Dichroic Theatre Series

User Manual

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Declaration of Conformity
according to ISO/IEC Guide 22 and EN45104

Manufacturer's name: High End Systems, Inc.

Distributor's name: High End Systems, Inc.
Distributor's address: 2217 West Braker Lane
Austin, Texas 78758 USA

Declares that the product
Product Name: ColorPower
Product Number: All
Product Options: All

conforms to the following EEC directives:
73/23/EEC, as amended by 93/68/EEC
89/336/EEC, as amended by 92/31/EEC and 93/68/EEC

Equipment referred to in this declaration of conformity was first manufactured in compliance with the following standards in 2003:

Safety: EN60950:2000

EMC: EN55022: 1998: Class A ITE
EN61000-3-2
EN61000-3-3
EN55024:1998
EN61000-4-2: Level 3, Class 2
EN61000-4-3: 1995 Level 2 (3V/m)
EN61000-4-4: 1995 Level 2 (1/.5kV)
EN61000-4-5: 1995 Level 3 (2/1kV)
EN61000-4-6: 1965 Level 2 (3Vrms)
EN61000-4-11:1994

USA, Wednesday, January 07, 2004
Kenneth Stuart Hansen, Compliance Engineer

Product Modification Warning

High End Systems products are designed and manufactured to meet the requirements of United States and International safety regulations. Modifications to the product could affect safety and render the product non-compliant to relevant safety standards.

Mise En Garde Contre La Modification Du Produit
Les produits High End Systems sont conçus et fabriqués conformément aux exigences des règlements internationaux de sécurité. Toute modification du produit peut entraîner sa non conformité aux normes de sécurité en vigueur.

Produktmodifikationswarnung
Design und Herstellung von High End Systems entsprechen den Anforderungen der U.S. Amerikanischen und internationalen Sicherheitsvorschriften. Abänderungen dieses Produktes können dessen Sicherheit beeinträchtigen und unter Umständen gegen die diesbezüglichen Sicherheitsnormen verstoßen.

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I prodotti di High End Systems sono stati progettati e fabbricati per soddisfare i requisiti delle normative di sicurezza statunitensi ed internazionali. Qualsiasi modifica al prodotto potrebbe pregiudicare la sicurezza e rendere il prodotto non conforme agli standard di sicurezza pertinenti.

Advertencia De Modificación Del Producto
Los productos de High End Systems están diseñados y fabricados para cumplir los requisitos de las reglamentaciones de seguridad de los Estados Unidos e internacionales. Las modificaciones al producto podrían afectar la seguridad y dejar al producto fuera de conformidad con las normas de seguridad relevantes.

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Important Safety Information

Instructions pertaining to continued protection against fire, electric shock, exposure to excessive ultraviolet (UV) radiation, and injury to persons are found in Appendix A.

Please read all instructions prior to assembling, mounting, and operating this equipment.

Important: Informations De Sécurité

Les instructions se rapportant à la protection permanente contre les incendies, l'électrocution, l'exposition à un rayonnement ultraviolet (UV) excessif et aux blessures corporelles se trouvent dans l'Annexe A.

Veuillez lire toutes les instructions avant d'assembler, de monter ou d'utiliser cet équipement.

Wichtige Sicherheitshinweise

Sicherheitsanleitungen zum Schutz gegen Feuer, elektrischen Schlag, übermäßige UV-Strahlung und Verletzung von Personen finden Sie in Anhang A.

Vor der Montage, dem Zusammenbau und der Intbetriebnahme dieses Geräts alle Anleitungen sorgfältig durchlesen.

Informazioni Importanti Di Sicurezza

Le istruzioni sulla protezione da incendi, folgorazione, esposizione eccessiva a raggi ultravioletti (UV) e infortuni sono contenute nell'appendice A.

Si prega di leggere tutte le istruzioni prima di assemblare, montare e azionare l'apparecchiatura.

Informacion Importante De Seguridad

En el Apéndice A se encuentran instrucciones sobre protección continua contra incendios, descarga eléctrica, exposición excesiva a radiación ultravioleta (UV) y lesiones personales.

Lea, por favor, todas las instrucciones antes del ensamblaje, montaje y operación de este equipo.

Symbols

The following international caution and warning symbols appear in margins throughout this manual to highlight messages.

Caution: **This symbol appears adjacent to Caution messages. Not heeding these messages could result in personal injury and/or damage to equipment.**

Warning: **This symbol appears adjacent to high voltage warning messages. Not heeding these messages could result in serious personal injury.**

This symbol indicates that a fire hazard is present. Not heeding these messages could result in serious personal injury.

This symbol indicates that eye protection is required.

This symbol indicates an explosion hazard.

This symbol indicates the minimum distance to a lighted object, which in this case, is 1 meter.

This symbol indicates a hot surface.

This symbol indicates that an object not be mounted on a flammable surface

Warranty Information

Limited Warranty

Unless otherwise stated, your *Product unit* is covered by a one year parts and labor limited warranty. Dichroic filters are not guaranteed against breakage or scratches to coating. It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.

Returning an Item Under Warranty for Repair

It is necessary to obtain a Return Material Authorization (RMA) number from your dealer or point of purchase BEFORE any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. Lamps are covered by the lamp manufacturer's warranty.

Any Product unit or parts returned to High End Systems must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts and with an RMA number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction. Ship returned Product units or parts to: 2209B Rutland, Suite 110, Austin, TX 78758 USA.

> *Note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.*

Freight

All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the Continental United States. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the Continental United States.

REPAIR OR REPLACEMENT AS PROVIDED FOR UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. HIGH END SYSTEMS, INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO ANY PRODUCT, AND HIGH END SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGH END SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGE, INCLUDING LOST PROFITS, SUSTAINED OR INCURRED IN CONNECTION WITH ANY PRODUCT OR CAUSED BY PRODUCT DEFECTS OR THE PARTIAL OR TOTAL FAILURE OF ANY PRODUCT REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, AND WHETHER OR NOT SUCH DAMAGE WAS FORESEEN OR UNFORESEEN.

Warranty is void if the Product is misused, damaged, modified in any way, or for unauthorized repairs or parts. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Table of Contents

Chapter 3:   Operation

Appendix A: Important Safety Information

Appendix B: ColorCommand Installation

Appendix C: ColorMerge Installation

List of Figures

Chapter 1:
Features and Specifications

This manual includes information for the ColorPower™ power supply, the ColorCommand™ fixture, and the ColorMerge™ module. These are the first of the new Dichroic Theatre series of products from High End Systems®. Features and specifications for each product in the series are listed below.

ColorPower Supply

The ColorPower supply is designed for use with Dichroic Theatre Series fixtures and modules. Each ColorPower supply can provide power and data for up to 12 color mixing units. You can either manually assign a DMX start address for each unit linked to ColorPower or allow ColorPower to assign the DMX start addresses automatically. The front panel on ColorPower has an LED (Light Emitting Diode) display that enables you to access the menu system to configure linked Dichroic Theatre Series fixtures and assign DMX start channels.
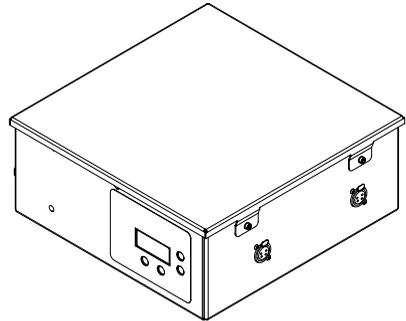
ColorPower Features

• Provides local data for up to 12 Dichroic Theatre Series units in any combination.

• Menu system for easy DMX addressing of attached color mixing units.

• Lightweight and easy to mount.

ColorPower Specifications

Mechanical

Height: 137 mm (5.4 in)

Width: 311 mm (12.3 in)

Depth: 309 mm (12.2 in)

Weight: 5.9 kg (13 lb)

Electrical

Power Output Ratings:

   40VDC / 750mA

Power Input Ratings:

   120V/230V, 50/60Hz @ 3A / 1.5A

Environmental Specifications

Max. ambient temperature:
   Ta =40°C (104°F)

Figure 1-1 ColorPower Physical Dimensions

Max. exterior surface temperature: T max=100°C (212°F)

Min. distance to flammable objects: .3 meter (12 in)

Cabling and Terminator Specifications

DMX 512 Link: 5-Pin XLR RS-485 data cable. Use Belden® 9842 or equivalent (meets specifications for EIA RS-485 applications) data cables with the following characteristics:

- Two twisted pairs (4-conductors) plus a shield

- Maximum capacitance between conductors: <15 pF/ft.

- Maximum capacitance between conductor and shield: 55 pF/ft.

- Maximum resistance: 20 Ω/1000 ft.

- Nominal impedance: 120 Ω.

ColorPower Supply Link: 4-Pin XLR DATAPLEX Color Changer cable.

Maximum combined cable length per ColorPower supply: 182.9 m (600 ft)

Terminators: 120 Ω

ColorCommand Fixture
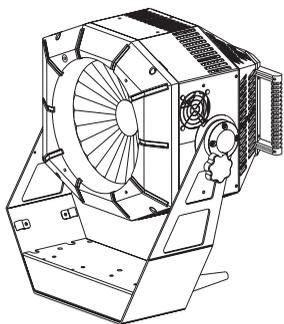
ColorCommand is a highly-versatile color mixing washlight that uses a simple, compact incandescent lamp and an innovative patented dichroic color mixing system. Because ColorCommand colors the whole beam simultaneously, it ensures a smooth, even field and allows you complete freedom when color mixing and adjusting beam size. ColorCommand produces a huge range of colors, from subtle pastels to deep saturates. ColorCommand can snap between one color and another in less than 1/3 second, or make slow, controlled fades.

ColorCommand uses dichroic borosilicate glass, which will not fade or change color, so the color you create during rehearsals is the same color you will see a week, month, or year later. There are no gel scrolls to burn out or replace, and ColorCommand can be used anywhere you would currently use a PAR can, Fresnel, or PC fixture. See Appendix B for ColorCommand installation and maintenance.

ColorCommand Features

- Philips Halogen Biplanar 750W or 800W lamp with a color temperature of 3200K matching other incandescent fixtures.
- Intregal, fully variable beam angle adjustable from 8° - 13°
- 18° - 32° field angle
- 270° tilt
- 1 meter minimum focus distance
- Lamp relay to automatically shut off the lamp if the power is disconnected or the cable is removed
- Compact and lightweight (similar in size to a PAR can)
- Fat output beam (8 inches (200 mm) in diameter)
- Smooth color mixing (including pastel and saturated colors)
- Fully dichroic colors that never fade
- Full control over color mixing from smooth, stepless movement (allowing slow, imperceptible color fades) to rapid snap color changes
- Quiet performance even during snap color changes
- Even, soft-edged wash with good beam distribution for easy blending
- Live color fading from one color to another at any speed
- Very little light spill
- Fits accessories such as barn doors, top hats, and snoots
- Operates on 4 DMX channels: Yellow, Magenta, Cyan, and Beam Angle Adjust

ColorCommand Specifications

Mechanical

(with yoke attached)

Height: 445 mm (17.5 in)

Width: 400 mm (15.8 in)

Depth: 350 mm (13.8 in)

Weight: 9.1 kg (20 lb)
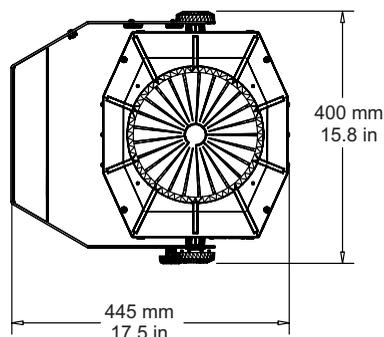
Electrical

Power Consumption:
  800 watts max

Fuse:
  125V, 2.5A, Slow Blow SMF

Power Input Ratings:
  115V, 50/60Hz @ 7A
  230V, 50/60Hz @ 3.5A

Environmental Specifications

Max. ambient temperature: Ta =40°C (104°F)

Max. exterior surface temperature: T max=200°C (392°F)

Min. distance to flammable objects: 1 meter (3.28 ft)

Min. distance to lighted object: 1 meter (3.28 ft)
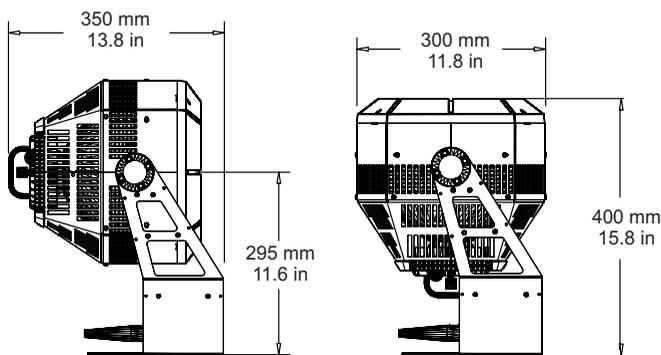
Figure 1-2 ColorCommand Physical Dimensions

Lamp Specifications

Lamp: Philips Halogen Biplanar

Lamp Type	Lamp Life	Color Temperature
750W / G9.5 / 115V	300 hours	3200K
800W / G9.5 / 230V	400 hours	3100K

Typical Field Lumens: 5000

Cabling and Terminator Specifications

ColorPower Supply Link: 4-Pin XLR DATAPLEX Color Changer cable.

Maximum combined cable length per ColorPower supply: 182.9 m (600 ft)

Terminators: 120 Ω
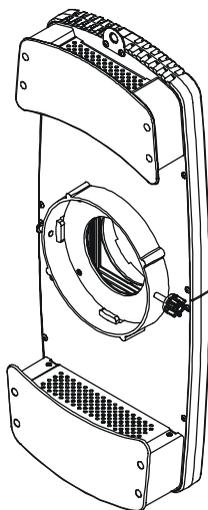
ColorMerge Module

The ColorMerge module is an innovative dichroic color mixing accessory for the ETC Source Four™ ellipsoidal fixture. ColorMerge gives you the freedom to mix any color as well as perform live fades from one color to another smoothly, silently, and cleanly.

ColorMerge attaches between the rear housing assembly and the front barrel assembly of the Source Four, and does not interfere with the gate area. You can still use patterns, irises, gobo changers, and all the usual accessories with your Source Four™ fixture. Like all Dichroic Theatre Series products, ColorMerge uses dichroic borosilicate glass which will not fade or change color. So, the color you create during rehearsals is the same color you will see a week, month, or year later. And, there are no gel scrolls to burn out or replace. See Appendix C for more information on Installing and Maintaining ColorMerge modules.

ColorMerge Features

- Easy Installation (locks onto existing bayonet lens mount with no modifications)
- High-efficiency dichroics (less light loss with dichroic color than with a gel)
- No interference with Source Four optics (use with any lens type)
- Smooth color mixing (including pastel and saturated colors)
- Fully dichroic colors that never fade
- Full control over color mixing from smooth, stepless movement (allowing slow, imperceptible color fades) to rapid color changes
- Silent operation (no fans)
- Live color fading from one color to another at any speed with no strange, intermediate colors
- No interference with Source Four's gobos, irises, or gobo rotators
- Operates on 3 DMX channels: Yellow, Magenta, and Cyan

ColorMerge Specifications

Mechanical

Height: 604 mm (23.8 in)

Width: 246 mm (9.7 in)

Depth: 122 mm (4.8 in)

Weight: 5.9 kg (13 lb)

Shipping Weight 7.7 kg (17 lb)

Electrical

Fuse: 125V, 2.5A,
     Slow Blow SMF

Environmental Specifications

Max. ambient temperature:
   Ta =40°C (104°F)

Max. exterior surface temperature: T max=200°C (392°F)

Note: For more information, see the Source Four™ User Manual.

Figure 1-3 ColorMerge Dimensions

Lamp Specifications

Lamp type: HPL lamp only. See the ETC™ Source Four™ Ellipsoidal User Guide for more information.

Cabling and Terminator Specifications

ColorPower Supply Link: 4-Pin XLR DATAPLEX Color Changer cable.

Maximum combined cable length per ColorPower supply: 182.9 m (600 ft)

Terminators: 120 Ω
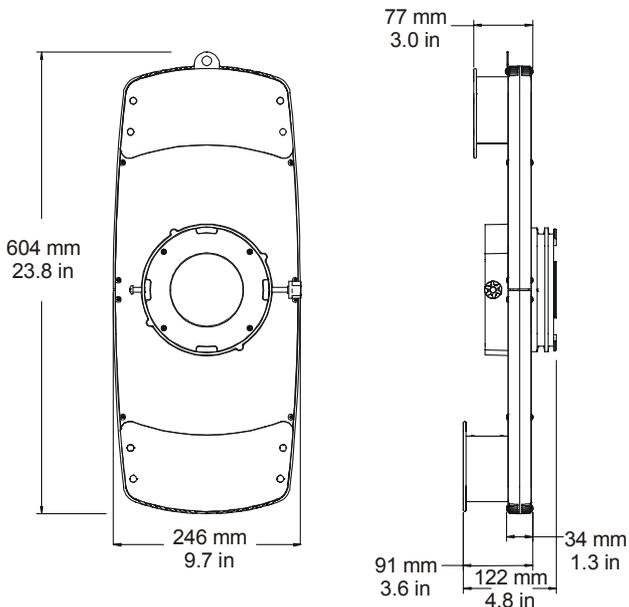
Optional Accessories

The following accessories are available from High End Systems:

Part Description	Part Number
Philips Halogen Biplanar lamp 750W / G9.5 / 115V	55030064
Philips Halogen Biplanar lamp 800W / G9.5 / 230V	55030065
Additional Terminator plug	80470215
4-pin XLR DATAPLEX Color Changer cable (6')	65040001
4-pin XLR DATAPLEX Color Changer cable (10')	65040002
4-pin XLR DATAPLEX Color Changer cable (25')	65040003
4-pin XLR DATAPLEX Color Changer cable (50')	65040004
5-pin XLR DMX Data Cable Heavy Duty (10')	55050017
5-pin XLR DMX Data Cable Heavy Duty (25')	55050018
5-pin XLR DMX Data Cable Heavy Duty (50')	55050019
5-pin XLR DMX Data Cable Heavy Duty (100')	55050020
Whole Hog® III Lighting Console	61020001
DMX Upload dongle	26040002
Safety cable	90701349
Cheeseborough truss clamp	55040014

Chapter 2:
Setup and Configuration

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Unpacking the Products

Unpack your products and verify that they are undamaged. If there is no damage, continue with the rest of the setup procedure described in this chapter. If there is damage, notify both the shipping agent and the sales agent immediately.

Save the shipping carton and packing materials. The carton and packing materials are specifically designed to protect the product during transport. High End Systems® assumes no responsibility for products that are damaged during transport. Return a product for repair in its original shipping carton and packing materials.

Before returning anything to the factory, call your High End Systems dealer/distributor for a Return Material Authorization (RMA) number. The factory cannot accept any goods shipped without an RMA number.

This chapter outlines the ColorPower Setup as well as setting up a ColorPower supply link and adding the ColorPower supply link to a DMX link.

For information on setting up your color mixing units, see the appropriate appendix at the back of this manual.

ColorPower Setup

The ColorPower supply ships with the following items:

- ColorPower supply
- User manual
- Two (2) terminator plugs
- Safety cable

Installing a Power Cord Cap

ColorPower ships with a power cord with a Standard NEMA 5-15 cord cap. Different locations may require a different power cord cap to connect the fixture to a power source. Because of the variety of power cord caps used worldwide, High End Systems, Inc. cannot make specific recommendations for the power cord cap.

Contact a local authority for the type of power cord cap needed. When installing the power cord cap, note that the cores in the mains lead are colored in accordance with the following code:

- green and yellow = earth
- blue = neutral
- brown = live

⚠ **Warning:** **Class 1 equipment - This equipment must be earthed.**

Installing a Line Cord Cap - U.K. Only

In the United Kingdom, the colours of the cores in the mains lead of this equipment may not correspond with the colored markings identifying the terminals in the fixture's plug. Therefore, install a line cord cap in accordance with the following code:

- The core which is coloured green and yellow must be connected to the plug terminal which is marked with the letter "E," or by the earth symbol ⏚, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal which is marked with the letter "N" or coloured black.
- The core which is coloured brown must be connected to the terminal which is marked with the letter "L" or coloured red.

⚠ **Warning:** **Class 1 equipment - This equipment must be earthed.**

Vatic Fitter Heads Information - Danmark

Advarsel: Beskyttelse mod elektrisk chock.

Vigtigt!

Lederne med gul/groen isolation maa kun tilsluttes en klemme maerket

⏚ eller ⏚

Setting up the Power Supply Link

A single ColorPower can control up to 12 color mixing units in any combination (six fixtures/modules per output).

⚠ **Caution:** **Dichroic Theatre color mixing fixtures and modules must be operated with the High End Systems ColorPower supply. Connection to any other manufacturer's power supply could damage the ColorCommand fixture and ColorMerge module.**

Disconnect mains power from ColorPower *before* **linking color changer cables to fixtures.**

ColorPower has two output links that supply 40VDC and data to the Dichroic Theatre Series products. The products can be combined and linked in any configuration, as long as there are no more than six (6) fixtures per output link. Because a ColorPower

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supply has two output links, you can connect a maximum of twelve (12) color mixing units for each ColorPower supply .

Note: Maximum total color- changer cable length per ColorPower supply should not exceed 600 ft. (182.9 m).

Unit Addressing

Addressing each color mixing unit with a unique number identifies it for the ColorPower supply. A DIP switch array is located on every Dichroic Theatre color mixing product (see Figure 2-1). You must select a DIP switch setting for each color mixing unit in the ColorPower supply link. The fixture's DIP switch setting determines the fixture's unit address.
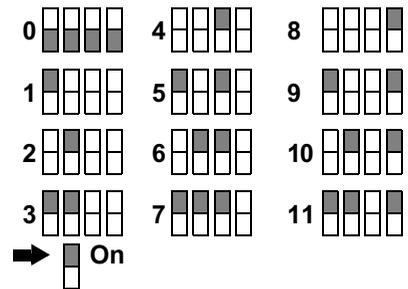
Figure 2-1 DIP switch settings

You can choose any order for fixtures on a link and any DIP switch setting for a fixture, as long as each fixture in the link is assigned a unique unit address.

Connecting Units to a ColorPower Supply Link

To connect the ColorPower to color mixing units on the link, you must use 4-pin XLR DATAPLEX Color Changer cables. Although these cables do not ship with the ColorPower supply, High End Systems offers them as optional accessories (see "Optional Accessories" on page 1-7).

The 4-pin XLR DATAPLEX Color Changer pin designation is as follows:
- Pin 1. Black #14 (40VDC +)
- Pin 2. Red #22 (Data +)
- Pin 3. Green #22 (Data -)
- Pin 4. White #14 (40 VDC -)

To connect units to a ColorPower link:

1. Connect the female XLR connector of the 4-pin XLR DATAPLEX Color Changer cable to the first fixture on the fixture link.

2. Continue linking the remaining ColorCommand and/or ColorMerge fixtures together by connecting a 4-pin XLR DATAPLEX Color Changer cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.

Terminating the Link

ColorPower ships with two terminators. You must use these terminators to terminate both ends of ColorPower's fixture link. Because you can connect two links (with six fixtures per link) on ColorPower, this means that if you use only one link, you must

terminate the unused link on ColorPower as well as the last fixture in the used link. If you use both fixture links, you must terminate the last fixture on both links.

To terminate the ColorPower supply link, connect a male terminator to the Data Out connector of the last fixture in the link.

⚠ **Warning:** **Unplug power from the ColorPower supply before making any changes to fixture configuration on the fixture link.**

Connecting ColorPower to a DMX Link

You can link one or more ColorPower units to a DMX Control desk using 5-pin DMX data cables. Use Belden® 9842 or equivalent (meets specifications for EIA RS-485 applications) data cables with the following characteristics:

- Two twisted pairs (4-conductors) plus a shield
- Maximum capacitance between conductors: <15 pF/ft.
- Maximum capacitance between conductor and shield: 55 pF/ft.
- Maximum resistance: 20 Ω/1000 ft.
- Nominal impedance: 120 Ω.

To link one or more ColorPower supplies as shown in Figure 2-2:

1. Connect the male XLR connector of a 5-pin DMX data cable to your DMX controller's DMX Data Out connector.

2. Connect the female XLR connector of the 5-pin DMX data cable to a ColorPower supply.

3. Connect the male XLR connector of a 4-pin XLR DATAPLEX Color Changer cable to the ColorPower supply Data Out connector.
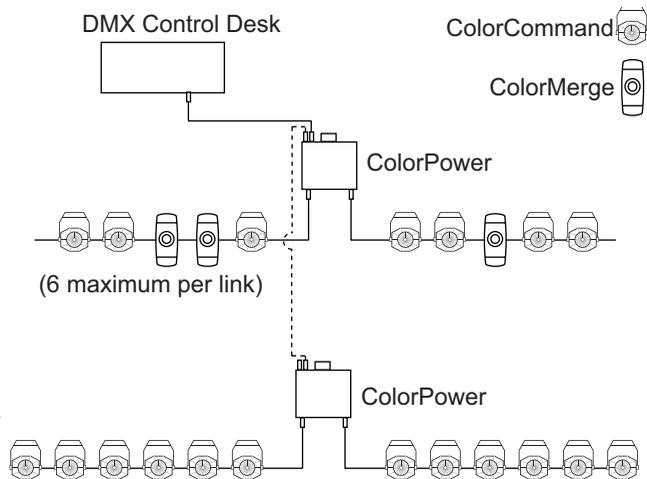
Figure 2-2 Adding a ColorPower supply link to a DMX link

DMX Addressing

After connecting the ColorPower supply link, you will need to address the ColorPower supply and the attached fixtures/modules for identification by the DMX controller. A fixture on a DMX link is addressed by assigning it a Start Channel from 1-512. Start channels are set in the ColorPower menu system. You can choose

Automatic or Manual address modes to address the color mixing units on the ColorPower supply link.

Determining Valid DMX Start Channels

The DMX start channel identifies each fixture on a link for the DMX controller. There are 512 available channels on each DMX link. These 512 channels are divided among *all* the devices on a particular link. The number of channels a fixture requires is called the fixture's channel range. The DMX start channel assigned to a particular fixture is the first channel available to a fixture in its channel range.

The fixture's channel range must not overlap any other device's channel range on the link. When two devices on the same DMX link have overlapping channel ranges, one or both devices will be disabled or behave erratically.

Remember the following criteria when determining a valid start channel:

- The Start channel is the number of the first channel in a consecutive block of channels assigned to an individual fixture.
- If you want two or more fixtures to respond to controller commands in exactly the same way, you can assign them the same Start Channel. In that case, those fixtures must be the same type and must share the *entire* channel range.
- A fixture can be assigned the second block of DMX channels on a link without physically being the second fixture on the link.
- To avoid overlapping channels, place the start channel at the beginning of a range of available channels large enough to accommodate that fixture type.
- Every channel in the link does not need to be assigned.
- The channel range required for a fixture differs depending on the fixture type.

For more information on channel ranges the DMX protocol for ColorPower and all High End Systems Dichroic Theatre fixtures and modules, see "DMX Programming" on page 3-8.

The following sections describe using the menu system to set DMX Start channels for ColorPower supply and attached color mixing units. For more information on the ColorPower Menu system, see Chapter 3.

Setting the ColorPower Supply DMX Start Channel

The ColorPower supply requires one DMX channel. Choose a DMX start channel that preceeds the start channel of any fixture the ColorPower supply controls. To set the ColorPower Start channel:

1. Access ColorPower's menu system via the LED display and four menu navigation buttons to assign a Start channel to ColorPower, (see Figure 2-3). For more information regarding the menu system, see "Menu Options" on page 3-2

Alphanumeric LED display

<UP> arrow
button scrolls to the previous

<DOWN> arrow button scrolls to
the next menu item or option

MENU

ENTER

<MENU> button moves back to
the previous menu level. (Press and
hold to enter the menu system)

<ENTER> button selects a menu option
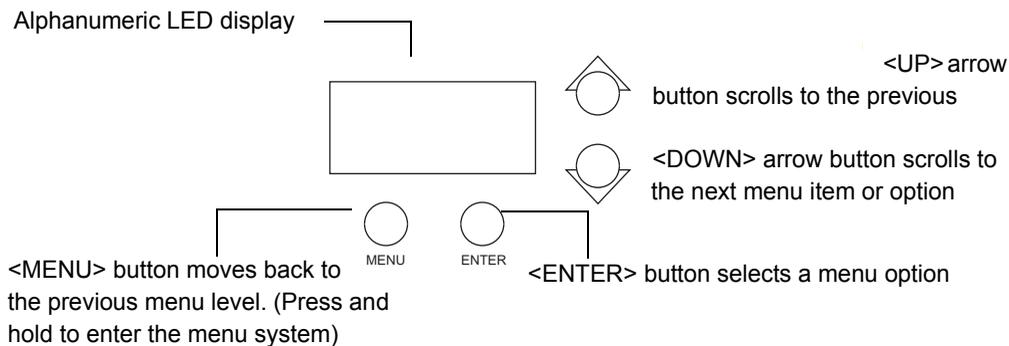
Figure 2-3 ColorPower menu navigation buttons

2. Press and hold <Menu> until *dMX* appears on the LED display.

3. Press <Enter>. This display will show *AddR*.

4. Press and hold <Enter> until the display begins flashing.

5. Use the arrow buttons to scroll to the desired DMX start channel (*1−512*)

6. Press and hold <Enter> until the display stops flashing.

NOTE: If you change the ColorPower supply DMX start channel after addressing your fixtures in Auto or Manual mode, you will change your show.

Setting DMX Start Channels for Color Mixing Units

Manual and Automatic options are available for setting DMX start channels on Dichroic Theatre fixtures and modules. A third menu option DISC (discovery) is actually a test mode used for fixture testing purposes. This mode ignores all address information stored in the EEPROM and dynamically assigns DMX addresses based on the current link configuration.

IMPORTANT: Since Discovery mode will change your show if fixtures are added, removed, or fail, use it only for troubleshooting purposes.

Manual DMX Addressing

Manually assigning a DMX start channel to a fixture enables you to control which consecutive block of DMX channels are assigned to each fixture in a link. For example, you might choose to assign channels 150-153 to a ColorCommand that is identified as the second fixture in the link, and channels 300-302 to a ColorMerge that is identified as the first fixture in the link (see Figure 2-4 on page 2-7).

Note: A fixture is identified by its DIP switch setting, which specifies its unit number.

A fixture on a ColorPower link can be assigned any valid DMX address starting with the address immediately following that of the ColorPower supply.

As the addresses are selected, both fixture type and address are stored in an on board EEPROM. Thereafter, ColorPower acquires its addressing information from this
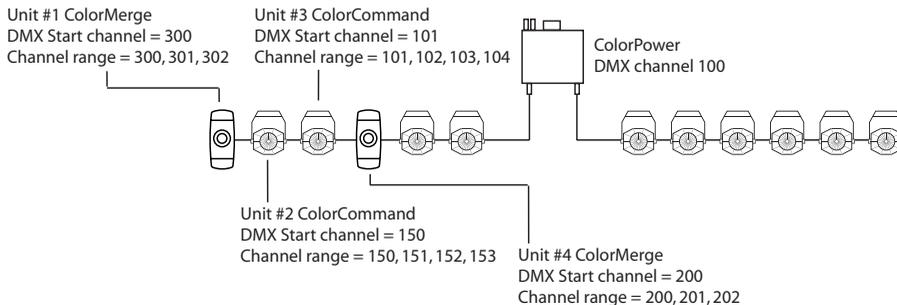
Figure 2-4 Sample manual assignment of DMX start channels

EEPROM. If fixtures are added to the link after selecting MANU, they will be assigned an invalid address. If fixtures are removed from the link, they will be ignored. In either event, removal or addition of fixtures does not change addressing, and will not change your show.

The manual address mode allows multiple fixtures to share the same DMX address. This can simplify show programming when you want several fixtures controlled in exactly the same way.

To Address a fixture by manually assigning the start channel:

1. Using ColorPower's menu system (see Figure 2-3), press and hold the <Menu> button until *dMX* appears on the LED display.

2. Press <Enter>.

3. Using the <Up> and <Down> arrow buttons, scroll to the *MOdE* menu and press the <Enter> button to select.

4. Using the <Up> and <Down> arrow buttons, scroll to the *MANU* menu, then press and hold the <Enter> button to select. The *UNIt* menu option will be displayed.

5. Press the <Enter> button to select.

6. Using the <Up> and <Down> arrow buttons, scroll to the desired fixture unit number and press the <Enter> button to select the unit. The format is *# XX* where *#* is the DIP switch setting and *XX* is the type of unit selected. For example, *1 CM* means a ColorMerge unit with a DIP switch setting of 1. A ColorCommand unit with a DIP switch setting of 3 will display as *3 CC*.

7. Press and hold the <Enter> button until the DMX start address begins flashing.

8. Using the <Up> and <Down> arrow buttons, scroll to the desired DMX start channel (*1–510*) and press the <Enter> button to select.

Note: The last valid Start channel for a ColorCommand (4-channel protocol) fixture on a 512-channel DMX link is Channel 509. The last valid Start channel for a ColorMerge (3-channel protocol) fixture is 510.

Automatic DMX Addressing

When automatically assigning DMX start channels to fixtures on a link, the ColorPower supply allocates the DMX addresses in the order of each fixture's unit number (specified by the DIP switch setting on each fixture) (see Figure 2-5). Addresses are assigned sequentially starting with the address immediately following that of the ColorPower supply. Each Dichroic Theater product attached to the ColorPower is assigned an address according to its module address and fixture type. ColorCommand fixtures require four channels, and ColorMerge fixtures require three channels.

Unit #2 ColorCommand
DMX Start channel = 5
Channel range = 5, 6, 7, 8

Unit #3 ColorCommand
DMX Start channel = 9
Channel range = 9, 10, 11, 12

ColorPower
DMX channel 1

Unit #1 ColorMerge
DMX Start channel = 2
Channel range = 2, 3, 4

Unit #4 ColorMerge
DMX Start channel = 13
Channel range = 13, 14, 15
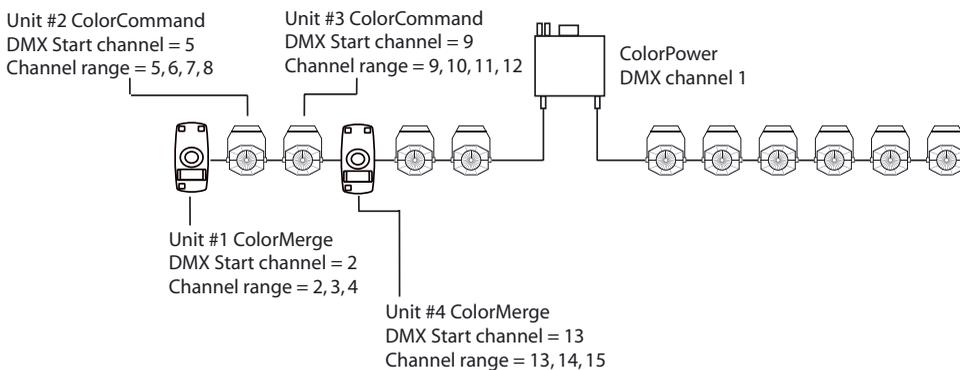
Figure 2-5 Sample automatic assignment of DMX start channels

After selecting AUTO, the attached fixture types and their addresses are stored in an on-board EEPROM. Thereafter ColorPower acquires its addressing information from this EEPROM. If fixtures are added to the link after selecting AUTO, they will be assigned an invalid address. If fixtures are removed from the link, they will be ignored. In either event, removal or addition of fixtures will not change addressing, and thus will not change your show. The auto address mode will not allow multiple fixtures to share the same DMX address.

To Address a fixture by automatically assigning the start channel:

1. Using ColorPower's menu system (see Figure 2-3 on page 2-6), press and hold the <Menu> button until *dMX* appears on the LED display.

2. Press <Enter>.

3. Using the <Up> and <Down> arrow buttons, scroll to the *MOdE* menu and press the <Enter> button to select. *AUTO* will appear on the display as the first option.

4. To select, press and hold the <Enter> button until *dONE* displays.

> **IMPORTANT: You must complete this procedure after all fixtures have been added to the fixture link. ColorPower only assigns start channels automatically after all steps in this procedure are completed. In other words, the start channels assigned using**

---

this procedure do not automatically change if a unit fails or is disconnected.

Reconfigurating the ColorPower Link

If you have a full complement of 12 Dichroic Theater fixtures attached to ColorPower and change the ColorPower link configuration, you will have to do the following:

1. After changing the link configuration, apply power to the ColorPower.

2. Auto address the fixtures [to clear the old fixture configuration].

3. Reset ColorPower by issuing a home all command, or navigating to *CTRL -> RST* on the ColorPower menu system.

4. Auto address the fixtures a second time [to store the new configuration]. The fixtures will now operate properly.

Mounting the ColorPower™ Supply

This section describes mounting procedures for a ColorPower supply. For information on mounting ColorCommand™ fixtures, see Appendix B. For information on mounting Source Four™ fixtures fitted with ColorMerge™ modules, consult the documentation for your Source Four fixture.

You can mount the ColorPower supply in any orientation suspended from a support system (such as a truss) or freestanding on a stable surface. Before mounting the ColorPower supply and any fixtures you are connecting to it, heed the warnings below to guard against personal injury and damage to the fixture.

Warning: This equipment for connection to a branch circuit having a maximum overload protection of 20 A.

Class I Equipment - This fixture must be earthed.

Mount the ColorPower supply and fixtures in a location that is away from direct heat and protected from moisture. Do not mount on a flammable surface.

For pluggable equipment, the socket outlet shall be installed near the equipment and shall be easily accessible.

Use a secondary safety cable when mounting the ColorPower supply or fixtures.

Caution: Do not remove top cover of the ColorPower supply or attempt to service unit while attached to rigging or truss.

When mounting the ColorPower supply or any fixture connected to it on a truss or another type of support, do all of the following:

- Verify the truss or support will handle the combined weight of *all* the devices on the truss.

- High End Systems strongly recommends using safety cables to attach any of its fixtures to a truss. Safety cables are provided with the ColorPower supply. If necessary, you can order additional safety cables from your High End Systems dealer/distributor (see "Optional Accessories" on page 1-7).

- You must supply your own clamps to attach the Color Power supply to the support. Verify that the clamp(s) you use are capable of supporting the weight of the unit. Each ColorPower supply weighs 13 lbs (5.9 kg).   You can order cheeseboroughs for a two-inch truss from your High End Systems dealer/distributor (see "Optional Accessories" on page 1-7).

- Make sure the ColorPower supply and attached fixtures cannot be rotated all the way around (360°). Allowing a unit to rotate 360° could loosen the clamp mounting bolts.

Note: Because of the variety of conceivable lighting designs, you should consider the procedure below as a suggested guideline only. High End Systems, Inc. cannot make specific recommendations for your particular lighting design or venue.

To mount the ColorPower supply to a truss or another type of support:

- Attach a suitable clamp through the handle.

- Always stand on a firm, stable surface when mounting a fixture to its support. The fixture should be at a height where you can comfortably work on it, and should either be resting on a stable surface or held in a stable manner.

- Tighten the clamp(s) firmly to the yoke and to the support.

- Loop one or more suitable safety cables around the support and through the handle.

> ⚠ **Caution: After mounting the fixtures, inspect all connected cables to ensure that the cables are properly routed away from any hot surface.**
>
> **Do not mount ColorPower above or next to a hot fixture closer than 1 ft (.3 m).**

Powering On Dichroic Theatre Units

> ⚠ **Caution: Do not power on the ColorPower supply or any fixtures linked to it until you have verified that the line cord cap is suitable for the power source in your location.**

> ⚡ **Warning: This equipment for connection to a branch circuit having a maximum overload protection of 20 A.**

Before powering on ColorPower or any Dichroic Theatre Series fixtures connected to ColorPower, verify that:

- The lamp is installed in each ColorCommand fixture on the ColorPower supply link as described in "Installing the Lamp" on page B-1.
- The appropriate power cord caps are installed on the ColorPower supply and all fixtures linked to it as described in "Installing a Power Cord Cap" on page 2-1.
- The DIP switch array on all fixtures has been set as described in "Unit Addressing" on page 2-3.
- The ColorPower supply is linked appropriately to all fixtures in the fixture link as described in "Setting up the Power Supply Link" on page 2-2.

At this point it is safe to connect ColorPower to an appropriately-rated power source (that turns ColorPower on).

On initial power up, the display board should read *HES*, indicating that the on board processor is running. After the CPU board boots, it will identify the display board and send it a reset command, the display should then flash off momentarily and redisplay *HES*. Soon thereafter the CPU will send initial display data to the display board and it will read *COLR*.

When Dichroic Theatre color mixing units are connected to ColorPower, they automatically begin a homing procedure to verify that the major functions of the fixture are oriented properly.

ColorPower's menu system provides an option for re-homing the fixtures. See "Reset and Home (RST)" on page 3-6 for instructions on using the Menu system and locating the Home function.

Chapter 3: Operation

This chapter contains information on using the ColorPower menu system and DMX control of the ColorPower supply and its linked fixtures. Use the Menu Map on page 3-8 for a quick reference on menu options. For Dichroic Theatre Series products DMX protocol tables, see page 3-9.

Verifying and Uploading Software

Use the following steps to verify that you are running the latest version of software for the ColorPower supply.

1. Use the menu system to identify the current version of software running on ColorPower (see "Display the Software Version (VERS)" on page 3-5).

2. Verify that the version displayed by ColorPower is the latest available. The latest software is available in the support section of the High End Systems® web site (www.highend.com).

3. If a software upgrade is required, attach a High End Systems Upload Dongle to the computer and upload the software to ColorPower.

    A High End Systems Upload Dongle requires a 386-based (or faster) computer, MS DOS® version 3.3 (or later) or Windows 95/98/ME, and one MB of free disk space. To obtain an Upload Dongle (with installation and operation instructions), contact your High End Systems dealer/distributor (see "Optional Accessories" on page 1-7).

Note: Dichroic Theatre colormixing products like ColorMerge and ColorCommand are controlled using the software stored in ColorPower. Therefore, you only need to upload ColorPower software (when applicable).

Accessing the Menu System

To access the menu system, press and hold the <Menu> key until *dMX* appears on the LED display. The menu system is protected against inadvertent menu changes by requiring the <Menu> button to be held for a few seconds before allowing entry to the menus.

To exit the menu system, you must keep pressing the <Menu> button to back out of each menu level until you reach the top menu level. After approximately 2 minutes, the display will revert to the fixture's currently assigned DMX start channel.

Basic Navigation

The navigation buttons on the ColorPower supply display panel allow you to navigate through the onboard menu system. As you navigate the menu system, the alphanumeric display will show the menu items you select from the menu map.

- Press the <Up> and <Down> arrow buttons to move to the Menus and options. The alphanumeric display will flash when a new option is selected and will stop flashing when a new option is stored by pressing the <Enter> button.

- If you have not pressed <Enter>, pressing the <Menu> button returns you to the previous menu without changing the value of an option.

Alphanumeric LED display

<UP> arrow button scrolls to the previous menu item or option

<DOWN> arrow button scrolls to the next menu item or option

MENU   ENTER

<Menu> button moves back to the previous menu level. (Press and hold to enter the menu system)

<Enter> button selects a menu option
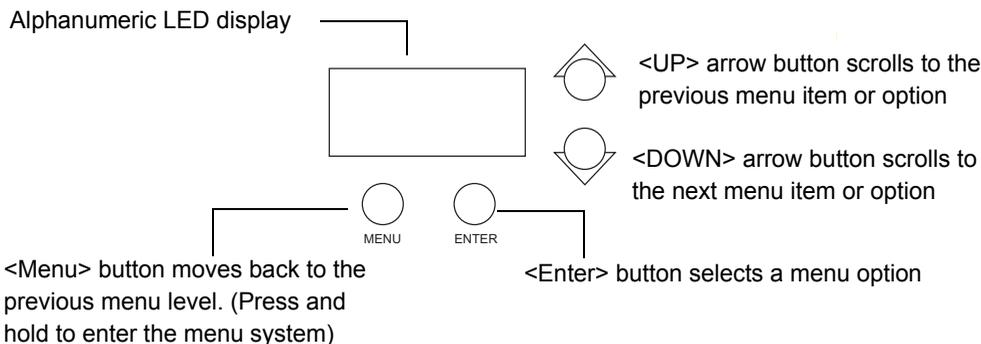
Figure 3-1 ColorPower Menu display panel

Menu Options

The following sections describe the Level 1 Menus available on a ColorPower supply and include option selection examples.

ColorPower Menu Map

Level 1	Level 2	Level 3	Level 4	Options	Description
DMX	ADDR			1 – 512	Set DMX Start channel number for Color Power hub 001– 512
	MODE	AUTO			Sets automatic start channel selection for attached modules. Displays **DONE** when complete.
		MANU	1 XX – 12XX	1 – 512	Sets manual start channel selection for attached modules
INFO	VERS	V.##.#			Displays version Major.Minor.Build
	MODE	AUTO			Displays current fixture addressing mode
		MANU			
	UNIT	MANU	1 XX – 12XX	1 – 512	Displays the DMX start channel for the selected unit on the ColorPower supply link
CTRL	RST				Resets ColorPower supply and homes all connected units
	UNIQ				Displays the ColorPower supply's unique number

Level 1	Level 2	Level 3	Level 4	Options	Description
TEST	DISC				Discovers all color mixing units attached to this ColorPower supply. Displays **DONE** when complete
	SELF	INIT			Displays *INIT* indicating that it is initializing. After a pause the display alternates between *FULL* (DMX =100) and *OPEN* (DMX = 0) with all the linked fixtures responding.
		FULL			
		OPEN			

(DMX) Menu

Use this Menu option to set the Start channel for the ColorPower supply as well as colormixing fixtures linked to it. For more information on setting a DMX start channel (see "DMX Addressing" on page 2-4).

Set the DMX Start Channel (ADDR)

1. To enter the Menu system, press and hold the <Menu> button until *dMX* appears on the LED display.

2. Using the <Up> and <Down> arrow buttons scroll to the desired start channel value *[1-512]* the <Enter> button to select.

Set the Addressing Mode (MODE)

The ColorPower supply has three modes for DMX. Manual Addressing and Auto Addressing are described here. Discovery (DISC) addressing is recomended for troubleshooting situations only. You can find more information about the DISC mode in "When to use Discovery addressing" on page 4-6.

Manual Addressing. allows the user to assign DMX addresses to fixtures attached to the link. Addresses may be assigned to any valid DMX address following the ColorPower supply Start channel. As the addresses are selected, both fixture type and address are stored in an on board EEPROM. Thereafter, ColorPower acquires its addressing information from this EEPROM. If fixtures are added to the link after selecting MANU, they will be assigned an invalid address. If fixtures are removed from the link, they will be ignored. In either event, removal or addition of fixtures will not change addressing, and thus will not change your show. The manual address mode allows multiple fixtures to share the same DMX address when you require more than one fixture to respond identically to the controller.

Use the following steps to manually address fixtures on the ColorPower link:

1. Press and hold the <Menu> button until *dMX* appears on the LED display

2. Press the <Enter> button to enter the DMX menu system. The first option will be *AddR*.

3. Navigate to the *ModE* menu by pressing the UP button.

4. Press the <Enter> button to enter the addressing mode sub-menu system. The first option will be the *AUTO* addressing mode.

5. Navigate to the *MANU* menu by pressing the UP button.

6. Press and hold the <Enter> button to select manual addressing.

7. Fixtures attached to the link, and their module address may be viewed by pressing the UP & DOWN buttons to scroll through all attached fixtures. The format is *# XX*, where *#* is the module address, and *XX* is the fixture type. *CM* = ColorMerge, *CC* = ColorCommand *XX* = missing fixture.

8. The DMX start address of each fixture may be viewed by pressing the <Enter> button.

9. To change the address of the selected fixture press and hold the <Enter> button until the DMX start address begins flashing.

10. Scroll to the desired start address using the UP and DOWN buttons.

11. Press <Enter> to select the desired start channel.

Automatic Addressing. Auto addressing automatically assigns DMX addresses to fixtures attached to the link. Addresses are assigned sequentially starting with the address immediately following the ColorPower Start channel. Each Dichroic Theater product attached to the ColorPower is assigned an address according to its module address and fixture type. ColorCommand fixtures require four channels, and ColorMerge fixtures require three channels. After selecting *AUTO*, the attached fixture types and their addresses are stored in an on-board EEPROM. Thereafter ColorPower acquires its addressing information from this EEPROM. If fixtures are added to the link after selecting AUTO, they will be assigned an invalid address. If fixtures are removed from the link, they will be ignored. In either event, removal or addition of fixtures will not change addressing, and thus will not change your show. The auto address mode will not allow multiple fixtures to share the same DMX address.

To use Auto addressing:

1. Press and hold the <Menu> button until *dMX* appears on the LED display.

2. Press the <Enter> button to enter the DMX menu system. The first option will be *AddR*.

3. Navigate to the *ModE* menu by pressing the UP button.

4. Press the <Enter> button to enter the addressing mode. The first option will be the *AUTO* addressing mode.

5. Press and hold the <Enter><Menu> button to select auto addressing.

Information (INFO) Menu

Use this Menu option to display information on software versions and connected units.

Display the Software Version (VERS)

To view the Software version currently running on the fixture:

1. If you are not already in the Menu system, press and hold the <Menu> button until *dMX* appears on the LED display.

2. Using the <Up> and <Down> arrow buttons, scroll to the *INFO* menu and press the <Enter> button to select.

3. Using the <Up> and <Down> arrow buttons, scroll to the *VERS* option and press the <Enter> button to select. The current ColorPower software version number will be displayed. Check with the High End Systems Website (www.highend.com) to verify that this is the latest version. If you need to install new software, see "Verifying and Uploading Software" on page 3-1.

Display the Mode (MODE)

The Mode option in the Info Menu displays the currently selected addressing mode of automatic or manual.

To view the current Mode:

1. If you are not already in the Menu system, press and hold the <Menu> button until *dMX* appears on the LED display.

2. Using the <Up> and <Down> arrow buttons, scroll to the *INFO* menu and press the <Enter> button to select.

3. Using the <Up> and <Down> arrow buttons, scroll to the *MODE* option and press the <Enter> button to select. The current ColorPower addressing mode will be displayed.

Display the Unit Information (UNIT)

To view unit information for each fixture on the link:

1. If you are not already in the Menu system, press and hold the <Menu> button until *dMX* appears on the LED display.

2. Using the <Up> and <Down> arrow buttons, scroll to the *INFO* menu and press the <Enter> button to select.

3. Using the <Up> and <Down> arrow buttons, scroll to the *UNIt* option and press the <Enter> button to select. The available data for the fixtures connected to the fixture link displays. For example, *1 CC* means that a ColorCommand fixture is connected to the link with a DIP switch setting of 1. A ColorMerge module connected to the fixture link with a DIP switch setting of 7 will display as *7 CM*.

4. Press <Enter> to view the DMX adress.

Control (CTRL) Menu

Use this Menu option to reset ColorPower and home all ColorMerge modules and ColorCommand fixtures connected to the fixture link.

Reset and Home (RST)

To view the Software version currently running on the fixture:

1. If you are not already in the Menu system, press and hold the <Menu> button until *dMX* appears on the LED display.

2. Using the <Up> and <Down> arrow buttons, scroll to the *CtRL* menu and press the <Enter> button to select.

3. Using the <Up> and <Down> arrow buttons, scroll to the *RSt* option and press the <Enter> button to select. ColorPower will reset and home all connected units.

Unique Number (UNIQ)

Every ColorPower supply has a unique number that is used for upload purposes. To view the ColorPower supply's unique number:

1. If you are not already in the Menu system, press and hold the <Menu> button until *dMX* appears on the LED display.

2. Using the <Up> and <Down> arrow buttons, scroll to the *CtRL* menu and press the <Enter> button to select.

3. Using the <Up> and <Down> arrow buttons, scroll to the *UNIQ* option and press the <Enter> button to select. ColorPower will display the unique number for the selected unit.

Test (TEST) Menu

Discovery (DiSC)

Discovery addressing is a test mode where addresses are assigned sequentially starting with the address immediately following that of the ColorPower box. Each Dichroic Theater product attached to the ColorPower is assigned an address according to its module address and fixture type.

This mode ignores all address information stored in the EEPROM and dynamically assigns DMX addresses based on the current link configuration. Use the following steps to access the Discovery mode:

1. Press and hold the <Menu> button until *dMX* appears on the LED display.

2. Navigate to the *TEST* menu by pressing the UP button.

3. Press the <Enter> button to enter the test sub-menu. The first option will be *dISC*.

4. Press and hold the <Enter> button to select discovery mode addressing.

⚠ **Caution:** **This mode of addressing may change your show** if fixtures are added, removed, or fail. **Use Discovery mode only for troubleshooting purposes.**

Self Test (SELF)

1. Press and hold the <Menu> button until *dMX* appears on the LED display.

2. Navigate to the *TEST* menu by pressing the UP button.

3. Press the <Enter> button to enter the test sub-menu. Use the up and down buttons to scroll to *SELF* and press the <Enter> button. The ColorPower will then display *INIT* indicating that it is initializing. After a pause the display will alternate between *FULL* (a DMX value of 100) and *OPEN* (a DMX value of 0)with all the linked fixtures responding together.

3

DMX Programming

A Parameter is a fixture attribute that can be controlled to modify the light beam in terms of color, beam quality and pattern, intensity, or focus (position). DMX programming assigns a DMX value to each of the fixture's parameters. A Cue (sometimes referred to as a *look* or a *scene*) is one combination of parameter settings. Cues are combined and timing is added to create shows.

Programming a fixture for a DMX link requires each parameter be assigned to a specific DMX channel in the fixture's channel range. Channel assignments are based on the DMX protocol used.

Parameters for each channel are described in the Protocol Tables on page 3-9. DMX values are given in decimal, percentage and hexadecimal units.

Parameter Descriptions

Control Parameter (ColorPower)

The control parameter allows you to remotely control the ColorPower display brightness or home units attached to the ColorPower supply.

Homing ColorPower Supply Link Fixtures (ColorPower)

ColorPower and all connected units automatically home when power is initially applied. You can also home the units remotely using a DMX controller with the following procedure:

1. Set the ColorPower DMX channel to the appropriate value for the desired unit(s) (see "ColorPower DMX Protocol Table" on page 3-9) and hold the value static for at least one second.

2. Return the ColorPower DMX channel to 0 (Safe). The specified unit(s) will home.

Color Parameters (ColorCommand, ColorMerge)

Parameters for Cyan, Magenta, and Yellow use three channels providing variable saturation from 0 (white) to 255 (maximum saturation).

Beam Angle (ColorCommand)

ColorCommand fixtures allow variable beam control from 0(narrow angle) to 255 Wide angle)

ColorPower DMX Protocol Table

Chan	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
1	CONTROL	Safe	0-15	0-6	00h-0Fh
		Display OFF	16-23	6-9	10h-17h
		Display DIM	24-31	9-12	18h-1Fh
		Display BRIGHT	32-39	13-15	20h-27h
		Reserved	32-63	13-25	20h-3Fh
		Home All	64-71	25-28	40h-47h
		Home Unit 0	72-79	28-31	48h-4Fh
		Home Unit 1	80-87	31-34	50h-57h
		Home Unit 2	88-95	35-37	58h-5Fh
		Home Unit 3	96-103	38-40	60h-67h
		Home Unit 4	104-111	41-44	68h-6Fh
		Home Unit 5	112-119	44-47	70h-77h
		Home Unit 6	120-127	47-50	78h-7Fh
		Home Unit 7	128-135	50-53	80h-87h
		Home Unit 8	136-143	53-56	88h-8Fh
		Home Unit 9	144-151	57-60	90h-97h
		Home Unit 10	152-159	60-62	98h-9Fh
		Home Unit 11	160-167	63-66	A0h-A7h
		Home Unit 12	168-175	66-69	A8h-AFh
		Home Unit 13	176-183	69-72	B0h-B7h
		Home Unit 14	184-191	72-75	B8h-BFh
		Home Unit 15	192-199	75-78	C0h-C7h
		Reserved	200-255	78-100	C8h-FFh

ColorCommand DMX Protocol Table

Chan	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
1	Cyan	Cyan (0 = open, 255 = fully saturated)	0-255	0-100	00-FF
2	Magenta	Magenta (0 = open, 255 = fully saturated)	0-255	0-100	00-FF
3	Yellow	Yellow (0 = open, 255 = fully saturated)	0-255	0-100	00-FF
4	Beam Angle	Beam Angle (0 = narrow, 255 = wide)	0-255	0-100	00-FF

ColorMerge DMX Protocol Table

Chan	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
1	Cyan	Cyan (0 = open, 255 = fully saturated)	0-255	0-100	00-FF
2	Magenta	Magenta (0 = open, 255 = fully saturated)	0-255	0-100	00-FF
3	Yellow	Yellow (0 = open, 255 = fully saturated)	0-255	0-100	00-FF

Appendix A:
Important Safety Information

Warning: For Continued Protection Against Fire

1. This equipment (ColorCommand^{TM}) is designed for use with a Philips #134205 (750W) / #134213 (800W) lamp only. Use of any other type lamp may be hazardous and may void the warranty.
2. Do not mount on a flammable surface.
3. Maintain minimum distance of.3 meter (0.98 foot) from combustible materials.
4. Replace fuses only with the specified type and rating.
5. This equipment for connection to branch circuit having a maximum overload protection of 20 A.

Warning: For Continued Protection Against Electric Shock

1. If this equipment was received without a line cord plug, attach the appropriate line cord plug according to the following code:
   - brown–live
   - blue–neutral
   - green/yellow–earth
2. As the colours of the cores in the mains lead of this equipment may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
   - the core which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol ⏚, or coloured green or green and yellow.
   - the core which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
   - The core which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
3. Class I equipment. This equipment must be earthed.
4. Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.
5. Disconnect power before re-lamping or servicing.
6. Refer servicing to qualified personnel; no user serviceable parts inside.

Warning: For Continued Protection Against Exposure To Excessive Ultraviolet (UV) Radiation

1. Do not operate this equipment without complete lamp enclosure in place or if shields, lenses, or ultraviolet screens are damaged.
2. Change shields, lenses, or ultraviolet screens if they have become visibly damaged to such an extent that their effectiveness is impaired, for example by cracks or deep scratches.
3. Never look directly at the lamp while lamp is on.

Warning: For Continued Protection Against Injury To Persons

1. Use secondary safety cable when mounting this fixture.
2. Caution: hot lamp may be an explosion hazard. Do not open for 5 minutes after switching off. Wear eye and hand protection when re-lamping.
3. Equipment surfaces may reach temperatures up to 100° C (212° F). Allow 5 minutes for cooling before handling.

4. Change the lamp if it becomes damaged or thermally deformed.

Appendice A
Importantes Informations Sur La Sécurité

Mise En Garde: Pour Une Protection Permanente Contre Les Incendies

1. Cet appareil (ColorCommand^{TM}) est conçu uniquement pour une lampe Philips #134205 (750W) / #134213 (800W). Son utilisation avec tout autre type de lampe peut être dangereuse et annuler la garantie.
2. Ne pas monter les lampes sur une surface inflammable.
3. Maintenir à une distance minimum de 0.3 mètre de matières inflammables.
4. Ne remplacer les fusibles qu'avec des modèles et valeurs assignées recommandés.
5. Cet appareil de connection au circuit comporte une protection contre les surcharges de 20 A.

Mise En Garde: Pour Une Protection Permanente Contre Les Chocs Électriques

1. Si cet équipement est livré sans prise de cable, veuillez connecter la prise de cable correcte selon le code suivant:
   - marron - phase
   - bleu - neutre
   - vert/jaune - terre
2. Débrancher le courant avant de changer les lampes ou d'effectuer des réparations.
3. Cet équipement doit être uniquement utilisé dans des endroits secs. Ne pas l'exposer à la pluie ou l'humidité.
4. À l'intérieur de l'équipement il n'y a pas de pièces remplaçables par l' utilisateur. Confiez l'entretien à un personnel qualifié.
5. Equipement de Classe I. Cet équipement doit être mis à la terre.

Mise En Garde: Pour Une Protection Permanente Contre Des Expositions Excessives Aux Rayons Ultra Violets (UV)

1. Ne pas utiliser cet appareil si le boîtier de la lampe n'est pas complètement fixé ou si les blindages, lentilles, ou écrans ultraviolets sont endommagés.
2. Changer les blindages ou les écrans ultraviolets s'ils sont visiblement endommagés au point que leur efficacité aient été altérée, par exemple par des fissures ou de profondes égratignures.
3. Ne jamais regarder directement la lampe quand celle ci est allumée.

Mise En Garde: Pour Une Protection Permanente Contre Les Blessures Corporelles

1. Lors de l'assemblage, utiliser un câble de sécurité secondaire.
2. AVERTISSEMENT: les lampes chaudes comportent un risque d'explosion. Après l'avoir éteinte, attendre 5 minutes avant de la dégager. Lors du remplacement de la lampe, une protection des yeux et des mains est requise.
3. Les surfaces de l'appareil peuvent atteindre des températures de 100 C. Laisser refroidir pendant 5 minutes avant la manipulation.
4. Changer la lampe si elle est endommagée ou thermiquement déformée.

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Anhang A
Wichtige Hinweise Für Ihre Sicherheit

Warnung: Zum Schutz Vor Brandgefahr

1. Dieses Gerät (ColorCommand^{TM}) ist nur für den Gebrauch mit einer Philips #134205 (750W) / #134213 (800W) Lampe . Der Gebrauch irgend eines anderen Lampentyps könnte Sie gefährden und Ihre Garantie außer Kraft setzen.
2. Das Gerät nie auf einer feuergefährlichen Fläche montieren.
3. Stets einen Mindestabstand von 0.3 Meter zu brennbaren Materialien einhalten.
4. Zum Ersatz nur Sicherungen verwenden, die dem vorgeschriebenen Typ und Nennwert entsprechen.
5. Dieses Gerät darf nur an eine Zweigleitung mit einem Überlastungsschutz von höchstens 20 A angeschlossen werden.

Warnung: Zum Schutz Gegen Gefährliche Körperströme

1. Wenn dieses Gerät ohne einen Netzkabelstecker erhalten wurde, ist der entsprechende Netzkabelstecker entsprechend dem folgenden Code anzubringen:
    * Braun - Unter Spannung stehend
    * Blau - Neutral
    * Grün/Gelb - Erde
2. Vor dem Austauschen von Lampen oder vor Wartungsarbeiten stets den Netzstecker ziehen.
3. Diese Geräte sind nur zum Einbau in trockenen Lagen bestimmt und müssen vor Regen und Feuchtigkeit geschützt werden.
4. Servicearbeiten sollten nur von Fachpersonal ausgeführt werden. Das Gerät enthält keine wartungsbedürftigen Teile.
5. Dieses Gerät gehört zur Klasse I. Dieses Gerät muß geerdet werden.

Warnung: Zum Schutz Gegen Übermässige Ultraviolett (UV)-Bestrahlung

1. Benutzen Sie dieses Gerät nur, wenn das komplette Lampengehäuse fest eingebaut ist; ebenfalls dürfen keine der Schutzabdeckungen, Linsen oder der UV-Schutz Beschädigungen aufweisen.
2. Die Schutzabdeckungen, Linsen und der UV-Schutz müssen ausgewechselt werden, wenn sie sichtlich dermaßen beschädigt sind, daß sie ihre Wirksamkeit einbüßen, z.B. infolge von Rissen oder tiefen Kratzern.
3. Nie direkt in die eingeschaltete Lampe schauen.

Warnung: Zum Schutz Vor Verletzungen

1. Verwenden Sie bei der Installation des Beleuchtungskörpers ein zusätzliches Sicherheitskabel.
2. VORSICHT: Bei einer heiße Lampe besteht Explosionsgefahr. Nach dem Abschalten der Netzspannung sollten Sie etwa 5 Minuten warten, bevor Sie das Lampengehäuse öffnen. Schützen Sie beim Auswechseln der Lampen Ihre Hände und tragen Sie eine Schutzbrille.
3. Die Oberflächen des Gerätes können Temperaturen bis zu 100 C erreichen. Vor dem Anfassen stets 5 Minuten lang abkühlen lassen.
4. Falls die Lampe beschädigt oder durch Wärmeeinwirkung verformt ist, muß sie ausgewechselt werden.

Apéndice A
Información Importante De Seguridad

Advertencia: Para Protección Continua Contra Incendios

1. Este equipo (ColorCommand^{TM}) está diseñado para utilizarse únicamente con la lámpara Philips #134205 (750W) / #134213 (800W). El uso de cualquier otro tipo de lámpara puedá resultar peligroso, y puedá anular la garantía.
2. No monte el equipo sobre una superficie inflamable.
3. Mantenga una distancia mínima de materiales combustibles de 0.3 metro.
4. Cambie los fusibles únicamente por otros que sean del tipo y la clasificación especificadas.
5. Este equipo debe conectarse a un circuito que tenga una protección máxima contra una sobrecargas de 20 A.

Advertencia: Para La Protección Continua Contra Electrocuciones

1. Si se recibió este equipo sin el conector de alimentacion, monte usted el conector correcto según ia clave siguiente:
   - moreno - vivo
   - azul - neutral
   - verde/amarillo - tierra
2. Desconecte el suministro de energía antes de cambiar lámparas o prestar servicio de reparación.
3. Este equipo esta disenado para usarce en lugares secos no lo exponga a la lluvia o humedad.
4. Derive el servicio de reparación de este equipo al personal calificado. El interior no contiene repuestos que puedan ser reparados por el usuario.
5. Equipo de Clase I. Este equipo debe conectarse a tierra.

Advertencia: Para Protección Continua Contra La Exposición A Radiación Ultravioleta (UV) Excesiva

1. No opere este equipo sin tener colocada en su lugar la caja protectora completa de la lámpara o bien, si el blindaje, los lentes o las pantallas ultravioletas están dañadas.
2. Cambie el blindaje, los lentes o las pantallas ultravioleta si nota una avería visible, a tal grado que su eficacia se vea comprometida. Por ejemplo, en el caso de grietas o rayaduras profundas.
3. Jamás mire directamente a la lámpara mientras ésta esté encendida.

Advertencia: Para Protección Continua Contra Lesiones Corporales

1. Almontareste sparato ulilize un cable de seguridad secundario.
2. Precaución: una lámpara caliente puede constituir un peligro de explosión. No la habra por 5 minutos luego de haberla apagado. Lleve puestos, un protector ocular, y guantes al cambiar lá lámparas.
3. Las superficies del equipo pueden alcanzar temperaturas máximas de 100° grados centígrados. Deje que se enfríen por 5 minutos antes de tocarlas.
4. Cambie la lámpara si ésta se avería o deformada por acción térmica.

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Appendice A
Importanti Informazioni Di Sicurezza

Avvertenza: Per Prevenire Incendi

1. Questa apparecchiatura (ColorCommand^{TM}) è stata progettata per l'uso esclusivo con lampada Philips #134205 (750W) / #134213 (800W). L'uso di qualsiasi altro tipo di lampada può essere pericoloso e può annullare la garanzia.
2. Da non montare sopra una superficie infiammabile.
3. Mantenere l' apparecchio a un minimo di 0.3 metri (0.98 piedi) di distanza dai materiali combustibili.
4. Sostituire i fusibili usando soltanto quelli del tipo e della taratura adatta.
5. Questa apparecchiatura e' da collegarsi ad un circuito con una protezione da sovraccarico massima di 20 ampere.

Avvertenza: Per Prevenire Le Scosse Elettriche

1. Se questa apparecchiatura è stata consegnata senza una spina del cavo di alimentazione, collegare la spina appropriata del cavo di alimentazione in base ai seguenti codici:
   - marrone - fase
   - blu - neutro
   - verde/giallo - terra
2. Disconnettere la corrente prima di cambiare la lampada o prima di eseguire qualsiasi riparazione.
3. Questo apparecchio deve essere utilizzato in ambienti secchi. Non deve essere esposto a pioggia o montato in luoghi umidi.
4. Per qualsiasi riparazione rivolgersi al personale specializzato. L' utente non deve riparare nessuna parte dentro l' unita'.
5. Aparecchio di Classe I. Questa apparecchiatura deve essere messa a terra.

Avvertenza: Protezione Contro Le Radiazioni Dei Raggi Ultravioletti

Non usare questa apparecchiatura se il sistema di chiusura della lampada non e' completo o se gli schermi, le lenti, o gli schermi ultravioletti si sono visibilmente danneggiati di maniera tale che la loro efficacia sia stata ridotta --- ad esempio, se vi sono visibili spaccature o graffi profondi. Mai guardare direttamente verso la lampada quando sia accesa.

Avvertenza: Per Non Ferire Ad Altre Persone

1. Montare questo apparecchio utilizzando il cavo secondario di sicurezza.
2. Avvertenza: la lampada calda potrebbe esplodere. Spegnerla per 5 minuti prima di aprirla. Usare protezioni per le mani e per gli occhi prima di cambiare la lampada.
3. Le superfici della apparecchiatura possono arrivare a temperature di 100 gradi centigradi (212 gradi f). Aspettare 5 minuti prima di maneggiare.
4. Cambiare la lampada se si e' danneggia o se si e' deformata dal calore.

Vigtig Sikkerhedsinformation

Advarsel: Beskyttelse mod elektrisk chock.
VIGTIGT!
LEDEREN MED GUL/GROEN ISOLATION MAA KUN TILSLUTTES KLEMME MAERKET ⏚ ELLER ⏚ .

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Appendix B: ColorCommand Installation

ColorCommand Setup

The ColorCommand fixture ships with the following items:

- ColorCommand fixture (with attached yoke)
- One power cord (without a cord cap)
- Declaration of Conformity

Installing the Lamp

The ColorCommand fixture ships without a lamp. Use the following procedure to install a lamp in a new fixture. or to replace a lamp.

Warnings: **Disconnect power before lamping or servicing.**

An operating, unshielded lamp emits ultraviolet and visible (UV-vis) radiation which could damage eyes and skin. Whenever you are working on or near an exposed lamp, wear protective eye gear. Never look directly at the lamp while the lamp is on.

Hot lamp. Let the lamp cool before replacing.

Caution: **This equipment is designed for use with a Philips® Halogen Biplanar lamp only. Using any other type lamp may be hazardous and will void the warranty.**

Disconnect power before re-lamping. Replace the lamp if it becomes damaged or thermally deformed.

To install a lamp in a new fixture, or replace a lamp in an existing fixture:

1. Perform this procedure *before* you connect the fixture to power.

2. Put on protective eye wear and gloves.

3. Access the lamp cap on the rear lamp socket housing and loosen the two thumbscrews.

4. Gently remove the socket housing from the reflector mount, exposing the lamp as shown in Figure B-1.

5. Remove the lamp from the socket housing.
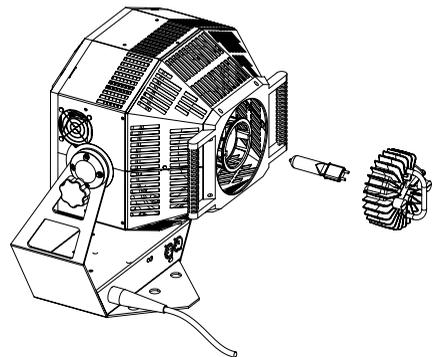
Figure B-1 Removing the lamp

6. The lamp assembly is connected to the fixture by lamp socket wires. Support the lamp assembly while inserting the lamp. Do not allow the lamp socket wires to support the weight of the lamp assembly.

7. Remove all packaging materials from the new Philips 800W max lamp.

8. Holding the new lamp by its base, gently press the two base pins straight into the lamp socket until the lamp is firmly seated as shown in Figure B-2.

Note: To avoid premature lamp failure, do not touch the lamp glass. If you touch the glass, clean the lamp glass carefully with rubbing alcohol and a clean, lint-free cloth.
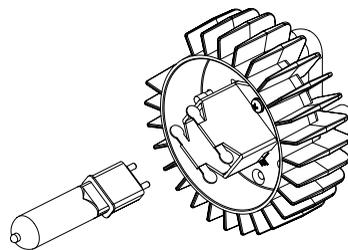
Figure B-2 Installing the lamp

9. Gently replace the lamp socket housing on the reflector mount and tighten the thumbscrews.

⚠ **Caution:** **Improperly-installed lamps cause premature lamp failure and socket problems.**

Make sure the lamp socket wires are not wrapped around the lamp or trapped while reinserting the lamp assembly.

Installing a Power Cord Cap

ColorCommand fixtures ships with a power cord *without* a cord cap. Different locations (even within the same country) may require a different power cord cap to connect the fixture to a power outlet.

Because of the variety of power cord caps used worldwide, High End Systems, Inc. cannot make specific recommendations for the power cord cap.

Contact a local authority for the type of power cord cap needed. When installing the power cord cap, note that the cores in the mains lead are colored in accordance with the following code:

- green and yellow = earth
- blue = neutral
- brown = live

⚡ **Warning: Class 1 equipment - This equipment must be earthed.**

Installing a Line Cord Cap - U.K. Only

In the United Kingdom, the colours of the cores in the mains lead of this equipment may not correspond with the colored markings identifying the terminals in the fixture's plug. Therefore, install a line cord cap in accordance with the following code:

- The core which is coloured green and yellow must be connected to the plug terminal which is marked with the letter "E," or by the earth symbol ⏚, or coloured green, or green and yellow.

- The core which is coloured blue must be connected to the terminal which is marked with the letter "N" or coloured black.

- The core which is coloured brown must be connected to the terminal which is marked with the letter "L" or coloured red.

⚡ **Warning:** **Class 1 equipment - This equipment must be earthed.**

Vatic Fitter Heads Information - Danmark

Advarsel: Beskyttelse mod elektrisk chock.

Vigtigt!

Lederne med gul/groen isolation maa kun tilsluttes en klemme maerket

⏚ eller ⏚

Mounting a ColorCommand Fixture

This section describes mounting procedures for a ColorCommand Fixture. For information on mounting a ColorPower supply, see Chapter 2. For information on mounting Source Four fixtures fitted with ColorMerge modules, consult the documentation for your Source Four fixture.

B

You can mount the ColorCommand fixture in any orientation suspended from a support system (such as a truss) or standing on it's yoke on a stable surface.

Mounting Considerations

Before mounting the ColorCommand fixture on a truss or another type of support, do all of the following:

- Verify the truss or support will handle the combined weight of *all* the devices on the truss.

- High End Systems strongly recommends using safety cables to attach any of its fixtures to a truss. You can order safety cables from your High End Systems dealer/ distributor (see "Optional Accessories" on page 1-7).

- You must supply your own clamps to attach the ColorCommand fixture to the support. Verify that the clamp(s) you use are capable of supporting the weight of the unit. Each ColorCommand weighs 20 lbs. You can order cheeseboroughs for a two-inch truss from your High End Systems dealer/distributor (see "Optional Accessories" on page 1-7).

- Make sure the ColorCommand fixture cannot be rotated all the way around (360°). Allowing a unit to rotate 360° could loosen the clamp mounting bolts.

Note: Because of the variety of conceivable lighting designs, you should consider the procedure below as a suggested guideline only. High End Systems, Inc. cannot make specific recommendations for your particular lighting design or venue.

Before mounting the ColorCommand fixture, heed the warnings below to guard against personal injury and damage to the fixture.

Warning: This equipment for connection to a branch circuit having a maximum overload protection of 20 A.

Class I Equipment - This fixture must be earthed.

Mount the power supply and fixtures in a location that is away from direct heat and protected from moisture. Do not mount on a flammable surface.

For pluggable equipment, the socket outlet shall be installed near the equipment and shall be easily accessible.

Use a secondary safety cable when mounting the fixtures.

Caution: Do not remove top cover of the ColorCommand fixture or attempt to service unit while attached to rigging or truss.

Mounting a ColorCommand Fixture

To mounta ColorCommand fixture to a truss or another type of support:

- Attach a suitable clamp through one of the holes on top of the yoke. If you are attaching one clamp, use the middle hole on the yoke. If you are attaching 2 clamps per fixture, attach one clamp to each of the outer holes on the yoke. *Use two locking washers per clamp when attaching the clamp to the yoke.*

- Always stand on a firm, stable surface when mounting a fixture to its support. The fixture should be at a height where you can comfortably work on it, and should either be resting on a stable surface or held in a stable manner.

- Tighten the clamp(s) firmly to the yoke and to the support.

- Loop one or more suitable safety cables around the support and the yoke.

Caution: After mounting the fixtures, inspect all connected cables to ensure that the cables are properly routed away from any hot surface.

Do not mount ColorCommand above or next to a hot fixture closer than 1 ft (.3 m).

Powering On

⚠ Caution: **Do not power on the fixture until verifying that the line cord cap is suitable for the power source in your location.**

⚠ Warning: **This equipment for connection to a branch circuit having a maximum overload protection of 20 A.**

Before powering on any ColorCommand fixture, complete the following:

- Make sure the lamp is installed as described in "Installing the Lamp" on page B-1.
- Make sure the appropriate power cord cap is installed as described in "Installing a Power Cord Cap" on page B-2.
- Make sure the rotary switch on all fixtures has been set as described in "Unit Addressing" on page 2-3.
- Make sure ColorPower is linked appropriately to all fixtures in the fixture link as described in "Setting up the Power Supply Link" on page 2-2.

At this point it is safe to connect ColorCommand fixtures to power.

Note: ColorCommand fixtures use a thermal protection relay. A ColorCommand fixture must have a 4-pin XLR Color Changer cable connected or the lamp will not turn on.

ColorCommand Maintenance

B

ColorCommand fixtures have no user-serviceable parts inside. If your fixture requires maintenance, contact customer support (see "Contacting High End Systems®" on page ii).

Cleaning the ColorCommand Lens

⚠ Warnings: **Disconnect power and turn power switch off before servicing.**

Equipment surfaces may reach temperatures up to 67° C (153° F). Allow the fixture to cool before handling.

Clean the front ColorCommand lens using a mild glass cleaner (containing no ammonia) and a soft, lint-free cotton cloth.

Replacing the ColorCommand Lamp

For information on replacing the lamp in a ColorCommand fixture, see "Installing the Lamp" on page B-1.

Appendix C: ColorMerge Installation

ColorMerge Setup

The ColorMerge module ships with the following items:

- ColorMerge product
- Declaration of Conformity

Adding a ColorMerge Module to a Source Four Fixture

Warning: INTENSE HEAT. AVOID CONTACT BY PERSONS AND MATERIALS.

Warning: CHALEUR INTENSE. ÉVITER TOUT CONTACT ET TENIR TOUTE MATIÈRE À L'ÉCART.

Perform this procedure *before* you connect the fixture to power. Refer to Figure C-1 as you complete these steps. To install a ColorMerge moduld in a Source Four ellipsoidal fixture:

1. Remove the front barrel assembly of the Source Four ellipsoidal fixture by loosening the thumbscrew and the Philips set screw located above and beneath the lens barrel. You must rotate the barrel assembly until it releases from the mounting tabs located in the rear housing assembly.
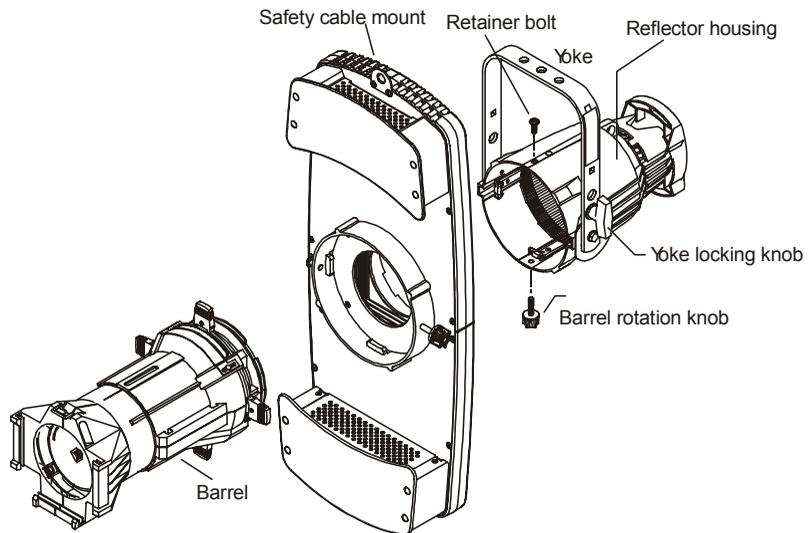

Figure C-1 Installing ColorMerge

2. Insert the ColorMerge module into the Source Four rear housing assembly by aligning the mounting tabs into the rear-locking ring of the ColorMerge module. You must rotate the ColorMerge module until the Source Four mounting tabs are captured in the ColorMerge locking ring channels.

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3. Adjust the ColorMerge module to the desired orientation. You can rotate ColorMerge 180° to any angle on the Source Four rear housing assembly. This enables you to stack the fixtures close to each other or fit a fixture into a confined space.

4. Tighten the thumbscrew and Philips set screw to lock the module onto the Source Four fixture.

⚠️ **Caution: The Source Four fixture with a ColorMerge module installed must be mounted or suspended so that the electronics housing of the ColorMerge module is never above the Source Four fixture (see Figure C-2).**

5. Insert the front barrel assembly onto the front locking ring of the ColorMerge module, engaging the barrel assembly into the ColorMerge locking ring channels.

6. Adjust the front barrel assembly to the desired orientation and tighten the thumbscrew and Philips set screw to lock the front barrel assembly to the ColorMerge module.

7. Mount the unit using safety cable at the mounting location.
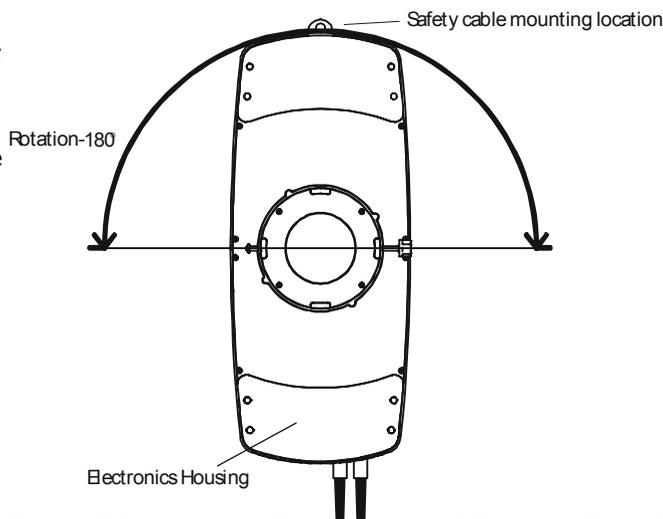
Figure C-2 Mounting Orientation and Range of Travel

Optimizing Performance

Soft Edge Beam

For optimum performance from ColorMerge and the Source Four when you need a soft edge always move the lens tube out (i.e. away from the lamphouse) from the focus point, not towards.

Beam Adjustment

The fitting of ColorMerge will slightly alter the flat field adjustment of the Source Four. This is easily corrected using the two concentric adjustment knobs located on the rear of the Source Four lamp housing. The controls allow you to align the lamp and adjust its field. The outer knob centers the lamp within the reflector while the inner knob adjusts the lamp's field.

1. Turn on the Source Four and aim it at a flat surface.

2. Unlock and loosen the outer knob by turning it counterclockwise.

3. Gently move the outer knob from side to side and up and down until the lamp is centered within the reflector.

4. Once the lamp is centered, turn the outer knob clockwise to lock it in place.

5. Turn the inner knob either clockwise or counterclockwise to achieve an optimum flat field. To correct for adding ColorMerge this knob should be turned clockwise from its original position.

Transporting the ColorMerge Module

Caution: **Insure that all color mixing filters are in the fully closed position before shipping or transporting to prevent glass from breaking.**

Cleaning the ColorMerge Dichorics

Warnings: **Disconnect power and turn power switch off before servicing.**

Equipment surfaces may reach temperatures up to 67° C (153° F). Allow the fixture to cool before handling.

Clean the Dichroic glass using a mild glass cleaner (containing no ammonia) and a soft, lint-free cotton cloth.

Caution: **Serious damage can occur to the optical system due to lamp explosion. If a lamp breaks in the Source Four fixture, inspect the ColorMerge module for broken filters or loose glass particles. The ColorMerge module may require internal service to clean out any loose or broken glass.**

C