Color Balance Tool for all Matrix Displays with G2 Architecture

Setup & Operations Guide

PLANAR
A LEYARD Company

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Color Balance Kit

Check the contents of the kit to make sure it contains the following items.

i1D3 Light Meter
The i1D3 Light Meter is the device that is placed up to the screen to measure brightness and color. This meter works well if you are measuring displays in a wall to balance to each other. Matrix Color Balance is currently compatible with the PhotoResearch PR-650 for measurement only.

Receiver for remote control stored in remote.

USB extension cable
This 15-foot long cable is included to make it easier to connect the Light Meter to the computer.

Matrix Color Balance software on a USB drive
The Matrix Color Balance software runs on a Microsoft Windows platform capable of supporting the Microsoft .NET Framework 4.5. 32-bit and 64-bit versions on Windows are supported.

Setup & Operation Manual
This manual, on the same USB drive, provides the instructions needed to install and operate the hardware and software related to the Color Balance Kit.

Cordless presentation controller
The presentation controller allows you to remotely control commands on the computer screen. This is useful if you are working with a large wall. This tool is not necessary for operation of the software but is included for your convenience.
The routines for measuring colors allow the use of this wireless device to start the next measurement. Because it communicates with Windows like a USB keyboard device, it requires no driver installation. The USB receiver is a small "dongle" that stores conveniently in the presentation controller when not in use.
Note: You do not need to have WiFi enabled to use this device.

Installing the Software

Install the software.

1. Copy the Planar Matrix Color Balance folder to your computer. This can be in any location on your computer, but the usual location is **C:\Program Files**.

2. Once you've copied the folder, double click the **MatrixColorBalance.exe** file to run the program.

Compliance

Below is information related to RoHS compliance, and European Union Disposal disposal.

RoHS Compliance

The RoHS directive restricts the use of certain hazardous substances in electrical and electronic equipment in the European Union. The Matrix Color Balance kit is RoHS compliant.

European Union Disposal Information

English

- Disposal of old Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collection programs)

  This symbol found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources.

This symbol is only valid in the European Union.
If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Français

- Mise au rebut des équipements électriques et électroniques usagés (Valable dans l'ensemble de l'Union Européenne ainsi que dans les pays européens disposant de programmes distincts de collecte des déchets)

  Ce symbole appliqué sur votre produit ou sur son emballage indique que ce produit ne doit pas être traité comme un déchet ménager lorsque vous voulez le mettre au rebut. Il doit au contraire être remis à un site de collecte agréé pour le recyclage des équipements électriques et électroniques. En veillant à ce que ce produit soit mis au rebut de façon adéquate, vous contribuerez à prévenir les conséquences potentiellement négatives sur l'environnement et sur la santé humaine qui risqueraient de se produire en cas de mise au rebut inappropriée de ce produit. Le recyclage des matériaux contribuera également à économiser les ressources naturelles.

Ce symbole n'est valable que dans l'Union Européenne.
Si vous souhaitez mettre ce produit au rebut, veuillez prendre contact avec les autorités locales ou avec votre revendeur et renseignez-vous sur la méthode de mise au rebut correcte.

Deutsch

- Entsorgung von elektrischen & elektronischen Altgeräten (geltend für die europäische Gemeinschaft und andere europäische Länder mit separaten Sammelprogrammen)

  Dieses Symbol, zu finden auf Ihrem Produkt oder dessen Verpackung, macht Sie darauf aufmerksam, dass dieses Produkt bei der Entsorgung nicht als Hausmüll behandelt werden darf. Statt dessen sollte es an eine Sammelstelle zum Recycling von elektrischen und elektronischen Altgeräten gegeben werden. Helfen Sie mit, potenziell schädliche Einflüsse auf Umwelt und Gesundheit, die durch eine unsachgemäße Entsorgung dieses Produktes entstehen können, zu vermeiden und entsorgen Sie dieses Produkt ordnungsgemäß. Recycling hilft, natürliche Rohstoffe einzusparen.

Dieses Symbol ist nur innerhalb der europäischen Gemeinschaft gültig.
Wenn Sie dieses Produkt entsorgen möchten, wenden Sie sich bitte an Ihre örtliche Behörde und fragen Sie nach der ordnungsgemäßen Entsorgungsmethode.

Español

- Deshecho de equipos eléctricos y electrónicos (aplicable a la Unión Europea y a otros países europeos con programas de reciclaje independientes)

  La presencia de este símbolo en el propio producto o en su material de embalaje, indica que no se debe tratar como residuo doméstico cuando desee deshacerse de él. En su lugar, debe entregarlo en el punto limpio correspondiente de reciclaje de equipos eléctricos y electrónicos. Asegurándose de que este producto se desecha de forma correcta, ayudará a evitar posibles consecuencias negativas para la conservación del medioambiente y la salud humana, consecuencias que podrían darse si se deshace del producto de forma inadecuada. El reciclado de materiales ayuda a conservar los recursos naturales.

Este símbolo solamente es válido en la Unión Europea.
Si desea deshacerse de este producto, póngase en contacto con las autoridades locales o con su distribuidor y pida información sobre el método de disposición adecuado.

Italiano

- Smaltimento delle attrezzature elettriche ed elettroniche usate (applicabile in tutta la Comunità Europea ed altri Paesi Europei che applicano programmi di raccolta differenziata)

  Il simbolo trovato sul prodotto, o sulla sua confezione, indica che il prodotto non può essere trattato come i domestici quando è il momento di smaltirlo. Al contrario, deve essere consegnato ad un centro di raccolta specializzato nel riciclaggio di attrezzature elettriche ed elettroniche. Assicurando che il corretto smaltimento di questo prodotto, si aiuterà a prevenire potenziali conseguenze negative sull'ambiente e sulla salute umana, che possono essere provocate da uno scorretto smaltimento di questa attrezzatura. I materiali riciclati aiuteranno a conservare le risorse naturali.

Questo simbolo è valido solo nell'Unione Europea.
Per smaltire questo prodotto, mettersi in contatto con le autorità locali – o con il rivenditore – e chiedere informazioni sul corretto metodo di smaltimento.

Nederlands

- Verwijderen van oude elektrische en elektronische apparatuur (toepasselijk in de volledige Europese Unie en andere Europese landen met afzonderlijke programma's voor afvalverzameling)

  Dit symbool dat op het product of zijn verpakking is aangebracht, geeft aan dat dit product niet mag worden behandeld als huishoudelijk afval als u het wilt wegwerpen. U moet het afgeven bij een specifiek verzamelpunt voor de recyclage van elektrische en elektronische apparatuur. Door te garanderen dat u dit product op de correcte manier wegwerpt, helpt u potentiële negatieve gevolgen voor het milieu en de menselijke gezondheid, die zouden kunnen worden veroorzaakt door een onrechtmatig wegwerpen van het product, te voorkomen. De recyclage van materialen helpt het behoud van natuurlijke bronnen.

Dit symbool is alleen geldig in de Europese Unie.
Als u dit product wenst weg te gooien, dient u contact op te nemen met uw lokale instanties voor details over de gepaste methode voor afvalverwijdering.

Português

- Eliminação de equipamentos eléctricos e electrónicos usados (aplicável na União Europeia e noutros países europeus com programas próprios de recolha destes equipamentos)

  Este símbolo, colocado no produto ou na respectiva embalagem, indica que o produto não deve ser tratado como lixo doméstico aquando da sua eliminação. Em vez disso, deve ser entregue num ponto de recolha de equipamentos eléctricos e electrónicos para posterior reciclagem. Ao garantir a correcta eliminação deste produto, estará a evitar consequências potencialmente negativas tanto para o ambiente como para a saúde humana. A reciclagem de materiais ajuda a preservar os recursos naturais.

Este símbolo apenas é válido na União Europeia.
Se quiser eliminar este produto, contacte as entidades locais ou o seu fornecedor para ficar a saber qual o método de eliminação correcto.

Polski

- Usuwanie zużytego sprzętu elektrycznego i elektronicznego (Dotyczy krajów Unii Europejskiej i innych krajów europejskich z oddzielnymi programami zbiórki odpadów)

  Obecność tego symbolu na produkcie lub na opakowaniu z produktem oznacza, że tego produktu nie można wyrzucać razem z odpadkami domowymi. Należy go przekazać do punktu zbiórki w celu poddania recyklingowi podzespołów elektrycznych i elektronicznych. Usunięcie tego produktu w prawidłowy sposób, pomoże w zabezpieczeniu przed negatywnym wpływem odpadów na środowisko i zdrowie ludzi, powodowanym przez niewłaściwe usuwanie produktu. Przetwarzanie materiałów pomaga w zachowaniu zasobów naturalnych.

Ten symbol obowiązuje wyłącznie w krajach Unii Europejskiej.
Informacje dotyczące prawidłowej metody usunięcia tego produktu, można uzyskać u władz lokalnych lub u dostawcy.

Waste Electrical and Electronic Equipment (WEEE) Directive In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling. EEE complies with Directive 'Regulation on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment'

Waste Electrical and Electronic Equipment (WEEE) Yönergeleri Avrupa Birliği'nde bu etiket, ürünün ev elektroniği aletleri atıkları ile imha edilemeyeceğini gösterir. Kurtarmak ve geri dönüşümünü sağlamak için uygun şartlarda saklanması gerekir. EEE Yönetmeliğine Uygundur Ve Elektronik Eşyalarda Bazi Zararli Maddelerin Kullaniminin Sinirlandirilmasina Dair Yönetmelik.

Svenska

- Avfall av förbrukad elektrisk och elektronisk utrustning (Tillämpbart i hela Europeiska unionen och andra europeiska länder med separata samlingsprogram)

  Den här symbolen som finns på din product eller på dess förpackning påvisar att produkten inte ska behandlas som hushållsavfall när du vill slänga bort den. Istället ska den lämnas över till en lämplig uppsamlingspunkt för återvinning av elektriska och elektroniska utrustningar. Genom att tillförsäkra att den här produkten återvinns på ett riktigt sätt hjälper du till med att förhindra möjliga negative konsekvenser för miljön och mänsklig hälsa. Det kan annars orsakas på grund av olämplig sophantering av den här produkten. Återvinning av material kommer att hjälpa till att bevara naturtillgångar.

Den här symbolen är endast giltig inom den Europeiska unionen.
Om du vill slänga bort den här produkten ska du kontakta lokala myndigheter eller återförsäljar, och fråga efter lämplig avfallsmetod

Suomi

- Vanhojen sähkö- ja elektroniikkalaitteiden hävittäminen (Sovelluva kaikkialla Euroopan unionin alueella, sekä muissa Euroopan maissa, joilla on erilliset keräysohjelmat)

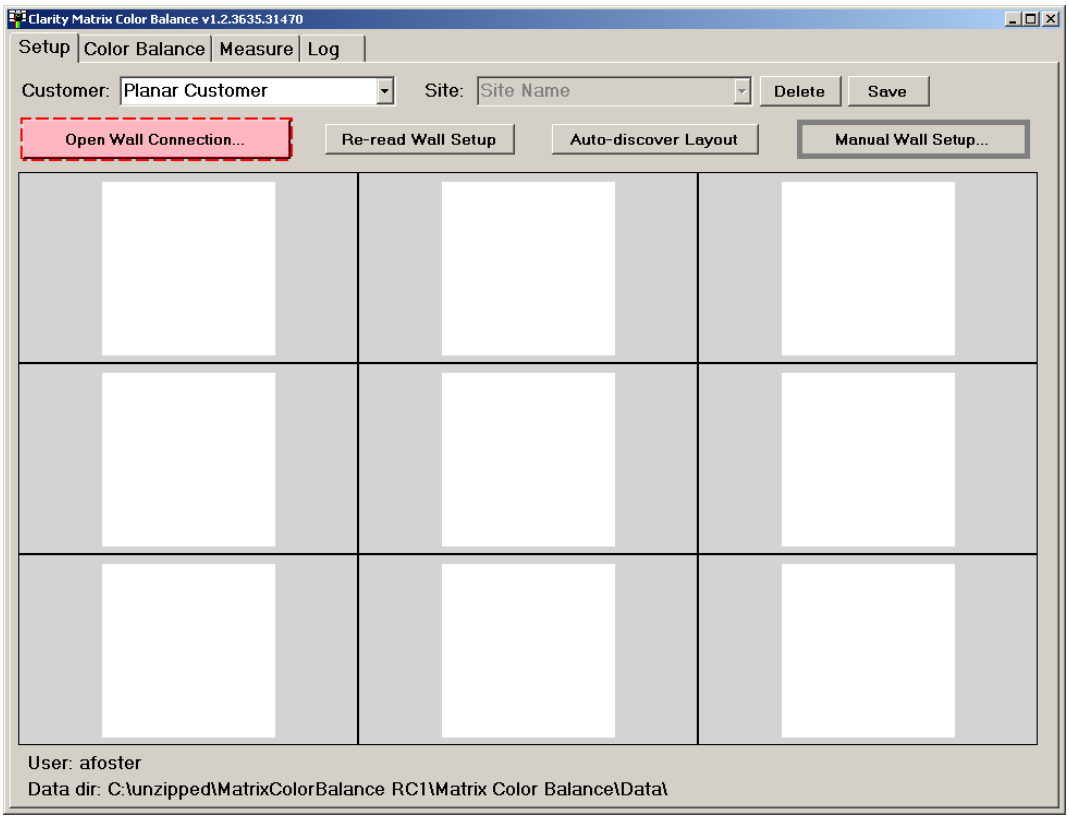
  Jos tuotteessa tai sen pakkauksessa on tämä symboli, sitä ei pidä hävitettäessä käsitellä tavallisena kotitalousjätteenä, vaan se kuuluu toimittaa sähkö- ja elektroniikkalaitteiden kierrätyspisteeseen. Varmistamalla, että tämä tuote hävitetään asiaankuuluvalla tavalla autat estämään mahdollisia ympäristölle ja ihmisille koituvia negatiivisia seuraamuksia, joita sen vääränlainen hävittäminen voi aiheuttaa. Materiaalien kierrättäminen auttaa säilyttämään luonnonvaroja.

Tämä symboli on voimassa ainoastaan Euroopan unionin alueella.
Jos haluat hävittää tämän tuotteen, ota yhteyttä paikallisiin viranomaisiin tai jälleenmyyjään ja tiedustele

Setting Up the Wall Layout

To open the software, run the executable file **MatrixColorBalance.exe**. When you first launch the program, it will look like the example below.

Before you connect to the display wall, make sure all other command connections to the wall are either disconnected or otherwise paused or stopped.



Entering Customer and Site Name

The customer and site name are used to identify result files generated during the color balance.

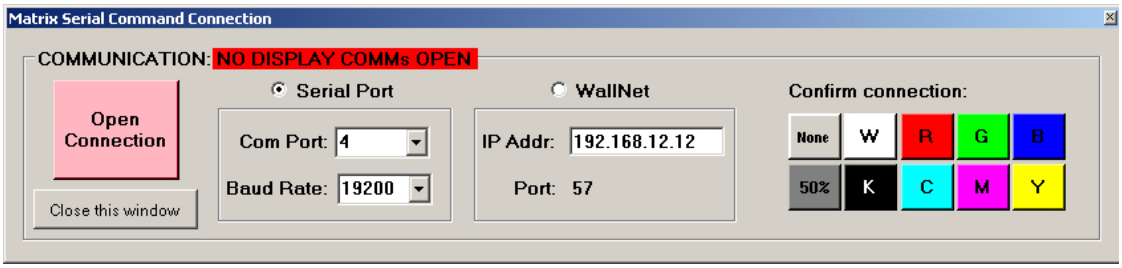
1. On the Setup tab, type the customer name in the CUSTOMER box.
2. Type a site name in the SITE box.
3. Click SAVE to save the customer and site information.

Note: After the first time you set up customer and site information, you can simply select that information from the dropdown lists. To remove a site, select it from the dropdown and then click the DELETE button.

Opening the Wall Connection

Whenever a wall connection is opened, the program reads the wall layout and IDs from the master (A1) Quad controller module.

1 On the Setup tab, click the OPEN WALL CONNECTION button. The following window appears.



2 Do one of the following:

- To use the serial port on your computer, select the SERIAL PORT radio button.
- To use WallNet over a network, select the WALLNET radio button.

WARNING You can measure through WallNet but for backlight and color balance, you must use a serial port connection.

3 Select the port number from the COM PORT dropdown, which corresponds to your computer's serial port.

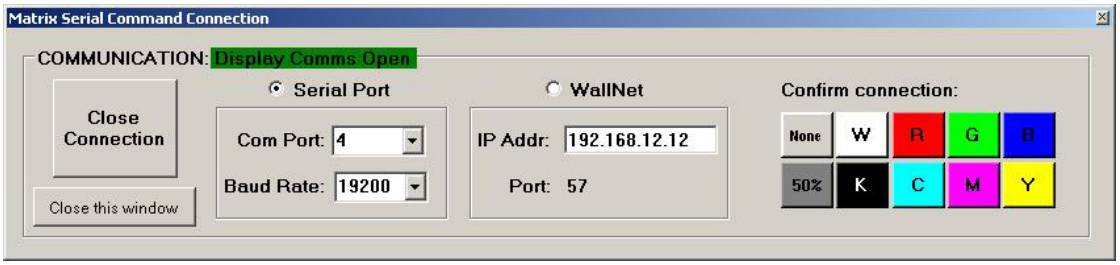
4 Select the appropriate baud rate from the BAUD RATE dropdown. This must match the Clarity Matrix Wall baud rate.

5 For a WallNet connection, enter the IP address of the WallNet in the IP ADDR box.

6 Click the red OPEN CONNECTION button. If the connection opens, this button will show CLOSE CONNECTION and the message "Display Comms Open" appears in a green box.

Note: If this message does not change, check your cables, serial port settings, network settings and display IDs, and then try again.

7 Once the connection is open, you can dismiss this window by clicking the CLOSE THIS WINDOW button or by clicking the X in the top right corner.

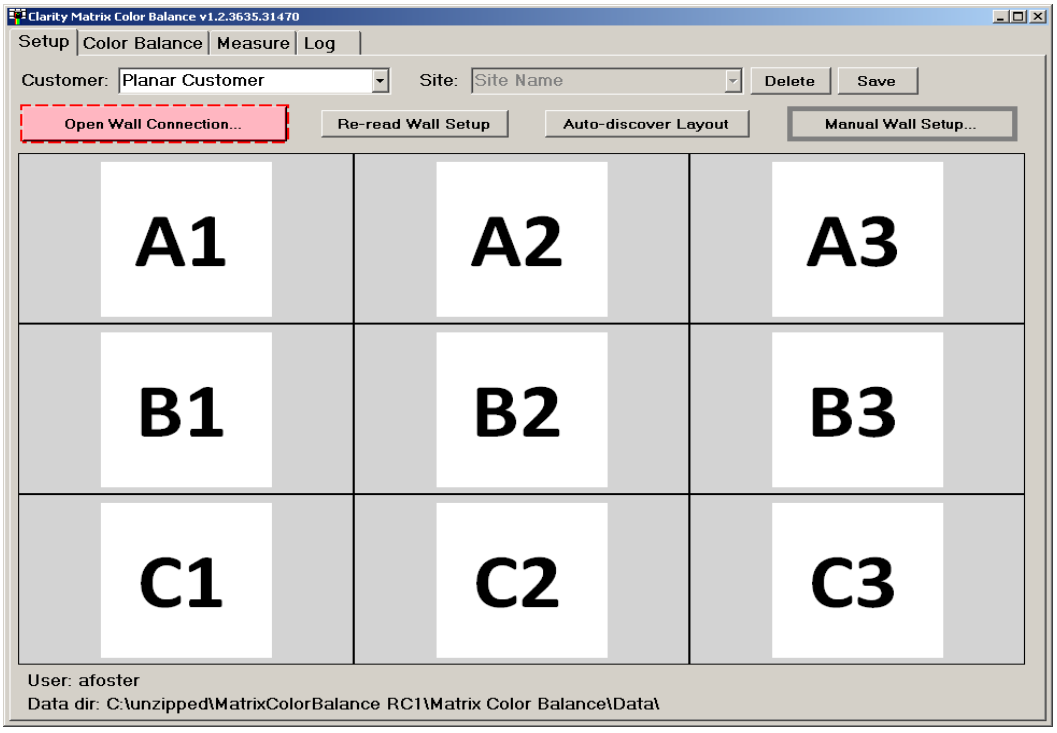


Note: Every time you successfully open a connection, your settings are saved for the next time you start the program.

Verifying Layout and IDs

Before continuing, it is important to verify that the program has read the wall layout and IDs correctly. The main area of the Setup tab shows a graphical representation of the wall. The width and height of the wall should match and each ID should be in the correct position that corresponds to your wall.

If what you see does not match, you may need to use the manual wall setup and force functions. These are **not** needed in normal operations. For more information, see "Advanced Setup" on page 20.



Note: If your wall connection is open but the layout was not read correctly, you can click the RE-READ WALL SETUP button to try reading the layout and IDs again.

Color Balancing the Wall

The following sections explain how to color balance your wall using the controls on the Color Balance tab.

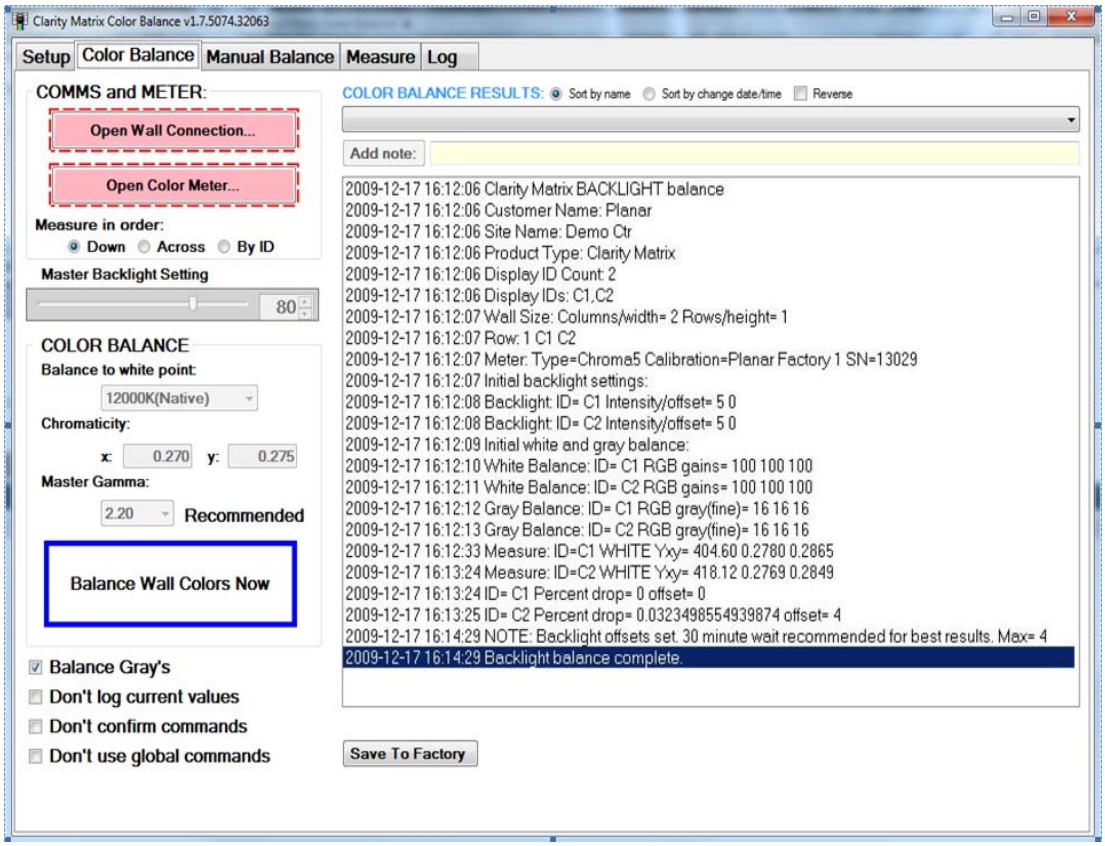
Opening Connections

Before you can color balance or measure the wall, you need to open the wall connection and the color meter.

To open the wall connection, follow the instructions in "Opening the Wall Connection" on page 6. As a convenience, the same button also appears on the Color Balance tab.

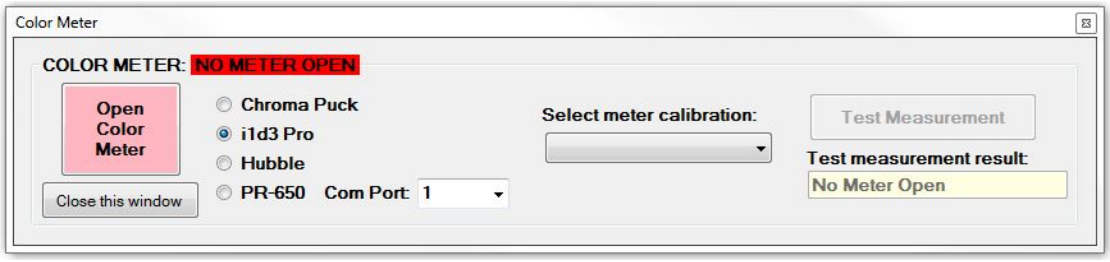
To open the color meter, complete the following steps.

1. Attach the Light Meter to the USB port.
2. Select the Color Balance tab.



Note: This example shows the program with the connection and color meter open.

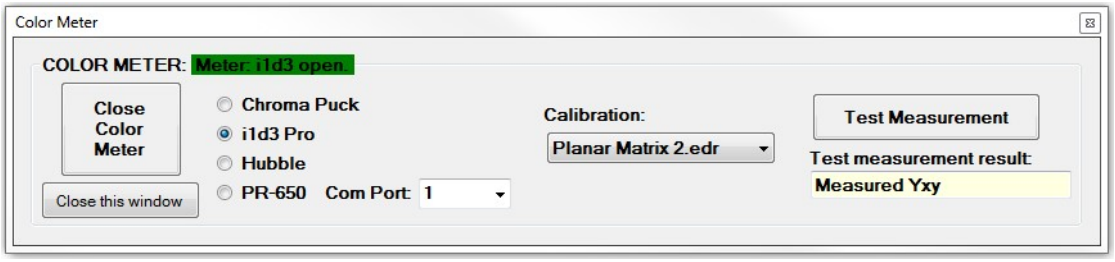
3 Click the OPEN COLOR METER button. The following window appears.



4 Select the I1D3 PRO radio button.

5 Click the red OPEN COLOR METER button. In a few seconds, a "Meter:i1D3 open" message should appear on the Color Balance tab and the OPEN COLOR METER button will show CLOSE COLOR METER.

6 Select the PLANAR MATRIX 2.EDR calibration from the Calibration list as shown.

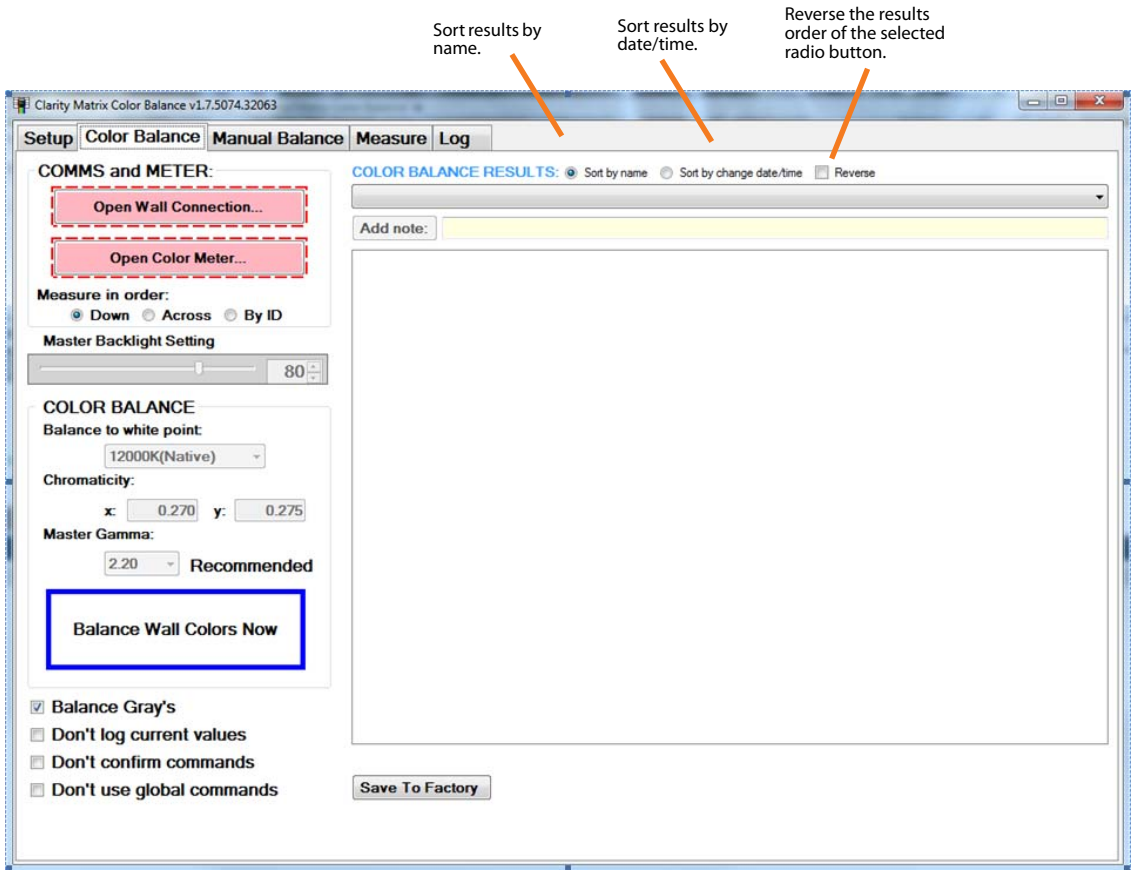


7 When you are finished, you can dismiss this window by clicking the CLOSE THIS WINDOW button or by clicking the X in the top right corner.

Color Balancing the Wall

Use the following instructions to color balance the wall.

1 Select the Color Balance tab.



2 Before you start the color balance process, make sure the CONNECTION and METER buttons are both green.

3 If you want to change the white point to which the balance will be targeted, select it from the BALANCE TO WHITE POINT dropdown. If you want to create a custom one, select CUSTOM from the dropdown and then enter the desired chromaticity in the X and Y boxes.

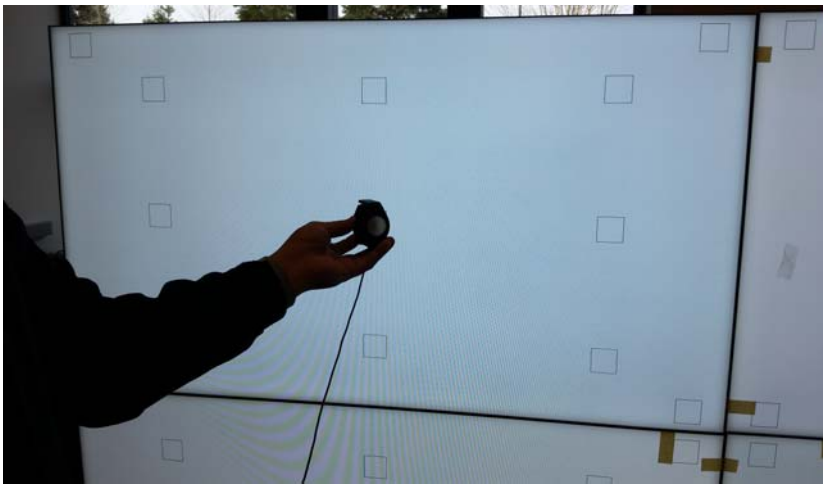
4 The MASTER GAMMA sets the target response function for the displays. In most cases, you can leave the default of 2.20 in the MASTER GAMMA dropdown. If you require a specific gamma that is different than 2.20, select the value from the dropdown.

5 Click the BALANCE WALL COLORS NOW button.

6 The following dialog box appears as the color balance starts.

7 For each display, the color balance will measure red, green, blue and several levels of white and gray.

8 Place the Light Meter on the display over the center box of the uniformity pattern.



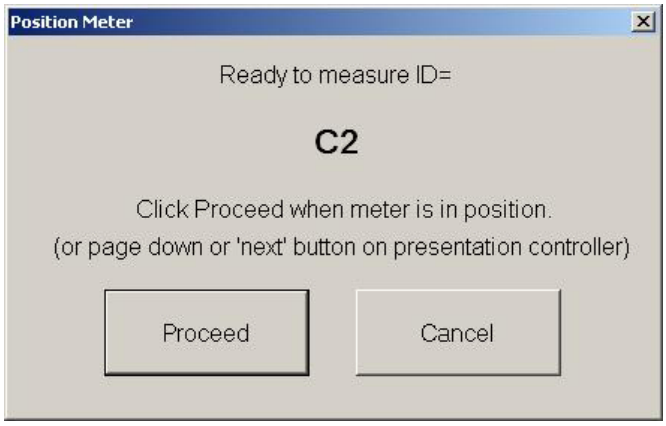
WARNING Don't apply much pressure to the front surface of the LCD while measuring. Since there is no protective cover over the LCD, any deformation of the liquid crystal material can interfere with accurate measurements.

Measure with the diffuser rotated away from the measurement lens.

Diffuser Cover On

Diffuser Cover Off Halfway, with Lens Showing

9 The Measure Proceed popup appears. Click PROCEED on the computer screen or click the right arrow on the presentation controller to continue.



10 The color balance will proceed from display to display in the order specified by the selected MEASURE IN ORDER radio button on the Color Balance tab.

11 If you have additional displays to color balance, move the Light Meter to the next display and repeat steps 8-10 of this section.

12 The Balance Colors progress dialog box appears while setting and confirming the final balance values. **Note that if you cancel the operation, the wall may be left in an unbalanced state.**

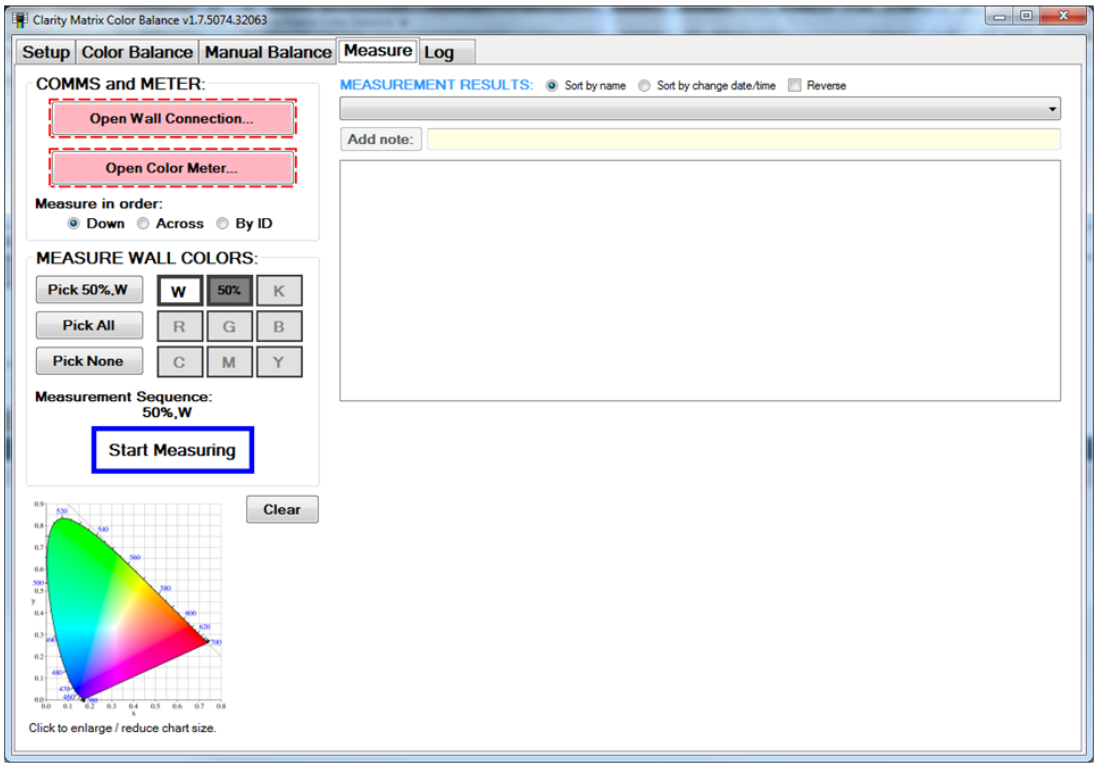
13 When the color balance is complete, the progress dialog box will disappear. If you want to confirm that the color balance was successful, look for the "Color balance complete" message on the Log tab.

Measuring the Wall

With both the wall and color meter connections open, use the following instructions to measure your wall.

1. Select the Measure tab.

2. Before measuring the wall, make sure the OPEN WALL CONNECTION and OPEN COLOR METER buttons are both green.

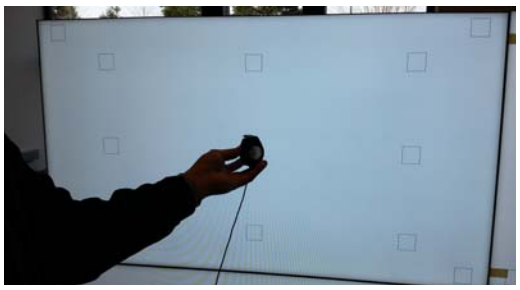


3. We recommend that you use the default PICK 50%, W option to measure your wall. The measurement process will follow the colors in the preset options you selected.

Note: The other options are available for diagnostic purposes.

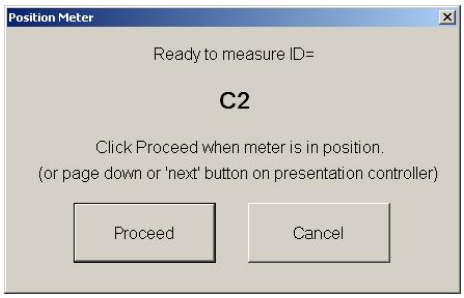
4. Click the START MEASURING button to start a wall measurement routine of the colors you have picked to measure.

5 Place the Light Meter on the display over the center box of the uniformity pattern.



WARNING Don't apply much pressure to the front surface of the LCD while measuring. Since there is no protective cover over the LCD, any deformation of the liquid crystal material can interfere with accurate measurements.

6 The Measure Proceed popup appears. Click PROCEED on the computer screen or click the right arrow on the presentation controller to continue.

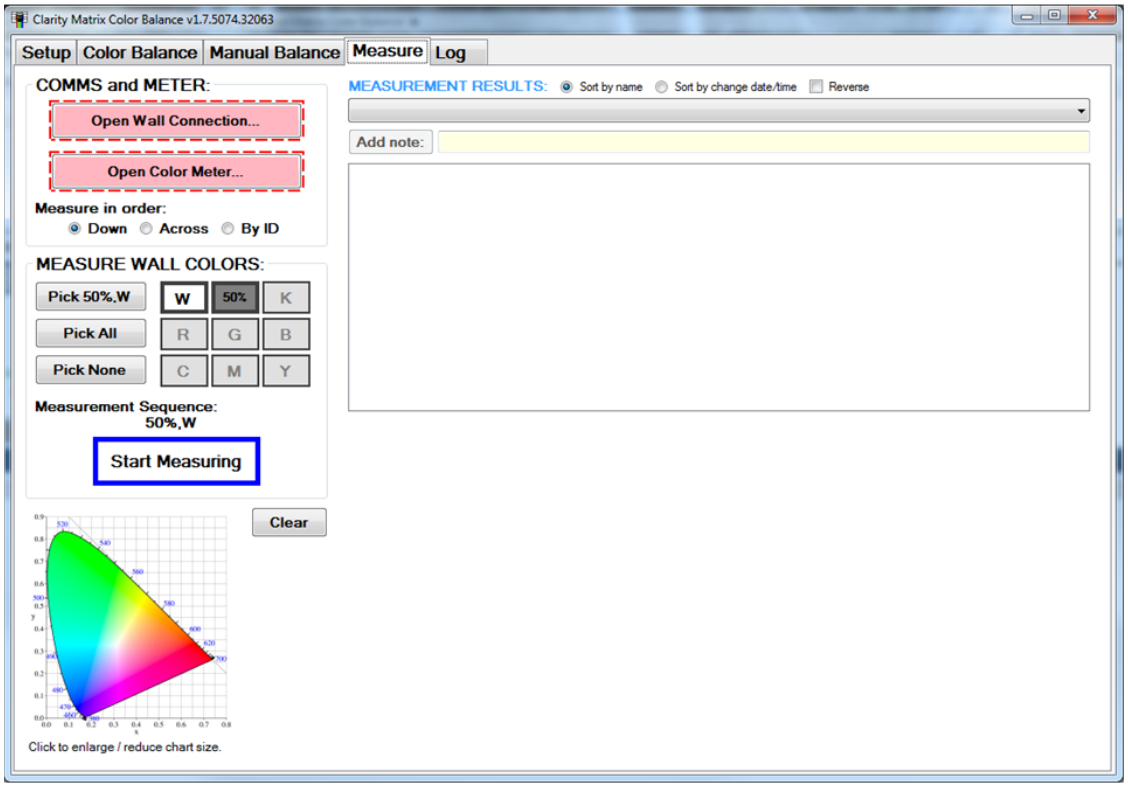


7 The measurement will proceed from display to display in the order specified by the selected MEASURE IN ORDER radio button on the Measure tab.

8 You will see the test patterns displayed in the order of colors you selected.

9 As each measurement occurs, the result is displayed in the list window on the right side of the main Measure tab window. This is also recorded in a "WallMeasurement##..." file in the Data folder, which was created at program startup in the same folder where the program resides. Analysis is only computed for gray and white.

Note: For more information about the different data files, see "Output Files" on page 23.



10 If you have additional displays to measure, move the Light Meter to the next display and repeat steps 5-9.

11 At the end of the measurement sequence, analysis of the data (min/max brightness and colors) will occur and be appended to the bottom of the MEASUREMENT RESULTS file shown on the right side of the window.

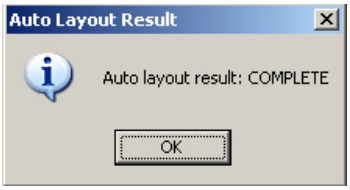
Advanced Setup

This section describes advanced options that will not need to be used in most normal setups.

Auto Discover Layout

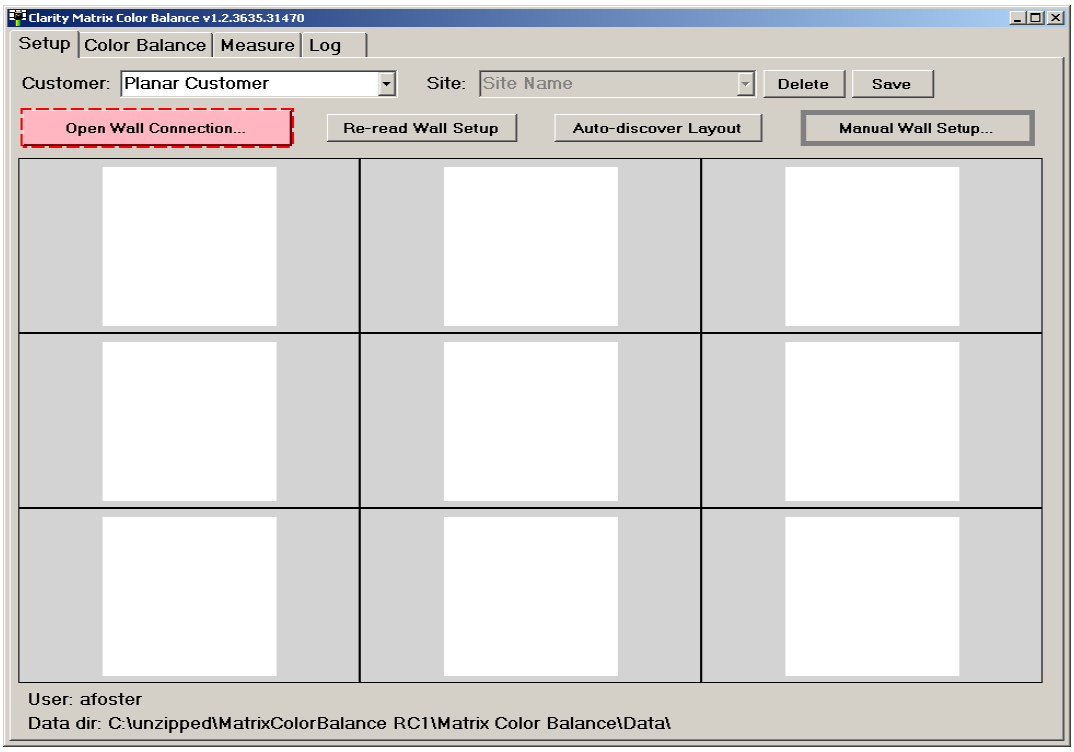
On the Setup tab, the AUTO-DISCOVER LAYOUT button is simply a convenience if you need to run the same function as the on-screen MATRIX LAYOUT menu (WALL CONFIGURATION > MATRIX LAYOUT > AUTO).

If you want to "auto discover" the Matrix wall layout, click the AUTO-DISCOVER LAYOUT button. When the process is complete, the following dialog box appears.



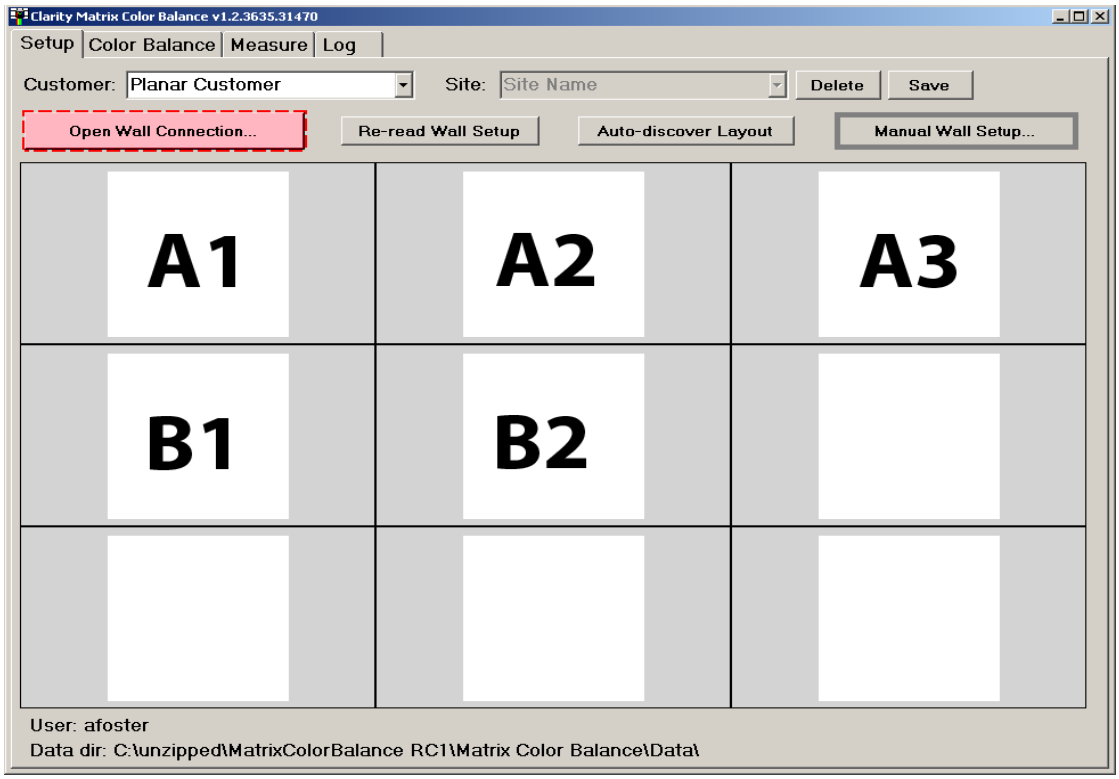
Manual Wall Setup

If you want to manually set up the wall layout, click the MANUAL WALL SETUP button. You should only need to use this function if you have a bad position sensor or have a non-rectangular installation.



1 You can set the number of columns and rows either by entering them in the WIDTH and HEIGHT boxes or by dragging the arrows in the upper left corner of the window.

2 To set the unit ID, simply click your mouse on the display for which you want to start. Continue clicking on the displays to assign IDs in order.



3 To jump to the first ID of the next module (for example, B1), right-click anywhere in the wall.

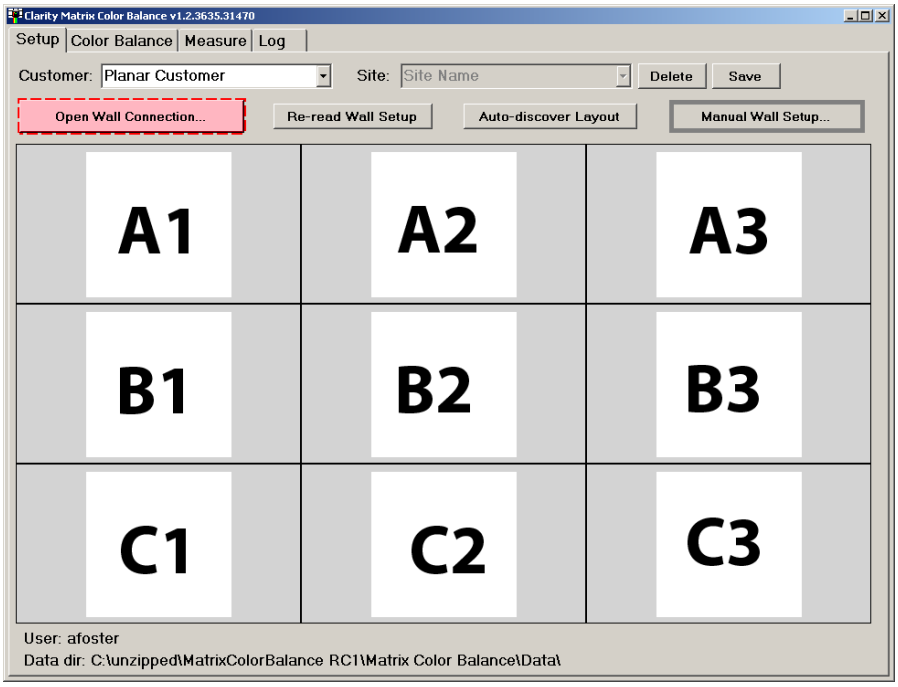
Note: If you make a mistake with the unit ID setup, you can enter the ID on which you want to start in the CLICK TO SET ID box.

4 If you have set up your wall and want to clear the layout so you can start over, click the CLEAR IDS button.

5 To override a bad position sensor or force a non-rectangular setup, click the FORCE button. If you want to continue with the force layout, click YES on the dialog box that appears. This sends serial commands to the wall that override the position sensors until the next time you cycle power on the wall.

Note: After forcing position of the wall, an auto discovery is started. The results of the discovery are saved in non-volatile memory on the wall.

6 When you are finished with your manual wall setup, click DONE to close the window and return to the main Setup tab. You will now see your layout on the main Setup tab.



Clear Forced Layout

Clear Forced Layout returns position sensors to their default settings and starts an auto discovery. Use the Clear Forced Layout function to undo a previous forced layout.

Output Files

There are several separate file types that are created when using the Matrix Color Balance software. All files are created/stored in the Data folder, which is created at program startup in the same directory as the **MatrixColorBalance.exe** application.

The types of files are:

- **ColorBalanceResult##<customername>##<sitename>##<username>.csv**
  This records the results of a color balance.
- **CustomerSites##<username>##<date>.csv**
  This contains a log of every customer site entered on the Setup tab.
- **Log##<username>##<date>.csv**
  This matches information on the Log tab and contains a log of every action taken on a given day during the program and measurement process.
- **WallMeasurement##<customername>##<sitename>##<username>.csv**
  This records the results of a wall measurement.

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