better off with a monitor with circuitry that takes into account changes in the monitor's displayed brightness, etc. due to continued use, and adjusts for them.



4 Easy-to-adjust display

One requirement is a display that can be finely adjusted for brightness and color tone with minimum effort. Most monitors are adjusted using buttons on the front of the monitor or software produced by other companies. However, because there are limits to the adjustments that can be performed, and it takes time and expertise to perform them, these monitors are not the most suitable for digital photo displays.

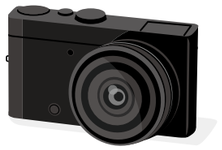
The ideal is to use software and sensors dedicated to the monitor you are using, in order to easily adjust color display correctly in a shorter time depending on the way you like to enjoy digital photos. In addition, you will find it easier to maintain the correct color display if you select timesaving items to make regular readjustments.

Choosing the right monitor

EIZO's ColorEdge color management monitors fulfill the four conditions listed on pages 6-7.
We have an extensive line-up for enjoying your digital photos so choose one that's best for you.

When using a compact digital camera

When using a mirrorless interchangeable lens camera or digital SLR camera



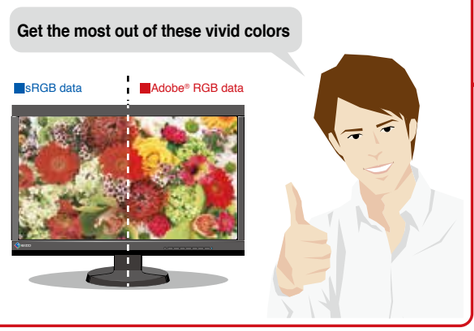
Color manage in sRGB

See Condition 1 on page 6

·Shoot in sRGB
·Shoot in RAW and develop in sRGB

Color manage in Adobe® RGB

·Shoot in Adobe® RGB
·Shoot in RAW and develop in Adobe® RGB



ColorEdge® CS230

ColorNavigator 6 included
Calibration device sold separately

Color manage in sRGB with ColorNavigator software and an external calibration device.

ColorEdge® CS240

ColorNavigator 6 included
Calibration device sold separately

99% Adobe RGB coverage enriches your digital photo experiences.
Quickly begin professional-level calibration with ColorNavigator. This 24.1" model shows images at A3 size + tool palette display.

For printing at A3 size or larger…

ColorEdge® CS270

ColorNavigator 6 included, calibration device sold separately.

Enjoy your digital photos all the more with this large 27-inch screen.

If you want to further master digital photos…

ColorEdge® CX Series

With built-in correction sensors, this series includes 24" and 27" models for professionals and prosumers in design, photography, and other creative fields.

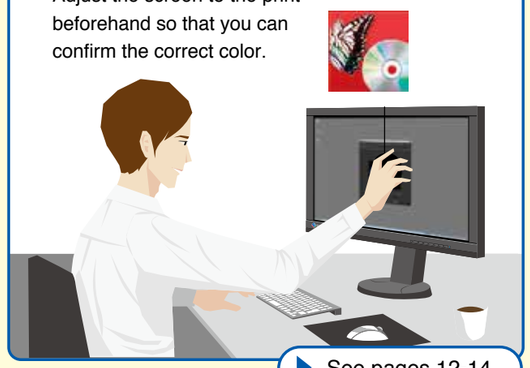
Color matching the monitor and photo prints

To color match the monitor and photo prints, you not only must choose a monitor that correctly displays digital photos and offers optimal adjustments, but must also select the correct settings with your retouching software and printer. This guide introduces the necessary adjustments and settings when making prints to achieve color matching.

1 Take photos

2 Adjust the monitor

Adjust the screen to the print beforehand so that you can confirm the correct color.



See pages 12-14

3 Retouch software settings

Import the photo data to your computer, view it with the proper settings, and choose the photos you will print.

See page 15

4 Printer settings

Do a test print with the correct settings.

See pages 16-21

5 Environment preparation

View the test print in the appropriate lighting environment.

See page 22

6 Fine tune the monitor

Compare the test print and the monitor and match them even closer.

See page 23

7 Matching completed!

Retouch and print knowing you can trust your screen. Then sit back and enjoy your work!

Color Matching with ColorNavigator 6

We introduce ColorNavigator 6 color management software for calibrating ColorEdge monitors for even greater enjoyment of digital photos.

■OS: Macintosh

1 Select the adjustment target

Click the butterfly icon on the desktop (Windows) or the dock (Mac).

Choose **Printing** from the three preset targets and then click **Adjust**.

·The recommended values are preset as follows.

Brightness: 80 cd/m^2,
White Point: 5000 K, Gamma: 2.2

Confirm in advance
Before launching the program make sure that your monitor and PC are connected by a USB cable.

·A license may be needed to use ColorNavigator 6 with certain models. Check with the EIZO subsidiary or sales distributor in your country.

2 Preparing the sensor

For the CX and CS series

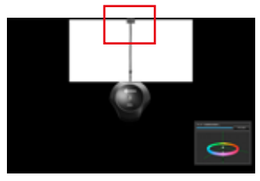
Attach the external calibration sensor to the monitor.

For Measuring Instrument, select the sensor name, click on the Next > button, and follow the instructions on the screen.

When the sensor is placed on the screen, click on the Proceed button.

- Tilting the monitor upward fixes the sensor in place and makes color measurements easier.
- After turning on the monitor, it is necessary to wait 60 minutes while the adjustment results from the external calibration sensor are saved to the built-in correction sensor.

The external calibration sensor adjusts the monitor.

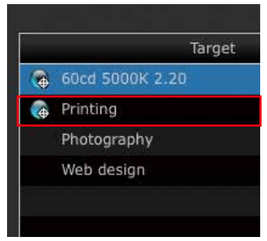


The built-in correction sensor* saves the adjustment values from that sensor.

*Not available with the ColorEdge CS240 or CS270.

3 Save the adjustment results

After confirming on the adjustment results screen that there are no major gaps between “Target” and “Result” values, click on the Finish button.



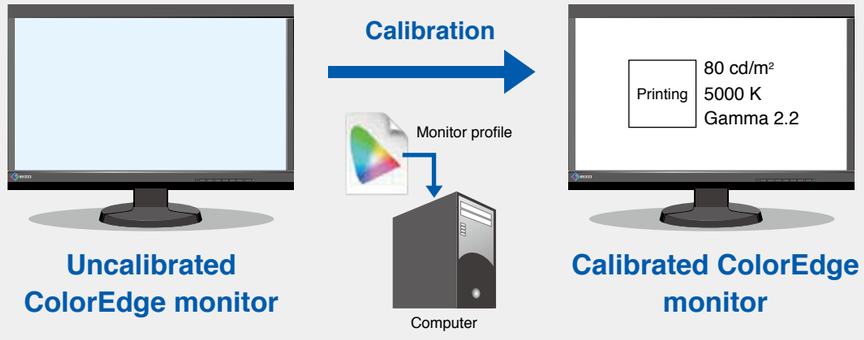
The display returns to the initial screen, and the adjustment target name is marked with a blue circle.

Your screen has been optimally adjusted for printing.
To maintain these settings, see “Regular calibration of the monitor” on the next page.

To confirm your matching, open your photo in your retouching software and make a test print.
See page 15 for details.

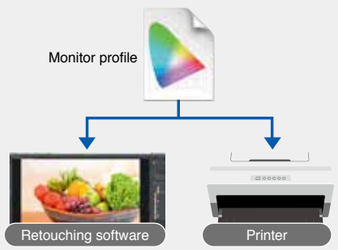
Why calibration is necessary

After calibrating with ColorNavigator 6, a “monitor profile” is generated and automatically configured to your computer’s OS It’s very important to match colors (color management) when using retouching software, printers, and monitors. ColorNavigator makes it easy to do this to a high degree of accuracy.



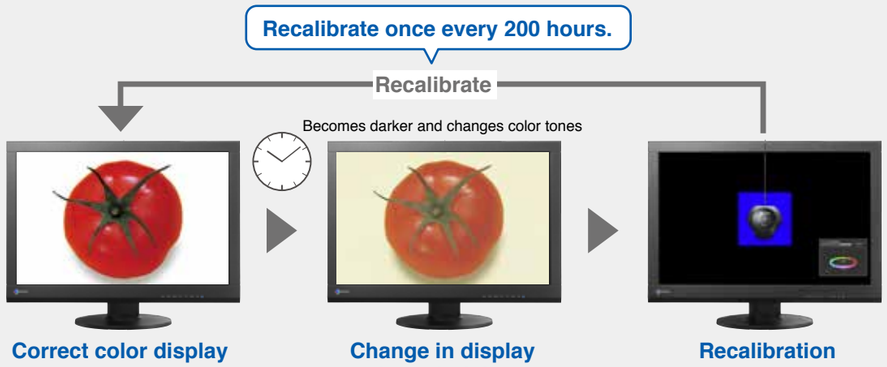
What’s a monitor profile?

It’s a data file that conveys to the system how a monitor displays color

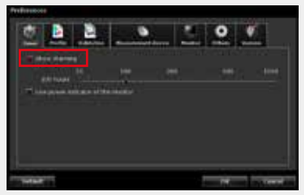


Regular calibration of the monitor

The monitor's display of color changes over time with use, so regular readjustments are important.
With ColorNavigator 6, you can set a timer that reminds you when to recalibrate the monitor based on your preferences.



Click on Preferences

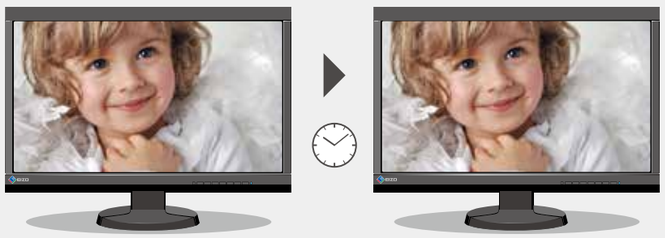


Check **Show Warning** under the Timer tab.

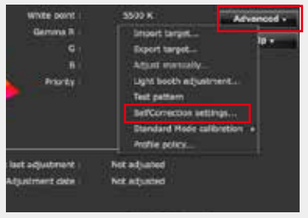
An alert will appear reminding you to readjust the monitor according to your timing preference.

Automatic Adjustment

The built-in sensor automatically adjusts the monitor at regular intervals to correct the display.

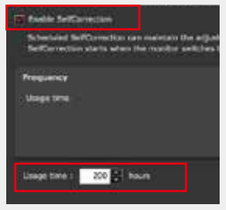


The CX Series and CS230 are equipped with a built-in sensor that automatically performs regular adjustments, constantly maintaining the same conditions and allowing you to enjoy your digital photos with peace of mind.



■ Settings

From Advanced select “SelfCorrection”.



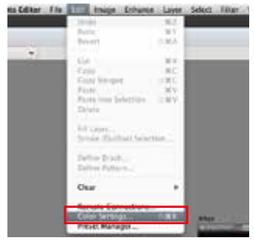
Check **Enable SelfCorrection** to set the intervals in usage time

Retouch software settings

In order to match monitor colors with printed ones, it is also important to appropriately select the color settings for the retouch software that is used to display photos. The following is an introduction to the recommended settings for color matching using three typical software packages.

Adobe® Photoshop Elements 13

The default settings are used here.

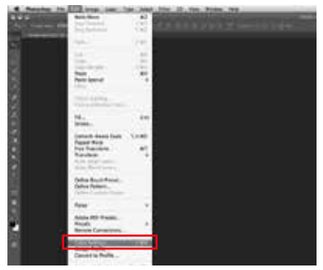


Click on **Edit** → **Color Settings**.

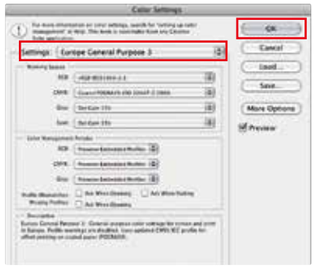
Select **Always Optimize Colors for Computer Screens**, and click **OK**.

Adobe® Photoshop CC

The default settings are used here.



Click on **Edit** → **Color Settings**.



From the Settings pull-down menu, select **Europe General Purpose 3** and click **OK**.

Canon Digital Photo Professional

Canon Digital Photo Professional requires manual setup.

For Windows

From the **Tool** pull-down menu, select **Preferences**, and then the **Color management** tab. In **Default settings of Work color space** select **sRGB** or **Adobe® RGB**, depending on your color management method. In **Color matching settings**, **For display** select **Use the OS settings**.
Click **OK**.

For Mac OS

From the **Digital Photo Professional** pull-down menu, select Preferences, and then the **Color management** tab.
In **Default settings of Work color space**, select **sRGB** or **Adobe® RGB**, depending on your color management method.
Under **CMS settings for print** and **For display**, select **Monitor profile**. Click on the **Browse...** button and set the profile of the created adjustment target.
Click **OK**.

Printer Settings

EIZO's recommendations for digital photo perfection

To match the color of your monitor and photo prints, it's necessary to use a printer that accurately prints photo data. Here, we introduce our recommended EIZO monitors and printers and explain the appropriate printer settings for color matching.

Canon

▶ See pages 18-19 for printer settings

Courtesy of Canon Europa N.V.

For color management in sRGB

EIZO
ColorEdge CS230
23" Hardware calibration monitor with sRGB color space.

Canon
PIXMA MG7700 series
Premium 6-ink All-in-One with touch control, cloud and mobile printing.

For color management in Adobe® RGB

EIZO
ColorEdge CS240
24.1" Hardware calibration monitor with 99% reproduction of Adobe RGB color space.

Canon
PIXMA PRO-10S
Gallery-quality A3+ photo printer with 10-ink system.

For printing at A3 size or larger…

ColorEdge CS270

ColorNavigator 6 included, calibration device sold separately.

Enjoy your digital photos all the more with this large 27-inch screen.

Epson

▶ See pages 20-21 for printer settings

Courtesy of Seiko Epson Corp.

For color management in sRGB.

EIZO
ColorEdge CS230
23" Hardware calibration monitor with sRGB color space.

EPSON
XP-950
Multi-functional model that prints up to A3-sized paper.

For color management in Adobe® RGB

EIZO
ColorEdge CS240
24.1" Hardware calibration monitor with 99% reproduction of Adobe RGB color space.

EPSON
SC-P600
Professional A3+ printer with Epson UltraChrome HD ink technology for unsurpassed quality.

If you want to further master digital photos…

ColorEdge CX Series

With built-in correction sensors, this series includes 24" and 27" models for professionals and prosumers in design, photography, and other creative fields.

Canon Printer Settings

EIZO × Canon

After correctly setting your retouching software, open the photo you want to color match. EIZO has prepared a print sample which you can use as a test print.

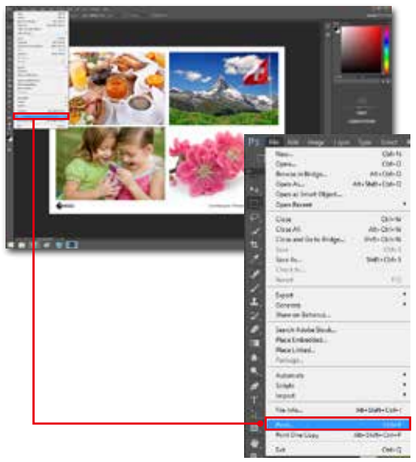
■You can download it here. http://www.eizo.com/global/i/print_sample/

■OS: Windows 8 / 7
■Printer: Canon PIXMA PRO-10S
■Retouching software: Adobe® Photoshop CC

Optimal print settings for color matching

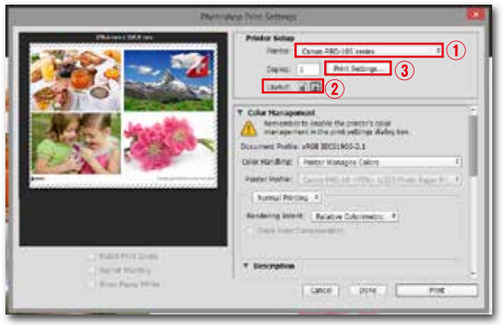
1

In Adobe Photoshop, go to **File > Print.**



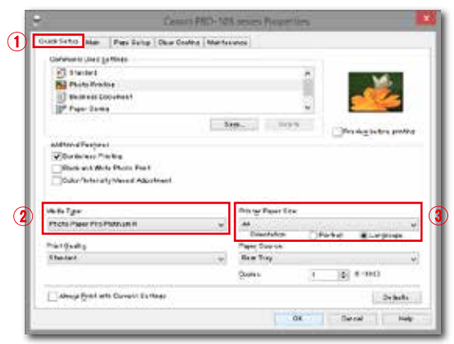
2

In the Print Settings window ①choose your printer. Select the ②**Layout** and click the ③**Print Settings** button.



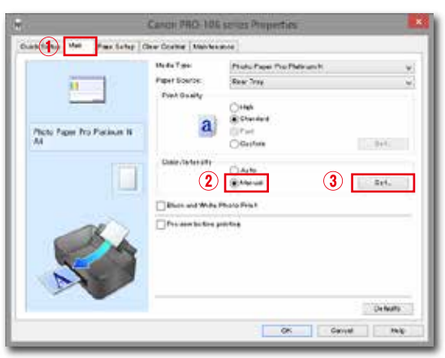
3

Select the ①**Quick Setup** tab in the Printer Properties window. Set the paper you will use under ②**Media Type** (ex. Photo Paper Pro Platinum N) and choose the ③**Printer Paper Size** from the dropdown menu.



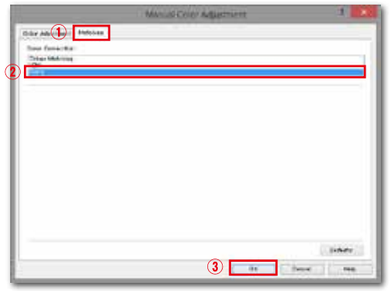
4

Select the ①**Main** tab in the Printer Properties window. For **Color/Intensity**, select ②**Manual** and click the ③**Set** button.



5

On the Manual Color Adjustment screen, select the ①**Matching** tab. We will manage colors through Photoshop so for ②**Color Correction**, select **None**. Click ③**OK**.

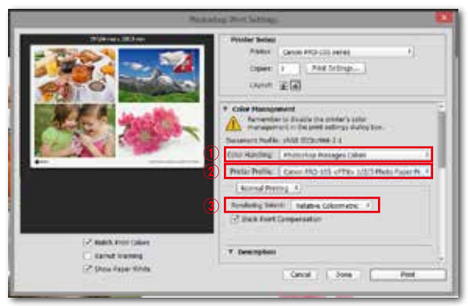


6

Click **OK** to return to the Print Settings screen.

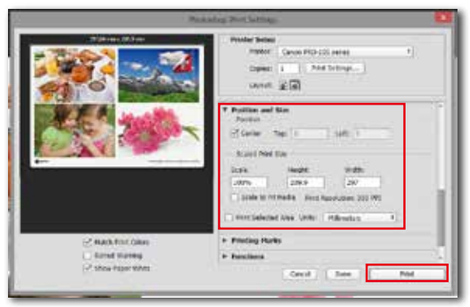
7

When you return to the Print Settings screen, select ①**Photoshop Manages Colors** under **Color Handling** and choose the profile you will use under ②**Printer Profile**. For ③**Rendering Intent**, select **Relative Colorimetric.**



8

Under **Position and Size**, choose your preferred settings and click **Print**.



For the printer settings of other retouching software, please visit:
http://www.eizo.com/global/i/printer/

Epson Printer Settings

After correctly setting your retouching software, open the photo you want to color match. EIZO has prepared a print sample which you can use as a test print.

■You can download it here. http://www.eizo.com/global/i/print_sample/

Optimal print settings for color matching

1

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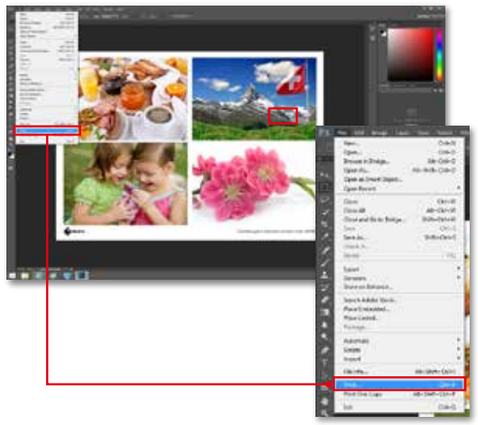
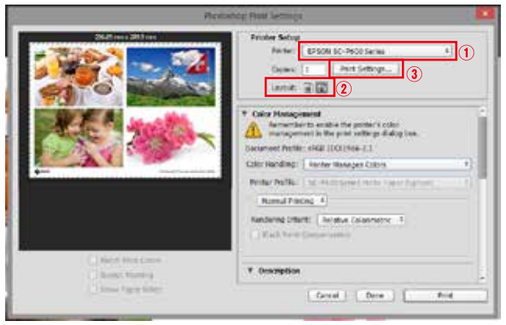


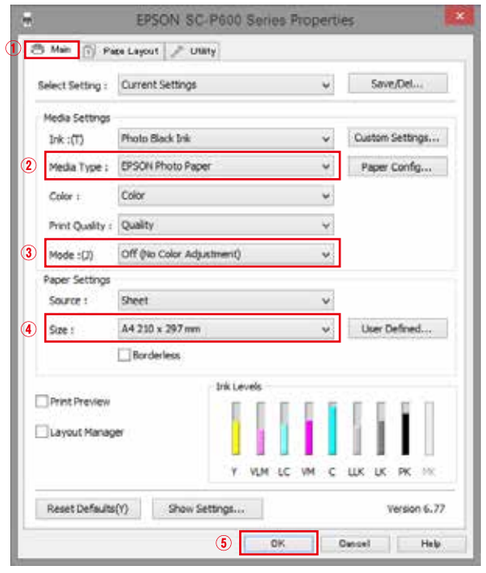
2

In the Print Settings window ①choose your printer. Select the ②**Layout** and click the ③**Print Settings** button.



3

Select the ①**Main** tab in the Printer Properties window. Set the paper you will use under ②**Media Type** (ex. EPSON Photo Paper). We will manage colors through Photoshop so under ③**Mode**, select **Off (No Color Adjustment)**. Select the ④**Paper Size** and click ⑤**OK**.

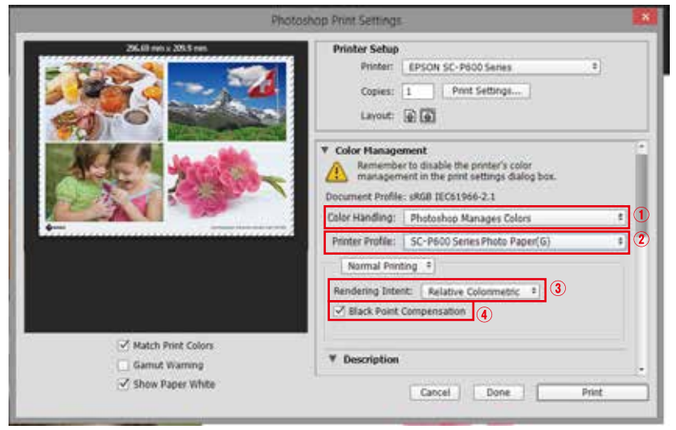


EIZO × EPSON

■OS: Windows 8 / 7
■Printer: EPSON SC-P600
■Retouching software: Adobe® Photoshop CC

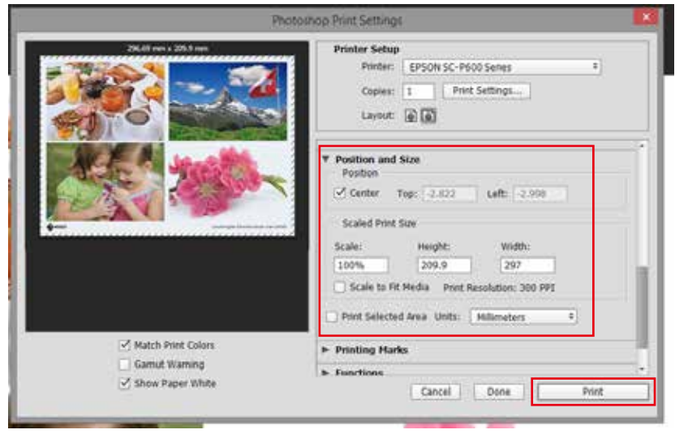
4

When you return to the Print Settings screen, select ①**Photoshop Manages Colors** under Color Handling. Select the ②**Printer Profile** you will use from the dropdown menu. For ③**Rendering Intent**, select **Relative Colorimetric**. ④Check the box for **Black Point Composition**.



5

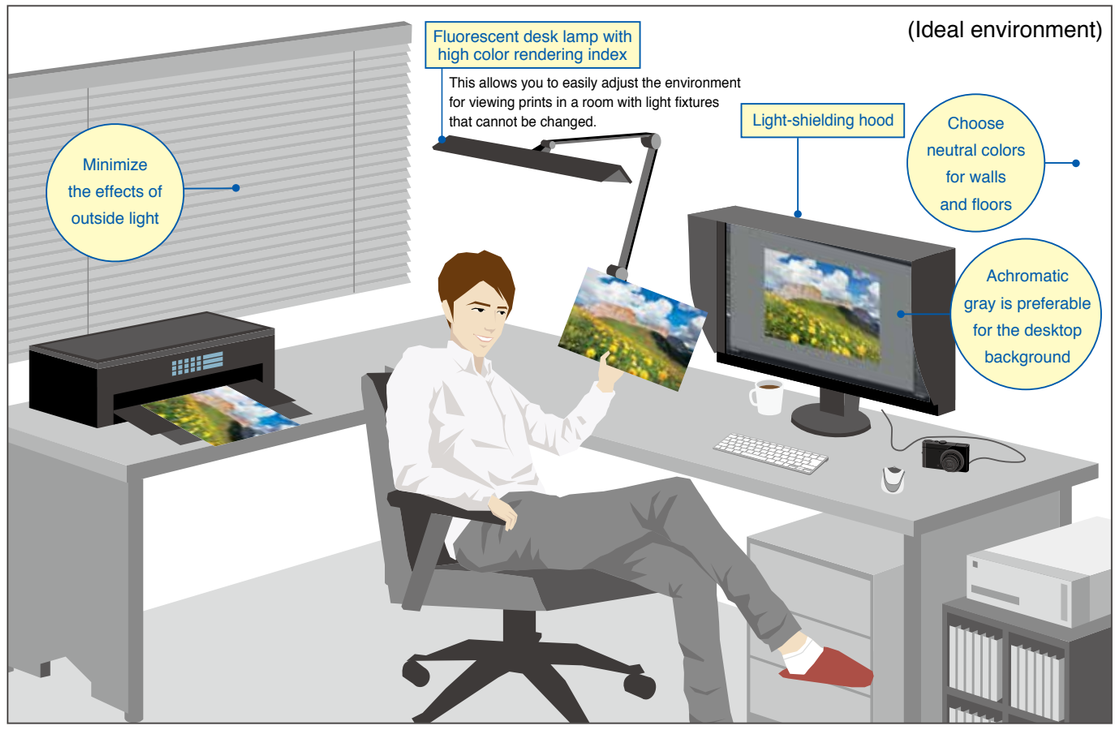
Under **Position and Size**, choose your preferred settings and click **Print**.



For the printer settings of other retouching software, please visit:
http://www.eizo.com/global/i/printer/

Environment preparation

Even if color matching has been successfully performed between on-screen and printed photos under indoor lighting conditions in the evening, they may look different under outside light during the daytime. To correctly check the color, it is necessary to adjust the lighting conditions and to control environmental light so that images are always evaluated under the same conditions.



EIZO's recommendations for enhancing your digital photography experience

Accessories

EIZO accessory
Monitor hood
CH7 For CX241 / CS240
CH6 For CS230
CH5 For CX271 / CS270
EIZO's original monitor hood effectively blocks outside light and reflections from the screen.

Good to Know

Fluorescent light tubes with a high color rendering index and a color temperature of 5000 K are recommended for room lighting.

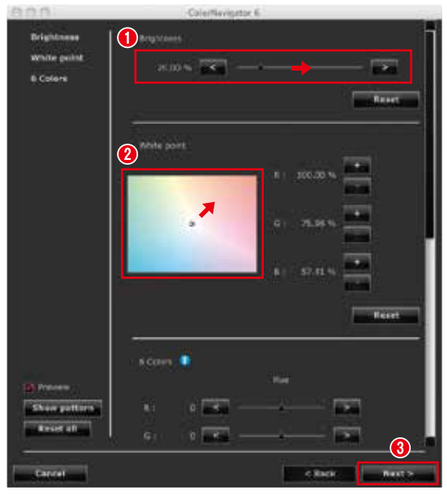
It is necessary to adjust the environmental light to 5000 K, the standard color temperature for printing, in order to establish a color matching environment.

Confirm your prints using fluorescent light with a color rendering index greater than RA 90.

ColorNavigator 6
Increase your matching precision

You've successfully made a test print. If your print matches your monitor then then you can forego the following steps. If something isn't quite right with your matching because of environmental factors, you can manually fine tune a calibrated target for more precise color matching.

Select **Adjust manually** from among the **Advanced** buttons in the upper right side of the screen.



While comparing your print with your monitor screen, Adjust the ❶**Brightness**. Move the pointer to the left or right until it approximates the appearance of your photo print.

Adjust the ❷**White Point**. Move the pointer to the left or right until it approximates the appearance of the print. If the screen output seems blue, move the pointer away from the blue spectrum and toward the red end of the spectrum to remove excess blue.

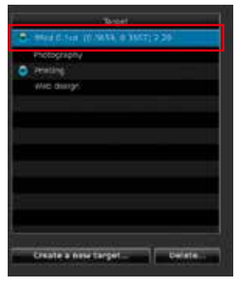
⚠ You will rarely need to use the Hue adjustment near the bottom of the menu.

❸When you have matched the colors, click Next >

Use the sensor to recalibrate.

When the adjustment results are displayed, click on the Next > button

Create a new target name and click on the Finish button



The new adjustment targets are added to the target list.

This concludes our guide for color matching with ColorNavigator 6. Enjoy your photo prints!

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