

studio beam[®]

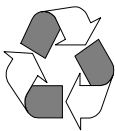
User Manual

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Studio Beam[®] User Manual
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Declaration of Conformity

according to ISO/IEC Guide 22 and EN45104

Manufacturer's name: High End Systems, Inc.
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Declares that the product

Product Name: Studio Beam
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 2000:

Safety: EN 60598-1 : 1993
EN 60598-2-17 ; 1989
A1-A3 : 1993

EMC: EN 55022, 1994 Class A ITE
EN 61000-4-2 : 1995 Level 2/3 (4/8kV)
EN 61000-4-3 : 1995 Level 2 (3 V/m)
EN 50204 : 1996 Level 2 (3 V/m)
EN 61000-4-4 : 1995 Level 2 (1.5 kV)
EN 61000-4-5 : 1995 Level 3 (2/1 kV)
EN 61000-4-6 : 1996 Level 2 (3VRMS)
EN 61000-4-11 : 1994
EN 61000-3-2 : 1995
EN 61000-3-3 : 1994



USA, Friday, April 16, 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.

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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.

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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 B.

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 B.

Veillez 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 B.

Vor der Montage, dem Zusammenbau und der Inbetriebnahme 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 B.

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

Informacion Importante De Seguridad

En el Apéndice B 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.

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.

Safety 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.

Document Conventions

This manual uses the following conventions for menus and menu navigation buttons:

Example	Meaning
<Button>	Press the appropriate LED display navigation button on the fixture. For example, the <Enter> button on the LED display panel (see Figure 4-1 on page 4-1).
"Menu Option"	Quotation marks are used to indicate the appropriate menu selection you should choose from the on-board menu system. For example, the "ADDR" menu option.

Warranty Information

Limited Warranty

Unless otherwise stated, your product is covered by a two year parts and labor limited warranty. Dichroic filters and LithoPatterns® high resolution glass gobos 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: 2105 Gracy Farms Lane, 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.

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Chapter 1

Features and Specifications

1

Unlike a fresnel wash or ellipsoidal spot fixture, the Studio Beam® is a third type of automated light featuring a **Pebble Convex (PC) lens** that produces a unique quality of light. This PC lens is similar to a fresnel lens in optical properties, but incorporates a diffusion pattern on its rear surface to produce a well-defined soft-edge beam without light spill.

Studio Beam® features a new MSR 700 watt, short-arc lamp and a patented combination elliptical/spherical reflector to yield over 20,000 lumens resulting in extremely high light output for a compact fixture of 21 kg (47 lbs). The aspheric lens system provides a broad zoom range from 15° to 26°. Fitted with full CMY Color Mixing (plus three additional discrete dichroic colors), Studio Beam® also includes variable frost and a variable strobe that rivals speeds seen in dedicated strobe fixtures.

All Studio Beam® fixtures support **TalkBack™ technology**. Any DMX controller supporting TalkBack protocol, like the HandShake™ handheld controllers from High End Systems, can remotely access every option in the Studio Beam onboard menu system. For more information, see “TalkBack™ Support for Remote Access” on page 3-1.

Audio modulation is a new Studio Beam feature available when running Standard protocol. Modulation is based on amplitude rather than beat and varies as the general sound level rises and falls. The effects of the modulation is seen best with music that has a wide dynamic sound range. Each fixture has an integral microphone and audio circuit to provide audio modulation for the following parameter functions:

- Color saturation changes on any single color mix wheel or combination of wheels with slow, medium or fast decay rates.
- Lenticular wheel motion (forward and reverse) to change beam shaping with slow, medium or fast decay rates.
- Frost flag opening and closing to change diffusion.
- Dimming.

Studio Beam[®] Features

Fixture

- High efficiency reflector and optical train provides an intensity range from 18,000 lumens with the aspheric zoom lens system installed to over 20,000 lumens without the aspheric zoom lens.
- 115mm Pebble Convex (PC) lens supplies a soft edge beam with no light spill and a blending curve output.
- Subtractive color mixing system plus three additional discrete colors (CTO, deep red, and dark blue) provides infinite color mixing.
- MSR 700-watt, short arc lamp developed by Philips[®] in conjunction with High End Systems[®], Inc.
- Motorized aspheric zoom lens system allows a 15° to 26° beam angle.
- Optical encoders to automatically correct the beam's position if the fixture's head is jarred from its programmed position.
- Enhanced frost and shutter construct parameters including ramp/snap, synchronous, and random functions.
- Rotatable, variable horizontal and vertical beam shaping.
- Time code synchronization in stand-alone mode via master/slave links to any combination of Technobeam[®], Studio Spot[™], Studio Color[®] 250, Studio Spot[™] 250, and Studio Beam[®] fixtures.
- Seamless, variable frost.
- Smooth full-field dimming without changing color temperature or beam shape.
- Electronic strobe in addition to a variable conventional strobe to 15.75 Hz.
- DMX analyzer for easy DMX troubleshooting.
- Lamp interlock cuts the current to the lamp if the lamp cap is opened while the lamp is on.
- Full optical dimming and fade-to-black.
- Remote fixture power up and shut down.
- Light burst lamp boosting and lightning effects.

Operation

- High-resolution DMX 512 programming control.
- TalkBack protocol support for remote fixture control.
- On-board Preset DMX programming via the fixture's menu system for stand-alone operation.

- Easy-to-program alphanumeric LED (light emitting diode) display.
- Factory-programmed demo sequence (cue) as a preset default in standalone mode.
- Two user modes (A and B), each with an on-board 16-scene memory for a total of 32-scene memory per fixture in stand-alone mode.
- DMX macro channel factory-programmed with four Internal Effects™ macros.
- Selectable audio modulation adjusts fixture movement to sound amplitude for all fixture parameters except Pan, Tilt, and Zoom.

Construction

- Warm-start circuitry allows for lamp restrike less than one minute after extinguishing.
- Compact size less than 1/2 of comparable fixtures.
- Exterior design prevents stray light scatter.
- Universal power supply automatically selects the appropriate voltage for the fixture (100V - 230V at 50-60 Hz).
- Motion range of 540° pan and 256° tilt.
- Both 3-pin and 5-pin XLR connectors.
- Exclusive High End Systems, Inc. multi-phase technology for stunningly fast, smooth, and quiet yoke movement.
- LED status indicators streamline troubleshooting.
- Precision stepper motors control iris, shutter, color, and effects wheels.

Optional Accessories

Table 1-1 lists the Studio Beam® optional accessories available from your High End Systems dealer/distributor.

Table 1-1 Studio Beam® Optional Accessories

Part Description	Part Number
Replacement MSR 700W short arc lamp	55030054
Male 3-pin XLR terminator	90404039
Heavy duty 3-pin XLR cable (10')	55050005
Heavy duty 3-pin XLR cable (25')	55050006
Heavy duty 3-pin XLR cable (50')	55050007
Heavy duty 3-pin XLR cable (100')	55050008
Heavy duty 5-pin XLR cable (10')	55050017
Heavy duty 5-pin XLR cable (25')	55050018
Heavy duty 5-pin XLR cable (50')	55050019
Heavy duty 5-pin XLR cable (100')	55050020
Whole Hog® II Lighting Console	25020001
HandShake™ handheld controller	10020001
Status Cue® Lighting Console	22020002
Upload Dongle	26040002
Galvanized safety cable	12040001
Cheeseborough clamp	55040014
Road Case for Studio Beam® fixtures	Call ¹

¹For more information about optional accessories, contact either your High End Systems® dealer/distributor, High End Systems Sales, or visit the High End Systems Web site. For contact information, see “Contacting High End Systems” on page ii.

Specifications

Physical Specifications

Height: 599.99 mm (23.62")

Width: 484.5 mm (19.08")

Depth: 295 mm (11.62")

Weight: 21 kg (47 lbs)

For additional dimensions, see Figure 1-1.

Environmental Specifications

Maximum ambient temperature, (T_a): 50° C (122° F)

Maximum exterior surface temperature: 90° C (194° F)

1m Minimum distance to flammable objects: 3.28 ft (1.0 m)

2m Minimum distance to lighted object: 6.56 ft (2.0 m)



Do not mount on a flammable surface.

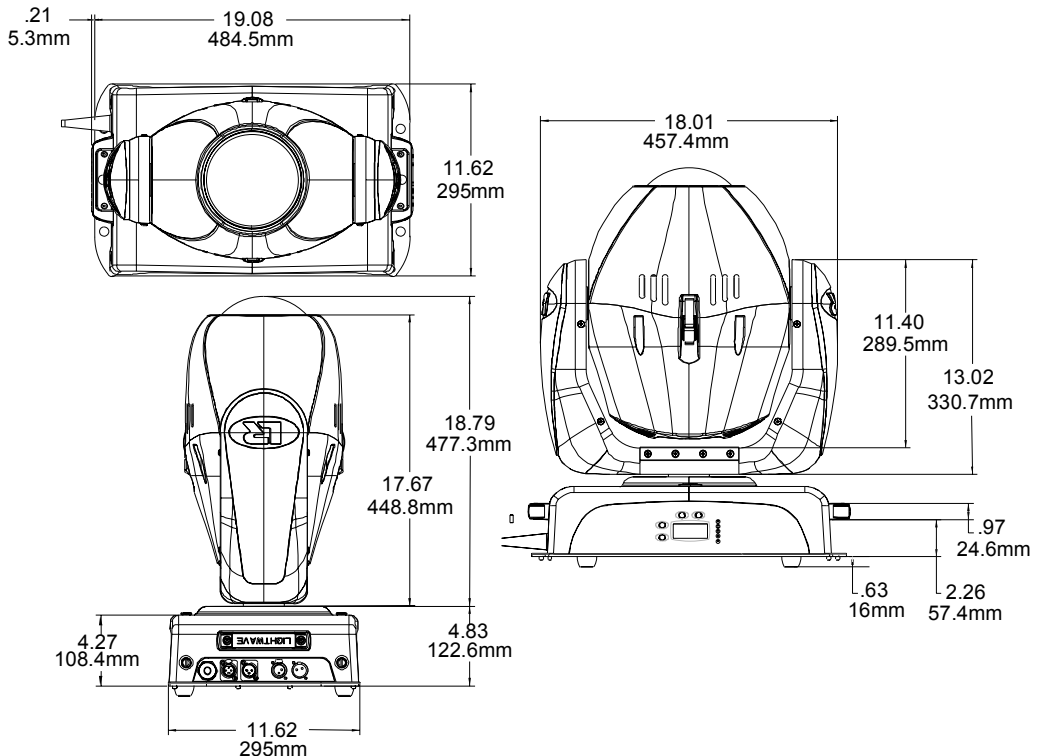


Figure 1-1 Studio Beam® dimensions.

Electrical Specifications

Voltage Range:100-230V, 50-60 Hz, 10-4.35 A

Power Consumption:1000 W

Fuses:Logic Board:

F1 - 2.5A, 250V, Slow Blow only (5 mm x 20 mm)

F2 - 2.5A, 250V, Slow Blow only (5 mm x 20 mm)

Motor Power Supply:

F1 - 6.3A, 250V, Slow Blow only (5 mm x 20 mm)

F2 - 6.3A, 250V, Fast Blow only (5 mm x 20 mm)

Filter Board:

F1 - 12.5A, 250V, Fast Blow only (5 mm x 20 mm)

F2 - 12.5A, 250V, Fast Blow only (5 mm x 20 mm)

Voltage Surge: A surge of 2000V or more may damage the power supply.



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

Cable and Connector Specifications

DMX data cables:

Belden[®] 9841 or equivalent (meets specifications for EIA RS-485 applications) with the following characteristics:

- 2-conductor twisted pair plus a shield
- maximum capacitance between conductors - 30 pF/ft.
- maximum capacitance between conductor and shield - 55 pF/ft.
- maximum resistance of 20 Ω / 1000 ft.
- nominal impedance 100-140 Ω

DMX data connectors: 3-pin or 5-pin male and female XLR connectors

DMX data terminators: Male XLR connector with 120 ohm terminator

Lamp Specifications

Lamp type: Philips[®] MSR 700W short arc (MSR700SA)

Color temperature: 5600 K

Chapter 2

Setup and Configuration

Unpacking the Fixture

Unpack your Studio Beam[®] and verify that the fixture arrived undamaged. Inspect both the outside of the fixture for physical damage and the inside of the fixture for damage to glass components.

To access the internal components, release the two bezel latches (one latch located on each side of the fixture's head) and remove the bezel (see Figure 2-1).

If the fixture is damaged, notify both the shipping agent and your sales agent immediately.

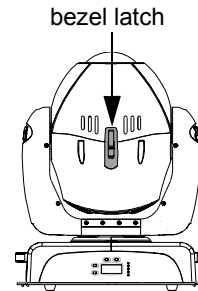


Figure 2-1 Remove the bezel

Saving the Shipping Materials

Do not discard 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 have been damaged during transport. Therefore, you should return a product for repair in its original shipping carton and packing materials.

Note: Before sending 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.

Changing the Attachment Plug

Studio Beam[®] fixtures are shipped with a molded attachment plug. However, different locations (even within the same country) may require a different attachment plug to connect your fixture to a power outlet. Because of the variety of attachment plugs used worldwide, High End Systems, Inc. cannot make specific recommendations for the particular attachment plug you should use. Contact a local authority if you are unsure which type of attachment plug you need to obtain. If you need to replace the attachment plug, note that the cores in the mains lead are colored according to the following code:


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



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

Installing an Attachment Plug - 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 your plug. Therefore, install an attachment plug 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.

Vigtig Fikker Heds Information - Danmark

Advarsel: Beskyttelse mod elektrisk chock.

Vigtigt!

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



Powering On the Fixture



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

Studio Beam fixtures do not have a power switch. To power on the fixture, simply connect it to an appropriately-rated power source. Once connected, you can remotely power up or shutdown the fixture via controller commands (see “Control Construct” on page 3-13). However, it is very important that you disconnect power to the fixture before performing certain procedures as shown in this manual.

Homing the Fixture

The fixture’s homing procedure verifies that the major functions of the fixture (color wheels, frost flags, and shutter) are oriented properly. The homing procedure is also used to take the fixture out of shutdown mode. During the homing process, you will hear clicking sounds as the wheels, flags, and shutter seek their home position.

When you connect any Studio Beam to an appropriately-rated power source, the fixture automatically begins a homing procedure. You can also remotely home the fixture via a DMX controller (see “Control Construct” on page 3-13) or manually home the fixture via the on-board menu system (see “Homing the Fixture (HOME)” on page 4-17).

Mounting the Fixture



Warnings: Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.



Maintain a minimum distance of 1 m (3.28 ft.) from combustible materials.



Maintain a minimum distance of 2 m (6.56 ft.) from lighted object. This means the fixture must be positioned at least 2 meters away from the object it is illuminating.

Do not mount on a flammable surface.

Use a secondary safety cable when mounting this fixture.

You can mount Studio Beam fixtures either upright (on the fixture’s base) or in any orientation suspended from a support system (such as a truss). Follow the instructions below for the mounting orientation you choose.

Mounting the Fixture Upright

To mount the fixture upright, make sure that all four rubber feet are installed on the fixture’s base (see Figure 2-2) and place the fixture on a sturdy, stable surface.

If the surface is above floor height, use safety cables to secure the fixture to the surface. Install the safety cable(s) by looping the cables around a support on the surface, through the side holes in the fixture’s base, and around the fixture’s handles. Make sure the support and cables can support the weight of the fixture (see “Physical Specifications” on page 1-5).



Caution: Do not mount the fixture upright without the four rubber feet installed.

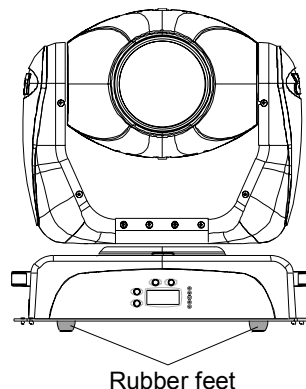


Figure 2-2 Upright mounting

Mounting the Fixture on a Truss

You will need:

- truss or other support system
- safety cables (2)
- clamps (2)
- locking washers (2)

Truss or Other Support System

If you are mounting the fixture(s) on a truss or another type of support, verify the truss or support will handle the weight of *all* the devices you are mounting. The Studio Beam fixture weight is listed in “Physical Specifications” on page 1-5.

Safety Cable

High End Systems strongly recommends that you use safety cable when mounting any fixture. You must supply your own safety cable and verify the cable is capable of supporting the weight of the fixture. You can order galvanized safety cables from your High End Systems dealer/distributor (see “Optional Accessories” on page 1-4).

Clamp

You must supply your own clamps and verify the clamp is capable of supporting the weight of the fixture. You can order deluxe C-clamps for a two-inch truss from your High End Systems dealer/distributor (see “Optional Accessories” on page 1-4).

Mounting Procedure

Note: Due to the wide variety of possible lighting designs, High End Systems cannot make specific mounting recommendations. Consider the following procedure as a suggested guideline only.

To mount Studio Beam fixtures on a truss:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Use two people to mount each fixture: one person to hold the fixture while it is being secured in place, and one person to secure the fixture to its support and attach safety cables.

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 securely. *Do not allow one person to both support and mount the fixture.*

3. Attach suitable clamps through the center holes on the base of the fixture (see Figure 2-3). *Install two locking washers per clamp when attaching the clamps to the fixture’s base.*
4. Tighten the clamps firmly to the fixture’s base and to the support.

5. Loop one or more suitable safety cables around the support, through the side holes in the fixture's base, and around the fixture's handles (see Figure 2-3).

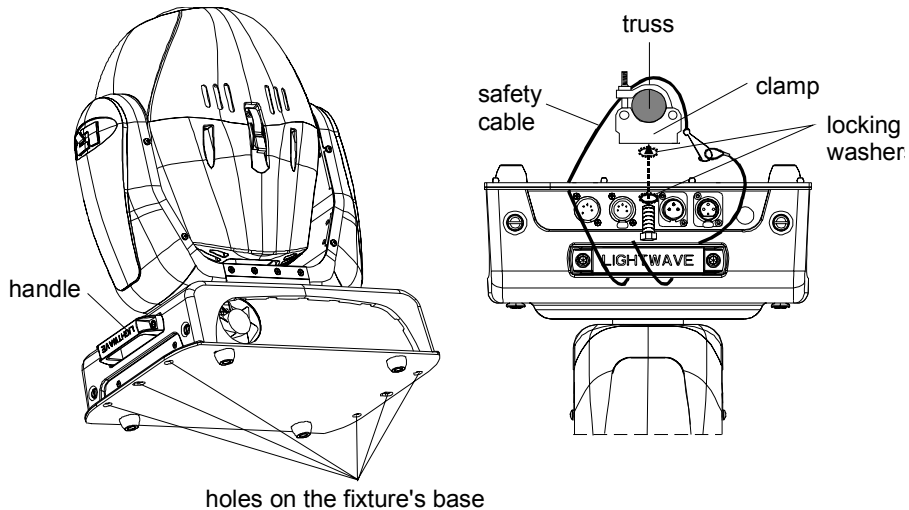


Figure 2-3 Attaching a clamp and safety cable to the fixture

Linking the Fixtures

The combined number of channels required by all the fixtures on a DMX 512 link determines the number of fixtures the link can support. Each Studio Beam[®] fixture uses 16 channels running standard protocol and 15 channels running flat protocol.

If you connect more than 32 fixtures to a link, you must use a DMX splitter. The 32 device limit complies with the EIA-485 standard. Connecting more than 32 devices per link without a DMX splitter will eventually deteriorate the digital signal.

Controllers, serial data distributors, data line optoisolators, and any fixtures using the RS-422 DMX standard of serial communications (including Dataflash[®] AF1000 xenon strobes, and Intellabeam[®] fixtures) block software uploads, crossloads, or TalkBack[™] protocol on a link. Therefore, make sure you either put all of these devices after the Studio Beam[®] fixture on the link, or bypass these devices when you perform software uploads or crossloads

Data Cabling and Connectors

To link one or more fixtures to a controller and/or to each other, you must obtain data cabling. You can either purchase cabling from High End Systems (see “Optional Accessories” on page 1-4) or construct your own cabling.

If you choose to construct cabling, High End Systems recommends that you use data-grade cable. Data-grade cable is designed to carry a high-quality signal with less susceptibility to electromagnetic interference.

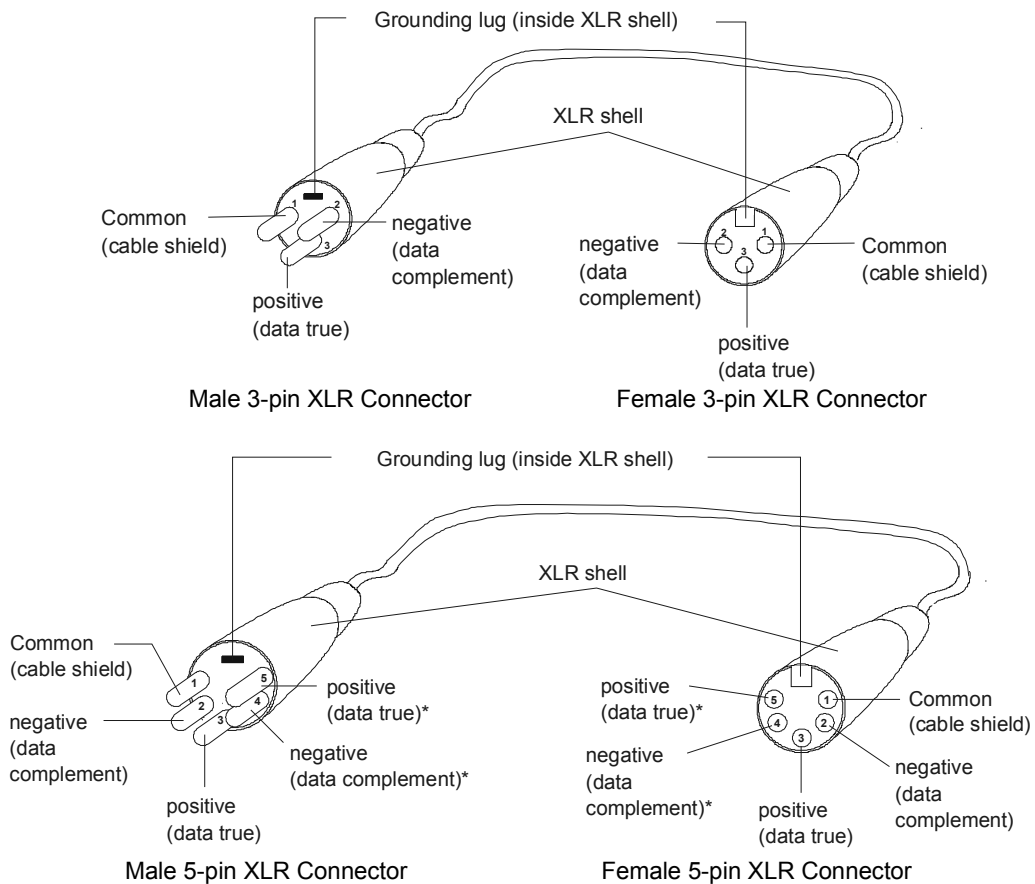
DMX data cables:

Belden® 9841 or equivalent (meets specifications for EIA RS-485 applications) with the following characteristics:

- 2-conductor twisted pair plus a shield
- maximum capacitance between conductors - 30 pF/ft.
- maximum capacitance between conductor and shield - 55 pF/ft.
- maximum resistance of 20 Ω / 1000 ft.
- nominal impedance 100-140 Ω

Cable Connectors:

Studio Beam fixtures can accept either 3-pin or 5-pin XLR cable connectors. Your cabling must have a male XLR connector on one end of the cable and a female XLR connector on the other end. Figure 2-4 shows the pin configuration for both cable types.



*This data line is not used by the fixture, but allows data to pass through the fixture.

Figure 2-4 Pin configuration for 3-pin and 5-pin XLR cables

Test each cable with a voltage/ohm meter (VOM) to verify correct polarity and to make sure that the negative and positive pins are not grounded or shorted to the shield or to each other.

Caution: Do not connect anything to the ground lug on the XLR connectors. Do not connect or allow contact between the common (cable shield) and the fixture’s chassis ground. Grounding the common could cause a ground loop and/or erratic behavior.

Setting up the Link

To link one or more fixtures to a controller using either 3-pin or 5-pin XLR cables:

1. Connect the male XLR connector of a DMX Data cable to the controller’s DMX Data Out connector.
2. Connect the Data cable’s female XLR connector to the Data In connector of the first (or next) fixture on the DMX link. (see Figure 2-5).
3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.
4. Connect a male terminator to the Data Out connector of the last fixture in the link (see “Obtaining a Terminator” on page 2-8). For information on obtaining a terminator, see “Optional Accessories” on page 1-4.

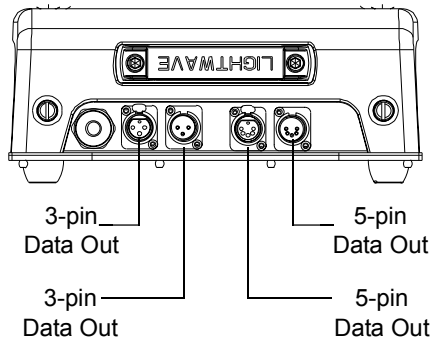


Figure 2-5 Data cable connectors on the Studio Beam® fixture’s side panel

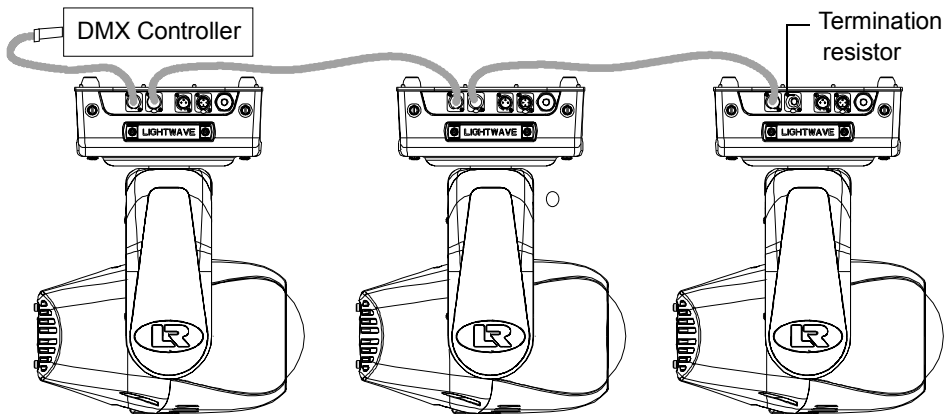


Figure 2-6 Linking fixtures to a controller with 5-pin cables

To link one or more fixtures to a controller using either 3-pin or 5-pin XLR cables:

1. Connect the male XLR connector of a DMX Data cable to the Data Out connector on the fixture addressed at DMX Start channel 1, see Figure 2-7.
2. Connect the cable's female XLR connector to the Data In connector of the next fixture on the DMX link.
3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.
4. Connect a male terminator to the Data Out connector of the last fixture in the link. For information on obtaining a terminator, see the following section.

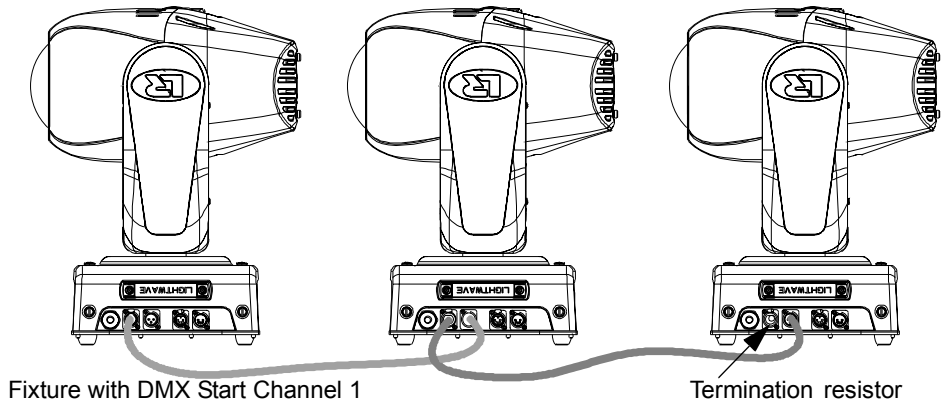


Figure 2-7 Linking without a controller with 3-pin cables



Caution: Do *not* connect more than one Data In and one Data Out connector to each fixture.

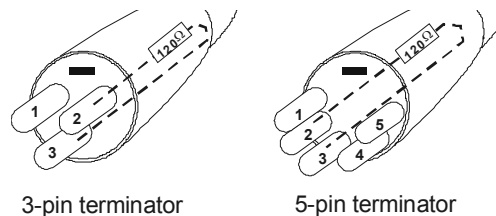
Obtaining a Terminator

You must install a 120 ohm, 1/4 watt (minimum) terminator in the fixture's Data Out (female) cable connector in the *last* fixture on each DMX link. If you plan to control your fixtures in stand-alone mode (with no controller on the link), you must also install a female terminator in the Data In cable connector on the *master* fixture (the fixture assigned to DMX start channel 1). A terminator will prevent data reflection, which can corrupt the data communication on the link.

You can purchase a male 5-pin terminator from your High End Systems dealer/distributor (see "Optional Accessories" on page 1-4), or use the following to construct a terminator.

To construct a terminator:

1. Obtain a 3-pin or 5-pin XLR connector.
2. Disassemble the connector.
3. Solder a 120 ohm resistor, minimum of 1/4 watt, between pins two and three (see Figure 2-8).
4. Reassemble the XLR connector.



3-pin terminator

5-pin terminator

Figure 2-8 Data cable terminator

Uploading Latest Fixture Software

The latest software for Studio Beam fixtures is available in the support section of the HighEnd Systems web site (www.highend.com). There are three ways to upload new software to Studio Beam fixtures:

1. Attach a High End Systems Upload Dongle to your computer and upload the software to your Studio Beam fixture.

To use a High End Systems Upload Dongle, you need a 386-based (or faster) computer, MS DOS[®] version 3.3 (or later) or Windows 95/98, 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 ‘Contacting High End Systems’ on page ii).

2. Upload the new software to all Studio Beam fixtures on the link using a HandShake handheld controller or a Status Cue lighting console.
3. Crossload software from one fixture that contains the new software to all other Studio Beam fixtures on the link. See “Crossloading Fixture Software (XLD)” on page 4-15.

Note: Before you can upload new software, you must disconnect any controllers, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash[®] AF1000 xenon strobes, and Intellabeam[®] fixtures) are located after the Studio Beam fixtures on the link. These devices will block communication with any other Studio Beam fixtures on the link.

Assigning a DMX Start Channel

The DMX start channel identifies each fixture on a DMX link. If you plan to control your fixtures with a DMX controller (or using synchronized preset playback), you must assign a DMX start channel to each fixture on the link.

If you *always* plan to use the fixture in stand-alone mode (without a controller or synchronized preset playback), you can skip this section.

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 each fixture requires is called the fixture’s channel range. Studio Beam fixtures running standard protocol have a 16-channel range. Studio Beam fixtures running flat protocol have a 15-channel range. The DMX start channel is the first channel available to a fixture in its channel range.

To assign a DMX start channel, you must access the fixture’s menu system via the alphanumeric LED display and four menu navigation buttons on the fixture’s front panel (see Figure 2-9).

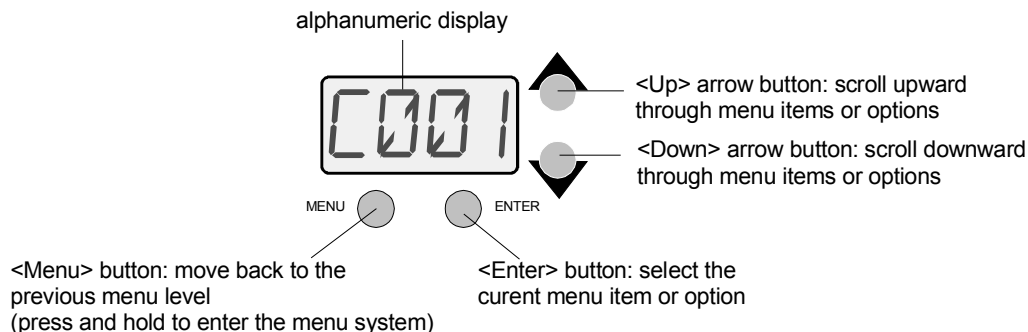


Figure 2-9 Menu navigation buttons

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.

**Note: The single exception to the non-overlapping rule is if you want the fixtures to respond to controller commands in exactly the same way. In this case, the fixtures must be the same type (for example, two Studio Beam fixtures) and the fixtures must share the entire channel range.*

To assign the start channel:

1. Press and hold <Menu> until “ADDR” appears on the LED display.
2. Press <Enter>.
3. Scroll to the desired DMX start channel (C001– C512)
4. Press <Enter>.

Determining the DMX Start Channel

DMX Link with Multiple Fixture Types

This section describes how to determine start channels for the fixtures on a DMX link if you plan to mix different fixture types (for example, a Studio Beam fixture and a Studio Spot 250 fixture) on the same DMX link.

To determine each fixture's DMX start channel in a link, you must know the number of channels used by each fixture. Knowing that the first fixture on the link will use DMX start channel 1, you can determine the DMX start channel for each successive fixture by adding the number of DMX channels used by the fixture to the fixture's DMX start channel. For example, in Table 2-1, 16 (channels used by Studio Beam running) + 1 (DMX start channel for the first fixture) = 17 (DMX start channel for the next fixture on the link).

Table 2-1 Determining Start Channels for different fixture types on a DMX link

Fixture location on the link	Fixture name	Number of DMX channels used per fixture	DMX start channel	Channel range used
First	Studio Beam (running standard protocol)	16 channels	C001	1-16
Second	Other device	9 channels	C017	17-25
Third	Other device	14 channels	C026	26-39
Fourth	Studio Beam (running flat protocol)	15 channels	C040	40-54

Note: The fixture location on the link does not have to comply with this example. The fixtures can be addressed in any order on the link. If there are other fixtures in the link skipped channels, note that the maximum address for the last Studio Beam fixture running standard protocol on the link is 497 (channel range 497-512).

Studio Beam Only DMX Link

If your DMX link will have only Studio Beam fixtures running the same protocol, utilize Table 2-2 and Table 2-3 for a listing of available DMX start channels for successive fixtures on the link according to the protocol used.

Table 2-2 lists the DMX start channels for Studio Beam fixtures running standard protocol. This table assumes that the fixtures are all assigned to the same link, one after another, and that all fixtures use the same number of channels (i.e. only Studio Beam fixtures (or other devices using 16 DMX channels) on the link.

Table 2-3 lists the DMX start channels for Studio Beam fixtures running flat protocol. This table assumes that the fixtures are all assigned to the same link, one after another, and that all fixtures use the same number of channels (i.e. only Studio Beam fixtures (or other devices using 15 DMX channels) on the link.

Table 2-2 DMX Start Channels for Fixtures Running Standard Protocol

Fixture Order in the Link	DMX Start Channel	Fixture Order in the Link	DMX Start Channel	Fixture Order in the Link	DMX Start Channel
1	1	11	161	22	337
2	17	12	177	23	353
3	33	13	193	24	369
4	49	14	209	25	385
5	65	15	225	26	401
6	81	16	241	27	417
7	97	17	257	28	433
8	113	18	273	29	449
9	129	19	289	30	465
10	145	20	305	31	481
		21	321	32	497

Table 2-3 DMX Start Channels for Fixtures Running Flat Protocol

Fixture Order in the Link	DMX Start Channel	Fixture Order in the Link	DMX Start Channel	Fixture Order in the Link	DMX Start Channel
1	1	13	181	25	361
2	16	14	196	26	376
3	31	15	211	27	391
4	46	16	226	28	406
5	61	17	241	29	421
6	76	18	256	30	436
7	91	19	271	31	451
8	16	20	286	32	466
9	121	21	301	33*	481
10	136	22	316	34*	496
11	151	23	331		
12	166	24	346		

**Note: If you connect more than 32 fixtures to a link, you must use a DMX splitter. The 32 device limit complies with the EIA-485 standard. Connecting more than 32 devices per link without a DMX splitter will eventually deteriorate the digital signal.*

Chapter 3

Fixture Programming

Fixture Operation Overview

Operational control features for Studio Beam[®] fixtures include:

- Assigning a DMX start channel
- Accessing and setting fixture options
- Viewing fixture status
- Crossloading software
- Performing self tests
- DMX Programming for creating, storing, and playing scenes

The Onboard Menu System controls all these features via the LED display. A DMX controller can provide remote DMX programming to all fixtures on a link and, if it is running TalkBack protocol, remote control of other fixture operations listed above.

For more information on the Studio Beam Menu System, see Chapter 4 and the Menu Map in Appendix D.

TalkBack™ Support for Remote Access

All Studio Beam fixtures support TalkBack™ technology. TalkBack™ technology is a new feature that allows remote access to the menu system built into High End Systems fixtures. A DMX controller supporting TalkBack protocol like the HandShake™ handheld controllers from High End Systems, can remotely access any option in the Studio Beam onboard menu system.

TalkBack protocol uses the normal DMX-512 connection for bi-directional communication with the fixture so physical access to the fixture is no longer required to perform operations like changing a DMX address or configuring preset programs. TalkBack protocol utilizes the primary DMX link (pins 2-3) in a half-duplex communication mode. This means that it does not require pins 4-5 to be connected or used to receive TalkBack messages coming from the fixture.

TalkBack protocol uses a discovery process to find the unique number that is embedded inside each fixture, similar to a serial number. Once the fixtures have all been identified, the current fixture parameter settings and information can be accessed. Fixture access can happen at anytime, but the Talkback messages are only valid after the fixture starts homing.

DMX Programming Overview

A Construct (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 constructs. A scene (sometimes referred to a *look* or a *cue*) is one combination of construct settings. These scenes are the building blocks for show creation.

Full Speed verses MSpeed Control

Some constructs can be set to operate at full speed or MSpeed (motor speed). Full speed operations are completed in the shortest length of time after the motor starts moving. With MSpeed control, change occurs smoothly over the entire MSpeed time value selected. For example, if you select an MSpeed time of 30 seconds, the motor will gradually change position until it reaches its new destination at the end of 30 seconds.

DMX Protocols

Programming a fixture for a DMX link requires each construct be assigned to a specific DMX channel in the fixture's channel range. Channel assignments are based on the DMX protocol used. There are two protocol's available for Studio Beam fixtures; 16-channel Standard, and 15-channel Flat. Table 3-1 lists the channel assignments for each protocol. See "Appendix A" for Standard and Flat protocol DMX Tables.

Table 3-1 Channel Assignments in Standard and Flat Protocols

Channel #	Function in Standard Protocol	Function in Flat Protocol
1	Pan Coarse	Pan Coarse
2	Pan Fine	Pan Fine
3	Tilt Coarse	Tilt Coarse
4	Tilt Fine	Tilt Fine
5	Color Function	Dim
6	Cyan	Shutter
7	Magenta	Lamp Control
8	Yellow	Cyan
9	Beam Shaping	Magenta
10	Zoom	Yellow
11	Frost	Color Function
12	Shutter	Beam Shaping
13	Dim	Zoom
14	MSpeed	Frost
15	Macro	Control
16	Control	

DMX Programming Options

Studio Beam fixtures can be programmed to create and play back scenes with either a DMX-compatible controller or with the Onboard Menu System Preset programming feature (for stand-alone operation). However, you cannot use both a DMX compatible controller and the fixture's on-board menu system at the same time. In other words, you cannot create a scene using the on-board memory and play it back using a controller. You also cannot use a controller at the same time on-board scenes are playing.

Using a DMX controller, you can program an unlimited number of sequences (combinations of scenes) and retain direct control over the Studio Beam fixture at all times. You may choose to save time by programming your fixtures using a controller and then capturing the scene(s) to the on-board memory of multiple Studio Beam fixtures.

If you plan to operate your fixtures without a DMX controller, you can utilize one of the fixtures on the link to synchronize preset playback among all fixtures of that type connected to the DMX link.

Note: Because controllers cannot transmit crossfade or delay construct values, you must use preset programming in the onboard menu system to manually set those construct values at the fixture.

Programming with a DMX Controller

The Whole Hog II[®] Lighting Console, the HandShake handheld controller, and the Status Cue console are the DMX controllers available from High End Systems to control Studio Beam fixtures (see “Optional Accessories” on page 1-4). For more information on whether your DMX controller supports Studio Beam fixtures, contact the controller's vendor. For more information on operating your fixture with a controller (or control device such as DMX control software), consult the documentation provided with the controller.

DMX Programming in the Onboard Menu System

Fixture level DMX programming is executed in the Preset portion of fixture's Onboard Menu system, see “Preset Menu (PRST)” on page 4-3. For more detailed information on all the settings you can control in Studio Beam fixtures using the onboard Menu System, see “Chapter 4” and “Appendix D” .

Construct Function Descriptions

The following sections describe the Constructs (Parameters) for Studio Beam fixtures running Standard or Flat DMX Protocol. All DMX values indicated in the detailed construct descriptions are in decimal units. See “Appendix A” for complete DMX tables.

Pan and Tilt Constructs

Channels 1–4 control the Pan and Tilt constructs in both the Standard and Flat Protocol. The Studio Beam fixture has a 540° pan range and a 256° tilt range. DMX channels 1 and 3 allow coarse adjustment to approximately one degree of the desired pan and tilt position. DMX channels 2 and 4 allow fine adjustment to a fraction of a degree of the desired pan and tilt position.

In Standard protocol, the pan and tilt motion for Studio Beam fixtures is controlled with MSpeed values by default (see “MSpeed (Motor Speed) Construct” on page 3-12). If you choose to control the Pan and Tilt constructs with DMX controller crossfading, set Pan/Tilt MSpeed off in the Control construct (see the DMX tables in “Appendix A”). Flat protocol does not have an MSpeed construct.

Note: Optical encoders for pan and tilt correct the fixture’s position if the fixture is jarred from its programmed position. If a physical obstruction prevents the fixture from correcting its position, the fixture “times out” to prevent wear on the motors. If your fixture has timed out, remove the obstruction and home the fixture to return it to normal operation.

Color Function Construct

The Color function construct is controlled with DMX Channel 5 in Standard Protocol and Channel 11 in Flat Protocol. This construct determines how the color wheels move.

In Standard Protocol

In Standard protocol, the Color Function mode can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor). For more information on MSpeed, see “MSpeed (Motor Speed) Construct” on page 3-12.

The Color Function you choose will effect which construct values are available for each individual color wheel (Cyan, Magenta, and Yellow). Table 3-2 describes the Color Functions available on the Studio Beam fixture.

Table 3-2 Color Function Settings in Standard Protocol

Color Function	Description
Continuous	Allows exact positioning at any point on the color wheel for a smaller <i>step</i> between color wheel positions for color crossfades.
Indexed	Allows the color wheel to take the quickest path and snap to any one of eight positions.
Pure Mix	Absolute positioning across color mix portion of the color wheel only.

Table 3-2 Color Function Settings in Standard Protocol

Color Function	Description
Spin	Wheel spin speed, direction, or fixed position is set individually on the Cyan, Magenta, and Yellow channels.
Cycle	Uses only the color mixing portion of all color wheels to cycle factory-determined colors at variable speeds. Cycle speed is set by the Cyan channel.
Color Scan	Scans the color mixing portion of the color wheel (not the additional discrete color). Scanning speed or fixed position can be set individually on Cyan, Magenta, and Yellow channels.
Random	Selects whole color positions at variable speeds. Random speed is set by the Cyan channel.
Blink-indexed	Closes then reopens the shutter between continuous wheel position changes.

Flat Protocol

In Flat protocol, Color channels are independent of each other. For example, one color wheel can spin while a second color wheel performs a media scan. The Color function channel (Channel 11) overrides channels 8, 9, and 10. Table 3-3 describes the settings available for the Color Function channel in Flat Protocol.

Table 3-3 Color Function Settings for Flat Protocol

Color Function	Description
Safe	Disables all Control settings
Color Cycle	Uses only the color mixing portion of all color wheels to cycle factory-determined colors at variable speeds. Cycle speed is set by the Cyan channel.
Random	Selects whole color positions at variable speeds. Random speed is set by the Cyan channel.
Blink	Closes then reopens the shutter between wheel position changes from continuous to discrete.

Cyan, Magenta, and Yellow Constructs

Studio Beam features CMY subtractive color mixing plus three additional discrete colors in a system of three color wheels as shown in Figure 3-1.

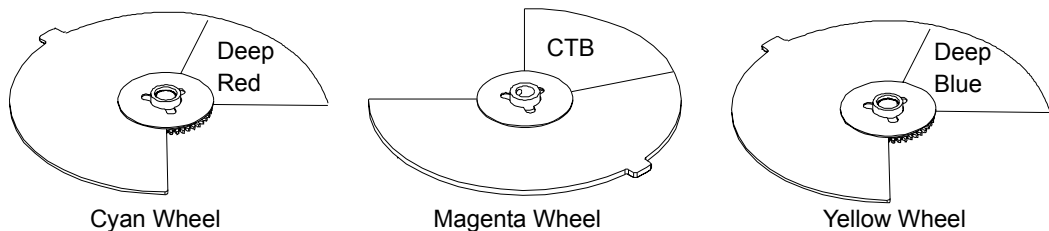


Figure 3-1 Studio Beam® color mixing wheels

These constructs determine how the individual color mixing wheels move. In Standard Protocol, Channels 6, 7, and 8 control Cyan, Magenta and Yellow respectively. In Flat Protocol, Channels 8, 9 and 10 control Cyan, Magenta and Yellow respectively.

The color wheel settings available are determined by the Color Function construct DMX value you choose (see Table 3-4). The wheel takes the quickest path to the setting in all Color Function Modes.

Table 3-4 Cyan, Magenta, and Yellow Channel Settings in Standard and Flat Protocol

Color Function Mode	Color Wheel Setting	Description
Continuous Mode	Open	White
Indexed	Discrete Color	Fixed color position on wheel <ul style="list-style-type: none"> • Cyan=Deep Red • Magenta=Color Temperature Blue (CTB) • Yellow=Deep Blue.
	Full Saturation	100% color (Cyan, Magenta or Yellow)
	Low Saturation	Reduced color (Cyan, Magenta or Yellow)
	Color Position 1 - Open	DMX values from 0–15 and 94–100
	Color Position 2 - Discrete Color	Fixed color position on wheel <ul style="list-style-type: none"> • Cyan=Deep Red • Magenta=Color Temperature Blue (CTB) • Yellow=Deep Blue.
	Color Position 3 - Full Saturation	DMX value ranges for wheel positions varying from 100% to low color saturation.
	Color Position 4	
	Color Position 5	
	Color Position 6	
	Color Position 7	
	Color Position 8 - Low Saturation	
Pure Mix	Full Saturation	100% color (Cyan, Magenta or Yellow)
	Low Saturation	Reduced color (Cyan, Magenta or Yellow)
Spin Mode	Continuous Positioning	Controls position on individual color mixing wheel
	Spin Reverse	Reverse spin from fastest (128) to slowest (187)
	Spin Stop	Stops the wheel
	Spin Forward	Forward spin from slowest (196) to fastest (255)
Color Scan	Continuous Positioning	Scanning rate set on each wheel individually from slowest (128) to fastest (255)
	Media Scan	
Cycle & Random Mode	The Cyan channel determines the speed at which all three (cyan, magenta, and yellow) color wheels move to the next cycle color or random color from slowest at 0 to fastest at 255.	

Standard Protocol has an additional audio color modulation function that can be accessed when the Control channel (Channel 16) is set in 170–197 DMX value range, see “Control Construct” on page 3-13.

Audio modulation is based on the amplitude of the sound, not the beat. When audio color modulation is selected, the color channels that are not selected for color modulation

default to Pure Mix mode. Table 3-5 describes the settings available for the color channels.

Table 3-5 for Color Channels in Standard Protocol

Audio Function	Modulation Type and Description
Saturated color to white	Full movement. Maximum amplitude music causes full scale movement. The selected color channel controls the decay rate of slow, medium and fast.
White to saturated color	
Saturated color to white	Limited movement. Cyan channel sets the maximum travel position. Decay rate is medium for all settings
White to saturated color	
More to less saturated color	Middle out. Limited movement. The center of the mix media is the center of the modulation. Cyan setting controls modulation size. Decay rate is medium.
Less to more saturated color	

Beam Shaping Construct

The Studio Beam fixture utilizes a lenticular wheel to control beam shaping. Channel 9 in the Standard Protocol and Channel 12 in Flat Protocol control the movement of the lenticular wheel. Table 3-6 describes the Beam Shaping settings.

Table 3-6 Beam Shaping Setting Descriptions in Standard and Flat Protocols

Beam Shaping Setting	Description
Open	Sets lenticular wheel to open position (no beam shaping). Available in Flat Protocol only.
Continuous Positioning	Allows exact positioning at any point on the lenticular wheel for a smaller <i>step</i> between color wheel positions for color crossfades.
Spin Reverse	Reverse spin from fastest (128) to slowest (187)
Spin Stop	Stops wheel
Spin Forward	Forward spin from slowest (196) to fastest (255)
Audio Modulation	Available in Standard Protocol only.

Standard Protocol also features audio modulation for Beam Shaping. Setting the Control Channel's (Channel 16) DMX value between 202 and 205 activates audio modulation. This feature modulates the movement of the Lenticular Wheel with the amplitude of the sound. Table 3-7 shows the Audio Modulation functions for Beam Shaping.

Table 3-7 Audio Modulation for Beam Shaping in Standard Protocol

Audio Function	Modulation Type and Description
Forward, slow decay	Full Movement Modulation. Maximum amplitude music causes full scale movement of the lenticular wheel. As amplitude is reduced the speed decays at the chosen rate.
Forward, medium decay	
Forward, fast decay	
Reverse, slow decay	
Reverse, medium decay	
Reverse, fast decay	

Table 3-7 Audio Modulation for Beam Shaping in Standard Protocol

Audio Function	Modulation Type and Description
Forward	Middle out. The center of movement is the vertical spread when the fixture base is horizontal. The channel setting controls the amplitude of modulation. Decay rate is medium.
Reverse	

Zoom Construct

The Zoom construct is controlled by Channel 10 in Standard protocol and Channel 13 in Flat protocol. The Zoom range spans from 15° at a DMX value of 0 to 26° at a DMX value of 255.

Frost Construct

The Frost construct allows you to add a haze or fog effect in increasing/decreasing densities to the projected pattern. The Frost effect is achieved with two frost flags that mechanically open and close in the optical path. DMX Channel 11 controls the Frost construct in Standard protocol. DMX Channel 14 controls the Frost construct in Flat protocol. Table 3-8 describes the Frost Settings.

Table 3-8 Frost Setting Descriptions in Standard and Flat Protocol

Frost Setting	Description
Continuous Positioning	Moves frost flags from open to closed in Standard protocol and from closed to open in Flat protocol
Closed	Frost flags fully closed in optical path producing a full frost effect
Periodic Frost Strobe	Allows variable strobing of the frost flags from slow to fast
Random Frost Strobe	Randomly strobes the frost flags from slow to fast
Ramp Open/Snap Shut	Ramps the frost flags open at variable speeds and snaps them shut at full speed
Snap Open/Ramp Shut	Opens the frost flags at full speed and then ramps them shut at variable speeds
Ramp Open/Ramp Shut	Ramps the frost flags open and then shut at variable speeds
Random Ramp/Snap Shut	Ramps the frost flags open at random speeds and then snaps them shut at full speed
Random Snap/Ramp Shut	Opens the frost flags at full speed and then ramps them shut at random speeds
Open (No Frost)	Removes the frost flags from the optical path

Audio Modulation is available in Standard Protocol for the Frost construct. Setting the Control Channel's (Channel 16) DMX value between 202 and 205 activates this Audio

modulation. This feature modulates the opening and closing of the frost flags to the amplitude of the sound. Table 3-7 shows the Audio Modulation functions for Frost.

Table 3-9 Audio Modulation for the Frost construct in Standard Protocol

Audio Function	Modulation Type and Description
No frost to frost	Full movement modulation. Maximum amplitude music will cause full scale movement of the frost flags. Decay rates can be set for slow, medium or fast to modify sensitivity to amplitude changes.
Frost to no frost	
No frost to frost	Limited movement modulation. The channel setting controls the maximum travel position between no movement to full movement
Forward	Middle out. The center of movement is the vertical spread when the fixture base is horizontal. The channel setting controls the amplitude of modulation. Decay rate is medium.
Reverse	

Shutter Construct

Basic Shutter functions are the same for Flat protocol and Standard protocol (when no lamp or dimming functions are set in Control Channel 16). Channel 12 controls the Shutter construct in Standard Protocol and Channel 6 controls the Shutter construct in Flat protocol. Table 3-10 describes the Shutter setting for Flat Protocol.

In Standard Protocol, the Control channel (Channel 16) also qualifies the Shutter construct as shown in Table 3-11 to create lamp boost, lightning and strobing effects. Flat Protocol accomplishes these effects in a separate channel, see “Lamp Control Construct” on page 3-11.

Table 3-10 Shutter Construct Functions in Flat and Standard Protocols

Shutter Function	Description
Close	Closes shutter
Periodic Strobe	Strobes beam at specified intervals
Random Strobe	Allows all Studio Beam Fixtures on the DMX link to strobe their shutters at random times.
Random/Synchronous Strobe	Allows all Studio Beam Fixtures on the DMX link to strobe their shutters at random times in unison.
Ramp Open/Snap Shut	Opens shutter at variable speeds, then snaps shut at full speed
Snap Open/Ramp Shut	Opens shutter at full speed, then ramps shut
Ramp Open/Ramp Shut	Opens shutter at variable speeds, then ramps shut
Random Ramp Open/Snap Shut	Opens shutter at random variable speeds, then snaps shut at full speed
Random Snap Open/ Ramp Shut	Opens shutter at full speed, then ramps shut at random variable speeds
Open	Opens shutter

Table 3-11 Other Shutter Functions with Control Channel Settings in Standard Protocol

Control Channel Setting	Shutter Function	Description
Values 134-137 Lamp Assisted Strobes	Close	Shutter functions are the same as normal Shutter functions. Periodic and random random and random synchronous strobe functions are lamp assisted. Ramping functions are not lamp assisted.
	Periodic Strobe	
	Random/Random Strobe	
	Random/Synchronous Strobe	
	Ramp Open/Snap Shut	
	Snap Open/Ramp Shut	
	Ramp Open/Ramp Shut	
	Random Ramp/Snap	
	Random Snap/Ramp	
Open		

Table 3-11 Other Shutter Functions with Control Channel Settings in Standard Protocol

Control Channel Setting	Shutter Function	Description
Values 138-141 Lamp Functions	Close	The Boost effect boosts the Lamp above the 700 Watt level for the specified period of time. The lamp is also boosted during the Lightning effects.
	Periodic lamp strobes	
	Random/random lamp strobes	Before another Boost or Lightning effect can occur, the Shutter channel must be moved to either closed or open, or the Lamp Control channel must be moved outside the Lamp Function range.
	Synchronous/random lamp strobes	
	Boost lamp, black. Six time ranges from 1–.25 second	Boost effects to black boost the lamp for a specified time then close the shutter.
	Boost lamp, white. Six time ranges from 1–.25 second	Boost effects to white boost the lamp for a specified time, then leave the shutter open with the lamp dimmed.
	Lightning strike	When a Lightning effect is selected, the Dim channel scales the overall brightness of the lightning stroke.
Open		
Values 146-149 Lamp Dimming	Closed	Shutter functions are same as normal shutter function range. Dimming is accomplished electronically, lowering the lamp power. Dimming will not go to black. Strobes are mechanical and will go to black.
	Open	

3

Lamp Control Construct

The Lamp Control construct is available in flat protocol and is controlled by DMX Channel 7. Table 3-12 describes the Lamp Control functions.

Table 3-12 Lamp Control Settings in Flat Protocol

Lamp Control Setting	Description
Lamp full power	
Lamp dim (full power to dim)	Electronically lowers the lamp power to dim the lamp
Lamp assists shutter strobes	The Boost effect boosts the Lamp above the 700 Watt level for the specified period of time.
Lamp/mechanical dimming	
Periodic lamp strobes	
Random lamp strobes	
Synchronous random strobe	
Boost lamp, black	Boost effects to black boosts the lamp above the 700 Watt level, then closes the shutter. This effect is available in six time increments from .25 seconds to 1 second
Boost lamp, white	Boost effects to white boosts the lamp above the 700 Watt level, then leaves the shutter open with the lamp dimmed. This effect is available in six time increments from .25 seconds to 1 second
Lightning strike	Six different lightning effects each composed of a series of intensity and timing variations.

Dim Construct

The Dim construct is controlled with DMX Channel 13 in Standard protocol and DMX Channel 5 in Flat protocol. The Dim construct provides full dimming capability without changing the color temperature or the beam shape. The dim values range from closed (DMX value of 0) to fully open (DMX value of 255).

In Standard protocol, Audio Modulation is available for the Dim construct when the Control channel value is set from 206–209.

MSpeed (Motor Speed) Construct

The MSpeed construct is controlled with DMX Channel 14 in Standard protocol. There is no MSpeed construct in Flat protocol.

MSpeed is the time required for a motor to complete movement when changing from one position to another. MSpeed provides a means for all motors to reach their target position at the same time, even though each motor may have different distances to travel. MSpeed movement is extremely smooth because the fixture controls its own movements and is not dependent on DMX refresh rates.

MSpeed times vary from 0.15 seconds to 252.7 seconds. However, if you apply MSpeed to a construct, be sure that the delay value (length of time allowed for the entire scene) is longer than the MSpeed value to allow the motors to complete their movement before the end of the cue. An MSpeed value that is longer than the delay value could produce an undesirable result; for example, no light output during the scene. For a listing of exact MSpeed times, see “Appendix B” .

By default, MSpeed is applied to Pan and Tilt positioning. However, you can disable MSpeed for pan and tilt with the control construct (see Table 3-13 on page 3-13 and “Appendix A”). You can also apply MSpeed times to the Color Function settings, see “Color Function Construct” on page 3-4.

Macro Construct

Channel 15 controls the Macro construct in Standard protocol. There is no Macro construct in Flat protocol.

Internal Effects™ macros are factory-programmed sequences which allow you to quickly program complicated looks in one scene (cue). Each Internal Effect™ macro modifies a specific set of constructs, while allowing user control of all other constructs in the scene. The amplitude of the position macro movement is determined by the Pan Coarse channel and Tilt Coarse channel, respectively. The MSpeed channel controls the speed of the macros.

With the MSpeed set at the default value of DMX 0-4, an Internal Effects macro completes its movement in approximately 2.5 seconds. This provides a pleasing look when the additional variation given by using the MSpeed channel is not required. With

the MSpeed set between DMX 5-255, Internal Effects macros complete movement at the selected MSpeed time (up to 25 seconds).

Those fixture types that support On Board Programming also support the Internal Effects macros as part of the On Board programming features. The Internal Effects macros operate as an additional programming parameter labeled MACR.

The four Internal Effect available on a standard configuration Studio Beam fixture are Pan Sweep, Tilt Sweep, Clockwise Circle and Counterclockwise Circle.

Control Construct

The Control construct is controlled with DMX Channel 16 in Standard protocol and Channel 15 in Flat protocol. Basic settings are similar in both protocols, but in Standard protocol, the Control construct also activates certain Shutter, Lamp and Audio modulation functions on other Channels.

Table 3-13 describes the Control setting in Standard Protocol. To access all control settings in Standard Protocol (except for Pan & Tilt MSpeed Off), first select a control channel value, then set the Shutter channel to “0.”

See Table 3-14 for the Control construct settings available in Flat protocol.

Table 3-13 Control Setting Descriptions in Standard Protocol

Control Setting	Description	Notes
Safe	Disables all Control settings for normal operation. The Control channel should not be crossfaded.	
Pan & Tilt MSpeed Off	Sets Pan & Tilt MSpeed to off. The Control channel should not be crossfaded.	Command is sent instantaneously
Display Off	Sets display to off.	Commands must be sent for 20 consecutive DMX packets. For example, if the controller sends 16 packets per second, send the value for 1.25 seconds.
Display Dim	Dims display characters.	
Display Bright	Brightens the display characters.	
Home	Remotely homes the fixture.	
Lamp On	Remotely restrikes the fixture's lamp.	
Lamp Off	Remotely extinguishes the fixture's lamp.	
Lock	Returns all fixtures to a “known” position (128° tilt and either 90° or 450° pan). This option is used when you are ready to shut down the fixtures and pack them for transport.	Commands must be sent for 80 consecutive DMX packets. For example, if the controller sends 16 packets per second, send the value for 5 seconds.
Shutdown	Remotely deactivates the fixture. When a fixture is shut down, the lamp is extinguished, power to the motors is disabled, and the LED display reads “SHUT DOWN”. If a fixture is in shutdown mode, you must home the fixture to bring it back into operation.	

Table 3-13 Control Setting Descriptions in Standard Protocol

Control Setting	Description	Notes
Lamp Assisted Strobes	Periodic and Random strobe functions are lamp assisted. Ramp functions are not lamp assisted.	The shutter does not have to be set to 0 for Lamp functions
Lamp functions	Modifies the shutter channel	
Lamp/mechanical dimming	Lamp output will vary from a minimum to 700 Watts as the mechanical dimming ranges from 0–100%	
Lamp only dimming	Electronic dimming only from a minimum to 700 Watts.	
Cyan modulation	Allows audio modulation of the color mix portion on the Cyan color wheel. Magenta and Yellow wheels default to pure mix.	Audio Modulation is based on amplitude, not beat. Audio Modulation commands are set instantaneously and there is no shutter requirement
Magenta modulation	Allows audio modulation of the color mix portion on the Magenta color wheel. Cyan and Yellow wheels default to pure mix.	
Yellow modulation	Allows audio modulation of the color mix portion on the Yellow color wheel. Magenta and Cyan wheels default to pure mix.	
Cyan & Magenta modulation	Allows audio modulation of the color mix portion on the Cyan and Magenta color wheels. Yellow wheel defaults to pure mix.	
Cyan & Yellow modulation	Allows audio modulation of the color mix portion on the Cyan and Yellow color wheels. Magenta wheel defaults to pure mix.	
Magenta & Yellow modulation	Allows audio modulation of the color mix portion on the Yellow and Magenta color wheels. Cyan wheel defaults to pure mix.	
Modulate all colors	Allows audio modulation of color mix portion on all three color wheels.	
Frost modulation	Allows audio modulation of frost flag movement.	
Beam Shaping modulation	Allows audio modulation of lenticular wheel movement.	
Dim modulation	Allows audio modulation of mechanical dimming.	
Lamp and Dim modulation	Allows audio modulation of mechanical and electronic dimming.	
Lamp modulation	Allows audio modulation for electronic dimming with short medium and long sustain rates.	

Table 3-14 Control Construct Settings in Flat Protocol

Control Setting	Description	Notes
Safe	Disables all Control settings for normal operation. The Control channel should not be crossfaded.	
Display Off	Sets display to off.	Commands must be sent for 20 consecutive DMX packets. For example, if you controller sends 16 packets per second, you should send the value for 1.25 seconds.
Display Dim	Dims display characters.	
Display Bright	Brightens the display characters.	
Home	Remotely homes the fixture.	
Lamp On	Remotely restrikes the fixture's lamp.	
Lamp Off	Remotely extinguishes the fixture's lamp.	
Lock	Returns all fixtures to a "known" position (128° tilt and either 90° or 450° pan). This option is used when you are ready to shut down the fixtures and pack them for transport.	Commands must be sent for 80 consecutive DMX packets. For example, if you controller sends 16 packets per second, you should send the value for 5 seconds.
Fixture Shutdown	Remotely deactivates the fixture. When a fixture is shut down, the lamp is extinguished, power to the motors is disabled, and the LED display reads "SHUT OFF". If a fixture is in shutdown mode, you must home the fixture to bring it back into operation.	

Chapter 4

The Menu System

On-Board Programming Capability

When you use the fixture's on-board menu system to program the Studio Beam[®] fixture, you manually assign a value to each of the fixture's available parameters.

The onboard Studio Beam menu system allows you to:

- Assign a DMX start channel.
- Access fixture options such as homing the fixture, viewing fixture status, crossloading software, and performing self tests.
- Create, store, and play scenes from the fixture's on-board memory.

Note: Preset Programming or Playback will default the fixture to standard protocol. If flat protocol is enabled when either Preset Editing or Preset Playback is enabled, flat protocol will be restored when Preset Editing or Playback is exited.

For a full menu map of the Studio Beam menu system, see "Appendix D" .

Navigating the Menu System

You access the menu system via the four menu navigation buttons on the fixture's front panel (see Figure 4-1).

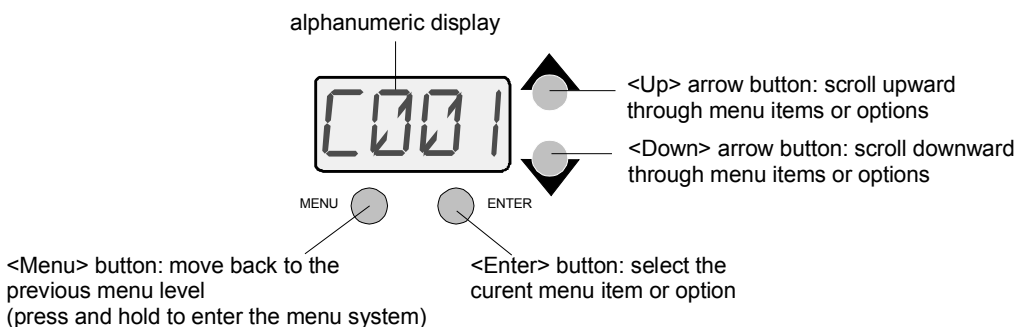


Figure 4-1 Menu navigation buttons.

The alphanumeric LED display shows the menu items you select from the menu map. When accessing fixture options (not preset scenes), the display will flash when a new option is *selected* (by pressing the <Up> or <Down> arrow buttons) and stops flashing when a new option is *stored* (by pressing the <Enter> button). Pressing the <Menu>

button returns you to the previous option or menu *without changing* the value of an option.

To access the menu system, press and hold the <Menu> button until “ADDR” appears on the 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 menu system.

To exit the menu system, keep pressing the <Menu> button until “MENU” appears on the display. “MENU” is replaced, after a few seconds, with the default cycling display of the fixture’s software version, fixture type, and DMX start channel.

Note: The words “AUTO” and “LOCK” appears briefly on the display after “TOP.” As mentioned above, the fixture’s software is “locking” the display after you have accessed the menu system.

Studio Beam Menu Options

The sections below explain how to access the fixture options shown in the fixture’s menu map.

Address Menu (ADDR)

The DMX start channel identifies each fixture on a DMX link. If you plan to control your fixtures with a DMX controller (or using synchronized preset playback), you must assign a DMX start channel to each fixture on the link.

The Address menu allows you to change the DMX start channel that is currently assigned to the fixture. Be sure you do not overlap fixture channel ranges when changing the DMX start channel. For more information, see “Determining the DMX Start Channel” on page 2-11.

To change the DMX start channel:



1. Press and hold <Menu> until “ADDR” appears on the LED display.
2. Press <Enter>.



3. Select a new DMX start channel (C001–C497 in Standard Protocol or C001–498 in Flat Protocol. The LED display flashes when a new option is selected.



4. Press <Enter> to accept the new DMX start channel. The LED display stops flashing when a new option is entered. If you do not press <Enter>, the new option you selected is not stored.

Preset Menu (PRST)

Studio Beam fixtures have 16 preset scenes for each of two user modes (A and B) for a total of 32 preset scenes. Some Preset menu options can be accessed for either user mode. However, you must *first* set the fixture to User A or User B. For more information, see “Setting the User Type (USER)” on page 4-13.

The Preset menu allows you to turn preset playback off or on, view which scene is currently playing, create/edit a scene using the on-board memory to program the fixture for stand-alone operation, copy a scene from the on-board memory to another scene, and capture a scene from your controller to the on-board memory. This menu also allows you to enable the factory-programmed preset sequence.

All preset functions use Standard protocol. If the fixture is set to use Flat protocol for control from a DMX controller, the fixture switches to Standard protocol when preset editing or preset playback are selected. The fixture reverts to the Flat protocol when present editing or playback is exited. Preset capture can only be accomplished when the fixture is being controlled with Standard protocol.

For a detailed example of using Preset programming for Scene creation, Looping and Synchronizing Playback, see page 4-27.

Setting Preset Playback (PLAY)

This menu option allows you to view which scene is currently playing in preset playback mode or turn preset playback on or off. To used this menu option you need to have the user mode for the desired scene already selected, see “Setting the User Type (USER)” on page 4-13. Scene 1 must be programmed before the fixture can play back scenes.






To set preset playback on or off, or to view the current scene:

1. Press and hold <Menu> until “ADDR” appears on the LED display.
2. Scroll to the “PRST” menu.
3. Press <Enter>.
4. Scroll to the “PLAY” menu (this will be the first menu displayed).
5. Press <Enter>.
6. Scroll to “ON” to set preset playback on, “OFF” to set preset playback off, or “SCN” to display which scene is currently playing.
7. Press <Enter>.

Editing or Creating an On-Board Memory Scene (EDIT)

This menu item allows you to select a scene to edit or create using the fixture’s on-board scene memory. To used this menu option you need to have the user mode for the desired scene already selected, see “Setting the User Type (USER)” on page 4-13.

To select a scene to create or edit:







-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “PRST” menu.
3. Press <Enter>.
-  4. Scroll to the “EDIT” menu.
5. Press <Enter>.
-  to
 6. Scroll to the scene you want to create or edit (SN01–SN16).
7. Press <Enter>.

After a scene is selected, the value of any parameter for that scene can be changed. “Step-by-Step Scene Creation” on page 4-27 contains a detailed example of modifying scene parameters.

Copying an On-Board Memory Scene (COPY)

Use the Copy menu option to copy the settings for a source scene to a destination scene location. This menu option will copy between any of the 32 scene locations available.

To Copy a Memory Scene from one location to another:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “PRST” menu.
3. Press <Enter>.
-  4. Scroll to the “COPY” menu.
-  5. Press <Enter>. The LED will display “FROM.”
6. Press <Enter>.
7. Scroll to the scene you want to copy from (source scene) for either User A (“FA01”–“FA16”) or user B (“FB01”–“FB16”). This example indicates From User A Scene **01**
-  8. Press <Enter>. The LED will display “TO.”
9. Press <Enter>.
10. Scroll to the scene you want to copy to (destination scene) for either User A (“TA01”–“TA16”) or user B (“TB01”–“TB16”). This examples indicates To user **B** Scene **16**
-  11. Press <Enter>. The fixture copies the desired scene to the selected scene location. When the copy is complete, “DONE” will appear briefly in the fixture’s LED display.

Capturing a Preset Scene (CAPT)




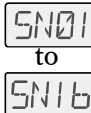
Preset capturing is a way to automate the creation of scenes on multiple Studio Beam fixtures connected to a DMX 512 link. Use a DMX controller to create a scene, then save

(capture) the scene into a fixture's presets to play back the scene without the controller. When capturing a scene into a fixture's presets, all parameter values must be constant (i.e., there cannot be any pan/tilt movement or scene-to-scene sequencing).

Note: You must use the fixture's on-board scene memory to manually select values for the XFAD and DLAY parameters, since a DMX controller will not transmit those parameter values.

This menu option can be accessed for user type A or B (see "Setting the User Type (USER)" on page 4-13).

After creating a scene with your DMX controller, follow the instructions below for each fixture on which you want to capture preset scenes:





-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "PRST" menu.
3. Press <Enter>.
-  4. Scroll to the "CAPT" menu.
5. Press <Enter>.
-  6. Scroll to the scene you want to copy the preset scene to (destination scene) (SN01 - SN16). Press <Enter>. The fixture will copy the DMX-512 controller's preset scene to the selected scene on your fixture's on-board 16 scene memory for either User A or User B. When the fixture finishes the capture successfully, "DONE" will appear briefly in the fixture's LED display.

Enabling the Preset Default (DFLT)

This menu item reverts all programming back to the factory-programmed preset default sequence.

This menu option can be accessed for either User type A or User type B. However, you must *first* set the fixture to the desired user type. To retain pre-programmed scenes you do not wish to erase, set the fixture to one user type and then enable the preset default for the *other* user type (see "Setting the User Type (USER)" on page 4-13).

To enable the Preset Default:

-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "PRST" menu.
3. Press <Enter>.
-  4. Scroll to the "DFLT" menu.
-  5. Press <Enter>. The LED display will show "OK?"
6. Press <Enter>. The fixture plays the default sequence continuously until you press <Menu>.

Note: To play the fixture's default sequence, preset playback must be "ON" (see "Setting Preset Playback (PLAY)" on page 4-3.)

Set Menu (SET)

The Set menu allows you to lock the fixture, and either set all factory options to their default settings or access and change the factory options individually. The procedures below are listed in the same order shown on the menu map (see “Appendix D”).

Setting Factory Defaults (FACT)





When you set this menu item on, all factory options return to their default settings. Studio Beam fixtures are shipped from the factory with the following default option settings:

PAN/TILT SWAP = OFF	LAMP LIFE WARNING = OFF
TILT INVERT = OFF	SHUTTER CLOSE WITH DMX DATA LOSS = SHORT
PAN INVERT = OFF	ZOOM ENABLED = OFF
LED DISPLAY = ON AND BRIGHT	FAST PAN/TILT MOVEMENT = OFF
LED DISPLAY INVERT = OFF	PRESET PLAYBACK = OFF

Note: To change the preset playback option, see “Setting Preset Playback (PLAY)” on page 4-3.

The factory default menu option displays On if all the factory options are at the factory default settings. If any of the items listed above are not at the factory default setting, the display reads OFF. Selecting the “OFF” option will have no effect.






To restore the factory default setting:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “SET” menu.
3. Press <Enter>.
-  4. Scroll to the “FACT” menu (this will be the first menu displayed).
5. Press <Enter>.
-  6. Scroll to “ON” to restore the factory option defaults on.
7. Press <Enter>.

Swapping Pan and Tilt (SWAP)

This menu option swaps the pan motor and tilt motor operation to allow fixtures hung perpendicular to each other to respond to pan and tilt movement commands in the same direction (see Figure 4-2).

To swap pan and tilt motion:

1. Press and hold <Menu> until “ADDR” appears on the LED display.

2. Scroll to the “SET” menu.

3. Press <Enter>.
4. Scroll to the “SWAP” menu.

5. Press <Enter>.
6. Scroll to “ON” to swap the fixture’s pan and tilt motion, or “OFF” to return the fixture’s pan and tilt motion to normal orientation.

or

7. Press <Enter>.

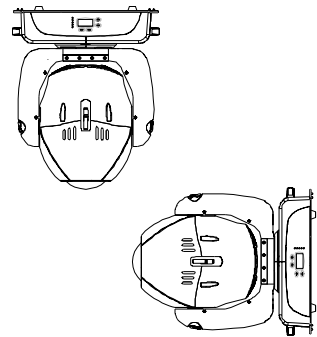







Figure 4-2 Fixture hung perpendicular

4

Inverting Tilt (T/IN)

This menu item inverts the direction of the tilt motor, to allow fixtures mounted opposite each other vertically to respond to tilt movement commands in the same direction (see Figure 4-3).

To invert the fixture’s tilt motion:

1. Press and hold <Menu> until “ADDR” appears on the LED display.

2. Scroll to the “SET” menu.

3. Press <Enter>.
4. Scroll to the “T/IN” menu.

5. Press <Enter>.
6. Scroll to “ON” to invert the fixture’s tilt motion, or “OFF” to return the fixture’s tilt motion to normal orientation.

or

7. Press <Enter>.

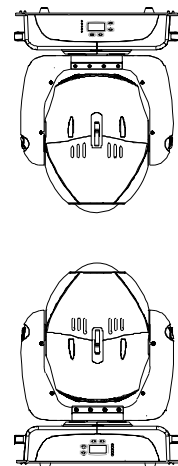


Figure 4-3 Vertically opposing fixtures

Inverting Pan (P/IN)

This menu item inverts the direction of the pan motor, to allow fixtures mounted opposite each other horizontally to respond to pan movement commands in the same direction (see Figure 4-4).

To invert the fixture's pan motion:

1. Press and hold **ADDR** until "ADDR" appears on the LED display.
2. Scroll to the "SET" menu.
3. Press <Enter>.
4. Scroll to the "P/IN" menu.
5. Press <Enter>.
6. Scroll to "ON" to invert the fixture's pan motion, or "OFF" to return the fixture's pan motion to normal orientation.
7. Press <Enter>.

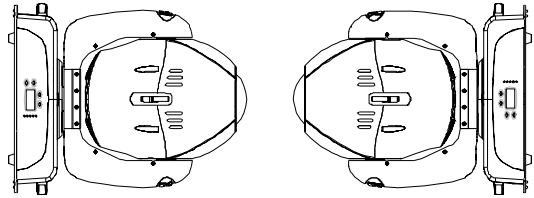


Figure 4-4 Horizontally opposing fixtures

Changing the Display Output (DSPL)

This menu item allows you to manually change the appearance of the fixture's alphanumeric LED display. You can set the display on or off, or you can dim the display to reduce visibility. If you want to remotely change the display output (using a DMX controller), see "Control Construct" on page 3-13.






To change the display output:

1. Press and hold **ADDR** until "ADDR" appears on the LED display.
2. Scroll to the "SET" menu.
3. Press <Enter>.
4. Scroll to the "DSPL" menu.
5. Press <Enter>.
6. Scroll to "ON" to set the LED display to normal intensity, "OFF" to turn the LED display off, or "DIM" to reduce the LED display visibility.
7. Press <Enter>.

Inverting LED Characters (D/IN)

This menu item allows you to invert the orientation of the LED display's alphanumeric characters. This option is useful if your fixture is standing upright (i.e., resting on its bottom panel on the floor).






To invert the LED display:

-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "SET" menu.
3. Press <Enter>.
-  4. Scroll to the "D/IN" menu.
5. Press <Enter>.
-  or  6. Scroll to "ON" to invert the fixture's alphanumeric characters, or "OFF" to return the fixture's alphanumeric characters to normal orientation.
7. Press <Enter>.

Setting the Lamp Warning Message (LMPL)

Use this menu item to enable your fixture to display the warning message "LAMP LIFE ERR" when the current lamp hours exceed 700. With this option enabled, after the current lamp hours exceed 800 hours, the fixture will display the warning message "LAMP OUT ERR." Once the lamp is extinguished, the fixture will no longer strike the lamp until the current lamp is replaced and the current lamp hours are reset to zero (see "Replacing the Lamp" on page 5-5 and "Resetting Lamp Hours (L/RS)" on page 4-25).





To enable the lamp warning message:

-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "SET" menu.
3. Press <Enter>.
-  4. Scroll to the "LMPL" menu.
5. Press <Enter>.
-  or  6. Scroll to "ON" to enable the lamp warning message, or "OFF" to disable the lamp warning message.
7. Press <Enter>.

Data Loss Shutter Close (DLOS)

Use this menu item to determine how the fixture will react in the event of DMX data loss by closing the shutter upon Data Loss or keeping the shutter open until shut down.





To select a shutter reaction to data loss:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “SET” menu.
3. Press <Enter>.
-  4. Scroll to the “DLOS” menu.
5. Press <Enter>.
-  6. Scroll to “LONG” to close the shutter only when the fixture is shut down, or “SHRT” to close the shutter one second after data loss.
7. Press <Enter>.

Increasing the Pan/Tilt Movement (FAST)

Use this menu item to increase the speed of the fixture’s pan/tilt movement. Enabling this option will yield increased speed but may compromise the fixture’s positioning. The “FAST” option works best in situations where the fixture is allowed to reach the target position before the next target position is requested.






To increase the pan/tilt movement:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “SET” menu.
3. Press <Enter>.
-  4. Scroll to the “FAST” menu.
5. Press <Enter>.
-  6. Scroll to “ON” to enable fast pan/tilt movement, or “OFF” to enable normal pan/tilt movement.
7. Press <Enter>.

Enabling Audio Modulation (ALED)

This menu enables Audio modulation. A blinking decimal point indicates audio modulation is “ON”. The modulation is based upon sound amplitude rather than beat. Modulation will vary as the general sound level rises and falls. Audio modulation operates in conjunction with all fixture parameters except pan, tilt and zoom.







To set the audio:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “SET” menu.
3. Press <Enter>.
4. Scroll to the “ADIO” menu
5. Press <Enter>
-  6. Scroll to the “ALED” menu.
7. Press <Enter>.
-  or
 8. Select “ON” to enable Audio Modulation. A blinking decimal will appear in display to indicate Audio Modulation is active when setting other parameters.
9. Press <Enter>.

Setting the Audio Gain (GAIN)

Use this menu item to place more or less emphasis on low sound levels. Any of 10 levels can be selected. The factory default setting is G006. The setting places more or less emphasis on low sound level with higher setting numbers providing more emphasis to low level sounds.





To set the Gain:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “SET” menu.
3. Press <Enter>.
-  4. Scroll to the “ADIO” menu
5. Press <Enter>
-  6. Scroll to the “GAIN” menu
7. Press <Enter>
-  to
 8. Scroll to a value between G001 and G010. Higher setting numbers provide more emphasis to low level sounds.
9. Press <Enter>.

Setting the Zoom (ZOOM)

This menu option enables/disables the Zoom motor. If the Aspheric lens is installed, turn this option “ON” to allow Zoom optics control. If Aspheric lens is not installed, turn this option “OFF”. For more information on installing the Aspheric lens, see “Removing or Replacing the Aspheric Lens” on page 5-10.

To set the Zoom function:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “SET” menu.
3. Press <Enter>.
-  4. Scroll to the “ZOOM” menu.
5. Press <Enter>.
-  6. Scroll to “ON” to enable the Zoom motor, or “OFF” to disable the Zoom motor.
7. Press <Enter>.

Mode Menu (MODE)

The Mode menu sets user type, copies settings and presets between user modes, and crossloads software versions from one fixture to all other Studio Beam fixtures on the link. The procedures below are listed in the same order shown on the menu map (see “Appendix D”).

Setting the User Type (USER)

Use this menu item to change the fixture’s user type between user A and user B. Each user type includes 16 different presets (scenes) and the following fixture settings:

- start channel number
- pan invert status
- tilt invert status
- pan/tilt swap status
- LED display status
- LED display invert status
- lamp life warning status
- shutter close with DMX data loss status
- preset playback status

Each user type can be configured with its own set of scene parameters and “default” fixture settings. These can be utilized, for example, when a fixture is moved between two locations.








To change the user type:

1. Press and hold <Menu> until “ADDR” appears on the LED display.
2. Scroll to the “MODE” menu.
3. Press <Enter>.
4. Scroll to the “USER” menu (this will be the first option displayed).
5. Press <Enter>.
6. Scroll to “A” to select User A settings, or “B” to select User B settings.
7. Press <Enter>.

Copying User Presets (PRST)

Use this menu item to copy the fixture's preset scenes from one user mode to the other. Each user type includes 16 different presets which can be copied to the other user type. This options copies all 16 presets at one time. To copy just one preset, see "Copying an On-Board Memory Scene (COPY)" on page 4-4.








To copy user presets:

-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "MODE" menu.
3. Press <Enter>.
-  4. Scroll to the "USER" menu.
5. Press <Enter>.
-  6. Scroll to the "COPY" menu.
7. Press <Enter>.
-  8. Scroll to the "PRST" menu (this will be the first menu displayed).
9. Press <Enter>.
-  or
 10. Scroll to "A →B" to copy User A presets to User B, or "B →A" to copy User B presets to User A.
11. Press <Enter>.

Copying User Settings (SETT)

Use this menu item to copy the fixture's user settings from one user mode to the other. The user settings for each user type are listed in the section titled "Setting the User Type (USER)" on page 4-13. This options copies all user settings at one time.

To copy user settings:








-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "MODE" menu.
3. Press <Enter>.
-  4. Scroll to the "USER" menu.
5. Press <Enter>.
-  6. Scroll to the "COPY" menu.
7. Press <Enter>.
-  8. Scroll to the "SETT" menu.
9. Press <Enter>.
-  or
 10. Scroll to "A →B" to copy User A settings to User B, or "B →A" to copy User B settings to User A.
11. Press <Enter>.

Copying User Presets and Settings (ALL)

Use this menu item to copy the fixture's 16 user preset scenes and fixture settings from User A to User B or vice versa. The user settings for each user type are listed in the section titled "Setting the User Type (USER)" on page 4-13.

Note: This options copies all user settings and all 16 presets at one time.

To copy user presets and settings:




-  1. Press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "MODE" menu.
3. Press <Enter>.
-  4. Scroll to the "USER" menu.
5. Press <Enter>.
-  6. Scroll to the "COPY" menu.
7. Press <Enter>.
-  8. Scroll to the "ALL" menu.
9. Press <Enter>.
-  or
 10. Scroll to "A →B" to copy User A presets and settings to User B, or "B → A" to copy all User B presets and settings to User A.
11. Press <Enter>.

Crossloading Fixture Software (XLD)

If you have a Studio Beam fixture with a newer software version, you can crossload the newer software to all other Studio Beam fixtures on the link.

Before crossloading, disconnect any controllers, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes and Intellabeam® fixtures) are located after the Studio Beam fixtures on the link. These devices will block communication with any other Studio Beam fixtures on the link.

To crossload software to all other Studio Beam fixtures on the link:

-  1. On the crossloading fixture *only*, press and hold <Menu> until "ADDR" appears on the LED display.
-  2. Scroll to the "MODE" menu.
3. Press <Enter>.
-  4. Scroll to the "XLD" option.
5. Press <Enter>. The fixture will upload its software to all other Studio Beam fixtures on the link.



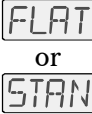
The Transmit LED on the crossloading fixture will remain on (or flicker) and the Transmit and Receive LEDs on receiving fixtures will flicker while the crossload is in progress. The alphanumeric LED on the Studio Beam fixtures will display “UPLD” as they are receiving the software upload. When the crossload has finished successfully, “DONE” will appear briefly in the LED display of the crossloading fixture, and all other fixtures will home.

Note: If a new boot code was included with the newer software, the alphanumeric LED will display a “BOOT DIFF” error. To correct the boot code, you must copy the new boot code for each fixture (see “Copying the Boot Code (BOOT)” on page 4-17).

Selecting Protocol (PROT)

Use this menu to choose Standard or Flat DMX protocol.

To select a protocol:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “MODE” menu.
3. Press <Enter>.
-  4. Scroll to “FLAT” to select Flat protocol or “STAN” to select Standard protocol.
5. Press <Enter>.




Test Menu (TEST)

The Test menu allows you to manually home the fixture, turn the lamp on or off, store new boot code information, and perform fixture self tests to determine the origin of mechanical problems.

Homing the Fixture (HOME)

This menu item allows you to manually home the fixture. To remotely home the fixture using a DMX controller, see “Control Construct” on page 3-13.






To manually home the fixture:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
3. Press <Enter>.
-  4. Scroll to the “HOME” option (this will be the first option displayed).
5. Press <Enter>. The LED will alternately display “RST” and “HOME” while the fixture homes.

Turning the Lamp On or Off (LAMP)




This menu item allows you to manually strike or extinguish the lamp. To remotely strike or extinguish the lamp using a DMX controller, see “Control Construct” on page 3-13.

To manually turn the lamp on or off:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
3. Press <Enter>.
-  4. Scroll to the “LAMP” menu.
5. Press <Enter>.
-  6. Scroll to “ON” to strike the lamp, or “OFF” to extinguish the lamp.
-  7. Press <Enter>.

Copying the Boot Code (BOOT)

New software uploaded to Studio Beam fixtures may contain a new boot code which must be copied to each BOOT section of the FlashROM. In this case, the LED displays a “BOOT DIFF” error. To accept and store the new boot code:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
3. Press <Enter>.
-  4. Scroll to the “BOOT” option.
5. Press <Enter>. The fixture stores the new boot code, then automatically homes.

Note: Do not remove power from the fixture while performing a boot copy.




Performing Self Tests (SELF)

The following self tests are available:

Construct	Self-Test Description
ALL	performs all of the self tests listed below
PAN	moves the pan motor from 0° to 540°
TILT	moves the tilt motor from 0° to 287°
CYAN	divides the cyan color wheel into eight equal sections (positions) and rotates the cyan color wheel from position 1 through 8
MAGN	divides the magenta color wheel into eight equal sections (positions) and rotates the magenta color wheel from position 1 through 8
YELW	divides the yellow color wheel into eight equal sections (positions) and rotates the yellow color wheel from position 1 through 8
BEAM	moves the beam shaping (lenticular wheel) from 0° to 359°
ZOOM	moves the aspheric lens through the entire beam angle range
FRST	performs frost functions
SHUT	performs strobe functions
DIM	moves the dim flags from closed to fully open

To see the effects of the self tests, the lamp must be on. If the lamp is off when you run the self test, the LED will display “LAMP” to indicate that the lamp is not struck, and the fixture will attempt to strike the lamp automatically. Self tests run continuously until you until you press <Menu> to exit the test.




To perform a self test:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
3. Press <Enter>.
-  4. Scroll to the “SELF” menu.
5. Press <Enter>.
6. Scroll to the desired option (listed above).
7. Press <Enter>. The fixture will perform the selected self test.
8. Press <Menu> to exit the test.

Placing the Fixture in Setup Mode (S/UP)




This menu item allows you to place the fixture in setup mode so that you can mechanically home your fixture. A fixture that is out of home (i.e., the dim or frost flags loses position), will emit an unusually loud clicking noise when strobing or homing. For more information on how to mechanically home the dim and frost flags, contact High End Systems customer service (see “Contacting High End Systems” on page ii).

To place the fixture in setup mode:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
- 3. Press <Enter>.
-  4. Scroll to the “S/UP” option.
- 5. Press <Enter>. When the LED displays “SET NOW,” mechanically home the dim and frost flags.
- 6. After mechanically homing the frost flags and shutter, press any button. This causes the fixture to reset and home.

Testing the LED Display (DISP)






To test the alphanumeric LED display:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
- 3. Press <Enter>.
-  4. Scroll to the “DISP” option.
- 5. Press <Enter>. The alphanumeric display will run through its self test.
- 6. Press <Menu> to exit the test.

Changing Encoder Operation (ENCD)

This menu option to disable the encoders which work to automatically correct the fixture’s pan and tilt position if the fixture is moved from its programmed position. Use this option when performing maintenance, to prevent the fixture from repeatedly trying to correct its position.

To enable/disable the encoders:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “TEST” menu.
- 3. Press <Enter>.
-  4. Scroll to the “ENCD” option.
- 5. Press <Enter>.
-  or  6. Scroll to “ON” to enable the encoders, or “OFF” to disable the encoders.
- 7. Press <Enter>.

Information Menu (INFO)

The Information menu allows you to view current fixture information such as internal temperature, lamp hours, fixture hours, lamp strikes, software version, DMX errors, and DMX data for any other device on the link. You can also reset the lamp hours, lamp strikes and fixture hours. The procedures below are listed in the same order shown on the menu map (see “Appendix D”).




Viewing Sensor Information (SENS)

This menu option allows you to view whether a specified sensor is working correctly or to view encoder position values. If you receive a “SENS ERR” error message on the alphanumeric display, this information may help you determine where the problem originates (see “Alphanumeric Display Error Messages” on page 6-1).

Sensor/encoder information is available for the following:

Parameter	Description
SEN1	magenta and beam shaping (lenticular) wheel sensor
SEN2	cyan and yellow color wheel sensors
TILT	tilt sensor
PAN	pan sensor
TPOS	tilt encoder
PPOS	pan encoder

To view sensor and encoder information:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “INFO” menu.
3. Press <Enter>.
-  4. Scroll to the “SENS” menu.
5. Press <Enter>.
6. Scroll to the desired sensor or encoder (listed above).
7. Press <Enter>. If you are viewing a sensor, the LED will display “ON” or “OFF” indicating the status described in the table below. If you are viewing an encoder, the LED will display the current numeric position of the encoder.

Sensor Type	ON	OFF
Wheel Sensor	tab not in path	tab in path
Pan/Tilt Sensor	not in slot	in slot

Viewing Fixture DMX Status and Parameter Values (FIXT)

This menu option allows you to view DMX status and parameter values for the fixture. You may want to view the DMX status and parameter values for a fixture if you are having a particular problem with a fixture; for example, a color wheel that does not respond to commands from the controller.

The following DMX status information is available for viewing:

Construct	DMX Status
BRKS	framing errors with value of zero (i.e. DMX breaks)
FE	framing errors with a non-zero value (i.e. errors in data transmission)
OV	overruns (changing values could indicate data link/connector problems)
STRT	start code

The following parameter values are available for viewing according to the protocol selected.

DMX Values Available for Viewing in Standard Protocol		DMX Values Available for Viewing in Flat Protocol	
Construct	Value	Construct	Value
PANH	high 16-bit pan value	PANH	high 16-bit pan value
PANL	low 8-bit pan value	PANL	low 8-bit pan value
TLTH	high 16-bit tilt value	TLTH	high 16-bit tilt value
TLTL	low 8-bit tilt value	TLTL	low 8-bit tilt value
COLC	color control value	DIM	shutter dim flag value
CYAN	cyan color wheel position	SHUT	shutter strobe value
MAGN	magenta color wheel position	LMPC	lamp control channel
YELW	yellow color wheel position	CYAN	cyan color wheel position
BEAM	beam shaping (lenticular) wheel position	MAGN	magenta color wheel position
ZOOM	aspheric lens (beam angle) position	YELW	yellow color wheel position
FRST	frost flag position value	COLC	color control value
SHUT	shutter strobe value	BEAM	beam shaping (lenticular) wheel position
DIM	shutter dim flag value	ZOOM	aspheric lens (beam angle) position
MSPD	Mspeed time value	FRST	frost flag position value
MACR	macro value	CNTL	control channel value
CNTL	control channel value		

To view the DMX status and parameter values:

ADDR

1. Press and hold <Menu> until “ADDR” appears on the LED display.

INFO

2. Scroll to the “INFO” menu.

3. Press <Enter>.

DMX

4. Scroll to the “DMX” menu.

5. Press <Enter>.

FIXT

6. Scroll to the “FIXT” menu (this will be the first option displayed).

7. Press <Enter>.

8. Scroll to the desired DMX status or parameter (listed above).

9. Press <Enter>. The LED will display the selected DMX status or parameter value.

If you have a particular problem with the fixture, follow the steps above to select a parameter and view its value. After noting the value of the parameter you selected, use your controller to change that parameter’s value.

If the value changes on the fixture’s LED display, but the fixture still does not respond, contact High End Systems customer service in one of the ways shown in the section titled “Contacting High End Systems” on page ii.

If the value does *not* change on the fixture’s LED display, remove the fixture from the DMX link and try to change the parameter’s value using the fixture’s menu system. If the fixture then functions normally, the problem was likely with the DMX link. Otherwise, contact High End Systems customer service (see “Contacting High End Systems” on page ii).

Viewing DMX Data for Another Device (DATA)







This procedure allows you to use a Studio Beam fixture to view DMX channel values for other devices on the DMX link. Use this menu option for testing devices that do not have built-in DMX diagnostics, or fixtures that are physically inconvenient to monitor directly.

If you experience a problem with a device on the link, use this menu to select a DMX channel in the device’s channel range and view its DMX value. After noting the value of the channel you selected, use your controller to change that channel’s value.

If the value of the DMX channel you selected does not change, there may be a problem with the DMX cable or your transmitting device (i.e. controller).

If the DMX channel value changes, but the device does not respond, the device may be faulty. Consult the documentation provided with that device for more information.





To view DMX data for another device on the DMX link:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “INFO” menu.
3. Press <Enter>.
-  4. Scroll to the “DMX” menu.
5. Press <Enter>.
-  6. Scroll to the “DATA” menu.
7. Press <Enter>.
-  8. Scroll to the desired DMX channel (C001–C512).
-  9. Press <Enter>. The LED will display the selected channel’s DMX value.

Viewing the Current Logic Board Temperature (PCB)

This menu option allows you to view the current ambient temperature at the logic board inside the fixture.

To view the logic board temperature:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “INFO” menu.
3. Press <Enter>.
-  4. Scroll to the “TEMP” menu.
5. Press <Enter>.
-  6. Scroll to the “PCB” option.
7. Press <Enter>. The LED will display the current internal temperature of the fixture’s logic board in degrees centigrade.
8. The maximum temperature for the logic board is 85 C. When maximum temperature is exceeded, the fixture shuts down and the display shows “PCB TEMP ERR.” For more information, see “Alphanumeric Display Error Messages” on page 6-1.

Viewing the Current Fixture Head Temperature (HEAD)

This menu option lets you view the current ambient temperature inside the fixture head.

To view the fixture's head temperature:

ADDR

1. Press and hold <Menu> until "ADDR" appears on the LED display.

INFO

2. Scroll to the "INFO" menu.

3. Press <Enter>.

HEAD

4. Scroll to the "HEAD" option.

5. Press <Enter>. The LED will display the current internal temperature of the fixture's head in degrees centigrade.

Note: The maximum temperature for the fixture head is 100 C. If this maximum temperature is exceeded, the fixture will shut down and the alphanumeric display will show "HEAD TEMP ERR." For more information, see "Alphanumeric Display Error Messages" on page 6-1.

Resetting Fixture Hours (F/RS)

Use this menu to reset the recorded number of hours the fixture has been on.

To reset the fixture hours to zero:

ADDR

1. Press and hold <Menu> until "ADDR" appears on the LED display.

INFO

2. Scroll to the "INFO" menu.

3. Press <Enter>.

F/RS

4. Scroll to the "F/RS" option.

5. Press <Enter>*. The LED will display "0000" when the fixture hours are reset.

**Note: This option has a five-second delay to avoid inadvertent changes. To reset the fixture hours, you must press and hold the <Enter> button for at least five seconds.*

Viewing the Current Fixture Hours (F/HR)

To view the number of hours the fixture has been on since this option was reset:

ADDR

1. Press and hold <Menu> until "ADDR" appears on the LED display.

INFO

2. Scroll to the "INFO" menu.

3. Press <Enter>.

F/HR




4. Scroll to the "F/HR" option.

5. Press <Enter>. The LED will display the number of hours the fixture has been on.

Resetting Lamp Hours (L/RS)

This menu item resets the hours the current lamp has been operating to zero. You should reset the lamp hours each time you replace the lamp (see “Replacing the Lamp” on page 5-5).




To reset the current lamp hours to zero:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “INFO” menu.
3. Press <Enter>.
-  4. Scroll to the “L/RS” option.
5. Press <Enter>*. The LED will display “0000” when the lamp hours are reset.

**Note: This option has a five-second delay to avoid inadvertent changes. To reset the lamp hours, you must press and hold the <Enter> button for at least five seconds.*

Viewing the Number of Current Lamp Strikes (L/ST)




To view the number of times the fixture has attempted to strike the current lamp:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “INFO” menu.
3. Press <Enter>.
-  4. Scroll to the “L/ST” option.
5. Press <Enter>. The LED will display the number of times the fixture has struck the current lamp.

Note: Lamp strikes are automatically reset when the lamp hours are reset (see “Resetting Lamp Hours (L/RS)” on page 4-25).

Viewing the Current Lamp Hours (L/HR)

To view the number of hours the current lamp has been on:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “INFO” menu.
3. Press <Enter>.
-  4. Scroll to the “L/HR” option.
5. Press <Enter>. The LED will display the number of hours the current lamp has been on.

Viewing the Current Software Version (VER)

To view the current software version:

ADDR

1. Press and hold <Menu> until “ADDR” appears on the LED display.

INFO

2. Scroll to the “INFO” menu.

3. Press <Enter>.

VER

4. Scroll to the “VER” option.

5. Press <Enter>. The LED will display the fixture’s current software version.





Note: The software version is also displayed when you exit the menu system (see “Alphanumeric Display Error Messages” on page 6-1).

Scene Creation, Looping and Playback with the Menu System



Step-by-Step Scene Creation

Follow the example below to create a sample scene using the fixture’s menu system to choose a value for each of the available parameters. For more information on available parameters, see “Appendix D” .



Choose a Scene to Create/Edit:

-  1. Press and hold <Menu> until “ADDR” appears on the LED display.
-  2. Scroll to the “PRST” menu.
- 3. Press <Enter>.
-  4. Scroll to the “EDIT” menu.
- 5. Press <Enter>.
-  6. Scroll to the scene you want to create (in this example, “SN01”).
- 7. Press <Enter>.



Select a Shutter Value (SHUT):

-  1. Scroll to the “SHUT” parameter (this will be the first parameter displayed).
- 2. Press <Enter>.
-  3. Scroll to the desired shutter value (in this example, “OPEN”).
- 4. Press <Enter>.

Select a Dim Value (DIM)

-  1. Scroll to the “DIM” parameter.
- 2. Press <Enter>.
-  3. Scroll to the desired dim value (in this example, “D255”).
- 4. Press <Enter>.

Select a Pan Value (PAN):

-  1. Scroll to the “PAN” parameter.
- 2. Press <Enter>.
-  3. Scroll to the desired pan value from “-49.9” to “+49.9” (in this example, “+30.5”).
- 4. Press <Enter>.

Select a Tilt Value (TILT)

TILT

1. Scroll to the “TILT” parameter.
2. Press <Enter>.

-20.3

3. Scroll to the desired tilt value from “-49.9”–“+49.9” (in this example, “-20.3”).
4. Press <Enter>.

Choose a Color Wheel Control Value (COLC)

COLC

1. Scroll to the “COLC” parameter
2. Press <Enter>.

IDX

3. Scroll to the desired color wheel control value (in this example, Indexed “IDX”).
4. Press <Enter>.

Select a Cyan Wheel Position (CYAN)

CYAN

1. Scroll to the “CYAN” parameter.
2. Press <Enter>.

OPEN

3. Scroll to the desired cyan color wheel position value (in this example, “OPEN”).
4. Press <Enter>.

Select a Magenta Wheel Position (MAGN)

MAGN

1. Scroll to the “MAGN” parameter.
2. Press <Enter>.

C 1

3. Scroll to the desired magenta color wheel position value (in this example, “C1”). C1 indicates the discrete color position on the color wheel.
4. Press <Enter>.

Select a Yellow Wheel Position (YELW)

YELW

1. Scroll to the “YELW” parameter.
2. Press <Enter>.

S 3

3. Scroll to the desired yellow color wheel position value (in this example, “S3”). S3 indicates the saturation level at the third color position on the color wheel.
4. Press <Enter>.

Select a Beam Shaping (Lenticular) Wheel Position (BEAM)

A rectangular display box containing the text "BEAM".

1. Scroll to the “FX” parameter.

2. Press <Enter>.

A rectangular display box containing the text "WR12".

3. Scroll to the desired effects wheel position value (in this example, “WR12”).

4. Press <Enter>.

Select a Zoom (Beam Angle) Position (ZOOM)

A rectangular display box containing the text "ZOOM".

1. Scroll to the “ZOOM” parameter.

2. Press <Enter>.

A rectangular display box containing the text "255".

3. Scroll to the desired zoom value (in this example, “255” for a 26° beam angle).

4. Press <Enter>.

Select a Frost Flag Position (FRST)

A rectangular display box containing the text "FRST".

1. Scroll to the “FRST” parameter.

2. Press <Enter>.

A rectangular display box containing the text "SR06".

3. Scroll to the desired frost flag position value (in this example, “SR06”).

4. Press <Enter>.

Set an MSpeed Value (MSPD)

A rectangular display box containing the text "MSPD".

1. Scroll to the “MSPD” parameter.

2. Press <Enter>.

A rectangular display box containing the text "1.5".

3. Scroll to the desired MSpeed (in this example, “1.5”) in decimal seconds.

4. Press <Enter>.

Note: In this example, the MSpeed value only affects the pan and tilt parameters, because the pan and tilt values default to MSpeed time, and no other parameters with MSpeed values were chosen.

Choose a Macro (MACR)

A rectangular display box containing the text "MACR".

1. Scroll to the “MACR” parameter.



2. Press <Enter>.

A rectangular display box containing the text "MCOF".

3. Scroll to the desired macro value (in this example, “MCOF”).



4. Press <Enter>.

Set a Crossfade Value (XFAD)

-  1. Scroll to the “XFAD” parameter.
2. Press <Enter>.
-  3. Scroll to the desired crossfade value in increments of 0.1 or 1 (in this example, “1.5”).
4. Press <Enter>.

Note: The crossfade value will affect the DIM and ZOOM parameters. Set the unit of time used for crossfade (seconds, minutes, or hours) using the TIME parameter. Cyan, Magenta and Yellow are crossfaded in continuous and pure mix modes that do not use MSpeed.



Set a Delay Value (DLAY)

-  1. Scroll to the “DLAY” parameter.
2. Press <Enter>.
-  3. Scroll to the desired delay value in increments of 0.1 or 1 (in this example, “6.0”).
4. Press <Enter>.

Note: The delay value determines the length of the scene. If you want all motor transitions to be completed before the next scene begins, XFAD or MSPD must be less than or equal to DLAY. If XFAD or MSPD is longer than DLAY, the motor movement will not be completed before the next scene begins, which could produce undesirable results - such as no light output during the scene.



Set the unit of time used for delay (seconds, minutes, or hours) using the TIME parameter.

Set the Time Unit (TIME)

-  1. Scroll to the “TIME” parameter.
2. Press <Enter>.
-  3. Scroll to the desired time value (in this example, “SEC”).
4. Press <Enter>.

Note: This parameter sets the unit of time used in for the XFAD and DLAY values.

Erase the Scene (ZERO)

-  1. Scroll to the “ZERO” parameter.
-  2. Press <Enter>. The LED will display “OK?”
3. In this example, press the <Menu> button. Pressing the <Menu> button will exit this parameter and leave the current scene as programmed. Pressing the <Enter> button will erase the current scene and mark the end of a loop.

Creating a Loop

A loop is a series of programmed scenes that continuously plays in sequential order. To create a loop, you must first create two or more contiguous scenes (see “Step-by-Step Scene Creation” on page 4-27). After you have created your scenes, go to the *next available* scene and choose the “ZERO” menu option to erase any programmed parameter values and mark the end of the loop.

Note: If you program all available on-board scenes, you do not have to mark the end of the loop. When preset playback is set on, the fixture will automatically loop after playback of all programmed scenes.

Playing Back a Loop

To play back a loop, you must set preset playback on for each fixture (see “Setting Preset Playback (PLAY)” on page 4-3). When preset playback is set on, your fixture will automatically begin playing back the first scene and continue through the loop.

Note: Scene 1 must be programmed to enable preset playback.

The fixture has two ways to indicate that preset playback is on. First, the display will show a dot in the lower right corner (see Figure 4-5). Second, during normal operation, the seven-segment LED cycled information will be changed to display “PRST” instead of the fixture’s software version (“Vxxx”).

If power is removed during playback, the fixture will home and begin playback at the first scene. To stop playback, manually set playback mode off, (see “Setting Preset Playback (PLAY)” on page 4-3).

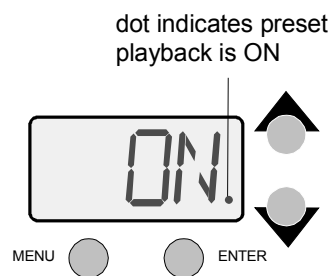


Figure 4-5 Preset playback indicator.

Synchronizing Preset Playback

After creating one or more scenes for your fixtures, you can synchronize the preset playback for all Studio Beam[®], x.Spot[™], Studio Spot[™] 250, Studio Color[®] 250, Studio Color[®] 575, Studio Spot[™] 575, EC-1[™], ES-1[™], Technobeam[®], Technopro[™], Technoray[™], Color Pro[®] HX, HXi, or FX fixtures in the link.

Note: Synchronizing preset playback is applicable for fixtures operating in stand-alone mode only. Do not include a DMX controller in the link while synchronizing preset scene playback.

Synchronizing playback allows you to set all applicable fixtures to a “master clock” so that all fixtures have a definite, synchronized starting point when playing back their sequences (or loops). It is the master fixture (the fixture assigned DMX start channel 1) which determines the sequence length for *all* the other fixtures in the link (slave fixtures), regardless of the number of programmed scenes or the sequence length of the individual slave fixtures.

When the master fixture reaches the end of its last scene, *all* fixtures will restart at scene 1 (regardless of whether the slave fixtures have finished playing their scenes) and *all* the “clocks” will be reset to zero. For example, if a slave fixture has a shorter sequence length, it will continuously repeat its sequence until the master fixture resets all the clocks (see Figure 4-6). If a slave fixture has a longer sequence length, it will restart at scene 1 before it completes its entire sequence.

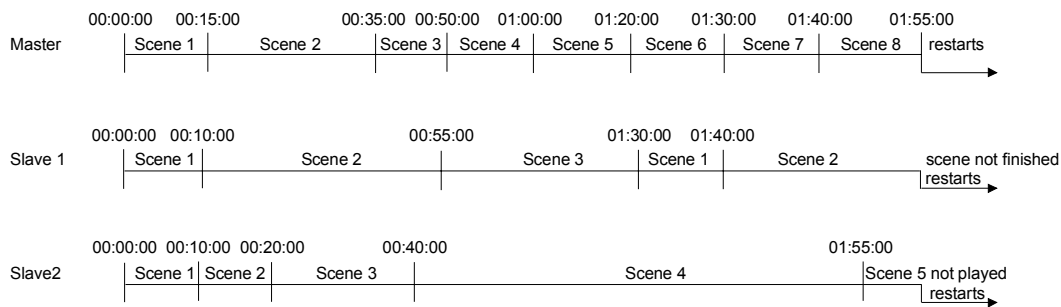


Figure 4-6 Example of synchronized playback.

To enable synchronized playback:

1. Link the fixtures you want to synchronize (see “Linking the Fixtures” on page 2-5). Make sure you terminate *both* the first and the last fixtures in the link and that there are no DMX controllers on the link.
2. Assign one fixture as the master fixture by assigning it a unique DMX start channel 1 or fixture number 1 (see “Uploading Latest Fixture Software” on page 2-9). Make sure *no other fixture* on the link is assigned DMX start channel 1 or fixture number 1.
3. Set preset playback on for all fixtures on the link (see “Setting Preset Playback (PLAY)” on page 4-3).

Chapter 5

General Maintenance

This chapter includes information on replacing parts, optimizing the lamp, cleaning the fixture, and updating fixture software. Please note the warnings under each heading before servicing your fixture.



Warning: This fixture must be serviced by qualified personnel. The information listed in this chapter is intended to assist qualified personnel *only*.

Replacing Parts



Warnings: 1) Disconnect power before servicing.

2) Replace fuses with the specified type and rating only.



3) Equipment surfaces may reach temperatures up to 90° C (194° F). Allow the fixture to cool before handling.

5

Replacing Fuses

You will need:

- replacement fuse (see Table 5-1)
- wide tip, flat head screwdriver
- #2 Phillips-head screwdriver

There are two fuses located on the logic board, two fuses located on the filter board, and two fuses located on the motor power supply board.

To replace the fuses:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Determine which fuse to replace by referring to Table 5-1.

Table 5-1 Description and Function of Fuses

Fuse	Type and Rating	Size	Protects	Symptom of Failure
Logic Board F1	2.5 A, 250 V, Slow Blow only	5mm x 20mm	Pan motor and Tilt motor	Pan and Tilt will no longer function.
Logic Board F2	2.5 A, 250 V, Slow Blow only	5mm x 20mm	Other motors and fans	Wheels will no longer function, and fans will shut off.

Table 5-1 Description and Function of Fuses

Fuse	Type and Rating	Size	Protects	Symptom of Failure
Motor Power Supply Board F1	6.3 A, 250 V, Slow Blow only	5mm x 20mm	Motor Power Supply Board	Motors will not move, lamp is off, and fixture appears dead.
Motor Power Supply Board F2	6.3 A, 250 V, Fast Blow only	5mm x 20mm	Logic Board and motors	Motors will not move, lamp is off, and fixture appears dead.
Filter Board F1	12.5 A, 250 V, Fast Blow only	5mm x 20mm	Entire fixture	Motors will not move, lamp is off, and fixture appears dead.
Filter Board F2	12.5 A, 250 V, Fast Blow only	5mm x 20mm	Entire fixture	Motors will not move, lamp is off, and fixture appears dead.

- Using a wide-tip, flat head screwdriver, loosen the two panel cover retaining screws on each side of the fixture (see Figure 5-1).
- Remove the fixture's two panel covers by sliding them off the fixture (see Figure 5-2).
- Refer to Figure 5-3 for the following:
If you want to access the **logic board fuses**, use a #2 Phillips-head screwdriver to loosen (but do not remove) the two LED display panel retaining screws.

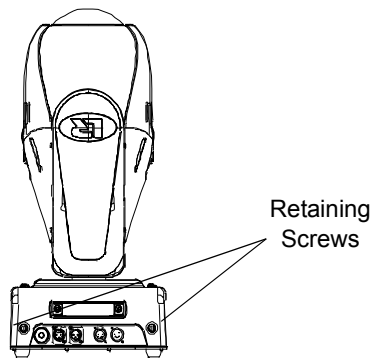


Figure 5-1 Loosen panel cover screws

If you want to access the **filter board fuses**, use a #2 Phillips-head screwdriver to loosen (but do not remove) the two filter panel retaining screws.

If you want to access the **motor power supply board fuses**, use a #2 Phillips-head screwdriver to loosen (but do not remove) both the LED display panel and the filter panel retaining screws.

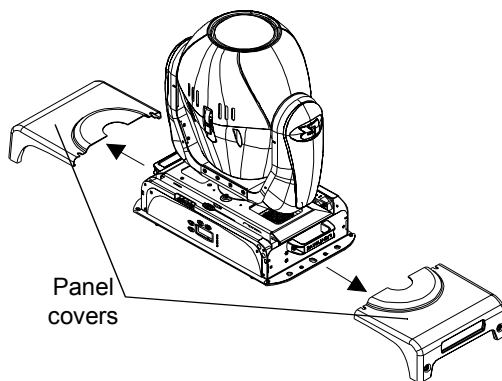


Figure 5-2 Remove the two panel covers.

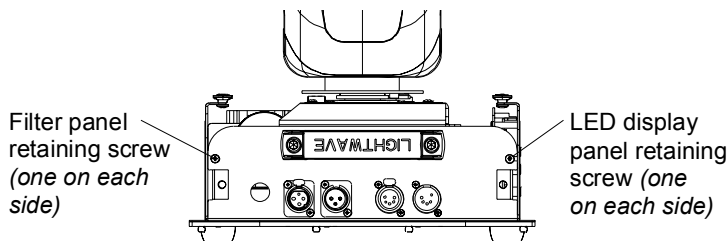


Figure 5-3 Loosen the two display panel screws.

6. Gently lower the desired panel(s) (see Figure 5-4).

If you want to access either the filter board or the logic board fuses, go on to Step 10.

To access the motor power supply board only continue.

7. From the LED display panel side of the fixture, disconnect the motor power supply cable from the logic board (see Figure 5-5).

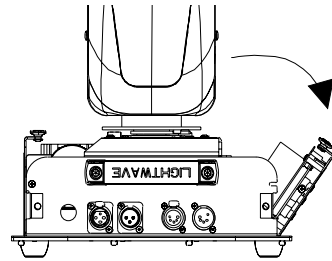


Figure 5-4 Lower the panel.

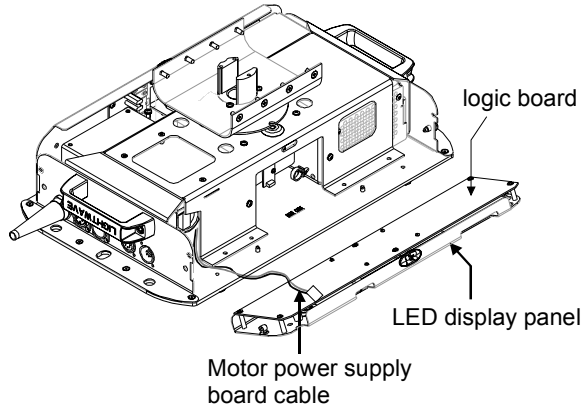


Figure 5-5 Remove the motor power supply cable from the logic board.

8. From the filter panel side of the fixture, disconnect the Ground (green wire), L1 (blue wire), and L2 (brown wire) from the motor power supply board (see Figure 5-6).

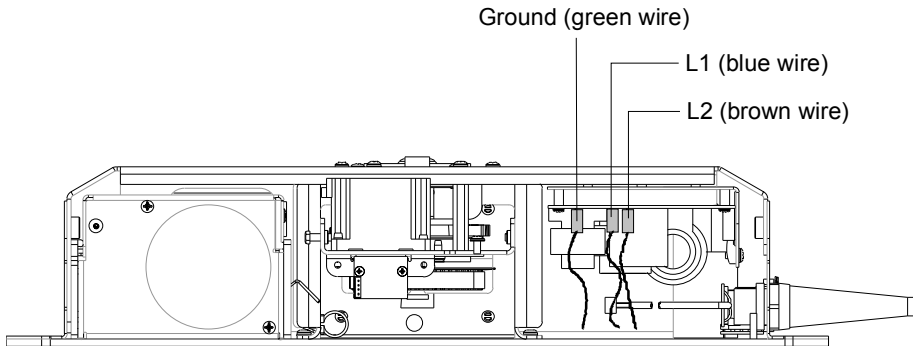


Figure 5-6 Remove the Ground, L1, and L2 wires.

- Referring to Figure 5-7, use a #2 Phillips-head screwdriver to remove the three screws (A) and slide the motor power supply board assembly (B) out of the fixture.

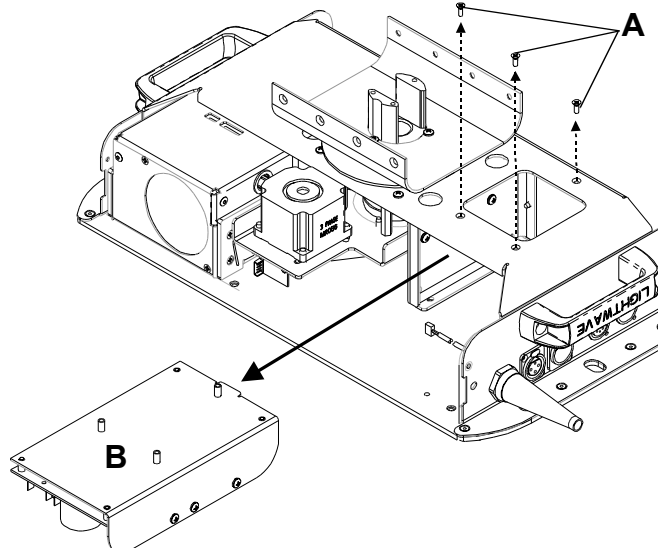


Figure 5-7 Remove the three screws and the motor power supply board

- Locate the fuse(s) to be replaced (see Figure 5-8) and replace with a fuse of the same type and rating.

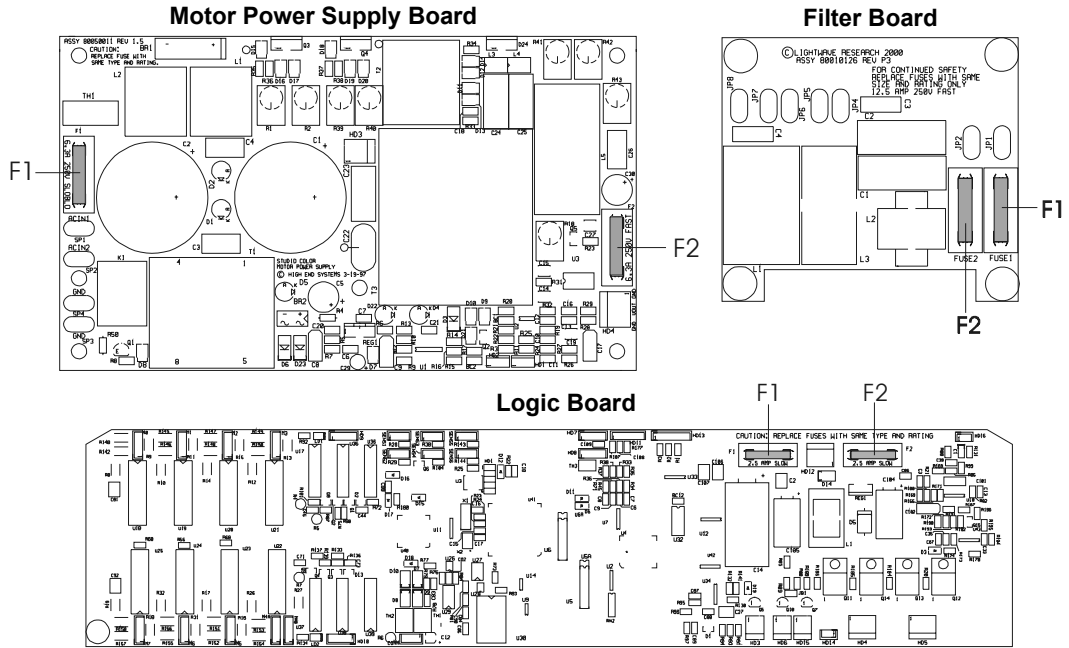


Figure 5-8 Fuse locations on the boards.

Note: If you are replacing the fuses on the LED display panel or the filter panel, you must first remove the protective plastic covering over the fuse(s).

11. Replace the appropriate fuse(s).

Note: If applicable, reinstall the protective plastic covering over the fuse.

12. If you removed the motor power supply board assembly, replace the assembly in the fixture and reinstall the three screws.

13. Reconnect the Ground, L1, and L2 wires to the motor power supply board.

14. Reconnect the motor power supply cable to the logic board.

15. Return the filter panel and/or the LED display panel to the original, upright position and tighten the display panel retaining screws.

16. Replace the two panel covers and tighten the four panel cover retaining screws.

Replacing the Lamp



Warnings: Disconnect power before re-lamping or servicing.



An operating, unshielded MSR 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 may be an explosion hazard. Do not open for five minutes after switching off. Wear eye and hand protection when re-lamping.

Equipment surfaces may reach temperatures up to 90° C (194° F). Allow the fixture to cool before handling.



Caution: This equipment is designed for use with a Philips® MSR 700-watt, short arc lamp only. Use of any other type lamp may be hazardous and may void the warranty.

You will need:

- Philips® MSR 700-watt, short arc lamp
- protective gloves and eyewear
- wide tip, flat head screwdriver

To install/replace the lamp:

1. Disconnect power to fixture. If the fixture has been operating, wait for the lamp to cool before handling.
2. Put on protective eyewear and gloves.
3. Tilt the fixture's head to access the lamp cap and using a wide tip, flat head screwdriver, loosen (but do not remove) the two lamp assembly screws, (see Figure 5-9).

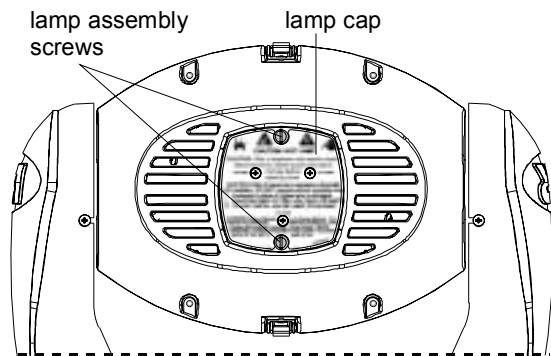


Figure 5-9 Lamp cap and assembly screws.

4. Pull the lamp assembly straight out of the fixture (see Figure 5-10).

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

5. Holding the existing lamp by its ceramic base, carefully pull the lamp straight out of the lamp socket (see Figure 5-11).



Caution: Do not squeeze the lamp glass while removing the existing lamp from the socket. Lamp glass may shatter.

6. Remove all packaging materials from the new lamp. Holding the new lamp by its ceramic base, gently press the two base pins into the lamp socket until the lamp is firmly seated.



Caution: When handling the new lamp, avoid contact with the lamp glass. If the lamp glass is soiled by oil or dirt from skin, gloves, etc., clean the cold lamp glass with an alcohol wipe. A soiled lamp could overheat and burst, causing damage to the fixture.

7. Reinsert the lamp assembly straight into the fixture.



Caution: Make sure the lamp socket wires are not wrapped around the lamp or crimped while reinserting the lamp assembly.

8. Tighten the lamp assembly screws.
9. Reset the lamp hours to zero so that you can track the lamp life (see “Resetting Lamp Hours (L/RS)” on page 4-25).
10. Optimize the new lamp (see “Optimizing the Lamp” on page 5-11).

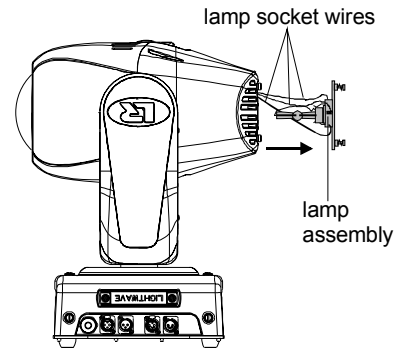


Figure 5-10 Remove the lamp assembly

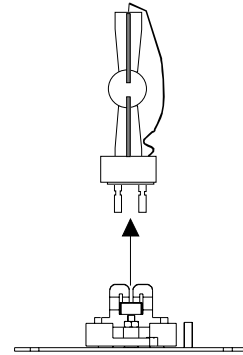


Figure 5-11 Remove the lamp from the lamp socket

Replacing a Wheel

This section shows how to replace the cyan, magenta, yellow, or beam shaping (lenticular) wheel. You should replace the wheels if they are damaged or broken.



Warnings: Disconnect power before servicing.

Equipment surfaces may reach temperatures up to 90° C (194° F). Allow the fixture to cool before handling.

You will need:

- #2 Phillips-head screwdriver
- 5/64 in. hex tool
- replacement wheel

To replace a Studio Beam[®] wheel:

1. Remove the fixture's bezel by releasing the bezel latch on each side of the fixture (see Figure 5-12).
2. Using a 5/64in. hex tool, loosen the set screw located under the optical plate on the motor shaft to the top frost flag (A in Figure 5-13).
3. Using a #2 Phillips-head screwdriver, remove the four screws securing the lens assembly to the optical module (B in Figure 5-13) and lift the lens assembly off the fixture.
4. Using a 5/64in. hex tool, loosen the set screw on the desired wheel hub, and remove the screws and washers as shown in Figure 5-14 on page 5-8.
5. Pull the desired wheel up and off the shaft (see Figure 5-14).
6. If applicable, remove all pieces of broken glass in the fixture.
7. Place the new wheel on the open wheel shaft and replace the washers, spacers, and set screws.
8. Replace the lens assembly guiding the top frost flag onto the motor shaft.

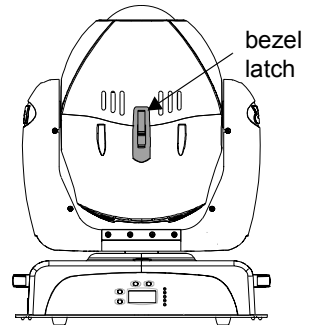


Figure 5-12 Remove bezel.

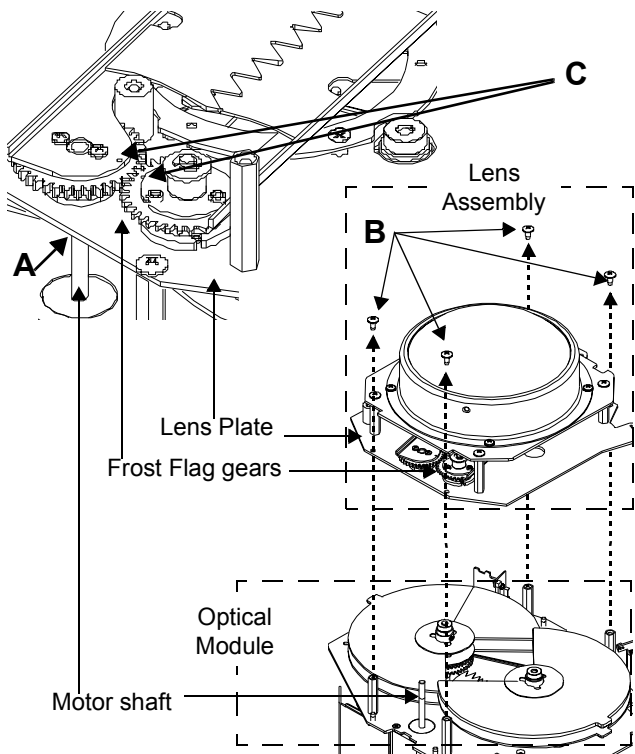


Figure 5-13 Remove the lens assembly

9. Realign the frost flag gears allowing enough spacing so top flag can move freely. Dots on the top of each gear (C in Figure 5-13) indicate gear alignment.
10. Reinstall the four #2 Phillips-head screws.
11. Replace the fixture's bezel and engage the two bezel latches.

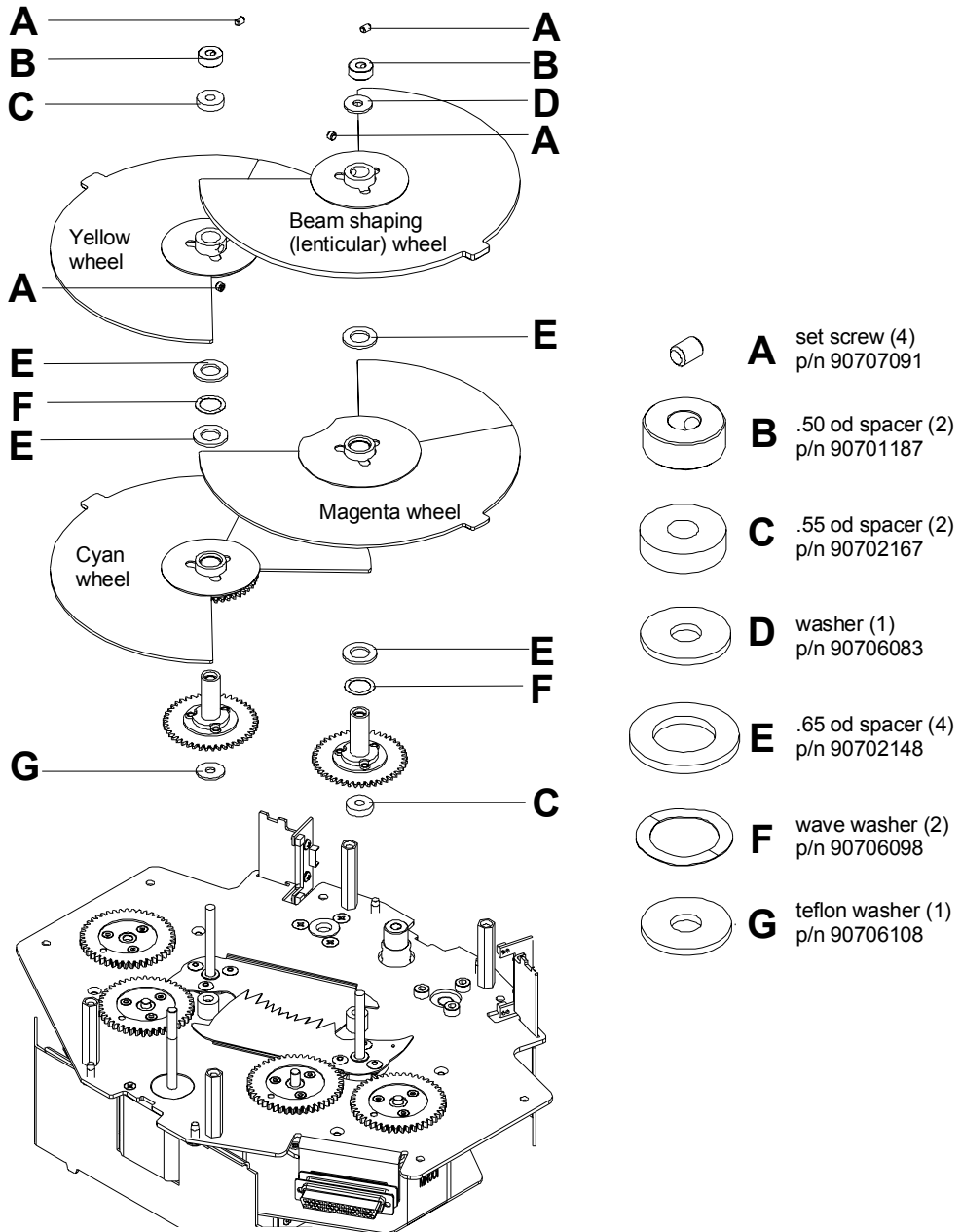


Figure 5-14 Location of the screws and washers on the color wheel assembly

Replacing the Lenses

This section shows how to replace the Pebble Convex (PC) lens and the aspheric (zoom) lens. You should replace the lenses if they are damaged or broken.

You can also completely remove the aspheric lens if you want to increase the fixture's lumens output. By removing the aspheric lens, the fixture will always have a 15° beam angle, but will increase its output by 2,000 lumens.



Warnings: Disconnect power before servicing.

**Equipment surfaces may reach temperatures up to 90° C (194° F).
Allow the fixture to cool before handling.**

Replacing the PC Lens

You will need:

- replacement PC lens
- #2 Phillips-head screwdriver

To replace the PC lens:

1. Disconnect power from the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Remove the bezel by unlatching the two bezel latches (see Figure 5-12 on page 5-7).
3. Remove the four #2 Phillips-head lens screws and remove the lens by pulling it straight up from the optical assembly (see Figure 5-15).
4. Place the new lens on the optical assembly.

Note: Before installing the new lens, you may need to clean it by using a soft, lint-free cotton cloth and a mild glass cleaning solution (containing no ammonia).

5. Replace and tighten the four #2 Phillips-head screws that secure the lens to the lens assembly.
6. Replace the bezel and engage the bezel latches.

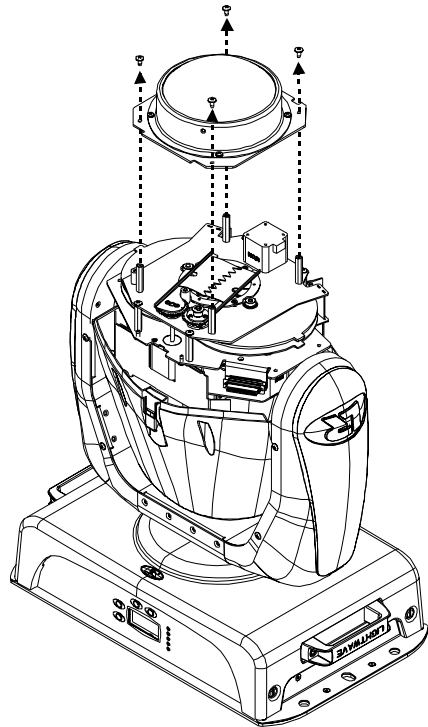


Figure 5-15 Remove the screws that secure the lens to the optical assembly.

Removing or Replacing the Aspheric Lens

You will need:

- replacement aspheric lens (if applicable)
- 1/16in. allen wrench
- #2 Phillips-head screwdriver
- a soft, lint-free cotton cloth
- mild glass cleaning solution

To remove or replace the aspheric lens:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Remove the bezel by unlatching the two bezel latches (see Figure 5-16).

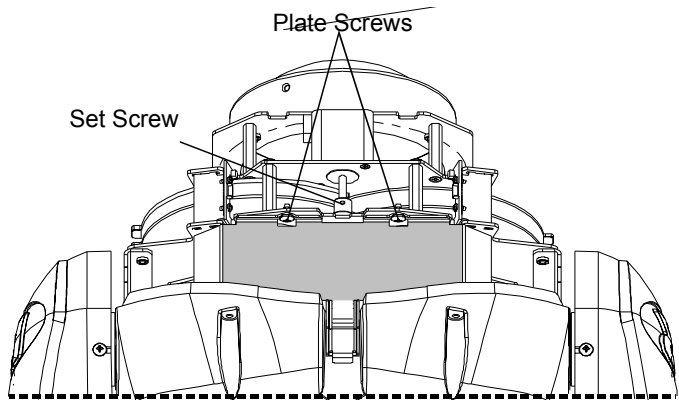


Figure 5-16 Loosen the screws securing the optical assembly plate.

3. Use a #2 Phillips-head screwdriver to loosen (*but not remove*) the two plate screws shown in Figure 5-16. When the screws are loosened, remove the plate by pulling the large end of the plate's keyhole slots over the screw heads you just loosened.
4. Use a 1/16in. allen wrench to loosen (*but not remove*) the set screw shown in Figure 5-16 and access the aspheric lens assembly.
5. Using a #2 Phillips-head screwdriver, remove the two aspheric lens mounting screws (see Figure 5-17).
6. Remove the aspheric lens assembly as shown in Figure 5-17.

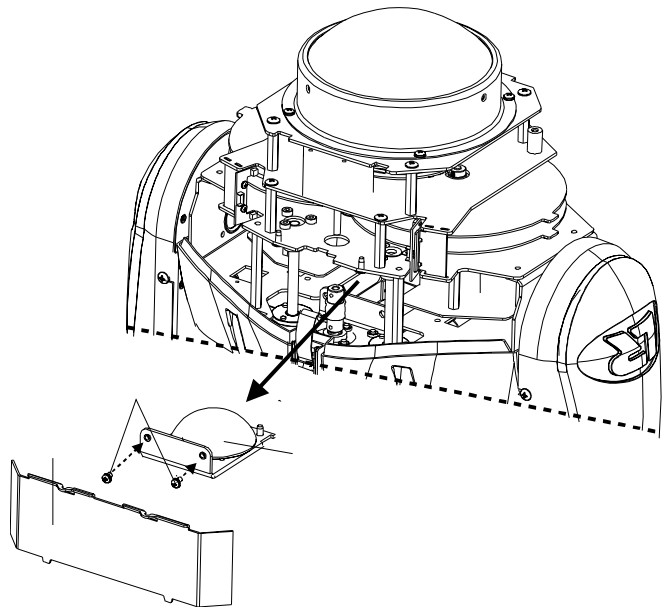


Figure 5-17 Remove the two aspheric lens mounting screws.

If you are replacing the lens, install the new aspheric lens assembly and reinstall the aspheric lens mounting screws.

Note: Before installing the new lens, you may need to clean it by using a soft, lint-free cotton cloth and a mild glass cleaning solution (containing no ammonia).

7. Replace the plate by sliding the large end of the keyhole slots over the two plate screws heads.
8. Using a #2 Phillips-head screwdriver, tighten the two plate screws to secure the plate to the optical assembly.
9. Replace the bezel and engage the bezel latches.
10. Set Zoom to “ON”, see “Setting the Zoom (ZOOM)” on page 4-12.

Optimizing the Lamp

You should optimize the lamp after you replace the lamp, or if you notice a “hot spot” of brightness anywhere other than the center of the light beam.

To complete the optimization procedure below, you can use either the fixture’s on-board menu system or your DMX controller.

1. Orient the fixture so that the beam will project onto a flat, white surface at least 10 feet (3 m) away as shown in Figure 5-18.

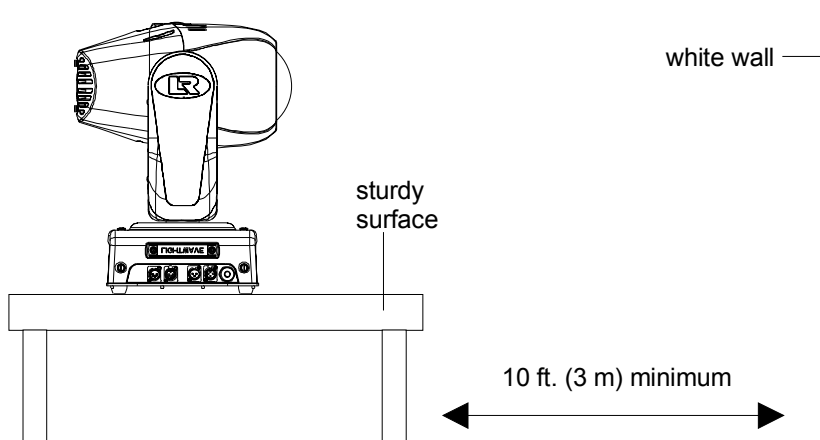


Figure 5-18 Orient the fixture for lamp optimization.

2. Turn the lamp on (see “Turning the Lamp On or Off (LAMP)” on page 4-17).
3. Make sure that the light beam is round and not oval.
4. If necessary, adjust the pan and tilt construct values until the beam is round (see “Select a Pan Value (PAN):” on page 4-27 and “Select a Tilt Value (TILT)” on page 4-28).
5. Locate the three lamp optimization screws (see Figure 5-19).

5

6. Loosen the three lamp optimization screws.
7. Look at the wall where the beam is projected and use the three optimization screws to adjust the lamp's position within the fixture.
8. When the beam is at its maximum brightness and the light level is even across the beam (or the "hot spot" of brightness is at the center of the beam), retighten the three optimization screws to secure the lamp in its new position.

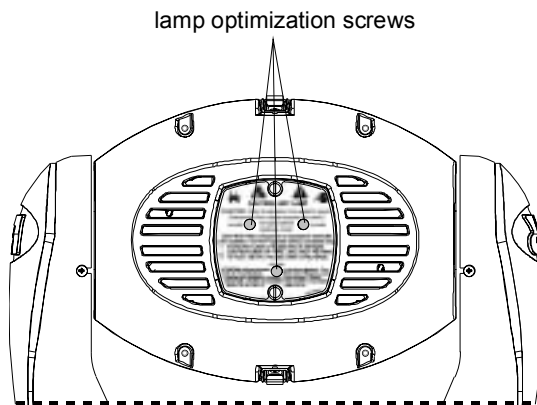


Figure 5-19 Lamp optimization screws.

Cleaning the Glass Components

If the glass components of your fixture become dirty, clean them by following the procedure below.



Warnings: Disconnect power before servicing.

**Equipment surfaces may reach temperatures up to 90° C (194° F).
Allow the fixture to cool before handling.**

You will need:

- a soft, lint-free cotton cloth
- mild glass cleaning solution (containing no ammonia)

To clean the internal components:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Remove the bezel by releasing the two bezel latches (see Figure 5-12 on page 5-7).
3. Clean the color wheels, aspheric lens, and PC lens using a mild glass cleaner (containing no ammonia) and a soft, lint-free cotton cloth.

To access the color wheels, see "Replacing a Wheel" on page 5-7. To access the aspheric lens, see "Removing or Replacing the Aspheric Lens" on page 5-10. To access the PC lens, see "Replacing the PC Lens" on page 5-9.
4. Replace the bezel and engage the two bezel latches.

Chapter 6

Troubleshooting

This chapter lists typical symptoms and solutions for problems you might experience when using your Studio Beam® fixture. If the problem you are experiencing is not listed in this chapter or the solution listed does not solve the problem, contact High End Systems customer service (see “Contacting High End Systems” on page ii).

Alphanumeric Display Error Messages

The front panel on Studio Beam fixtures has an alphanumeric LED (Light Emitting Diode) display, five status LEDs, and four menu navigation buttons (see Figure 6-1).

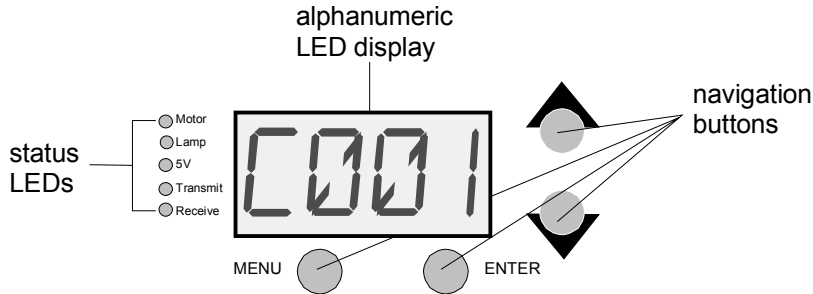


Figure 6-1 Front panel display.

Under normal circumstances, the alphanumeric display cycles between displaying the fixture’s name (“BEAM”), the fixture software version (“Vxxx”), the fixture’s DMX start channel (“Cxxx”), and the current protocol setting (“STAN” or “FLAT”). However, if you are experiencing problems with your fixture, the status LEDs and/or alphanumeric display can also provide insight on where the problem is originating.

Table 6-1 on page 6-2 lists alphabetically the Error Messages Studio Beam fixtures can display along with the problem(s) each may indicate and potential solutions.

Table 6-1 Alphanumeric Display Error Messages

Display Message	Problem	Solution
BOOT DIFF	The fixture's normal boot code does not match the backup boot code.	Update the boot code (see "Copying the Boot Code (BOOT)" on page 4-17).
CYAN SENS	The fixture cannot find the color wheel home slot due to a possible: <ul style="list-style-type: none"> • broken color wheel • broken belt • faulty motor • faulty motor driver • broken wire connecting the sensor or cyan wheel motor to the logic board • bad sensor 	Replace the wheel (see "Replacing a Wheel" on page 5-7). Contact High End Systems customer support (see page ii) if problem continues.
EFCT SENS	The fixture cannot find the beam shaping (lenticular) wheel home slot due to a possible: <ul style="list-style-type: none"> • broken lenticular wheel • broken belt • faulty motor • faulty motor driver • broken wire connecting the sensor or lenticular wheel motor to the logic board • bad sensor 	Replace the wheel (see "Replacing a Wheel" on page 5-7). Contact High End Systems customer support (see page ii) if problem continues.
EMEM ADIO	The fixture lost the audio gain setting and defaults to a setting of 6.	To restore setting, see "Setting the Audio Gain (GAIN)" on page 4-11. Contact High End Systems customer support (see page ii) if problem continues.
EMEM ALED	The fixture lost the audio LED setting and will default to off	To restore setting, see "Enabling Audio Modulation (ALED)" on page 4-11. Contact High End Systems customer support (see page ii) if problem continues.
EMEM CHNL	The fixture lost the assigned DMX start channel and will automatically default to DMX start channel 1.	To reassign the DMX start channel, see "Assigning a DMX Start Channel" on page 2-9.
EMEM DINV	The fixture lost the display invert setting and will default to non-inverted	To restore display invert setting, see "Inverting LED Characters (D/IN)" on page 4-9.
EMEM DLOS	The fixture lost the DMX data loss setting and will default to short mode.	To reassign the DMX data loss setting (see "Data Loss Shutter Close (DLOS)" on page 4-10).
EMEM DPLY	The fixture lost the display setting and will default to on and bright.	To restore the display setting, see "Changing the Display Output (DSPL)" on page 4-8).

Table 6-1 Alphanumeric Display Error Messages

Display Message	Problem	Solution
EMEM FHRS	The fixture lost the number of fixture hours and will default to zero.	Not Applicable.
EMEM FMOD	The fixture lost the fast pan and tilt mode setting and will default to normal pan and tilt mode.	To reassign the pan and tilt mode setting, see “Increasing the Pan/Tilt Movement (FAST)” on page 4-10).
EMEM LHRS	The fixture lost the number of lamp hours and will default to zero.	Not Applicable.
EMEM LMPL	The fixture lost the lamp life limitation setting and will default to unlimited lamp life.	If the fixture was set to lamp life limitation, reassign the lamp life setting (see “Setting the Lamp Warning Message (LMPL)” on page 4-9).
EMEM L/ST	The fixture lost the number of lamp strikes and will default to zero.	Not Applicable.
EMEM MODE	The fixture lost the mode setting (DMX control or preset playback) and will default to DMX control.	To reassign the mode setting, see “Setting Preset Playback (PLAY)” on page 4-3.
EMEM PINV	The fixture lost the pan invert setting and will default to non-inverted.	To reassign the pan invert setting, see “Inverting Pan (P/IN)” on page 4-8.
EMEM PROT	The fixture lost the protocol setting and will default to standard protocol.	To reset to flat protocol, see “Selecting Protocol (PROT)” on page 4-16 Contact High End Systems customer support (see page ii) if problem continues.
EMEM SWAP	The fixture lost the pan/tilt swap setting and will default to non-swapped.	To enable pan/tilt swap (see “Swapping Pan and Tilt (SWAP)” on page 4-7).
EMEM TINV	The fixture lost the tilt invert setting and will default to non-inverted.	To reassign tilt invert setting (see “Inverting Tilt (T/IN)” on page 4-7).
EMEM TMOD	The fixture lost the test mode setting (<i>Factory Use Only</i>) and defaults to normal operation.	Not Applicable.
EMEM USER	The fixture lost the assigned user setting and will automatically default to user A.	To reassign the user setting (see “Setting the User Type (USER)” on page 4-13).
EMEM ZOOM	The fixture lost the zoom setting and will default to off	To restore zoom, see “Setting the Zoom (ZOOM)” on page 4-12.
ERSE FLSH	One or more fixtures on the data link has failed to erase the FlashROM in a suitable amount of time.	Attempt another software crossload (see “Crossloading Fixture Software (XLD)” on page 4-15). Contact High End Systems customer support (see page ii) if problem continues.

Table 6-1 Alphanumeric Display Error Messages

Display Message	Problem	Solution
HEAD TEMP	<p>Fixture head temperature has exceeded the maximum permissible level due to:</p> <ul style="list-style-type: none"> • a bad fan • excessive ambient temperatures • blockage in fan vents on back of the fixture head • a broken wire connecting the fan to the logic board. <p>The fixture automatically turns the lamp and motors off.</p>	<p>Reduce the ambient temperature around the fixture and/or remove any blockage from the fixture's fan vents.</p> <p>Contact High End Systems customer support (see page ii) if problem continues.</p>
INIT SEN1	<p>The fixture cannot clear sensor 1 (magenta color wheel and beam shaping (lenticular) wheel) due to a possible:</p> <ul style="list-style-type: none"> • broken wheel • motor failure • motor driver failure • bad sensor • break in the wires connecting the motors or sensor to the logic board 	<p>Contact High End Systems customer support (see page ii).</p>
INIT SEN2	<p>The fixture cannot clear sensor 2 (yellow and cyan color wheels) due to a possible:</p> <ul style="list-style-type: none"> • broken wheel • motor failure • motor driver failure • bad sensor • break in the wires connecting the motors or sensor to the logic board 	<p>Contact High End Systems customer support (see page ii).</p>
LAMP LIFE	<p>The fixture's lamp life limitation setting was enabled and the current lamp has exceeded 700 hours.</p>	<p>This message is only a warning. Take no action unless this message changes to "LAMP OUT."</p>
LAMP MISS	<ul style="list-style-type: none"> • The fixture cannot detect the temperature readback from the thermometer in the fixture head. • The lamp cap is not installed on the fixture. • There is a broken wire or loose connector between the thermometer and the logic board. • The lamp interlock in the head has failed. 	<p>Make sure lamp cap is installed on the fixture (see "Replacing the Lamp" on page 5-5). The lamp will not strike if the lamp plate is removed. If the lamp is on when the lamp plate is removed, the lamp is extinguished. If the lamp was on when the lamp plate was removed, the lamp strikes again 30 seconds after the lamp plate is reinstalled. Contact High End Systems customer support (see page ii) if problem continues.</p>

Table 6-1 Alphanumeric Display Error Messages

Display Message	Problem	Solution
LAMP OUT	The fixture's lamp life limitation setting was enabled and the current lamp has exceeded 800 hours. The fixture can no longer strike the lamp.	Replace the lamp (see "Replacing the Lamp" on page 5-5) and reset the lamp hours (see "Resetting Lamp Hours (L/RS)" on page 4-25).
LAMP STAT	Because of an unexpected electrical event, the fixture cannot determine the current status of the lamp.	Home the fixture (see "Homing the Fixture (HOME)" on page 4-17). Contact High End Systems customer support (see page ii) if problem continues.
LAMP TOUT	The fixture has unsuccessfully attempted to strike the lamp.	Allow the fixture to cool, then attempt to manually strike the lamp (see "Turning the Lamp On or Off (LAMP)" on page 4-17). Replace the lamp (see "Replacing the Lamp" on page 5-5). Contact High End Systems customer support (see page ii) if problem continues.
LINK BUSY	Two fixtures on the same link are both attempting to transmit data during preset playback or software crossloads.	Disconnect any controllers, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes and Intellabeam® fixtures) are located <i>after</i> the Studio Beam fixtures on the link. These devices block communication with any other Studio Beam fixtures on the link.
LINK EMTY	The fixture is attempting to crossload software but cannot find any suitable fixtures on the data link.	Make sure that all data cables are functioning and that all receiving fixtures are connected to the data cable and powered on. Contact High End Systems customer support (see page ii) if problem continues.
MAGN SENS	The fixture cannot find the magenta color wheel home slot due to a possible: <ul style="list-style-type: none"> • broken color wheel • broken belt • faulty motor • faulty motor driver • broken wire connecting the sensor or magenta wheel motor to the logic board • bad sensor 	Replace the wheel (see "Replacing a Wheel" on page 5-7). Contact High End Systems customer support (see page ii) if problem continues.

Table 6-1 Alphanumeric Display Error Messages

Display Message	Problem	Solution
PAN ENCD	<p>The fixture has detected a pan error and cannot correct its position due to a:</p> <ul style="list-style-type: none"> • physical obstruction • broken belt • bad pan encoder • bad encoder wheel • broken wire connecting the encoder to the logic board 	<p>Remove the object (externally or internally) that is blocking the fixture's pan movement and home the fixture (see "Homing the Fixture (HOME)" on page 4-17).</p> <p>Contact High End Systems customer support (see page ii) if problem continues.</p>
PAN SENS	<p>The fixture cannot find the pan home slot due to a possible:</p> <ul style="list-style-type: none"> • broken belt • faulty motor • faulty motor driver • broken wire connecting the sensor or pan motor to the logic board • bad sensor 	<p>Contact High End Systems customer support (see page ii).</p>
PCB TEMP	<p>The temperature in the top box has exceeded the maximum permissible level due to a possible:</p> <ul style="list-style-type: none"> • bad fan • excessive ambient temperatures • blockage in the fan vents • broken wire connecting the fan to the logic board. <p>The fixture will automatically turn the lamp and motors off.</p>	<p>Reduce the ambient temperature around the fixture and/or remove any blockage from the fixture's fan vents.</p> <p>Contact High End Systems customer support (see page ii) if problem continues.</p>
PRST LOST	<p>The fixture failed to read preset data from non-volatile memory.</p>	<p>Reassign the preset scenes' construct values (see "Editing or Creating an On-Board Memory Scene (EDIT)" on page 4-3).</p>
PRGM TIME	<p>One or more fixtures on the data link has failed to program the FlashROM in a suitable amount of time.</p>	<p>Attempt another software crossload (see "Crossloading Fixture Software (XLD)" on page 4-15).</p> <p>Contact High End Systems customer support (see page ii) if problem continues.</p>
TMP1 LOST	<p>The fixture cannot detect the temperature readback from the thermometer on the PCB.</p>	<p>Contact High End Systems customer support (see page ii).</p>

Table 6-1 Alphanumeric Display Error Messages

Display Message	Problem	Solution
TILT ENCD	Fixture has detected a tilt error and cannot correct its position due to a: <ul style="list-style-type: none"> • physical obstruction • broken belt • bad tilt encoder or encoder wheel • a broken wire connecting the encoder to the logic board. 	Remove the object (externally or internally) that is blocking the fixture's tilt movement and home the fixture (see "Homing the Fixture (HOME)" on page 4-17). Contact High End Systems customer support (see page ii) if problem continues.
TILT SENS	Fixture cannot find the tilt home slot due to a: <ul style="list-style-type: none"> • broken belt • faulty motor or motor driver • broken wire connecting the sensor or tilt motor to the logic board • bad sensor. 	Contact High End Systems (see "Contacting High End Systems" on page ii).
UPLD	The software upload or crossload was interrupted and the fixture is held in boot mode.	Make sure the fixture is properly connected to both data and power cables, then attempt another software crossload (see "Crossloading Fixture Software (XLD)" on page 4-15). Contact High End Systems customer support (see page ii) if problem continues.
YEL SENS	The fixture cannot find the yellow color wheel home slot due to a possible: <ul style="list-style-type: none"> • broken color wheel • broken belt • faulty motor or motor driver • broken wire connecting the sensor or yellow wheel motor to the logic board • bad sensor. 	Replace the wheel (see "Replacing a Wheel" on page 5-7). Contact High End Systems customer support (see page ii) if problem continues.

Status LEDs

Studio Beam® fixtures have five Status LEDs on the display panel shown in Figure 6-1 on page 6-1. The status LEDs help determine where any problems with your Studio Beam fixture may be originating..

Table 6-2 Status LEDs

LED	State	Problem Indication?	Description
Motor	solid green	No	The motor power supply is receiving adequate voltage.
	OFF	Yes	Fuse or power failure.
Lamp	solid yellow	No	Lamp power is on. Lamp is striking. The lamp power supply is receiving the proper voltage, and the lamp is on.
	OFF	Not necessarily ¹	The lamp is extinguished.
5V	solid red	No	The logic board is receiving the required voltage.
	OFF	Yes	Fuse or power failure.
Transmit	solid yellow	No	Fixture is crossloading software to other fixtures on the link.
	OFF	Not necessarily ²	DMX 512 data is not being transmitted.
	flashing	No	The fixture is in preset playback mode, and is the master fixture or the fixture is a slave fixture receiving an upload.
Receive	solid or (flickering green)	No	The fixture is receiving data.
	OFF	Not necessarily ²	DMX 512 data is not being received.

¹ If you shut down the lamp using a remote shutdown command, the lamp and the Lamp LED will shut off normally. However, if you have bad data cables, no data cables/controller connected to the fixture, or the controller is off, the lamp and its LED will also be off. If correcting these problems does not turn the lamp on, see the next section.

² Neither the Transmit nor the Receive LED will be on until you have connected the fixture to a DMX 512-compatible controller using XLR data-grade cabling. If these LEDs remain OFF even though you have connected the fixture to a controller and are sending DMX 512 commands to the fixture, see the next section.

General Troubleshooting

To find solutions to general fixture problems not indicated by alphanumeric LED display error messages or status LEDs, see Table 6-3.

Table 6-3 General Troubleshooting

Problem	Probable Cause	Solution
Fixture will not power on.	No power is connected.	Connect power to the fixture.
	Fuse is bad.	Check the power supply fuses (see “Replacing Fuses” on page 5-1).
	Power connectors are bad.	Contact High End Systems customer support (see page ii).
Fixture functions but lamp does not strike.	The lamp is bad.	Replace the lamp (see “Replacing the Lamp” on page 5-5).
	The lamp is currently too hot to strike.	Provide correct power source voltage, power cord cap, and input voltage setting (see “Changing the Attachment Plug” on page 2-1).
	The Ignitor connection is loose.	Allow the lamp to cool, then restrike the lamp (see “Turning the Lamp On or Off (LAMP)” on page 4-17). Contact High End Systems customer support (see page ii) if problem continues.
Lamp is dimmer than other fixtures.	<ul style="list-style-type: none"> • The lamp is bad or old. • The wrong type of lamp is installed. 	Replace lamp with the specified type (see “Replacing the Lamp” on page 5-5).
	The lamp is not optimized.	Optimize the lamp (see “Optimizing the Lamp” on page 5-11).
Lamp shuts off during operation.	The lamp is bad.	Replace the lamp (see “Replacing the Lamp” on page 5-5).
	The fixture has exceeded the maximum temperature.	Allow the fixture 5 to 10 minutes to cool, then attempt to strike the lamp (see “Turning the Lamp On or Off (LAMP)” on page 4-17).
	The lamp socket is loose and causing arcing.	Contact High End Systems customer support (see page ii).
Fixture will not home properly.	A sensor, driver, or motor is faulty.	Contact High End Systems customer support (see page ii).
Color system is not producing the correct color.	The fixture is not properly homed.	Home the fixture (see “Control Construct” on page 3-13 for controller Homing or “Homing the Fixture (HOME)” on page 4-17 to Home the fixture manually.) Contact High End Systems customer support (see page ii) if problem continues.

Table 6-3 General Troubleshooting

Problem	Probable Cause	Solution
Fixture is not responding to controller commands or is producing unexpected results.	The data cable is faulty.	Test and replace the data cables as necessary.
	No controller is attached to the link or the controller is not generating any output.	Verify that a controller is connected to the link and is generating output by sending commands to a known working device.
	The fixture has an incorrect fixture number or DMX start channel.	Verify the fixture number or DMX start channel does not overlap another fixture's DMX start channel (see "Uploading Latest Fixture Software" on page 2-9).
	The link was not terminated.	Terminate the link (see "Obtaining a Terminator" on page 2-8).
Pan or Tilt position is off.	The pan and tilt is out of home.	<ul style="list-style-type: none"> • Home the fixture (see "Control Construct" on page 3-13 or "Homing the Fixture (HOME)" on page 4-17). • Contact High End Systems customer service (see "Contacting High End Systems" on page ii).
Display is not functioning.	The LED display is set off.	Turn the LED display on (see "Changing the Display Output (DSPL)" on page 4-8).
	The power supply fuse is bad.	Check the power supply fuses (see "Replacing Fuses" on page 5-1).
	The power connectors are loose.	Re-seat the power connectors and turn the LED display on.
	The software upload was incomplete.	At fixture start-up, press the two navigational arrow buttons simultaneously. The LED will display "UPLD" and hold the fixture in boot mode. Reload the latest version of the software.
	The logic board is bad.	Contact High End Systems customer service (see "Contacting High End Systems" on page ii).
Light output is low and/or fuzzy.	The optical path is dirty.	Clean the internal glass components (see "Cleaning the Glass Components" on page 5-12).

Upload and Crossload Troubleshooting

Table 6-4 describe solutions to problems encountered while uploading or crossloading new software versions.

Table 6-4 Upload and Crossload Troubleshooting

Problem	Probable Cause	Solution
Not all fixtures on the link are receiving the upload.	Fixture(s) are off	Power on the fixture(s)
	Bad cable(s)	Test and replace cable(s) as necessary
	Cable(s) disconnected	Reconnect cable(s)
	Controllers, serial data distributors, data line Optoisolators, or fixture(s) using RS-422 communication is connected <i>before</i> Studio Beam fixtures on the link.	Remove or bypass any incompatible devices from the data link or move them to a link position <i>after</i> the Studio Beam fixtures.
Lighting controller is not able to erase FlashROM.	The XLR cable(s) disconnected	Reconnect XLR cable(s)
	Bad cable(s)	Replace cable(s)
	The fixture's electrical circuitry is damaged	Contact High End Systems customer support (see page ii).
Lighting controller does not recognize a fixture at the assigned address	Status Cue was configured with a fixture at that address, but no fixtures were found there.	If there is not a fixture at that address, ignore this message - if there is a fixture at that address, verify the fixture number/DMX start channel. Check connections. Check to ensure fixture is turned on.
	Controllers, serial data distributors, data line optoisolators, or fixture(s) using RS-422 communication is connected <i>before</i> Studio Beam fixtures on the link.	Remove or bypass the offending devices from the data link or move them <i>after</i> the Studio Beam fixtures.
The fixture's LED displays: BOOT DIFF ERR	New software included a new boot code.	Accept and store the new boot code (see "Copying the Boot Code (BOOT)" on page 4-17).
Fixtures are not crossloading.	Controllers, serial data distributors, data line Optoisolators, or fixture(s) using RS-422 communication is connected <i>before</i> Studio Beam fixtures on the link.	Remove or bypass any offending devices from the data link or move them <i>after</i> the Studio Beam fixtures.

Appendix A

Studio Beam® DMX Protocol

Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
1	Pan	Pan, coarse adjustment	0-255	0-100	00-FF
2	Pan	Pan, fine adjustment	0-255	0-100	00-FF
3	Tilt	Tilt, coarse adjustment	0-255	0-100	00-FF
4	Tilt	Tilt, fine adjustment	0-255	0-100	00-FF
5	Color Function	Full Speed Control			
		Continuous	0-15	0-6	00-0F
		Indexed	16-31	6-12	10-1F
		Pure Mix	32-47	13-18	20-2F
		Spin	48-63	19-25	30-3F
		Cycle (Speed is set by the Cyan channel)	64-79	25-31	40-4F
		Color Scan (Speed or fixed position set individually on Cyan, Magenta, and Yellow channels)	80-95	31-37	50-5F
		Random (Speed is set by the Cyan channel)	96-111	38-44	60-6F
		Blink Continuous	112-127	44-50	70-7F
		MSpeed Controlled			
		Continuous	128-143	50-56	80-8F
		Indexed	144-159	57-62	90-9F
		Pure Mix	160-175	63-69	A0-AF
		Spin	176-191	69-75	B0-BF
		Cycle (Speed is set by the Cyan channel)	192-207	75-81	C0-CF
		Color Scan (Speed or fixed position set individually on Cyan, Magenta, and Yellow channels)	208-223	82-87	D0-DF
		Random (Speed is set by the Cyan channel)	224-239	88-94	E0-EF
		Blink Continuous	240-255	94-100	F0-FF
		6	Cyan Color Wheel	Continuous Mode Absolute position across color mix portion of wheel	
Open	0			0	00
Discrete Color (Deep Red) position	57			22	39
Cyan Full Saturation	105			41	69
Cyan Low Saturation	255			100	FF
Indexed Mode					
Open Position 1	0-15			0-6	00-0F
Discrete Color (Deep Red) Position 2	16-47			6-18	10-2F



Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)		
6 (cont.)	Cyan Color Wheel (cont.)	Cyan Full Saturation Position 3	48-79	19-31	30-4F		
		Cyan Position 4	80-111	31-44	50-6F		
		Cyan Position 5	112-143	44-56	70-8F		
		Cyan Position 6	144-175	56-69	90-AF		
		Cyan Position 7	176-207	69-81	B0-CF		
		Cyan Low Saturation	208-239	82-94	D0-EF		
		Open	240-255	94-100	F0-FF		
		Pure Mix Mode (Absolute position across color mix portion of wheel)					
		Cyan Full Saturation	0	0	00		
		Cyan Low Saturation	255	100	FF		
		Spin Mode					
		Continuous Positioning	0-127	0-50	00-7F		
		Spin Reverse (fastest to slowest)	128-187	50-73	80-BB		
		Spin Stop	188-195	74-77	BC-C3		
		Spin Forward (slowest to fastest)	196-255	77-100	C4-FF		
		Color Scan Mode					
		Continuous Positioning	0-127	0-50	00-7F		
		Scanning (slowest to fastest)	128-255	50-100	80-FF		
		Cycle & Random Modes (sets the rate for all color wheels)					
		Slow Rate	0	0	00		
		Fast Rate	255	100	FF		
		Audio Modulation Mode: Select Audio Function in Control Channel					
		Full Movement. Maximum amplitude music causes full scale movement.					
		Saturated cyan to white, slow decay	0-7	0-3	00-07		
		Saturated cyan to white, medium decay	8-15	3-6	08-0F		
		Saturated cyan to white, fast decay	16-23	6-9	10-17		
		White to saturated cyan, fast decay	24-31	9-12	18-1F		
		White to saturated cyan, medium decay	32-39	13-15	20-27		
		White to saturated cyan, slow decay	40-47	16-18	28-2F		
		Limited movement. Cyan channel sets the maximum travel position. Decay rate is medium for all settings.					
		Saturated cyan to white. No to full movement	48-79	19-31	30-4F		
		White to saturated cyan. Full to no movement	80-111	31-44	50-6F		
		Middle out. Limited movement. The center of the mix media is the center of the modulation. Cyan setting controls modulation size. Decay rate is medium.					
More to less saturated cyan	112-143	44-56	70-8F				
Less to more saturated cyan	144-175	56-69	90-AF				
Reserved for future use							
To be determined	176-255	69-100	B0-FF				

Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
7 (cont.)	Magenta Color Wheel	Continuous Mode			
		Open	0	0	00
		Discrete color (CTO) position	57	22	39
		Magenta Full Saturation	105	41	69
		Magenta Low Saturation	255	100	FF
		Indexed Mode			
		Open Position 1	0-15	0-6	00-0F
		Discrete color (CTO) position 2	16-47	6-18	10-2F
		Magenta Full Saturation Position 3	48-79	19-31	30-4F
		Magenta Position 4	80-111	31-44	50-6F
		Magenta Position 5	112-143	44-56	70-8F
		Magenta Position 6	144-175	56-69	90-AF
		Magenta Position 7	176-207	69-81	B0-CF
		Magenta Low Saturation 8	208-239	82-94	D0-EF
		Open Position 1	240-255	94-100	F0-FF
		Pure Mix Mode			
		Magenta Full Saturation	0	0	00
		Magenta Low Saturation	255	100	FF
		Spin Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Spin Reverse (fastest to slowest)	128-187	50-73	80-BB
		Spin Stop	188-195	74-77	BC-C3
		Spin Forward (slowest to fastest)	196-255	77-100	C4-FF
		Color Scan Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Scanning (slowest to fastest)	128-255	50-100	80-FF
		Audio Modulation Mode: Select Audio Function in Control Channel			
		Full Movement. Maximum amplitude music causes full scale movement.			
		Saturated magenta to white, slow decay	0-7	0-3	00-07
		Saturated magenta to white, medium decay	8-15	3-6	08-0F
		Saturated magenta to white, fast decay	16-23	6-9	10-17
		White to saturated magenta, fast decay	24-31	9-12	18-1F
		White to saturated magenta, medium decay	32-39	13-15	20-27
		White to saturated magenta, slow decay	40-47	16-18	28-2F
Limited movement. Magenta channel sets the maximum travel position. Decay rate is medium for all settings.					
Saturated magenta–white. No–full movement	48-79	19-31	30-4F		
White–saturated magenta. Full–no movement	80-111	31-44	50-6F		



Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
7 (cont.)	Magenta Color Wheel (cont.)	Middle out. Limited movement. The center of the mix media is the center of the modulation. Magenta setting controls modulation size. Decay rate is medium.			
		More to less saturated magenta	112-143	44-56	70-8F
		Less to more saturated magenta	144-175	56-69	90-AF
		Reserved for future use			
		To be determined	176-255	69-100	B0-FF
8	Yellow Color Wheel	Continuous Mode			
		Open	0	0	00
		Discrete color (Deep Blue) position	57	22	39
		Yellow Full Saturation	105	41	69
		Yellow Low Saturation	255	100	FF
		Indexed Mode			
		Open Position 1	0-15	0-6	00-0F
		Discrete color (Deep Blue) Position 2	16-47	6-18	10-2F
		Yellow Full Saturation Position 3	48-79	19-31	30-4F
		Yellow Position 4	80-111	31-44	50-6F
		Yellow Position 5	112-143	44-56	70-8F
		Yellow Position 6	144-175	56-69	90-AF
		Yellow Position 7	176-207	69-81	B0-CF
		Yellow Low Saturation Position 8	208-239	82-94	D0-EF
		Open Position 1	240-255	94-100	F0-FF
		Pure Mix Mode			
		Yellow Full Saturation	0	0	00
		Yellow Low Saturation	255	100	FF
		Spin Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Spin Reverse (fastest to slowest)	128-187	50-73	80-BB
		Spin Stop	188-195	74-77	BC-C3
		Spin Forward (slowest to fastest)	196-255	77-100	C4-FF
		Color Scan Mode			
		Continuous Positioning	0-127	0-50	00-7F
		Scanning (slowest to fastest)	128-255	50-100	80-FF
		Audio Modulation Mode: Select Audio Function in Control Channel.			
		Full Movement. Maximum amplitude music causes full scale movement.			
		Saturated yellow to white, slow decay	0-7	0-3	00-07
		Saturated yellow to white, medium decay	8-15	3-6	08-0F
		Saturated yellow to white, fast decay	16-23	6-9	10-17
		White to saturated yellow, fast decay	24-31	9-12	18-1F

Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)	
8	Yellow Color Wheel (cont.)	White to saturated yellow, medium decay	32-39	13-15	20-27	
		White to saturated yellow, slow decay	40-47	16-18	28-2F	
		Limited movement. Yellow channel sets the maximum travel position. Decay rate is medium for all settings.				
		Saturated yellow–white. No–full movement	48-79	19-31	30-4F	
		White–saturated yellow. Full–no movement	80-111	31-44	50-6F	
		Middle out. Limited movement. The center of the mix media is the center of the modulation. Yellow setting controls modulation size. Decay rate is medium.				
		More to less saturated yellow	112-143	44-56	70-8F	
		Less to more saturated yellow	144-175	56-69	90-AF	
		Reserved for future use				
		To be determined	176-255	69-100	B0-FF	
9	Beam Shaping	Continuous Positioning	0-127	0-50	00-7F	
		Spin Reverse (fastest to slowest)	128-187	50-73	80-BB	
		Spin Stop	188-195	74-77	BC-C3	
		Spin Forward (slowest to fastest)	196-255	77-100	C4-FF	
		Audio Modulation Mode				
		Full movement. Maximum amplitude music will cause full scale movement				
		Forward, slow decay	0-7	0-3	00-07	
		Forward, medium decay	8-15	3-6	08-0F	
		Forward, fast decay	16-23	6-9	10-17	
		Reverse, fast decay	24-31	9-12	18-1F	
		Reverse, medium decay	32-38	13-15	20-27	
		Reverse, slow decay	40-47	16-18	28-2F	
		Middle out. The center of movement is the vertical spread when the fixture base is horizontal. The channel setting controls modulation amplitude. Decay rate is medium.				
		Forward	48-79	19-31	30-4F	
		Reverse	80-111	31-44	50-6F	
Reserved for future use						
To be determined	112-255	44-100	70-FF			
10	Zoom	Zoom In	0	0	00	
		Zoom Out	255	100	FF	



Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)		
11	Frost	Continuous Positioning (open to closed)	0-127	0-50	00-7F		
		Closed	128-135	50-53	80-87		
		Periodic Strobe	136-151	53-59	88-97		
		Random Strobe	152-167	60-65	98-A7		
		Ramp Open / Snap Shut	168-183	66-72	A8-B7		
		Snap Open / Ramp Shut	184-199	72-78	B8-C7		
		Ramp Open / Ramp Shut	200-215	78-84	C8-D7		
		Random Ramp Open / Snap Shut	216-231	85-91	D8-E7		
		Random Snap Open / Ramp Shut	232-247	91-97	E8-F7		
		Open	248-255	97-100	F8-FF		
		Audio Modulation Mode					
		Full movement. Maximum amplitude music causes full scale movement.					
			No frost to frost, slow decay	0-7	0-3	00-07	
			No frost to frost, medium decay	8-15	3-6	08-0F	
			No frost to frost, fast decay	16-23	6-9	10-17	
			Frost to no frost, fast decay	24-31	9-12	18-1F	
			Frost to no frost, medium decay	32-39	13-15	20-27	
			Frost to no frost, slow decay	40-47	16-18	28-2F	
		Limited Movement					
			No frost to frost, No movement to full movement	48-79	19-31	30-4F	
	Frost to no Frost. Full movement to no movement	80-111	31-44	50-6F			
Reserved for future use							
	To be determined						
12	Shutter	Normal shutter functions. No lamp or dimming functions selected in the Control channel.					
		Close	0-23	0-9	00-17		
		Periodic Strobe	24-49	9-19	18-31		
		Random Strobe	50-75	20-29	32-4B		
		Synchronous Random Strobe	76-101	30-40	4C-65		
		Ramp Open / Snap Shut	102-127	40-50	66-7F		
		Snap Open / Ramp Shut	128-153	50-60	80-99		
		Ramp Open / Ramp Shut	154-179	60-70	9A-B3		
		Random Ramp Open / Snap Shut	180-205	71-80	B4-CD		
		Random Snap Open / Ramp Shut	206-231	81-91	CE-E7		
	Open	232-255	91-100	E8-FF			

Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)		
12	Shutter (cont.)	Lamp assisted strobes. Accessed when the Control channel is set in the range 134-137					
		<i>The shutter functions are the same as in the normal shutter function range. Periodic strobes, random random and random synchronous strobes are lamp assisted.</i>					
		Lamp functions. Accessed when the Control channel is set in the range 138-141					
		<i>For lamp boost effects, the lamp is boosted above the 700 Watt level for the specified period of time. The lamp is also boosted during the lightning effects.</i>					
		<i>Before another boost or lightning effect can occur, the shutter channel must be moved to either closed or open, or the control channel must be moved outside the lamp function range.</i>					
		<i>Boost functions to black will boost the lamp for the specified time then close the shutter. Boost functions to white will boost the lamp for the specified time, then leave the shutter open with the lamp dimmed.</i>					
		<i>When lightning functions are selected, the dim channel scales the overall brightness of the lightning stroke. Dim at 255 will yield maximum brightness.</i>					
				Close	0-23	0-9	00-17
				Periodic lamp strobes	24-49	9-19	18-31
				Random random lamp strobes	50-75	20-29	32-4B
				Synchronous random lamp strobes	76-101	30-40	4C-65
				Boost lamp 1.0 second, black	102-105	40-41	66-69
				Boost lamp .75 second, black	106-109	42-43	6A-6D
				Boost lamp .66 second, black	110-113	43-44	6E-71
				Boost lamp .5 second, black	114-117	45-46	72-75
				Boost lamp .33 second, black	118-121	46-47	76-79
				Boost lamp .25 second, black	122-127	48-50	7A-7F
				Boost lamp 1.0 second, white	128-131	50-51	80-83
				Boost lamp .75 second, white	132-135	52-53	84-87
				Boost lamp .66 second, white	136-139	53-55	88-8B
				Boost lamp .5 second, white	140-143	55-56	8C-8F
				Boost lamp .33 second, white	144-147	56-58	90-93
				Boost lamp .25 second, white	148-153	58-60	94-99
				Lightning strike 1	154-157	60-62	9A-9D
				Lightning strike 2	158-161	62-63	9E-A1
				Lightning strike 3	162-165	64-65	A2-A5
				Lightning strike 4	166-169	65-66	A6-A9
				Lightning strike 5	170-173	67-68	AA-AD
		Lightning strike 6	174-179	68-70	AE-B3		
		To be determined, default black	180-231	71-91	B4-E7		
		Open	232-255	91-100	E8-FF		



Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
12 (cont.)	Shutter (cont.)	Lamp Dimming only. Accessed when the Control Channel is set in the range 146-149. <i>The shutter functions are the same as the normal shutter function range. Dimming is accomplished electronically, lowering the lamp power. Dimming will not go to black. Strobes are mechanical and will go to black.</i>			
13	Dim	Close	0	0	00
		Open	255	100	FF
14	MSpeed	Disable	0-3	0-1	00-03
		Longest (252.7 sec.)	4	2	04
		Shortest (0.15 sec.)	255	100	FF
15	Macro	Macro Off	0-5	0-2	00-05
		Pan sweep, small to large angle	6-62	2-24	06-3E
		Macro Off	63-65	25-25	3F-41
		Tilt sweep, small to large angle	66-122	26-48	42-7A
		Macro Off	123-125	48-49	7B-7D
		Clockwise circle, small to large	126-160	49-63	7E-A0
		Macro Off	161-163	63-64	A1-A3
		Counterclockwise circle, small to large	164-198	64-78	A4-C6
Reserved	199-255	78-100	C7-FF		
16	Control	The Control channel should not be crossfaded.			
		Safe (disables all Control settings)	0-9	0-4	00-09
		Pan & Tilt MSpeed Off	10-19	4-7	0A-13
		Set Shutter channel to 0 for access to the following commands.			
		Display Off	20-28	8-11	14-1C
		Display Dim	30-38	12-15	1E-26
		Display Bright	40-48	16-19	28-30
		Home	60-68	24-27	3C-44
		Lamp On	80-88	31-35	50-58
		Lamp Off	90-98	35-38	5A-62
		Lock (send for 5 seconds)	110-118	43-46	6E-76
		Shutdown (send for 5 seconds)	120-130	47-51	78-82
		Lamp Functions. No shutter channel requirement.			
		Lamp assisted strobes (Periodic and Random strobe functions are lamp assisted. Ramp functions are not lamp assisted.)	134-137	53-54	86-89
		Lamp functions (modifies the shutter channel)	138-141	54-55	8A-8D
		Lamp/mechanical dimming (Lamp output will vary from a minimum to 700 Watts as the mechanical dimming ranges from 0-100%)	142-145	56-57	8E-91
Lamp only dimming (Electronic dimming only from a minimum to 700 Watts.)	146-149	57-58	92-95		

Table A-1 Studio Beam® Standard Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
16 (cont.)	Control (cont.)	Reserved for future use.			
		To be determined	150-169	59-66	AA-AD
		Audio Modulation Functions. No shutter channel requirement			
		Cyan Modulation	170-173	67-68	AA-AD
		Magenta Modulation	174-177	68-69	AE-B1
		Yellow Modulation	178-181	70-71	B2-B5
		Cyan & Magenta Modulation	182-185	71-73	B6-B9
		Cyan & Yellow modulation	186-189	73-74	BA-BD
		Magenta and Yellow Modulation	190-193	75-76	BE-C1
		Modulate all colors	194-197	76-77	C2-C5
		Frost Modulation	198-201	78-79	C6-C9
		Beam Shaping Modulation	202-205	79-80	CA-CD
		Dim Modulation	206-209	81-82	CE-D1
		Lamp and Dim Modulation	210-213	82-84	D2-D5
		Lamp Modulation (long sustain)	214-217	84-85	D6-D9
		Lamp Modulation (medium sustain)	218-221	85-87	DA-DD
		Lamp Modulation (short sustain)	222-225	87-88	DE-E1
		Reserved for future			
		To be determined	226-255	89-100	E2-FF



Table A-2 Studio Beam® Flat Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
1	Pan Coarse	Pan, coarse adjustment	0-255	0-100	00-FF
2	Pan Fine	Pan, fine adjustment	0-255	0-100	00-FF
3	Tilt Coarse	Tilt, coarse adjustment	0-255	0-100	00-FF
4	Tilt Fine	Tilt, fine adjustment	0-255	0-100	00-FF
5	Dim	Dim setting, continuous	0-255	0-100	00-FF
6	Shutter	Open	0	0	00
		Periodic	1-26	0-10	01-1A
		Random/Random	27-52	11-20	1B-34
		Random/Synchronous	53-78	21-31	35-4E
		Ramp Open/Ramp Shut	79-104	31-41	4F-68
		Snap Open/Ramp Shut	105-120	41-47	69-78
		Ramp Open/Ramp Shut	121-146	48-57	79-92
		Random Ramp Open/Snap Shut	147-172	58-68	93-AC
		Random Snap Open/Ramp Shut	173-198	68-78	AD-C6
		To be determined, defaults Open	199-250	78-98	C7-FA
	Closed	251-255	98-100	FB-FF	
7	Lamp Control	Lamp full power	0	0	0
		Lamp dim (full to dim)	1-128	0-50	1-80
		Lamp assists shutter strobes	129	51	81
		Lamp/mechanical dimming	130	51	82
		Periodic lamp strobes	131-156	51-61	83-9C
		Random lamp strobes	157-172	62-68	9D-AC
		Synchronous random strobe	173-198	68-78	AD-C6
		Boost lamp 1.0 second, black	199	78	C7
		Boost lamp .75 second, black	200	78	C8
		Boost lamp .66 second, black	201	79	C9
		Boost lamp .5 second, black	202	79	CA
		Boost lamp .33 second, black	203	80	CB
		Boost lamp .25 second, black	204	80	CC
		Boost lamp 1.0 second, white	205	80	CD
		Boost lamp .75 second, white	206	81	CE
		Boost lamp .66 second, white	207	81	CF
		Boost lamp .5 second, white	208	82	D0
		Boost lamp .33 second, white	209	82	D1
		Boost lamp .25 second, white	210	82	D2
		Lightning strike 1	211	83	D3
Lightning strike 2	212	83	D4		
Lightning strike 3	213	84	D5		
Lightning strike 4	214	84	D6		
Lightning strike 5	215	84	D7		

Table A-2 Studio Beam® Flat Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
7 (cont.)	Lamp Control (cont.)	Lightning strike 6	216	85	D8
		To be determined	217-255	85-100	D9-FF
8	Cyan	Open White	0	0	0
		Cyan (0% to 100% saturation)	1-128	0-50	01-80
		Discrete color (deep red position)	129	51	81
		Open white	130	51	82
		Media Scan	131-172	51-68	83-AC
		Reverse Spin (fast to slow)	173-213	68-84	AD-D5
		Spin Stop	214	84	D6
		Forward Spin (slow to fast)	215-255	84-100	D7-FF
9	Magenta	Open White	0	0	0
		Magenta (0% to 100% saturation)	1-128	0-50	1-80
		Discrete color (CTO position)	129	51	81
		Open white	130	51	82
		Media Scan	131-172	51-68	83-AC
		Reverse Spin (fast to slow)	173-213	68-84	AD-D5
		Spin Stop	214	84	D6
		Forward Spin (slow to fast)	215-255	84-100	D7-FF
10	Yellow	Open White	0	0	0
		Yellow (0% to 100% saturation)	1-128	0-50	1-80
		Discrete color (deep blue position)	129	51	81
		Open white	130	51	82
		Media Scan	131-172	51-68	83-AC
		Reverse Spin (fast to slow)	173-213	68-84	AD-D5
		Spin Stop	214	84	D6
		Forward Spin (slow to fast)	215-255	84-100	D7-FF
11	Color Function	Safe (disables all Control settings)	0	0	0
		Blink (continuous to discrete)	1	0	1
		Color Cycle (Uses only the color mixing portion of all color wheels to cycle factory determined colors at variable speeds (slow to fast))	2-65	0-26	2-41
		Random (Uses only the color mixing portion of all color wheels to cycle factory- (slow to fast))	66-129	26-51	42-81
		To be determined, defaults to safe	130-255	51-100	82-FF
12	Beam Shaping	Open	0	0	1
		Continuous Positioning	1-127	0-50	1-7F
		Reverse Spin (fast to slow)	128-191	50-75	80-BF
		Spin Stop	192	75	C0
13	Zoom	Forward Spin (slow to fast)	193-255	75-100	C1-FF
		Zoom (In to Out)	0-255	0-100	0-FF



Table A-2 Studio Beam® Flat Protocol DMX Values

Channel	Construct	Description	Value (dec.)	Value (%)	Value (hex)
14	Frost	Closed	0	0	0
		Continuous Positioning (closed to open)	1-127	0-50	1-7F
		Periodic Strobe	128-143	50-56	80-8F
		Random Strobe	144-159	57-62	90-9F
		Ramp Open/Snap Shut	160-175	63-69	A0-AF
		Snap Open/Ramp Shut	176-191	69-75	B0-BF
		Ramp Open/Ramp Shut	192-207	75-81	C0-DF
		Random Ramp Open/Snap Shut	208-223	82-91	D0-EF
		Random Snap Open/Ramp Shut	224-239	88-94	E0-EF
		Open	240-255	94-100	F0-FF
15	Control	Safe	0-9	0-4	0-9
		Display off	20-28	8-11	14-1C
		Display dim	30-38	12-15	1E-26
		Display bright	40-48	16-19	28-30
		Home	60-68	24-27	3C-44
		Lamp On	80-88	31-35	50-58
		Lamp Off	90-98	35-38	5A-62
		Lock	110-118	43-46	6E-76
		Fixture Shutdown	120-130	47-51	78-82

Appendix B

MSpeed Conversion Table

The following table lists the MSpeed (motor) movement times and their corresponding DMX controller values. If you have a numeric-type controller, use the Value Decimal (dec.) column. If you have a fader-type controller, use the Value Percentage (%) column. If your controller allows you to program hex values, use the Value (hex) column.

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
0.15	255	100	FF
0.15	254	100	FE
0.17	253	99	FD
0.19	252	99	FC
0.21	251	98	FB
0.25	250	98	FA
0.29	249	98	F9
0.35	248	97	F8
0.41	247	97	F7
0.47	246	96	F6
0.55	245	96	F5
0.63	244	96	F4
0.73	243	95	F3
0.83	242	95	F2
0.94	241	95	F1
1.05	240	94	F0
1.18	239	94	EF
1.31	238	93	EE
1.45	237	93	ED
1.60	236	93	EC
1.75	235	92	EB
1.92	234	92	EA
2.09	233	91	E9
2.27	232	91	E8
2.46	231	91	E7
2.66	230	90	E6
2.86	229	90	E5

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
3.07	228	89	E4
3.29	227	89	E3
3.52	226	89	E2
3.76	225	88	E1
4.00	224	88	E0
4.25	223	87	DF
4.52	222	87	DE
4.78	221	87	DD
5.06	220	86	DC
5.34	219	86	DB
5.64	218	85	DA
5.94	217	85	D9
6.25	216	85	D8
6.56	215	84	D7
6.89	214	84	D6
7.22	213	84	D5
7.56	212	83	D4
7.91	211	83	D3
8.27	210	82	D2
8.63	209	82	D1
9.00	208	82	D0
9.39	207	81	CF
9.77	206	81	CE
10.17	205	80	CD
10.58	204	80	CC
10.99	203	80	CB
11.41	202	79	CA

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
11.84	201	79	C9
12.28	200	78	C8
12.72	199	78	C7
13.17	198	78	C6
13.63	197	77	C5
14.10	196	77	C4
14.58	195	76	C3
15.07	194	76	C2
15.56	193	76	C1
16.06	192	75	C0
16.57	191	75	BF
17.09	190	75	BE
17.61	189	74	BD
18.14	188	74	BC
18.68	187	73	BB
19.23	186	73	BA
19.79	185	73	B9
20.36	184	72	B8
20.93	183	72	B7
21.51	182	71	B6
22.10	181	71	B5
22.70	180	71	B4
23.30	179	70	B3
23.92	178	70	B2
24.54	177	69	B1
25.17	176	69	B0
25.80	175	69	AF

B

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
26.45	174	68	AE
27.10	173	68	AD
27.76	172	67	AC
28.43	171	67	AB
29.11	170	67	AA
29.80	169	66	A9
30.49	168	66	A8
31.19	167	65	A7
31.90	166	65	A6
32.62	165	65	A5
33.34	164	64	A4
34.08	163	64	A3
34.82	162	64	A2
35.57	161	63	A1
36.33	160	63	A0
37.09	159	62	9F
37.87	158	62	9E
38.65	157	62	9D
39.44	156	61	9C
39.44v	156	61	9C
40.23	155	61	9B
41.04	154	60	9A
41.85	153	60	99
42.68	152	60	98
43.50	151	59	97
44.34	150	59	96
45.19	149	58	95
46.04	148	58	94
46.90	147	58	93
47.77	146	57	92
48.65	145	57	91
49.54	144	56	90
50.43	143	56	8F
51.33	142	56	8E
52.24	141	55	8D
53.16	140	55	8C
54.09	139	55	8H
55.02	138	54	8A

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
55.96v	137	54	89
56.91	136	53	88
57.87	135	53	87
58.84	134	53	86
59.81	133	52	85
60.79	132	52	84
61.78	131	51	83
62.78	130	51	82
63.79	129	51	81
64.80	128	50	80
65.82	127	50	7F
66.85	126	49	7E
67.89	125	49	7D
68.94	124	49	7C
69.99	123	48	7B
71.05	122	48	7A
72.13	121	47	79
73.20	120	47	78
74.29	119	47	77
75.38	118	46	76
76.49	117	46	75
77.60	116	45	74
78.71	115	45	73
79.84	114	45	72
80.98	113	44	71
82.12	112	44	70
83.27	111	44	6F
84.43	110	43	6E
85.59	109	43	6D
86.77	108	42	6C
87.95	107	42	6B
89.14	106	42	6A
90.34	105	41	69
91.55	104	41	68
92.76	103	40	67
93.98	102	40	66
95.21	101	40	65
96.45	100	39	64

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
97.70	99	39	63
98.95	98	38	62
100.22	97	38	61
101.49	96	38	60
102.77	95	37	5F
104.05	94	37	5E
105.35	93	36	5D
106.65	92	36	5C
107.96	91	36	5B
109.28	90	35	5A
110.61	89	35	59
111.94	88	35	58
113.28	87	34	57
114.63	86	34	56
115.99	85	33	55
117.36	84	33	54
118.73	83	33	53
120.12	82	32	52
121.5v	81	32	51
122.91	80	31	50
124.31	79	31	4F
125.73	78	31	4E
127.15	77	30	4D
128.58	76	30	4C
130.02	75	29	4B
134.39	72	28	48
135.86	71	28	47
137.34	70	27	46
138.82	69	27	45
140.32	68	27	44
141.82	67	26	43
143.33	66	26	42
144.85	65	25	41
146.38	64	25	40
147.92	63	25	3F
149.46	62	24	3E
151.01	61	24	3D
152.57	60	24	3C

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
154.14	59	23	3B
155.71	58	23	3A
157.30	57	22	39
158.89	56	22	38
160.49	55	22	37
162.09	54	21	36
163.71	53	21	35
165.33	52	20	34
166.96	51	20	33
168.60	50	20	32
170.25	49	19	31
171.91	48	19	30
173.57	47	18	2F
175.24	46	18	2E
176.92	45	18	2D
178.61	44	17	2C
180.30	43	17	2B
182.01	42	16	2A
183.72	41	16	29
185.44	40	16	28
187.17	39	15	27
188.90	38	15	26
190.65	37	15	25
192.40	36	14	24
194.16	35	14	23
195.92	34	13	22
197.70	33	13	21
199.48	32	13	20
201.28	31	12	1F
203.08	30	12	1E
204.88	29	11	1D
206.70	28	11	1C
208.52	27	11	1B
210.36	26	10	1A
212.19	25	10	19
214.04	24	9	18
215.90	23	9	17
217.76	22	9	16

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
219.63	21	8	15
221.51	20	8	14
223.40	19	7	13
225.30	18	7	12
227.20	17	7	11
229.11	16	6	10
231.03	15	6	0F
232.96	14	5	0E
234.90	13	5	0D
236.84	12	5	0C
238.79	11	4	0B
240.75	10	4	0A
242.72	9	4	09
244.70	8	3	08
246.68	7	3	07
248.68	6	2	06
250.68	5	2	05
246.68	7	3	07
248.68	6	2	06
250.68	5	2	05
252.68	4	2	04

B


Appendix C

Important Safety Information

Warning: For Continued Protection Against Fire

1. This equipment is designed for use with a Phillips 700 watt, GY 9.5 base, metal halide 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 1.0 meter (3.28 feet) from combustible materials.
4. Replace fuses only with the specified type and rating.
5. Observe minimum distance to lighted objects of 2.0 meter (6.56 feet).
6. 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.

C

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

4. Use secondary safety cable when mounting this fixture.
5. 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.
6. Equipment surfaces may reach temperatures up to 90° C (194° F). Allow 5 minutes for cooling before handling.
7. Change the lamp if it becomes damaged or thermally deformed.

Appendice C

Importantes Informations Sur La Sécurité

Mise En Garde: Pour Une Protection Permanente Contre Les Incendies

8. Cet appareil est conçu uniquement pour une lampe métallique à halogène Philips, de 700 watts, à base GY 9.5. Son utilisation avec tout autre type de lampe peut être dangereuse et annuler la garantie.
9. Ne pas monter les lampes sur une surface inflammable.
10. Maintenir à une distance minimum de 1.0 mètre de matières inflammables.
11. Ne remplacer les fusibles qu'avec des modèles et valeurs assignées recommandés.
12. Respecter une distance minimum de 2.0 mètre par rapport aux objets éclairés.
13. 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 90 C. Laisser refroidir pendant 5 minutes avant la manipulation.
4. Changer la lampe si elle est endommagée ou thermiquement déformée.

Anhang C

Wichtige Hinweise Für Ihre Sicherheit

Warnung: Zum Schutz Vor Brandgefahr

1. Dieses Gerät ist nur für den Gebrauch mit einer 700-Watt, Philips, Metall-Halogen-Lampe mit GY 9.5-Sockel konzipiert. 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 1 Meter zu brennbaren Materialien einhalten.
4. Zum Ersatz nur Sicherungen verwenden, die dem vorgeschriebenen Typ und Nennwert entsprechen.
5. Einen Mindestabstand von 2 Meter zu den angestrahlten Objekten einhalten.
6. 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.

C

Warnung: Zum Schutz Vor Verletzungen

1. Verwenden Sie bei der Installation des Beleuchtungskörpers ein zusätzliches Sicherheitskabel.
2. **VORSICHT:** Bei einer heißen 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 90 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 C

Información Importante De Seguridad

Advertencia: Para Protección Continua Contra Incendios

5. Este equipo está diseñado para utilizarse únicamente con la lámpara de haluro metálico Philips, de 700 vatios y base GY 9.5. El uso de cualquier otro tipo de lámpara podrá resultar peligroso, y podrá anular la garantía.
6. No monte el equipo sobre una superficie inflamable.
7. Mantenga una distancia mínima de materiales combustibles de 1,0 metro.
8. Cambie los fusibles únicamente por otros que sean del tipo y la clasificación especificadas.
9. Guarda una distancia mínima a objetos iluminados de 2,0 metro.
10. Este equipo debe conectarse a un circuito que tenga una protección máxima contra las sobrecargas de 20 A.
11. Advertencia: Para La Protección Continua Contra Electrocuiones
12. Si se recibió este equipo sin el enchufe de alimentación, monte usted el enchufe correcto según el clave siguiente:
13. moreno - vivo
14. azul - neutral
15. verde/amarillo - tierra
16. Desconecte el suministro de energía antes de recambiar lámparas o prestar servicio de reparación.
17. Questa apparecchiatura e' da usarsi in ambienti secchi. Non e' da essere esposta ne alla pioggia ne all' umidita'.
18. Derive el servicio de reparación de este equipo al personal calificado. El interior no contiene repuestos que puedan ser reparados por el usuario.
19. Equipo de Clase I. Este equipo debe conectarse a la 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 en tanto ésta esté encendida.

C

Advertencia: Para Protección Continua Contra Lesiones Corporales

1. Al montare questa apparecchiatura, usare un secondo cavo di sicurezza.
2. Precaución: una lámpara caliente puede constituir un peligro de explosión. No la abra por 5 minutos luego de haberla apagado. Lleve puestos, un protector ocular, y guantes al recambiar lámparas.
3. Las superficies del equipo pueden alcanzar temperaturas máximas de 90 grados centígrados. Deje que se enfríen por 5 minutos antes de tocarlas.
4. Cambie la lámpara si ésta se avería o deforma por acción térmica.

Appendice C

Importanti Informazioni Di Sicurezza

Avvertenza: Per Prevenire Incendi

1. Questa apparecchiatura è stata progettata per l'uso esclusivo con lampada a sali metallici Philips da 700 watt, base GY 9.5. 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 1.0 metri (3.28 piedi) di distanza dai materiali combustibili.
4. Rimpiazzare i fusibili usando soltanto quelli del tipo e della taratura adatta.
5. Mantenere una distanza minima di 2.0 metri (6.56 piedi) dagli oggetti accesi.
6. Questa apparecchiatura e' da collegarsi ad un circuito con una protezione da sovraccarico massima di 20 amperes.

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 - sotto tensione
 - blu - neutro
 - verde/giallo - terra
2. Disinnestare la corrente prima di cambiare la lampadina o prima di eseguire qualsiasi riparazione.
3. Este equipo se adecua a lugares secos solamente. no lo exponga a la lluvia o humedad.
4. Per qualsiasi riparazione rivolgersi al personale specializzato. L'utente non deve riparare nessuna parte dentro l'unita'.
5. Aparrecchio di Classe I. Questa apparecchiatura deve essere messa a terra.

Avvertenza: Per Proteggersi Contro Le Radiazioni Dei Raggi Ultravioletti

Non usare questa apparecchiatura se il sistema di chiusura della lampadina non e' completo o se gli scudetti, 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 lampadina quando sia accesa.

C

Avvertenza: Per Non Ferire Ad Altre Persone

1. Use cable secundario de seguridad al montar este aparato.
2. Avvertenza: la lampadina calda potrebbe esplodere. Spegnerla per 5 minuti prima di aprirla. Usare protezioni per le mani e per gli occhi prima di cambiare la lampadina.
3. Le superfici della apparecchiatura possono arrivare a temperature di 90 gradi centigradi (194 gradi f). Aspettare 5 minuti prima di maneggiare.
4. Cambiare la lampadina se si danneggia o se si e' deformata dovuto alle alte temperature.

Vigtig Sikkerhedsinformation

Advarsel: Beskyttelse mod elektrisk chock.

VIGTIGT!

LEDEREN MED GUL/GROEN ISOLATION MAA KUN TILSLUTTES KLEMME
MAERKET  ELLER .

Appendix D

Menu Map

The Studio Beam fixture’s onboard menu system allows you to:

- Assign a DMX start channel
- Access fixture options such as, homing the fixture, viewing fixture status, crossloading software, and performing self tests
- Preset (PRST) programming options that allow you to create, store, and play scenes from the fixture’s on-board memory.

For a more detailed description, see individual menu options listed in “Chapter 4” .

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
ADDR	Cxxx				change the existing DMX start channel
	PLAY	OFF			set preset playback off
		ON			set preset playback on
		SCN			display which scene is currently playing
PRST	EDIT	SN01 - SN16	SHUT	CLSD	close the shutter
				P01–P26	select shutter strobe at periodic intervals from slow (P 01) to fast (P268)
				NN01–NN26	select shutter strobe at random intervals from slow (NN01) to fast (NN26)
				NK01–NK26	select shutter strobe at random intervals from slow (NK01) to fast (NK26), in synchronization with the random strobing of all other Studio Beam fixtures on the link
				RS01–RS26	select shutter ramp open slow (RS01) to fast (RS26), snap shut
				SR01–SR26	select shutter snap open, ramp shut slow (SR01) to fast (SR26)
				RR01–RR26	select shutter ramp open, ramp shut slow (RR01) to fast (RR26)
				NR01–NR26	select the frequency to randomly ramp open slow (NR01) to fast (NR26), snap shut
				NS01–NS26	select the frequency to snap open, randomly ramp shut slow (NS01) to fast (NS26)
				OPEN	open the shutter
			DIM	D001–D255	select a dim value from dark (D001) to bright (D255)
			PAN	-49.9–+49.9	select a pan value from -49.9% to +49.9% of the pan range
			TILT	-49.9–+49.9	select a tilt value from -49.9% to +49.9% of the tilt range

D

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01 - SN16 (cont.)	COLC	Full Speed Mode	
				CON	continuous—select exact positioning at any point on the color wheel
				IDX	index—divide the cyan, magenta, and yellow color wheels into eight equal sections, full speed
				MIX	pure mix—access the color mixing portion of the wheels
				WSP	spin—set all three color wheels to spin mode, (spin speed and direction set by each individual wheel)
				CYC	cycle—use only the color mixing portion (for all three color wheels) to cycle colors from red to green to blue (speed set by cyan channel)
				SCN	scan—oscillate within the color mixing portion of the color wheel (speed set by each individual wheel)
				RND	random—perform random color chase of 12 factory-selected colors using the three color wheels (speed set by cyan channel)
				BLK	blink—close shutter between indexed color changes
				MSpeed Mode	
				MCON	continuous—select exact positioning at any point on the color wheel
				MIDX	index—divide the cyan, magenta, and yellow color wheels into eight equal sections
				MMIX	pure mix—access the color mixing portion of the wheels
				MWSP	spin—set all three color wheels to spin mode, (spin speed and direction set by each individual wheel)
			MCYC	cycle—use only the color mixing portion (for all three color wheels) to cycle colors from red to green to blue (speed set by cyan channel)	
			MSCN	scan—oscillate within the color mixing portion of the color wheel (speed set by each individual wheel)	
			MRND	random—perform random color chase of 12 factory-selected colors using the three color wheels (speed set by cyan channel)	
			MBLK	blink—close shutter between indexed color changes	
			CYAN	Continuous (available with COLC set to CON or MCON)	
				D000 - D357	select an exact position on the cyan color wheel from 0° (D000) to 357° (D357)
				Indexed (available with COLC set to IDX or MIDX)	
				OPEN	select the open “white” position on the cyan color wheel
				C 1	select the additional fixed color (deep red) on the cyan color wheel
				S 6	select most saturated position on the cyan color wheel

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description			
PRST (cont.)	EDIT (cont.)	SN01 - SN16 (cont.)	CYAN (cont.)	S 5	select second most saturated position on the cyan color wheel			
				S 4	select third most saturated position on the cyan color wheel			
				S 3	select fourth most saturated position on the cyan color wheel			
				S 2	select fifth most saturated position on the cyan color wheel			
				S 1	select least saturated position on the cyan color wheel			
				Pure Mix (available with COLC set to MIX or MMIX)				
				C000 - C255	select an exact position within the color mixing section of the cyan color wheel from most saturated (C000) to least saturated (C255)			
				Wheel Spin (available with COLC set to WSP or MWSP)				
				D000 - D357	select a fixed position on the cyan color wheel from 0° (D000) to 357° (D357)			
				WR60 - WR01	select a reverse cyan color wheel spin speed from fast (WR60) to slow (WR01)			
				STIL	stop the cyan color wheel from spinning			
				WF01 - WF60	select a forward cyan color wheel spin speed from slow (WR01) to fast (WR60)			
				Color Cycle (available with COLC set to CYC or MCYC)				
				L000 - L255	select the speed at which all three color wheels move to the next cycle color, from slow (L000) to fast (L255)			
				Color Scan (available with COLC set to SCN or MSCN)				
				K001 - K128	select the speed to scan (oscillate) within the color mixing portion of the cyan color wheel from slow (K001) to fast (K128)			
				Random Color (available with COLC set to RND or MRND)				
				N000 - N255	select the speed at which all three color wheels move to the next random color, from slow (N000) to fast (N255)			
				Blink (available with COLC set to BLK or MBLK)				
				BC 1	select the additional fixed color (deep red) on the cyan color wheel with shutter blink			
				BS 6	choose the most saturated position on the cyan color wheel with shutter blink			
				BS 5	choose the second most saturated position on the cyan color wheel with shutter blink			
				BS 4	choose the third most saturated position on the cyan color wheel with shutter blink			
BS 3	choose the fourth most saturated position on the cyan color wheel with shutter blink							
BS 2	choose the fifth most saturated position on the cyan color wheel with shutter blink							
BS 1	choose the least saturated position on the cyan color wheel with shutter blink							

D

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01 - SN16 (cont.)	MAGN	Continuous (available with COLC set to CON or MCON)	
				D000 - D357	select an exact position on magenta color wheel from 0° (D000) to 357° (D357)
				Indexed (available with COLC set to IDX or MIDX)	
				OPEN	select the open "white" position on magenta color wheel
				M 1	select the additional fixed color (CTO) on magenta color wheel
				S 6	select most saturated position on magenta color wheel
				S 5	select second most saturated position on magenta color wheel
				S 4	select third most saturated position on magenta color wheel
				S 3	select fourth most saturated position on magenta color wheel
				S 2	select fifth most saturated position on magenta color wheel
				S 1	select least saturated position on magenta color wheel
				Pure Mix (available with COLC set to MIX or MMIX)	
				M000 - M255	select an exact position within the color mixing section of the magenta color wheel from most saturated (C000) to least saturated (C255)
				Wheel Spin (available with COLC set to WSP or MWSP)	
				D000 - D357	select a fixed position on the magenta color wheel from 0° (D000) to 357° (D357)
				WR60- WR01	select a reverse magenta color wheel spin speed from fast (WR60) to slow (WR01)
				STIL	stop the magenta color wheel from spinning
				WF01 - WF60	select a forward magenta color wheel spin speed from slow (WR01) to fast (WR60)
				Color Scan (available with COLC set to SCN or MSCN)	
				K001 - K128	select the speed to scan (oscillate) within the color mixing portion of the magenta color wheel from slow (K001) to fast (K128)
				Blink (available with COLC set to BLK or MBLK)	
				BM 1	select the additional fixed color (CTO) on the magenta color wheel with shutter blink
				BS 6	choose the most saturated position on the magenta color wheel with shutter blink
				BS 5	choose the second most saturated position on the magenta color wheel with shutter blink
				BS 4	choose the third most saturated position on the magenta color wheel with shutter blink
				BS 3	choose the fourth most saturated position on the magenta color wheel with shutter blink
				BS 2	choose the fifth most saturated position on the magenta color wheel with shutter blink
BS 1	choose the least saturated position on the magenta color wheel with shutter blink				

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01- SN16 (cont.)	YELW	Continuous (available with COLC set to CON or MCON)	
				D000 - D357	select an exact position on yellow color wheel from 0° (D000) to 357° (D357)
				Indexed (available with COLC set to IDX or MIDX)	
				OPEN	select the open "white" position on yellow color wheel
				Y 1	select the additional fixed color (Dark Blue) on yellow color wheel
				S 6	select most saturated position on yellow color wheel
				S 5	select second most saturated position on yellow color wheel
				S 4	select third most saturated position on yellow color wheel
				S 3	select fourth most saturated position on yellow color wheel
				S 2	select fifth most saturated position on yellow color wheel
				S 1	select least saturated position on yellow color wheel
				Pure Mix (available with COLC set to MIX or MMIX)	
				Y000 - Y255	select an exact position within the color mixing section of the yellow color wheel from most saturated (C000) to least saturated (C255)
				Wheel Spin (available with COLC set to WSP or MWSP)	
				D000 - D357	select a fixed position on the yellow color wheel from 0° (D000) to 357° (D357)
				WR60- WR01	select a reverse yellow color wheel spin speed from fast (WR60) to slow (WR01)
				STIL	stop the yellow color wheel from spinning
				WF01 - WF60	select a forward yellow color wheel spin speed from slow (WR01) to fast (WR60)
				Color Scan (available with COLC set to SCN or MSCN)	
				K001 - K128	select the speed to scan (oscillate) within the color mixing portion of the yellow color wheel from slow (K001) to fast (K128)
				Blink (available with COLC set to BLK or MBLK)	
				BY 1	select the additional fixed color (Dark Blue) on the yellow color wheel with shutter blink
				BS 6	choose the most saturated position on the yellow color wheel with shutter blink
				BS 5	choose the second most saturated position on the yellow color wheel with shutter blink
				BS 4	choose the third most saturated position on the yellow color wheel with shutter blink
				BS 3	choose the fourth most saturated position on the yellow color wheel with shutter blink
				BS 2	choose the fifth most saturated position on the yellow color wheel with shutter blink
				BS 1	choose the least saturated position on the yellow color wheel with shutter blink

D

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01 - SN16 (cont.)	BEAM	D000– D358	select an exact lenticular wheel (beam shaping) position from 0° (D000) to 358° (D358)
				WR60– WR01	select a reverse lenticular wheel (beam shaping) spin speed, from fast (WR60) to slow (WR01)
				STIL	stop the lenticular wheel from spinning
				WF01– WF60	select a forward lenticular wheel (beam shaping) spin speed, from slow (WF01) to fast (WF60)
			ZOOM	Z000– Z255	select a zoom value for a beam angle from 15° (000) to 30° (255)
			FRST	OPEN	open the frost flags
				F001– F127	select the exact positioning of the frost flags from fully opened (F001) to fully closed (F127).
				CLSD	close frost flags
				P 01– P 16	select frost strobe at periodic intervals from slow (P 01) to fast (P 16)
				N 01– N 16	select frost strobe at random intervals from slow (N 01) to fast (N 16)
				RS01– RS16	select frost ramp open slow (RS01) to fast (RS16), snap shut
				SR01– SR16	select frost snap open, ramp shut slow (SR01) to fast (SR16)
				RR01– RR16	select frost ramp open, ramp shut slow (RR01) to fast (RR16)
				NR01– - NR16	select the frequency to randomly ramp open slow (NR01) to fast (NR16), snap shut
				NS01– NS16	select the frequency to snap open, randomly ramp shut slow (NS01) to fast (NS16)
			MSPD	252.7– 0.15	select a motor movement time in decimal seconds, from slow (252.7) to fast (0.15)
				0.15– 252.7	select a motor movement time in decimal seconds, from fast (0.15) to slow (252.7)
			MACR	MCOF	set all macro options off
				P00– P56	pan sweep macro from small to large
				TO	macros off
				T00– T56	tilt sweep from small to large
				CO	macros off
				C00– CC34	clockwise circle macro
				CCO	macros off
				CC00– CC34	counterclockwise circle macro
				MCOF	set all macro options off

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01 - SN16 (cont.)	XFAD	X 0.1 - X 9.9	select the DIM and FCUS construct's crossfade time in increments of 0.1
				X 10 - X166	select the DIM and FCUS construct's crossfade time in increments of 1
			DLAY	D 0.1 - D 9.9	select the scene delay time in increments of 0.1
				D 10 - D166	select the scene delay time in increments of 1
			TIME	SEC	select seconds as the units of time used for the XFAD and DLAY constructs
				MIN	select minutes as the units of time used for the XFAD and DLAY constructs
			TIME (cont.)	HOUR	select hours as the units of time used for the XFAD and DLAY constructs
	ZERO	OK?	erase any programming of the current scene by voiding all construct values / mark the end of the loop		
	COPY	FROM	FA01 - FA16		select a user A scene to copy from (source scene)
			FB01 - FB16		select a user B scene to copy from (source scene)
		TO	TA01 - TA16		select a user A scene to copy to (destination scene)
			TB01 - TB16		select a user B scene to copy to (destination scene)
	CAPT	SN01 - SN16			select a scene to capture a pre-programmed scene to (from your DMX controller)
	DFLT	OK?			enable the factory-programmed preset scene sequence (self-demo) / erases any preset scenes previously programmed
SEND				send all presets in current user	
SET	FACT	ON			set factory defaults on
		OFF			set factory defaults off
	SWAP	ON			set pan/tilt swap on
		OFF			set pan/tilt swap off
	T/IN	ON			set tilt invert on
		OFF			set tilt invert off
	P/IN	ON			set pan invert on
		OFF			set pan invert off
	DSPL	ON			set the LED display on
		OFF			set the LED display off
		DIM			dim the LED display
	D/IN	ON			select inverted LED display orientation
OFF				select normal LED display orientation	
LMPL	ON			enable lamp hour warning message	
	OFF			disable lamp hour warning message	

D

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	
SET (cont)	FAST	ON			enable fast pan and tilt movement	
		OFF			enable normal pan and tilt movement	
	DLOS	LONG			shutter will remain open until shutdown if DMX data is lost	
		SHRT			shutter will close one second after DMX data is lost	
	ADIO	ALED	ON		uses central dot of alphanumeric display as audio indicator	
			OFF		audio indicator off	
	ZOOM	GAIN	G001–G010		set a value from G001 (more emphasis on quiet sounds) to G010 (less emphasis on quiet sounds). Factory default is G006	
			ON		DMX zoom channel used to position zoom optics	
		OFF			DMX zoom channel ignored. Zoom optic placed at default position.	
	MODE	USER	A			select user A settings
B					select user B settings	
COPY			PRST	A → B		copy user A presets to user B
				B → A		copy user B presets to user A
SETT			ALL	A → B		copy user A settings to user B
				B → A		copy user B settings to user A
XLD					crossload fixture software to all other Studio Beam fixtures on the link	
PROT		FLAT			15-channel flat protocol enabled	
		STAN			16-channel standard protocol enabled	
TEST		HOME				home the fixture
	LAMP	ON			strike the lamp	
		OFF			extinguish the lamp	
	BOOT				copy the boot sector	
	SELF	ALL				self test all constructs
		PAN				self test pan movement
		TILT				self test tilt movement
		CYAN				self test cyan color wheel movement
		MAGN				self test magenta color wheel movement
		YELW				self test yellow color wheel movement
		BEAM				self test beam shaping (lenticular wheel) movement
		ZOOM				self test lens focus movement
		FRST				self test frost flag movement
		SHUT				self test shutter strobe movement
DIM				self test dim flag movement		
S/UP				place the fixture in setup mode for mechanical homing		
DISP				self test the LED display		

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description		
TEST (cont.)	ENCD	ON			restore pan and tilt encoder operation		
		OFF			disable pan and tilt encoder operation		
	CODE				Factory use only		
INFO	SENS	SEN1			view whether the magenta and beam shaping wheel sensor is obstructed ("ON") or is not obstructed ("OFF")		
		SEN2			view whether the cyan and yellow wheel sensor is obstructed ("ON") or is not obstructed ("OFF")		
		TILT			view whether the tilt sensor is obstructed ("ON") or is not obstructed ("OFF")		
		PAN			view whether the pan sensor is obstructed ("ON") or is not obstructed ("OFF")		
		TPOS			view the tilt position encoder status		
		PPOS			view the pan position encoder status		
	UNUM				Customer Service use only		
	DMX	<i>DMX Values displayed when standard protocol is selected</i>					
		FIXT	BRKS			view the number of DMX breaks	
			FE			view the number of DMX framing errors	
			OV			view the number of DMX overruns	
			STRT			view the DMX start code value	
			PANH			view the DMX high resolution pan value	
			PANL			view the DMX low resolution pan value	
			TLTH			view the DMX high resolution tilt value	
			TLTL			view the DMX low resolution tilt value	
			COLC			view the DMX color control channel value	
			CYAN			view the DMX cyan color wheel position value	
			MAGN			view the DMX magenta color wheel position value	
			YELW			view the DMX yellow color wheel position value	
			BEAM			view the DMX beam shaping (lenticular wheel) position value	
			ZOOM			view the DMX zoom lens position value	
FRST					view the DMX frost position value		
SHUT					view the DMX shutter strobe value		
DIM					view the DMX shutter dim flag value		
MSPD					view the DMX MSpeed time value		
MACR			view the DMX macro value				
CNTL			view the DMX control channel value				
DATA	C001 - C512			view the DMX data for the selected DMX channel			

D

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description
INFO (cont.)	DMX (cont.)	DMX Values displayed when flat protocol is selected			
		FIXT (cont.)	BRKS		view the number of DMX breaks
			FE		view the number of DMX framing errors
			OV		view the number of DMX overruns
			STRT		view the DMX start code value
			PANH		view the DMX high resolution pan value
			PANL		view the DMX low resolution pan value
			TLTH		view the DMX high resolution tilt value
			TLTL		view the DMX low resolution tilt value
			DIM		view the DMX shutter dim flag value
			SHUT		view the DMX shutter strobe value
			LMPC		view the DMX lamp control channel
			CYAN		view the DMX cyan color wheel position value
			MAGN		view the DMX magenta color wheel position value
			YELW		view the DMX yellow color wheel position value
			COLC		view the DMX color control channel value
			BEAM		view the DMX beam shaping (lenticular wheel) position value
			ZOOM		view the DMX zoom lens position value
			FRST		view the DMX frost position value
			CNTL		view the DMX control channel value
		DATA	C001 - C512		view the DMX data for the selected DMX channel
	TEMP	PCB			view the current temperature at the logic board (C)
		HEAD			view the current internal head temperature (C)
	F/RS				reset fixture hours to zero (<i>press and hold the <Enter> button for five seconds to change the value</i>)
	F/HR				view current number of fixture hours
	L/RS				reset lamp hours to zero (<i>press and hold the <Enter> button for five seconds to change the value</i>)
	L/ST				view the current number of lamp strikes
L/HR				view the current number of lamp hours	
VER				view the fixture's software version	

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