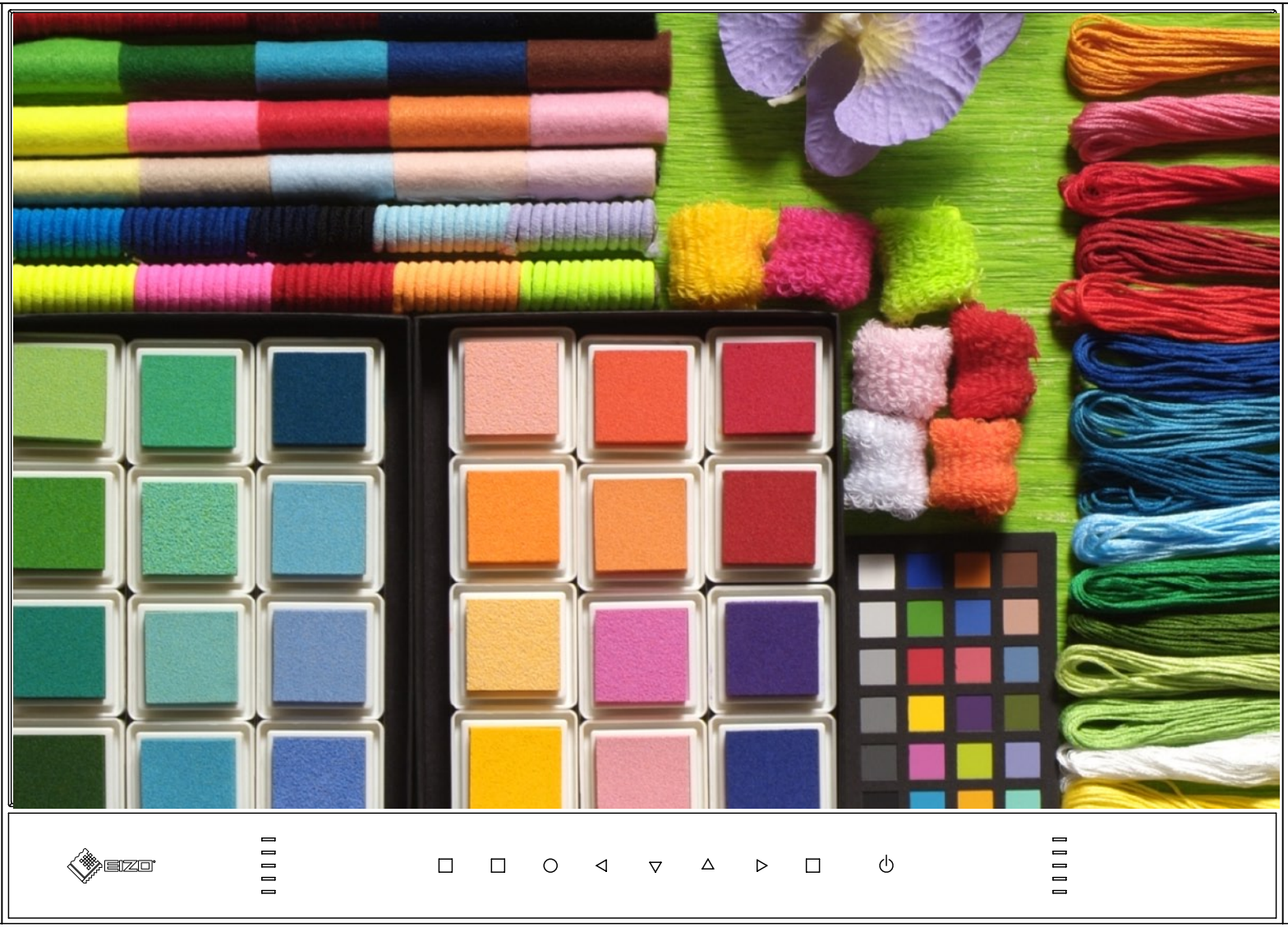
# ColorEdge® CG221

*Color as it's meant to be*


Cyan
Magenta
Yellow
Black
R G B
5 25 50 75 95100 5 25 50 75 95100 5 25 50 75 95100 5 25 50 75 95100
M+Y Y+G G+M

# *See all the colors of life*

With the ColorEdge CG221, EIZO is once again taking the performance of LCD monitors to new levels. Not only does it reproduce the Adobe RGB color space for stunningly rich and natural hues, but it also addresses color and brightness uniformity issues common to LCD monitors. Outfitted with EIZO's latest circuitry, the ColorEdge CG221 comes with a digital uniformity function that ensures color and brightness are virtually the same anywhere on the screen. From delicate cyans to deepest greens, as well as rich emeralds, yellows and magentas, every color looks just as it should whether its displayed in the center of the screen or in the perimeters.



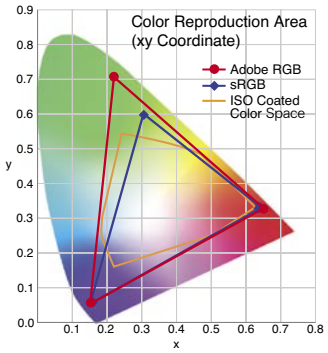
## sRGB Monitor

ON

*This photo is for illustrative purposes only. Actual display of color may vary depending on the monitor.*

# *Adobe RGB Coverage*

## Expanded Color Space Meets Professional Needs

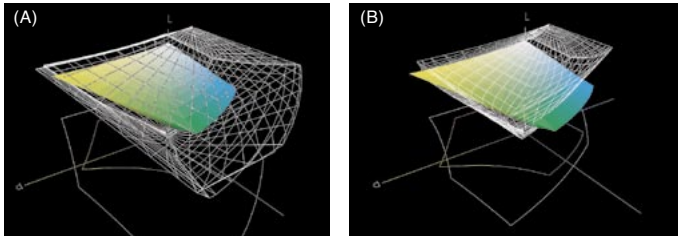



Graphics professionals are well aware that a totally digital workflow and the ability to do soft proofing results in higher efficiency and lower costs. Many also want to switch to space-saving LCD monitors, but are hesitant to do so because of concerns regarding the color accuracy required for professional color work. EIZO's solution is the ColorEdge CG221: an LCD monitor that covers the Adobe RGB color space. It thus encompasses not only the sRGB color space, widely supported by many computer monitors, operating systems and digital cameras, but also the ISO-coated and US web-coated CMYK color spaces used in printing. This ultra-high-performance monitor finally provides all the color reproduction capabilities graphics professionals have been seeking, in the compact LCD format.

## Advantages Of Adobe RGB

In order to realize the advantages of soft proofing, a color management system for sharing accurate colors among photographers, graphic artists and printers is a necessity. The most efficient way to achieve this is for all parties to use a standardized color space with a wide range of colors. The ColorEdge CG221 now makes it possible to adopt the Adobe RGB extended color space, which has become the de facto standard for professional color processing. It ensures guaranteed color reproduction across all digital platforms, providing a color management environment that fully supports soft proofing, from the photography stage to final CMYK printing.

**3D representation in CIE Lab of comparisons between ISO Coated and sRGB/Adobe RGB Color Spaces**

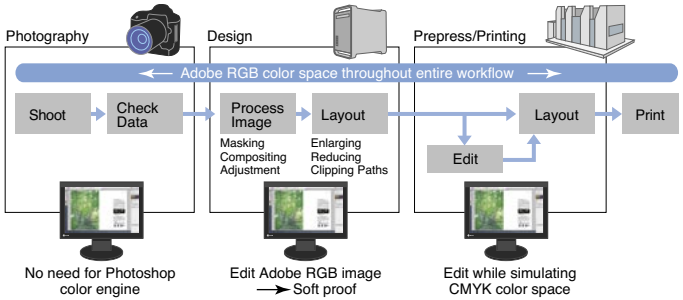



Created in ColorThink

*(A) Adobe RGB (white wire frame) encompasses the ISO coated color space (multicolor solid).*

*(B) sRGB (white wire frame) does not cover many of the green, cyan, and yellow areas of the ISO coated color space (multicolor solid).*

**Color Management**



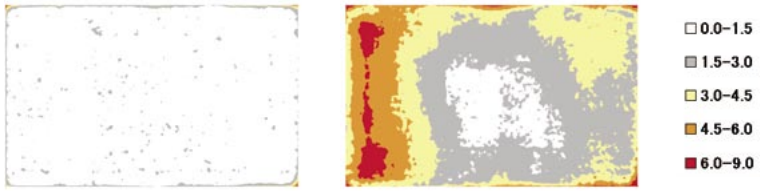

*A common color space throughout the workflow lets you switch from hardcopy proofing to soft proofing.*

By covering the Adobe RGB color space, the ColorEdge CG221 is not subject to influence from the OS color engine or software, and allows final color checks in Adobe RGB. This offers a great advantage over sRGB monitors, whose smaller palette is not capable of accurately reproducing colors in certain areas of the spectrum, notably emerald greens and cyans. Retouching images with these monitors requires numerous printouts to achieve accurate color matching. By enabling on-screen retouching and color confirmation, the ColorEdge CG221 makes your work faster, easier and more accurate.

# *Precision Color Reproduction*

## Brightness and Color Uniformity with 12-Bit LUT

Achieving uniform levels of brightness and color across the screen has been all but impossible with LCD monitors. To correct this problem, EIZO has developed an ASIC (Application Specific Integrated Circuit) and incorporated it into the ColorEdge CG221. This ASIC has a 12-bit look-up table (LUT) with an extensive palette of 4,096 grayscale tones for each R, G, and B, and internal calculation accuracy of 16-bits (64 times more accurate than 10-bit internal calculation).

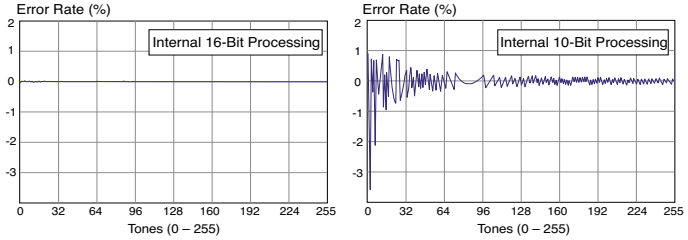



*Color-separated image with Delta-E*ab distribution across the screen (gray level 128 measured)*

## 16-bit Processing

The 16-bit internal calculation produces grayscale rendering that is on a par with high-end CRT monitors. The result is not only a much greater degree of detail in dark areas, but overall uniformity of brightness and color throughout the entire screen.

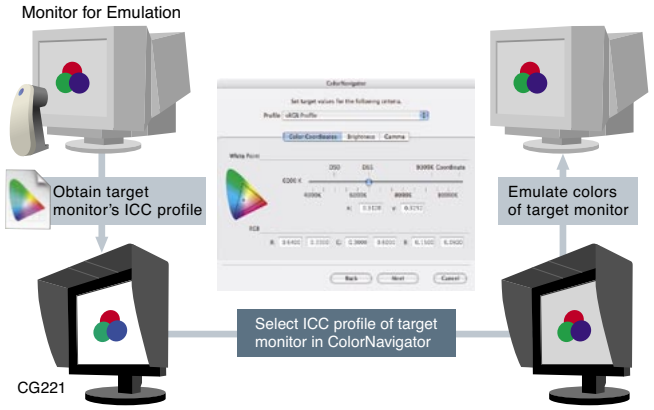
**16-bit v. 10-bit processing**




*With 10-bit processing, the error rate is high in low tonal areas during calculation. With 16-bit processing, accuracy is significantly improved resulting in fewer conversion errors.*

## Emulation Function

To take full advantage of the 12-bit LUT and 16-bit internal processing capabilities, EIZO has equipped the ColorEdge CG221 with an emulation function. Simply by obtaining the ICC profile of another monitor and using EIZO's ColorNavigator software, the ColorEdge CG221 can emulate its color characteristics. This is useful when another monitor is the standard monitor in a workflow, when different models are used in a multi-monitor setup, or for a remote proofing environment where the client, designer and printer want to be sure that their various monitors are displaying color the same way.



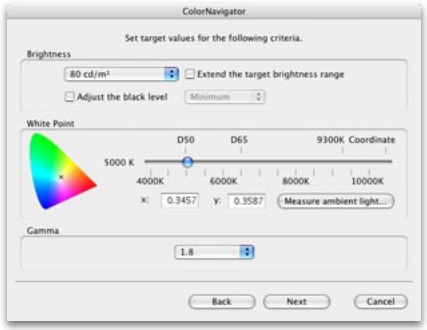

## Factory Adjustment Of Gamma

Each ColorEdge CG221 monitor is adjusted at the factory to a gamma level of 2.2. This is accomplished by measuring the R, G and B gamma values from 0 to 255, then using the monitor's LUT with its 4,096-tone palette to select the 256 most appropriate tones to achieve the 2.2 value.

The benefit of factory adjustment is that precise, non-fluctuating gamma values are necessary for the accurate display of colors. If colors are not based on specific values and cannot be adjusted, images will be displayed differently by different monitors. The ColorEdge CG221 provides both precision and consistency, so you can be sure that the final product will look exactly the way you want it to.

# *ColorNavigator Software*

## Simple and Precise Calibration



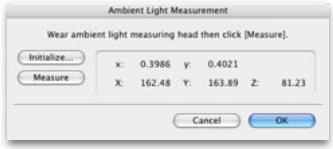

The EIZO-developed ColorNavigator software makes calibration both simple and accurate. Instead of having to judge colors and do time-consuming inputting, or having a specialist do it for you, all you need to do is input target values for brightness, white point and gamma. ColorNavigator directly utilizes the 12-bit LUT for accurate and reliable calibration in minutes.

**Calibration Parameters**

| | | |
|---|---|---|
| **Brightness** | | 30 cd/m² – 200 cd/m²† in 5 cd/m² increments<br>Possible to set to the monitor's maximum and minimum values. |
| | **Black Level** | 0.5 cd/m² – 3.5 cd/m² in 0.1 cd/m² increments<br>Possible to set to the monitor's minimum value. |
| **White Point** | **Color Temperature** | 4,000 K – 10,000 K in 100 K increments |
| | **Color Coordinates** | X Value, Y Value |
| **Gamma** | | 1.0 – 2.6 in 0.1 increments and L* |

† *It may not be possible to set the brightness to the maximum value (200 cd/m²) depending on LCD panel performance.*

## Ambient Light Measurement

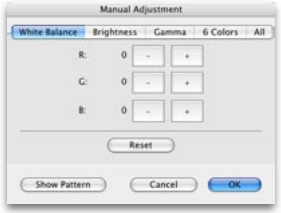



ColorNavigator can be used to measure the ambient light environment and automatically set it as the monitor's white point calibration target. Especially helpful when there is no light box to view a proof or when the light box's white point is not precisely on target, it ensures that the monitor's white point matches that of the ambient light environment for an accurate comparison between the hard (printed) and soft proofs.

*As of March 2006, this function is supported by GretagMacbeth Eye-One series measurement devices only (excluding Eye-One Monitor/Display).*

## Post-Calibration Color Adjustment

Sometimes due to variations in output from different printers or the special requirements of a project, it is necessary to fine-tune an otherwise perfectly calibrated monitor to match target colors. ColorNavigator lets you easily adjust hue and saturation for all six colors (red, green, blue, cyan, magenta and yellow), as well as white balance, brightness, black level and gamma, to achieve the closest possible visual match. For confirmation of calibration results or to achieve more accurate manual adjustments, a test pattern screen can now be displayed.




*Post-Calibration Manual Adjustment Screen*

*Test Pattern Screen*

The test pattern screen shows a full grayscale ramp as well as just the low tones (blacks), high tones (whites), and gamma values. The results of all manual adjustments are immediately reflected on the test pattern screen.

## Convenient Calibration Profile Management


ColorNavigator also makes it easy to keep track of calibration profiles. When you want to adjust a profile in order to match your monitor to other equipment such as printers or light boxes, you can use the Duplicate function to make a copy of it, then adjust the duplicate profile and give it a new name. Naturally, you can make as many duplicates, and thus adjusted profiles, as desired.

## Recalibration Reminder

After initial calibration, a monitor needs to be recalibrated at regular intervals to maintain color accuracy. ColorNavigator includes a recalibration reminder that will appear after a certain number of user-determined hours. When the monitor is first calibrated, the date and time are saved. After the time you set has elapsed, an LED on the front panel lights up, and a reminder message appears the next time ColorNavigator starts up. If you prefer to calibrate according to the amount of change that has occurred, you can measure the color difference (Delta-E) between the original target points and the actual current points at any time.

# Additional Features

## Ergonomic Design

The monitor swivels smoothly through 70°, tilts 33° and moves up and down over a 100 mm range. The panel can be removed for mounting.

## Touch Sensitive Switches

The front panel features highly sensitive electrostatic “touch” switches. Ports and modes are listed on the panel and LEDs indicate which port and mode is in use. The LEDs can be set to low, middle or high luminance, or can be turned off entirely.

## Monitor Hood Supplied

The ColorEdge CG221 comes supplied with a monitor hood for glare reduction. The inside of the hood is coated with an anti-reflective material. A panel on the top cover slides open so the hood does not need to be removed in order to use a calibration device.

## Screen Cleaner Kit

Keep your screen free from dust and fingerprints with this screen cleaner kit. Includes pump spray and cloth.

## Five-Year Warranty

EIZO and its authorized distributors offer a five-year limited warranty for the ColorEdge CG221.

# Accessories

## Compatible Measurement Devices

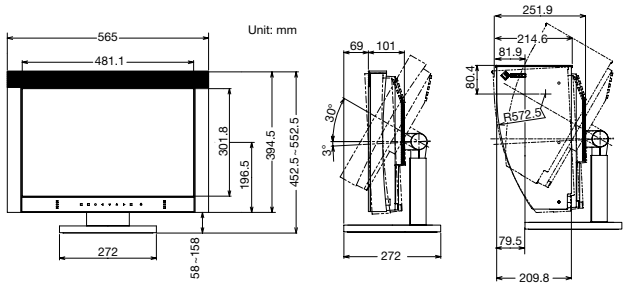
| GretagMacbeth | |
|---|---|
| Eye-One Series | |

| X-Rite | |
|---|---|
| MonacoOPTIX$^{XR}$ | MonacoOPTIX$^{XR}$Pro |

| ColorVision | |
|---|---|
| Spyder2 | Spyder2Pro |

*For optimum calibration results, a GretagMacbeth Eye-One spectrophotometer is recommended. For more information about Eye-one products, please visit www.i1color.com.*

# Dimensions



# *Specifications*

## ColorEdge® CG221

| | | | |
|---|---|---|---|
| **Panel** | **Panel Size and Type** | | 56.4 cm (22.2") TFT color LCD panel |
| | **Viewing Angles (H, V)** | | 170°, 170° (at contrast ratio of 10:1) |
| | **Brightness / Contrast** | | 200 cd/m² / 400:1 |
| | **Response Time** | | 30 ms (typical) |
| | **Native Resolution** | | 1920 × 1200 |
| | **Active Display Size (H × V)** | | 478 × 299 mm |
| | **Viewable Image Size** | | Diagonal: 563 mm |
| | **Pixel Pitch** | | 0.249 × 0.249 mm |
| | **Display Colors** | | 16.77 million from a palette of 1.06 billion |
| **Cabinet Color** | | | Black |
| **Dot Clock** | | | Analog: 202.5 MHz, Digital: 162 MHz |
| **Scanning Frequency (H, V)** | | **Analog** | 31 – 94 kHz, 49 – 86 Hz |
| | | **Digital** | 31 – 76 kHz, 59 – 61 Hz (VGA Text: 69 – 71 Hz) |
| **Input Signals** | | | Analog: RGB Analog, Digital: DVI Standard 1.0 |
| **Input Terminals** | | | DVI-I 29 pin × 2 (switchable) |
| **USB Port / Standard** | | | 1 upstream, 2 downstream / USB Standard Rev. 2.0 |
| **Plug & Play** | | | VESA DDC 2B |
| **Power** | **Power Requirements** | | AC 100 – 120 V, 200 – 240 V: 50 / 60 Hz |
| | **Power Consumption** | | 90 W (typical) |
| | **Power Save Mode** | | Less than 2 W |
| **Physical Specifications** | **Height Adjustment Range** | | 100 mm |
| | **Tilt / Swivel / Pivot** | | 30° Up, 3° Down / 35° Right, 35° Left / – |
| | **Dimensions (W × H × D)** | | With Stand: 565 × 452.5 – 552.5 × 272 mm |
| | | | Without Stand: 565 × 394.5 × 101 mm |
| | **Net Weight** | | With Stand: 14.5 kg, Without Stand: 10.4 kg |
| **Auto Brightness Functions** | | | Auto Brightness Stabilization |
| **Auto Adjustment Functions** | | | Auto Adjustment, Range Adjustment |
| **Display Mode Options** | | | Fine Contrast (sRGB, Custom, Calibration, Emulation) |

| | | | |
|---|---|---|---|
| **ScreenManager OSD Adjustment Functions** | **Screen Adjustment** | | Clock, Phase, Position, Resolution, Signal Filter, Screen Size (full screen, enlarge, normal), Smoothing (5 stages), Border Intensity |
| | **Color Adjustment** | | Range Adjustment (RGB) Independent 6-Color Control, Gamma, Temperature (500 K increments from 4,000 K – 10,000 K), Saturation, Hue, Gain, Reset |
| | **Power Save Settings** | **Analog** | PowerManager (VESA DPMS), Off Timer |
| | | **Digital** | PowerManager (DVI DMPM), Off Timer |
| | **Other Settings** | | Signal Settings, Input Priority, Product Information (product name, serial number, resolution, operating time), OSD Menu Settings, Adjustment Lock, Languages (English, French, German, Italian, Japanese, Spanish, Swedish), Reset |
| **Certifications and Standards** | | | c-Tick, CE, CB, UL (cTÜVus), CSA (cTÜVus), FCC-B, Canadian ICES-003-B, TÜV/S, VCCI-B, RoHS, WEEE, EIZO Eco Products 2004 |
| **Supplied Accessories** | | | AC power cord, signal cables (DVI-D – DVI-D, DVI-I – D-Sub mini 15 pin), USB cable, setup guide, EIZO LCD Utility Disk (ColorNavigator software, HTML user's manual, ICC Profile), adjustment certificate, screen cleaner kit, monitor hood, quick reference, warranty registration card |
| **Warranty** | | | Five Years* |

** The usage time is limited to 30,000 hours from the date of purchase, and the warranty period is limited to three years for the LCD panel and two years for the backlight from the date of purchase.*
*With current LCD technology, a panel may contain a limited number of missing or flickering pixels.*

All Product names and logos are trademarks or registered trademarks of their respective companies. PowerManager is a trademark, and ColorEdge, ScreenManager, and EIZO are registered trademarks of Eizo Nanao Corporation.

Specifications are subject to change without notice.

Published on chlorine-free paper. © 2006 Eizo Nanao Corporation. All rights reserved.

(050102d) Printed in Japan, 3, 2006, 4K

EIZO NANAO CORPORATION

153 Shimokashiwano, Hakusan, Ishikawa 924-8566 Japan

Phone: +81-76-277-6792 Fax: +81-76-277-6793

www.eizo.com