SOFTWARE VERSION 1.0

WWW.PRG.COM

BEST BOY® WASH LUMINAIRE

USER MANUAL

Best Boy® Wash Luminaire User Manual

Version as of: March 26, 2015

PRG part number: 02.9815.0001 B

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FOREWORD

Compliance Notice

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) This device must accept any interference received, including interference that may cause undesired operation.

Conforms to:

UL STD 1573

Certified to:

CAN/CSA STD E598-1
CAN/CSA STD E598-2-17

Safety Notice

It is extremely important to read ALL safety information and instructions provided in this manual and any accompanying documentation before installing and operating the products described herein. Heed all cautions and warnings during installation and use of this product.

Safety symbols used throughout this manual are as follows:

CAUTION advising of potential damage to product.

WARNING advising of potential injury or death to persons.

GENERAL INFORMATION PERTAINING TO PROTECTION AGAINST ELECTRICAL SHOCK, FIRE, EXPOSURE TO EXCESSIVE UV RADIATION, AND INJURY TO PERSONS CAN BE FOUND BELOW.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST FIRE

1) PRG luminaires have been designed for use only with specific lamps. Note lamp type before replacing. Installing another type of lamp may be hazardous.
2) PRG luminaires may be mounted on any type of surface as long as mounting instructions are followed. See instructions detailed in this manual.
3) Replace fuses with same type and rating only.
4) Minimum distance from head to any flammable object is 2m.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST ELECTRICAL SHOCK

1) PRG luminaires are designed for dry locations only. Exposure to rain or moisture may damage luminaire.
2) Disconnect power before servicing any PRG equipment.
3) Servicing to be performed by qualified personnel only.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST EXPOSURE TO EXCESSIVE ULTRAVIOLET RADIATION

1) PRG luminaires may use an HID type lamp which produces UV radiation. DO NOT look directly at lamp.
2) It is hazardous to operate luminaires without complete lamp enclosure in place or when lens is damaged. Lenses or UV shields shall be changed if they have become visibly damaged to such an extent that their effectiveness is impaired.

WARNING: INSTRUCTIONS FOR PROTECTION AGAINST INJURY TO PERSONS

1) Exterior surfaces of the luminaire will be hot during operation. Use appropriate safety equipment (gloves, eye protection, etc.) when handling and adjusting hot equipment and components. Service and maintenance should be performed only by qualified personnel as determined by the high pressure lighting fixture manufacturer.
2) Arc lamps generate intense heat. Disconnect power and allow lamp to cool for 5 minutes before relamping.
3) Arc lamps emit ultraviolet radiation which can cause serious skin burn and eye inflammation. Additionally, arc lamps operate under high pressure at very high temperatures. Should the lamp break, there can exist a danger of personal injury and/or fire from broken lamp particles being discharged.
4) The lamp shall be changed if it has become damaged or thermally deformed.
5) If lamp is touched with bare hands, clean lamp with denatured alcohol and wipe with lint-free cloth before installing or powering up the luminaire.
6) Serious injury may result from the generation of ozone by this lamp system. A proper means of venting must be provided.

Notes de sécurité

Avant de procéder à l'installation des produits décrits dans ce guide et de les mettre en marche, il est extrêmement important de lire TOUS les renseignements et TOUTES les directives de sécurité contenues dans ce guide ainsi que toute documentation jointe. Tenir compte de tous les avertissements et suivre toutes les précautions pendant l'installation et l'utilisation de cet appareil.

Les symboles de sécurité utilisés dans ce guide sont les suivants :

ATTENTION Ce symbole annonce que l'appareil risque d'être endommagé.

AVERTISSEMENT Ce symbole annonce qu'il y a risque d'accident grave ou même fatal.

CETTE SECTION CONTIENT DES INFORMATIONS GÉNÉRALES POUR SE PROTÉGER CONTRE LES DÉCHARGES ÉLECTRIQUES, LES INCENDIES, L'EXPOSITION EXCESSIVE AUX RAYONS UV ET TOUT AUTRE ACCIDENT POUVANT ENTRAÎNER DES BLESSURES.

AVERTISSEMENT: RISQUE D' EXPLOSION.

1) Le service et le maintenance ne devront être assurés que par des personnes qualifiées comme precisé par le frabricant des lampes à haute pression.
2) Des vêtement de protection et les procédures précisées dans le manuel du frabricant doit être fournies.

AVERTISSEMENT: RÉGLAGE DES LAMPES

1) Chaleur intense. Débrancher le matériel et laisser refroidir pendant 5 minutes avant de rallumer.
2) Risque l'incendie. N'utilise que des Philips MSR Gold™ FastFit Lamp.

AVERTISSEMENT: DIRECTIVES POUR SE PROTÉGER CONTRE UNE EXPOSITION EXCESSIVE AUX RAYONS UV

1) Risque d'explosion en cas de radiation ultraviolet imprantes.
2) Ne pas intervener en l'absence de confinement de la lampe en place ou quand la lentille est abîmée.

AVERTISSEMENT: DIRECTIVES POUR SE PROTÉGER CONTRE LES ACCIDENTS POUVANT ENTRAÎNER DES BLESSURES

1) Chaleur intense. Eviter tout contact avec des personnes ou des tissues. Attention, de graves blessures peuvent résulter de production d'ozone par cette lampe. Un système de ventilation adapté doit être fournies
2) La température de surface = 300.c
   La temperature de l'ambiance = 50.c
3) Ne convient pas pour un usage résidential.
4) Utilisable seulement dans les locaux secs.

Revision History

This manual has been revised as follows:

Version	Release Date	Notes
BASIC	April 14, 2014	Initial release.
A	August 19, 2014	Added Narrow Fresnel Lens information. Updated Customer Service section.
B	March 26, 2015	Updated to software version 1.07.

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Chapter 4. Troubleshooting and Maintenance

Appendix A. Technical Specifications

Appendix B. Glossary

INTRODUCTION

About This Manual

This manual provides necessary information regarding product safety, installation, and operation for the following equipment:

+ Best Boy® Wash Luminaire

Familiarizing yourself with this information will help you get the most out of your lighting system.

WARNING: It is important to read ALL accompanying safety and installation instructions to avoid damage to the product and potential injury to yourself or others.

Additional Documentation

For in-depth service information, refer to the following PRG manuals:

+ Best Boy® Wash Luminaire Field Service Manual (02.9815.0005)
+ Best Boy® Wash Luminaire Shop Service Manual (02.9815.0010)

For more information about DMX512 and sACN protocols, refer to the following documents available from the American National Standards Institute (ANSI) at www.ansi.org:

+ ANSI E1.11 - 2008 (R2013)
  Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories
+ ANSI E1.31 - 2009
  Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN
+ ANSI E1.20 - 2010
  Entertainment Technology-RDM-Remote Device Management over USITT DMX512 Networks

The above documents are also available for free in electronic format at tsp.plasa.org

For more information about Art-Net, refer to the following document available from Artistic Licence Engineering at www.artisticlicence.com:

+ Specification for the Art-Net Ethernet Protocol

Customer Service

For technical assistance, contact the PRG International Service Center or contact your nearest PRG office. Contact information for all PRG office locations can be found on our website at: www.prg.com

PRG Dallas (International Service)

8617 Ambassador Row, Suite 120
Dallas, Texas 75247 USA
Phone: 214.630.1963
Fax: 214.630.5867
Service Fax: 214.638.2125

For Best Boy support, please contact: BestBoyService@prg.com

For additional resources and documentation, please visit our website at: www.prg.com

1.

DESCRIPTION

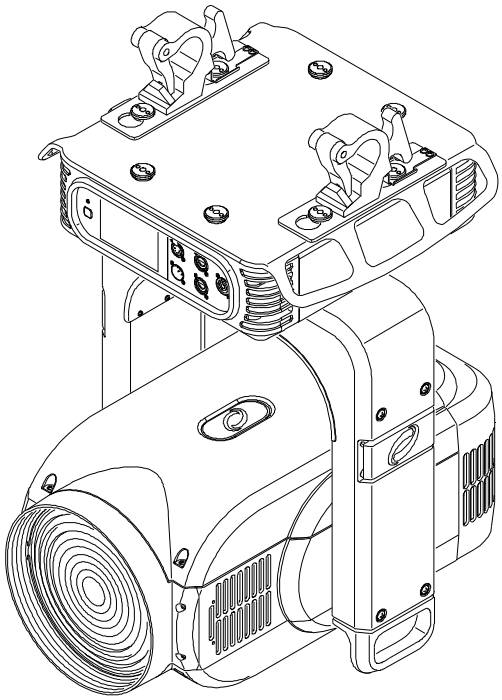
This chapter contains an overview of luminaire features and components.

+ FEATURES

+ COMPONENTS

FEATURES

Overview



The Best Boy Wash Luminaire is a precision-engineered, automated fixture that generates over 60,000 lumens of light output.

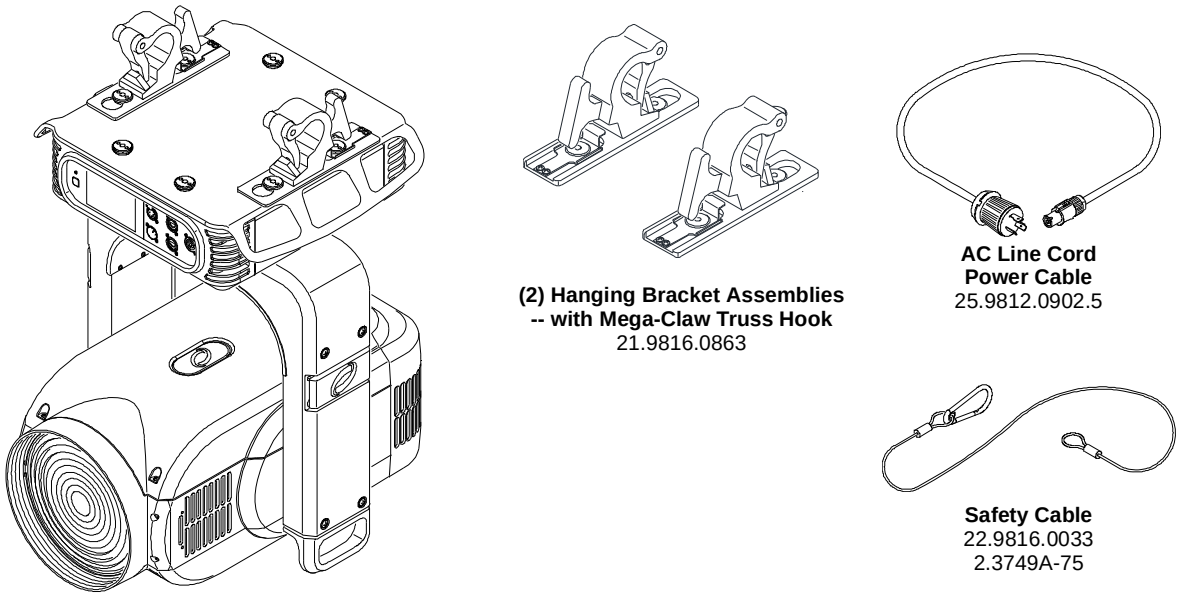
Features

+ SOURCE: HTI 1500 lamp optics optimized for 60,000 lumens
+ OUTPUT: 60,000+ lumens
+ POWER DRAW: 10.5 Amps at 208V, 8.75 Amps at 240V. Auto-sensing voltage input range is 170V to 270V.
+ POWER FACTOR: 0.99
+ REFLECTOR: Precision glass reflector with cold mirror coating
+ ZOOM RANGE: 6:1 from a narrow beam of 10° to a wide flood of 60°
+ BEAM SIZE CONTROL: In addition to the zoom optics, a mechanical iris provides continuous beam size control for both rapid changes and smooth, timed beam angle changes
+ DIMMING: Gray-scale glass dimmer for full-field dimming from 0% to 100% with accurate slow-speed control and fast bumps
+ STROBE: Lightning fast strobe wheel
+ COLOR: CMY color system featuring three (3) crossfading color wheels of Cyan, Magenta, and Yellow, plus one (1) fixed wheel with five (5) fixed filters
+ COLOR TEMPERATURE CONTROL: Adjustable color temperature wheel, range from 3,200K all the way up to 8,000K. Also includes a minus green filter on the fixed color wheel
+ ROTATING GOBOS: One (1) indexable, rotating gobo wheel with four (4) gobos
+ OPERATING TEMP: 0° to 120°F (18° to 49°C)
+ CONTROL: Compatible with all PRG consoles and a wide variety of DMX512 and Art-Net consoles
+ ON-BOARD CONTROL: Built-in LCD touchscreen display allows for on-board fixture control and feedback. On-board battery power allows for the fixture address and configurations to be set without having to apply AC power to the luminaire
+ DMX CHANNELS: 26 channels
+ PAN & TILT: Three-phase stepper motors
+ RANGE: Pan - 540°, Tilt - 260°

COMPONENTS

Included Items

The following illustration shows all items included with the luminaire:



Best Boy Wash Luminaire
20.9815.0001
2.3749H-

(2) Hanging Bracket Assemblies
-- with Mega-Claw Truss Hook
21.9816.0863

AC Line Cord
Power Cable
25.9812.0902.5

Safety Cable
22.9816.0033
2.3749A-75

Figure 1-1: Best Boy Wash Luminaire Included Items

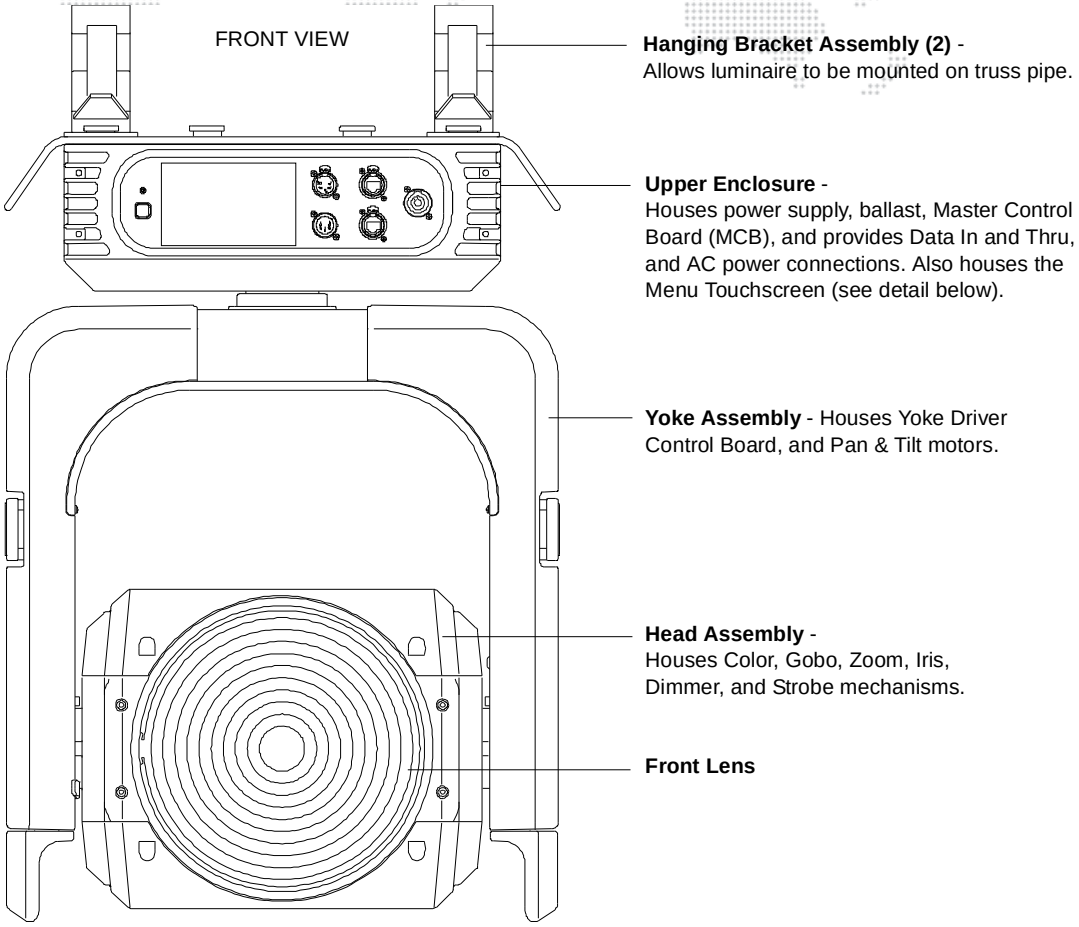
Replacement Items and Accessories

The following items can be ordered from PRG.

PRG P/N	TEAM Ecode	Accessory
21.9816.0863	-	Hanging Bracket Assembly
22.9816.0033	2.3749A-75	Heavy Duty Safety Cable
23.9623.0177	-	DMX Termination Connector
25.9812.0902.5	-	AC Line Cord 2.5' 14/3 L6-20 Cable Assembly
71.2550.1500	2.3749H-03	HTI 1500W/D7/60 Osram Lamp

Major Components and Controls

The following illustration shows the external luminaire components and controls.



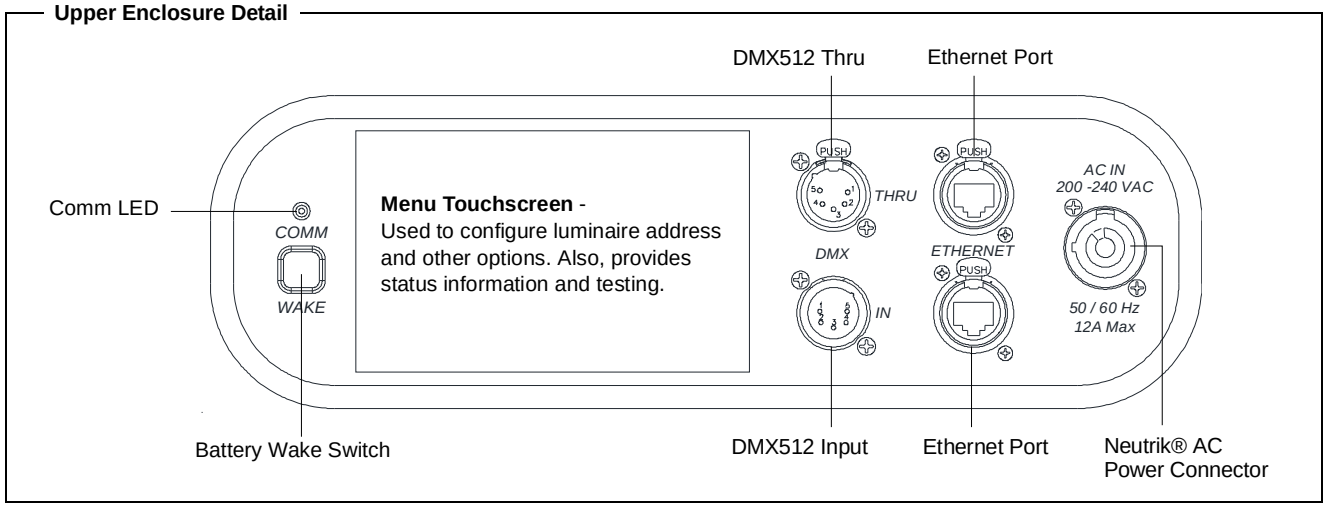


Figure 1-2: Best Boy Wash Luminaire External Components and Controls

A Locking Lever, located between the yoke and head, can be used to keep the head from rotating. Be sure to disengage the lock during operation.

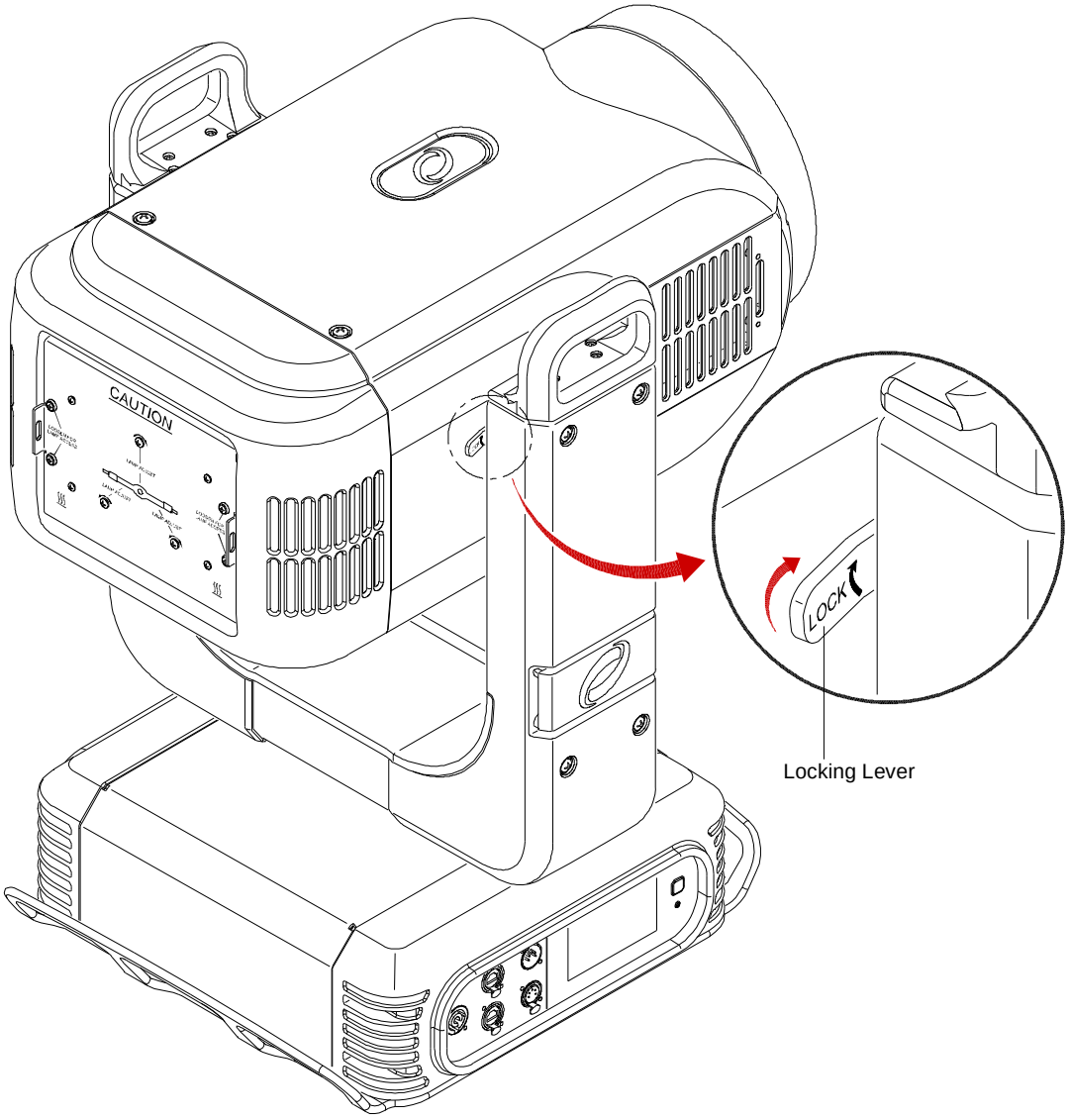


Figure 1-3: Tilt Locking Lever

Fixed Color Wheel Configuration

The following drawing shows the standard Fixed Color Wheel configuration.

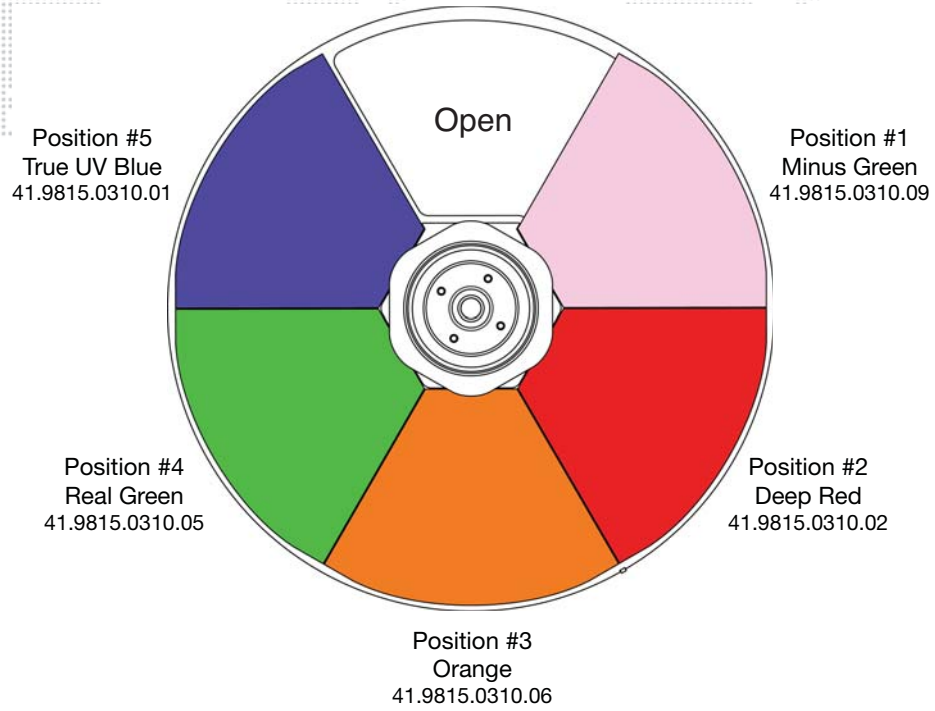


Figure 1-4: Fixed Color Wheel Standard Configuration

Gobo Wheel Configuration

The following drawing shows the standard Gobo Wheel configuration.

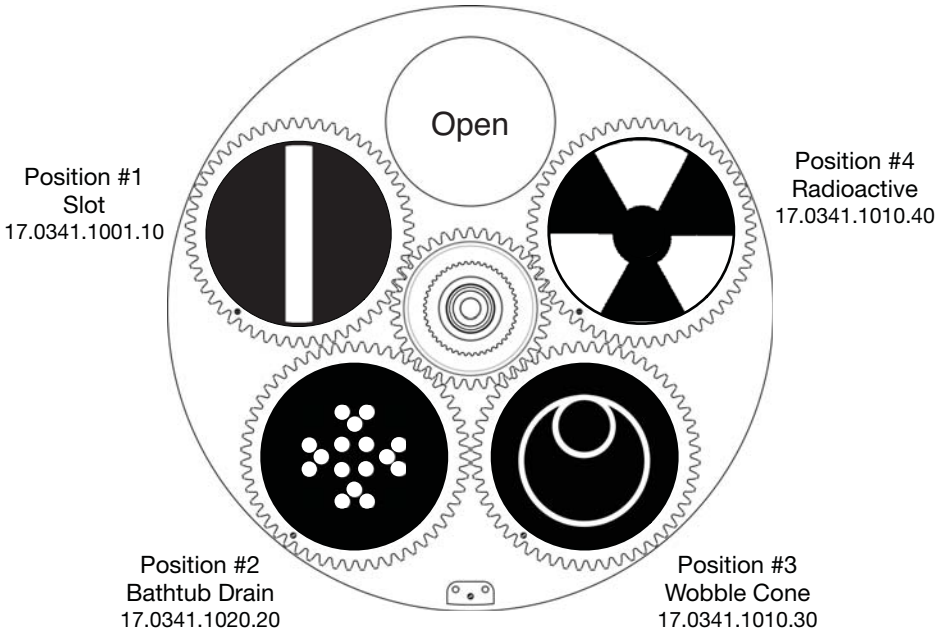


Figure 1-5: Gobo Wheel Standard Configuration

2.

INSTALLATION

This chapter contains instructions for installing the luminaire. It includes instructions for connecting power and data, along with instructions for powering up the luminaire for the first time and addressing it within your system.

+ POWER AND DATA CABLING REQUIREMENTS
+ INSTALLATION PROCEDURES
+ POWER UP AND BASIC SETUP PROCEDURES

POWER AND DATA CABLING REQUIREMENTS

Power

The Best Boy Wash Luminaire requires standard AC power distribution from 200-240 VAC, 50/60 Hz, 12A maximum. The upper enclosure provides a Neutrik® PowerCon connector for power input. Use the provided AC Line Cord Cable Assembly (25.9812.0902.5) to connect power.

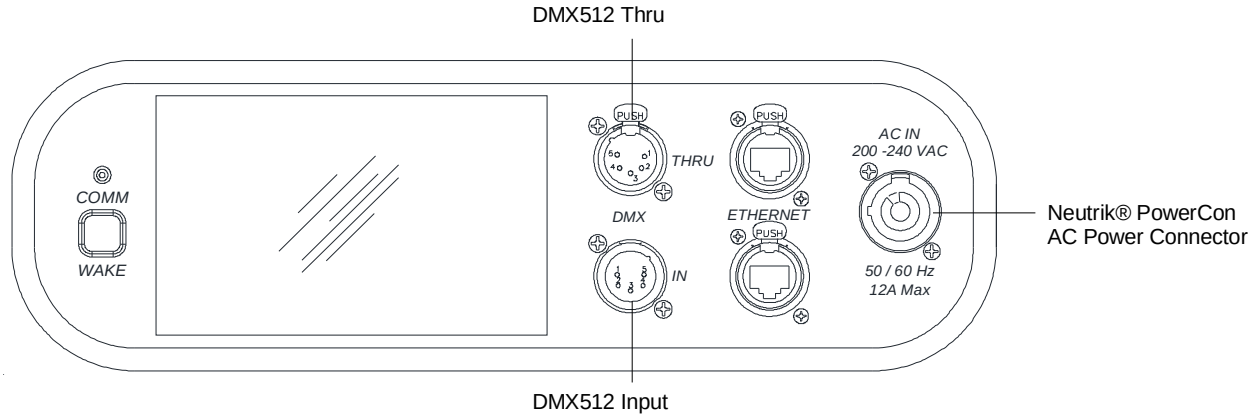


Figure 2-1: Power Input and DMX512 Connections

Data

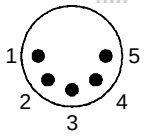
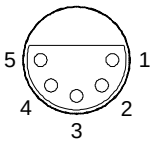
DMX512 Cables

The Best Boy Wash Luminaire is equipped with two, 5-pin XLR connectors for DMX IN and DMX THRU (out) applications. DMX IN requires a 5-pin, female XLR connector and DMX THRU requires a 5-pin, male XLR connector. When purchasing or constructing data cables, it is important that not only the correct cable type be used, but also quality cable to ensure a reliable DMX512 system. Your cabling should meet the following USITT DMX specification requirements:

+ Suitable for use with EIA485 (RS485) operation at 250k baud.
+ Characteristic impedance 85-150 ohms, nominally 120 ohms.
+ Low capacitance.
+ Two twisted pairs.
+ Foil and braid shielded.
+ 24 AWG minimum gauge for runs up to 1000 feet (300m).
+ 22 AWG minimum gauge for runs up to 1640 feet (500m).

Note: Microphone type cables and other general purpose, two-core audio or signal cables are not suitable for use with DMX512.

The XLR 5-pin connectors should be wired as follows:

Pin/Wire Code to XLR Connectors						
DMX Thru Cable Pinout  Male Conn	**Pin 1** Foil & Braided Shield	**Pin 2** 1st conductor of 1st twisted pair Data (-)	**Pin 3** 2nd conductor of 1st twisted pair Data (+)	**Pin 4** 1st conductor of 2nd twisted pair Data (-)	**Pin 5** 2nd conductor of 2nd twisted pair Data (+)	DMX In Cable Pinout  Female Conn

Note: Refer to the USITT Recommended Practice for DMX512 guide for additional information regarding DMX512 systems. See "Additional Documentation" on page 1.

Recommended Cable Types/Manufacturers

These are only a few of the suitable cable types. Any quality EIA485, twisted pair, 120 ohm, shielded cable will also work.

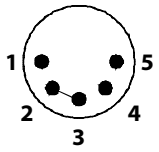
Type	Pairs	ZΩ*	Jacket	AWG	Use	Temp (F)
Belden Cables						
1215A	2	150	PVC	26	IBM Type 6 Office cable	75
1269A	2	100	PTFE	22 (Solid)	High Temp, Plenum cable	200
8102	2	100	PVC	24	UL2919	80
8132	2	120	PVC	28	UL2919	80
8162	2	100	PVC	24	UL2493	60
82729	2	100	PTFE	24	High Temp, Plenum cable	200
88102	2	100	PTFE	24	High Temp, Plenum cable	200
89696	2	100	PTFE	22	High Temp, Plenum cable	200
89729	2	100	PTFE	24	High Temp, Plenum cable	200
89855	2	100	PTFE	22	High Temp, Plenum cable	200
9729	2	100	PVC	24	UL2493	60
9804	2	100	PVC	28	UL2960	60
9829	2	100	PVC	24	UL2919	80
9842	2	120	PVC	24	UL2919	80
Proplex Cables						
PC224P	2	110	Polyurethane	22	Heavy Duty and Portable	105
PC224T	2	110	PVC	22	UL2464	105
PC226T	3	110	PVC	22	UL2464	

* Characteristic Impedance

DMX512 Male Termination Connector

A male XLR DMX512 termination connector is required at the last luminaire (or "far end of the line") to prevent signal reflections. Signal reflections may cancel out the signal at certain line lengths, resulting in errors. The terminator is also necessary for software downloads and running tests on multiple luminaires. To construct your own connector, you will need the following components:

+ 5-pin, male XLR connector.
+ 120 ohm resistor.



Solder resistor across pins 2 & 3

Note: A male termination connector is also available as an accessory from PRG. See "Replacement Items and Accessories" on page 5.

Ethernet Cables

The Best Boy Wash Luminaire is equipped with two RJ-45 type connectors for Ethernet input/output. Ethernet cabling should follow these guidelines:

+ Ethernet cable assemblies must match the CAT5e specification.
+ Regular or crossover cables are acceptable.
+ Both EtherCon® and RJ-45 connectors are acceptable.

Ethernet Bypass

A relay allows Ethernet signals to pass through daisy-chained luminaires even if power is removed.

INSTALLATION PROCEDURES

Unpacking and Attaching Hanging Brackets

The Best Boy Wash Luminaire can be hung horizontally or vertically from any structure designed to accommodate the load of this moving luminaire. Two provided Hanging Bracket Assemblies (21.9816.0863) are used to attach the luminaire to a truss pipe. The Hanging Brackets consist of a pre-assembled bracket with a Mega-Claw Truss Hook.

To unpack and attach brackets:

Step 1. Unlatch case lid and tilt upward as shown in **Figure 2-2**.

Step 2. Remove Power Cord, Safety Cable, and Hanging Brackets from case.

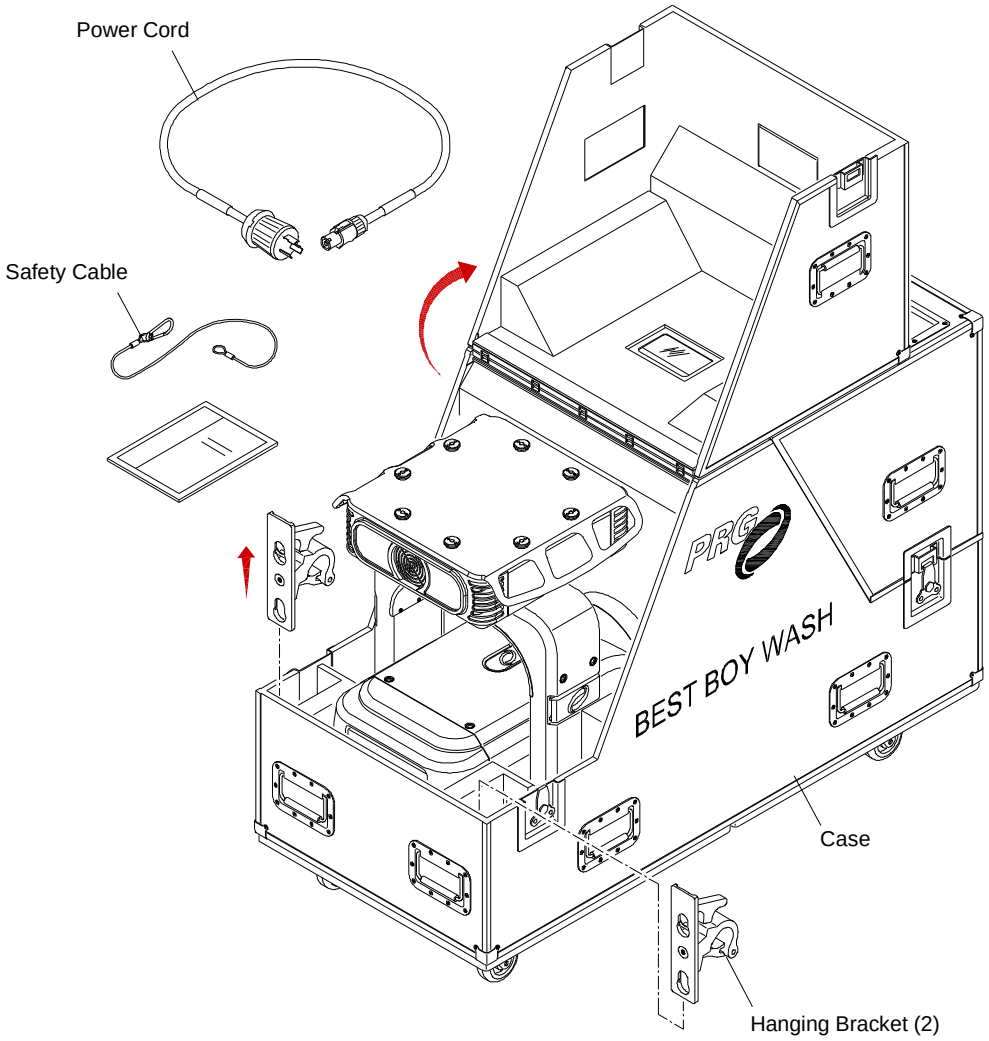


Figure 2-2: Unpacking Road Case

Step 3. Install Hanging Brackets as follows:

a. Choose orientation. Brackets may be attached in one of four positions as shown in **Figure 2-3**.

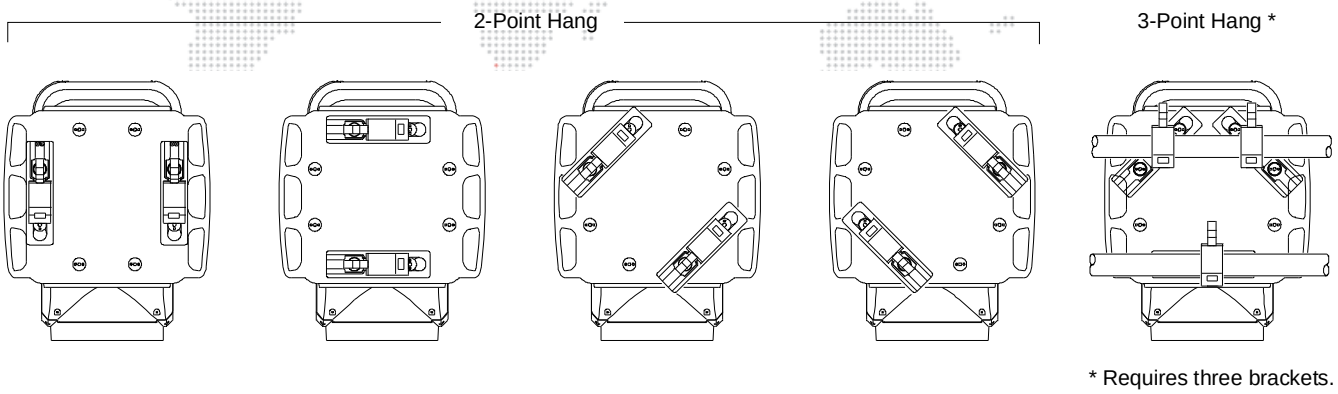


Figure 2-3: Hanging Bracket Orientations

b. Orient Hanging Bracket in desired direction over two attachment buttons on bottom of upper enclosure (**Figure 2-4**).

c. Place Hanging Bracket down over buttons and slide until bracket locks into place (you will hear a "click" when bracket is locked).

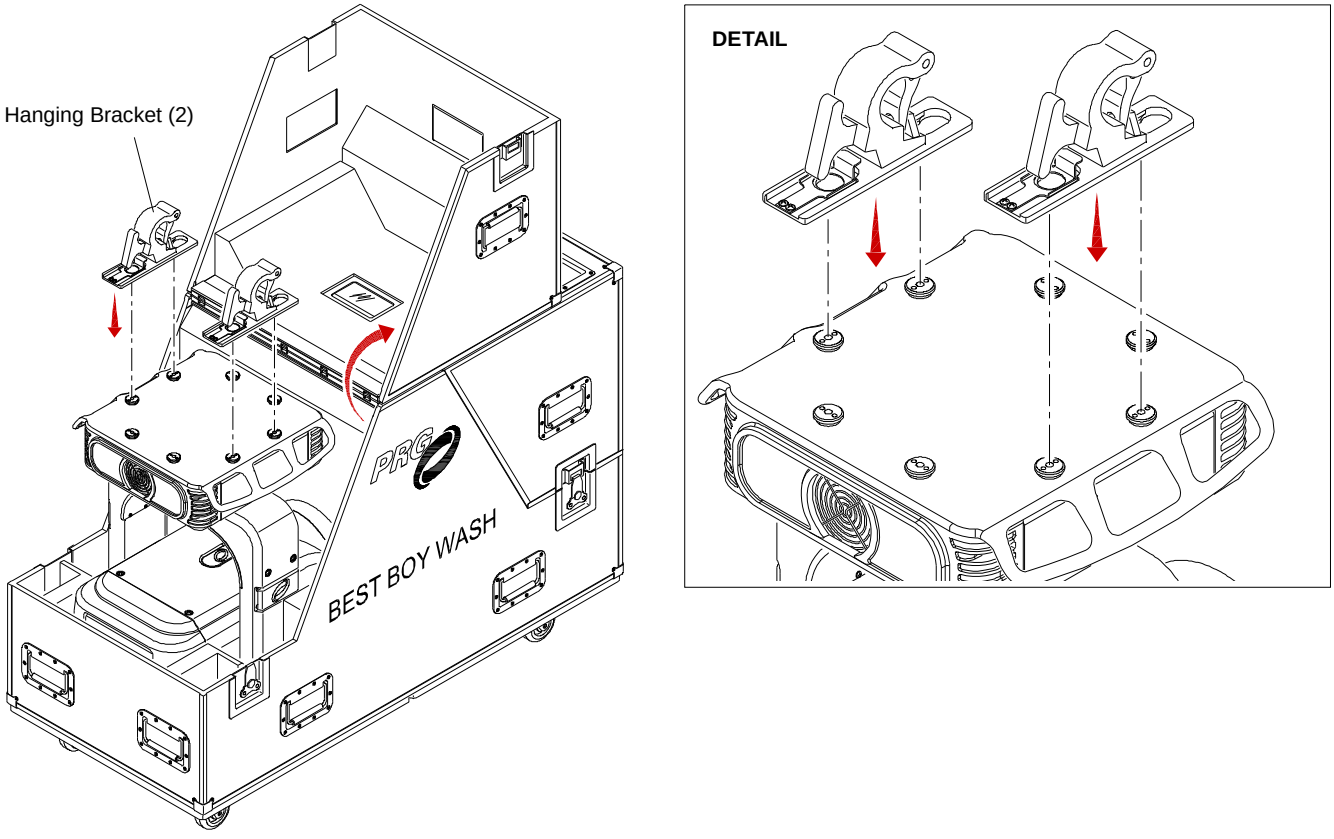


Figure 2-4: Attaching Hanging Brackets

Standard Hang

WARNING: The luminaire is heavy. Use caution when lifting.

WARNING: One safety cable and at least two truss hooks should be used in all hang configurations.

To install in standard 2-point hang:

Step 1. Unpack case and attach Hanging Brackets. Refer to "Unpacking and Attaching Hanging Brackets" on page 13.

Step 2. Roll case to mounting location as required (**Figure 2-5**).

Step 3. Using two people, carefully lift luminaire into mounting position on truss pipe.

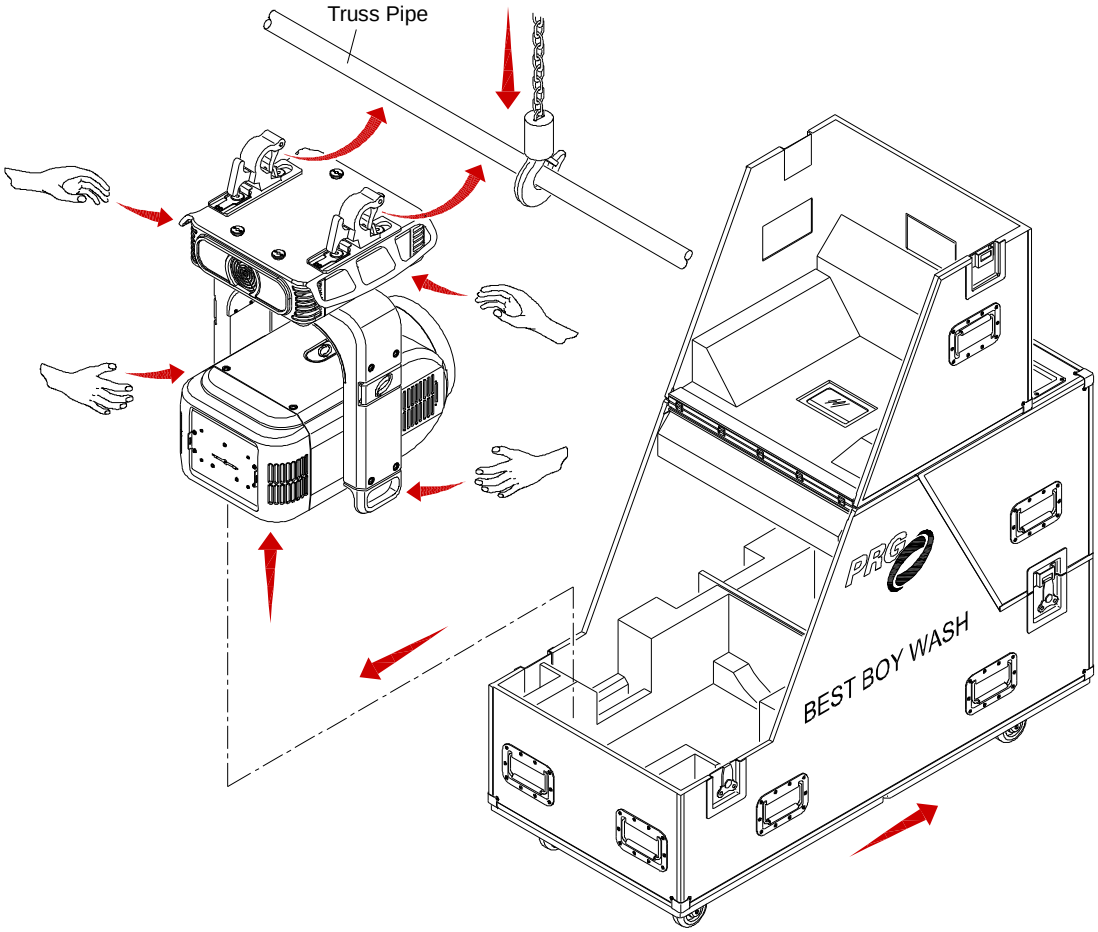
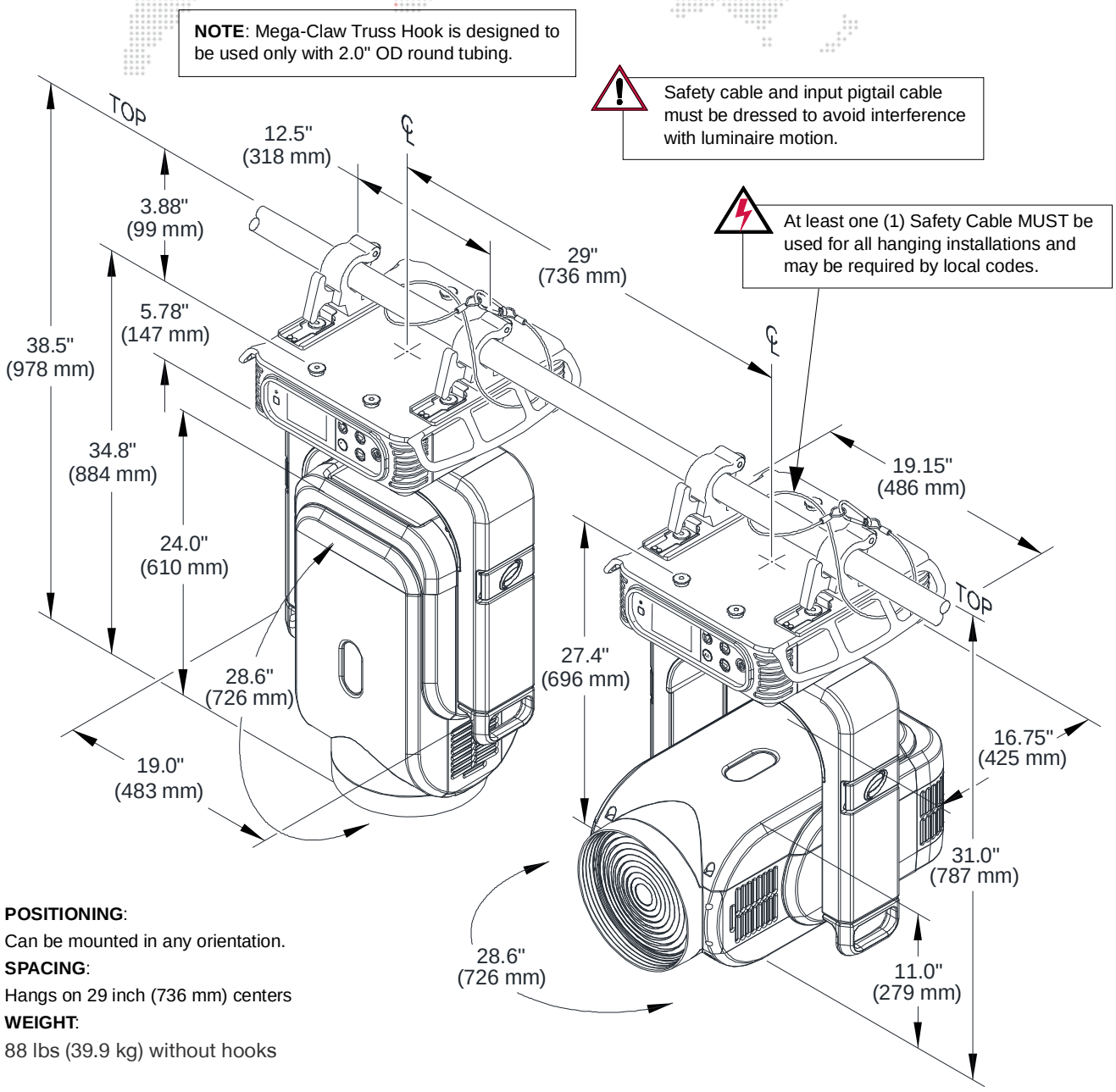


Figure 2-5: Removing Luminaire From Case

Step 4. Secure in place by tightening Truss Hook wing bolts (**Figure 2-6**). Ensure that luminaire is fully supported.

Step 5. Feed safety cable through base and secure around pipe as shown in **Figure 2-6**.

Step 6. Connect power and data cables according to "Connecting Power and Data" on page 20.



POSITIONING:
Can be mounted in any orientation.
SPACING:
Hangs on 29 inch (736 mm) centers
WEIGHT:
88 lbs (39.9 kg) without hooks

Figure 2-6: Standard Hanging Configuration and Dimensions

Vertical "Yoke Out" Hang

The Best Boy Wash Luminaire can be hung in a vertical position, if required. In this configuration, the luminaire should be positioned so that the interface panel (display) is facing to the side for ease of programming.

WARNING: The luminaire is heavy. Use caution when lifting.

WARNING: The vertical configuration requires **3 people** to hang and secure the luminaire.

WARNING: One safety cable and at least two truss hooks should be used in all hang configurations.

To install in vertical hang:

Step 1. Orient Hanging Brackets as shown in **Figure 2-7**.

Step 2. Place Hanging Bracket down over buttons and slide until bracket locks into place (you will hear a "click" when bracket is locked).

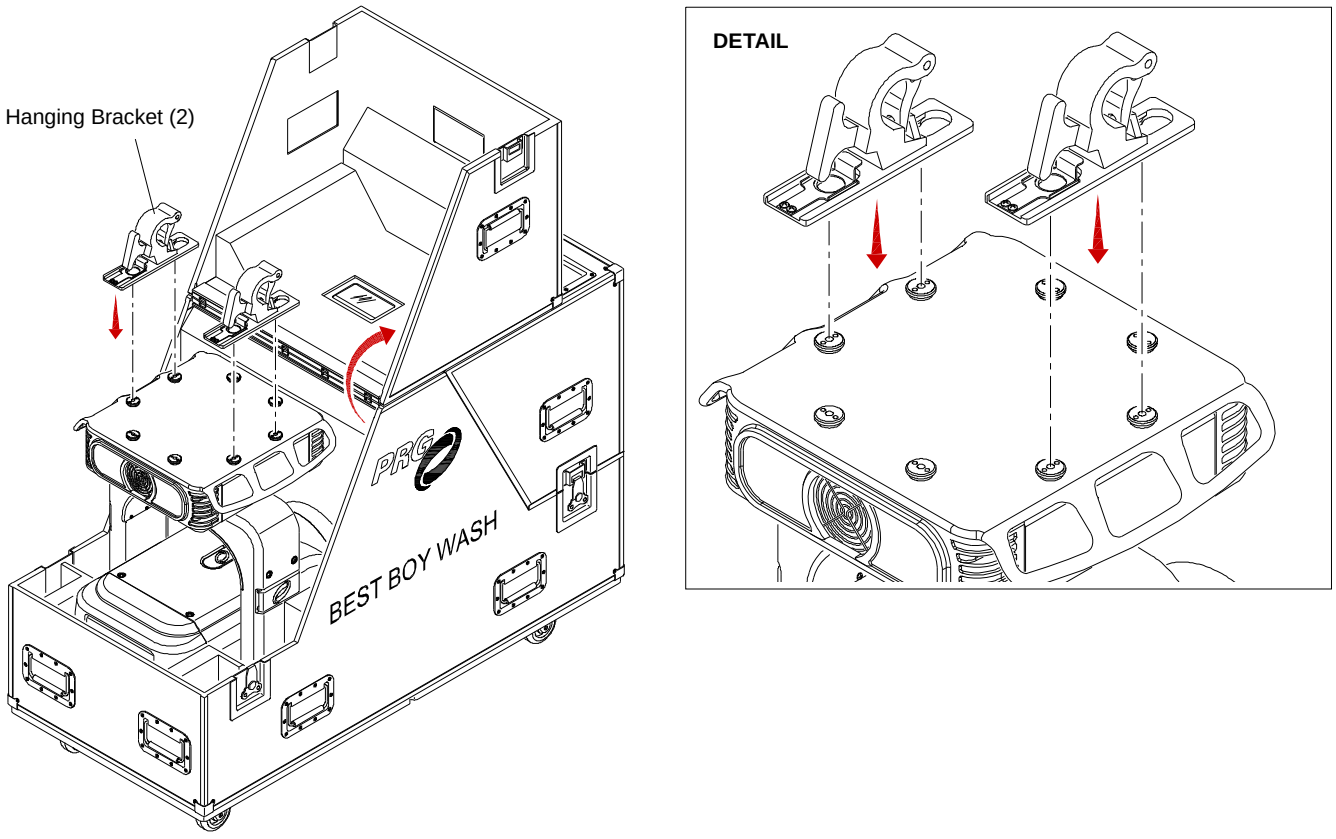


Figure 2-7: Attaching Hanging Brackets

Step 3. Roll case to mounting location as required (**Figure 2-8**).

Step 4. Using two people, carefully lift luminaire into mounting position so that *display is facing to the side*.

Step 5. Using a third person, secure in place by tightening Truss Hook wing bolts. Ensure that luminaire is fully supported.

Step 6. Feed safety cable through upper enclosure bracket and secure around pipe.

Step 7. Connect power and data cables according to "Connecting Power and Data" on page 20.

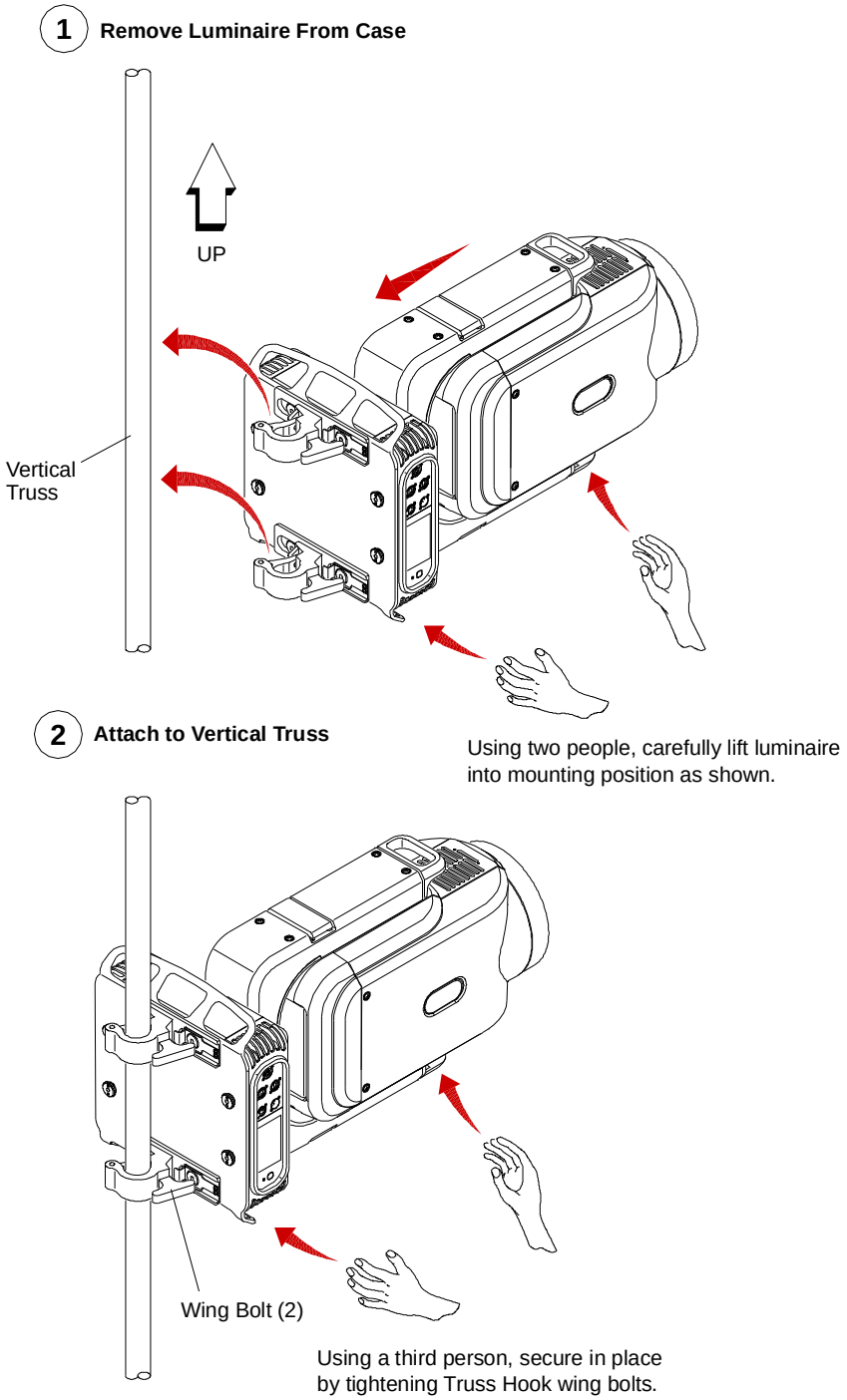


Figure 2-8: Vertical "Yoke Out" Hanging Configuration

Standing Position

The Best Boy Wash Luminaire can also be used in a standing position. Be sure that the floor or stage will accommodate the load of this moving luminaire.

To install in a standing position:

Step 1. Unpack case as shown in **Figure 2-2** on page 13, but do not remove hanging brackets. (These are not used for standing installations.)

Step 2. Carefully remove luminaire from case and place in standing position.

Step 3. Connect power and data cables according to "Connecting Power and Data" on page 20.

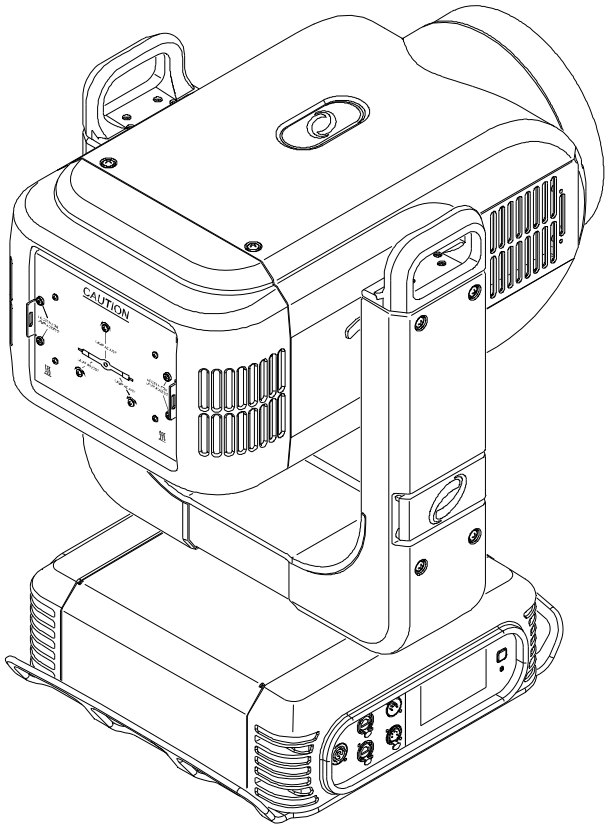


Figure 2-9: Standing Position

Connecting Power and Data

The Best Boy Wash Luminaire may be controlled by DMX512 or Ethernet. The control inputs are located at the upper enclosure connector panel.

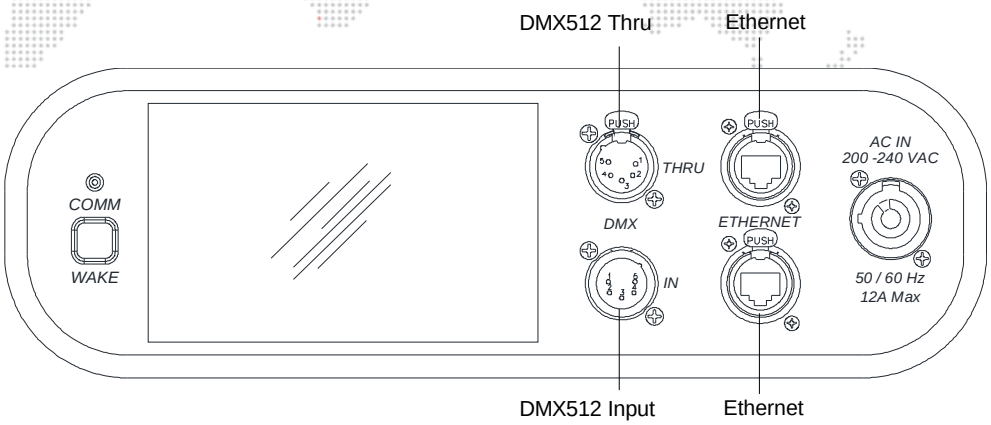


Figure 2-10: Data Connections

Observe the following guidelines when setting up the system:

- A maximum of **32** luminaires may be connected in any one DMX512 or Ethernet data link. However, note that the maximum limit applies to the luminaire "daisy-chain" only. Your system or console may require fewer luminaires on a single data link path. Consult your console documentation for more information.
- The Ethernet ports are not assigned as either In or Thru as the DMX512 ports are assigned. Ethernet can be connected in any configuration.
- Standard "star" topology should be used with Ethernet configurations. DO NOT create a "ring" with Ethernet.
- The ports may not be used as converters (i.e., you cannot input Art-Net and get DMX512 out on an XLR, or vice versa).
- A relay allows Ethernet signals to pass through daisy-chained luminaires even if power is removed.

Power is provided by the AC Line Cord Cable Assembly (25.9812.0902.5) connected to the Neutrik® power input connector. There is no power on/off switch. Turn off the circuit breaker at the power distribution rack *before* connection or disconnecting the Neutrik PowerCon.

Note: Refer to "Comm LED Operation" on page 23 for more details about the Comm LED.

To connect power and data:

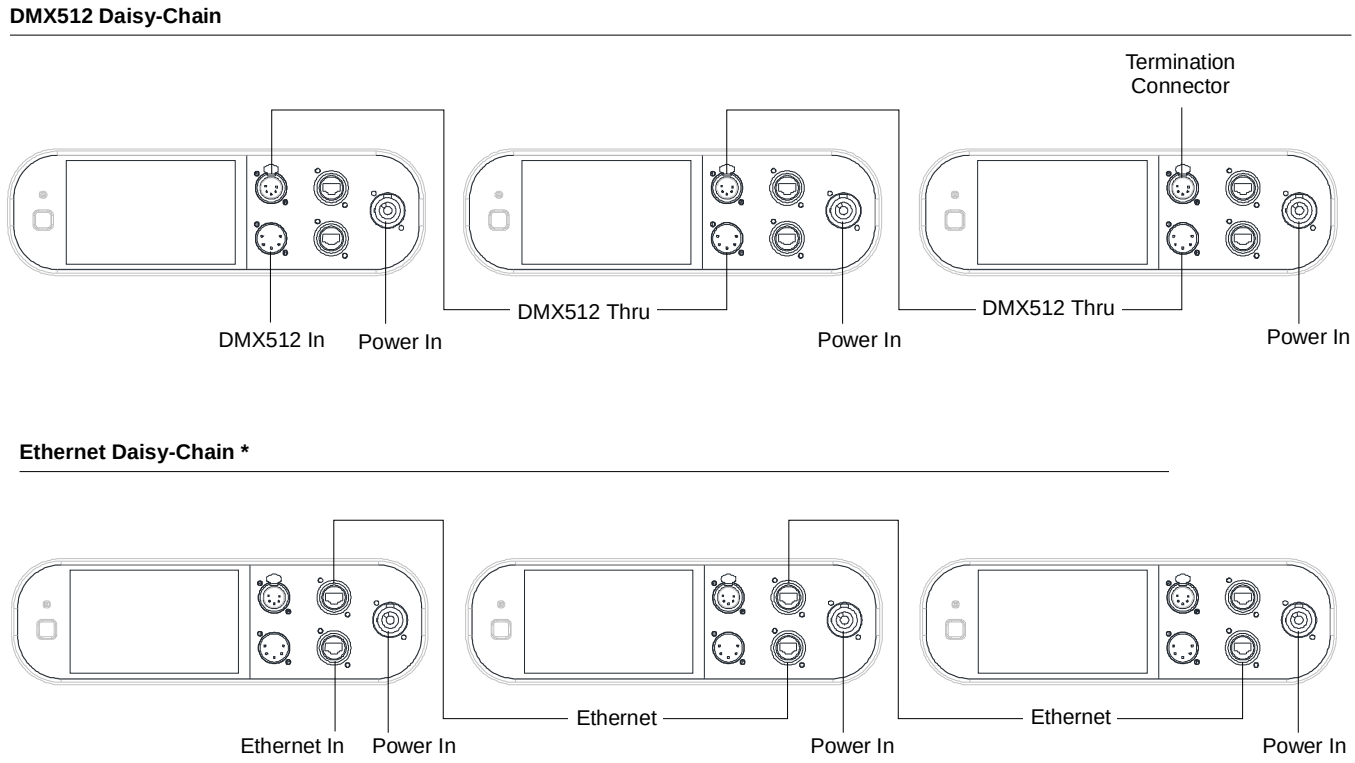
Step 1. Connect data cable (DMX512 or Ethernet) from console to appropriate input connector at first luminaire in chain (**Figure 2-11**).

Step 2. If required, connect additional data cables from appropriate thru connectors to input connectors of remaining luminaires in chain.

Step 3. *For DMX512 systems*: At last luminaire in chain, install male termination connector at DMX512 THRU connector. (Luminaires and other devices on the same DMX512 chain may not function properly without termination.) Refer to "DMX512 Male Termination Connector" on page 12.

Step 4. At each luminaire, connect AC Line Cord Cable Assembly from power input source.

Step 5. Dress and secure all cables so that they will not interfere with luminaire head or yoke movement.



*The Ethernet ports are not assigned as either In or Thru as the DMX512 ports are. Ethernet can be connected in any configuration.

Figure 2-11: Connecting Power and Data Cables

Note: If control data is active on both XLR and Ethernet connections, the fixture will follow the DMX512 commands coming from the XLR.

POWER UP AND BASIC SETUP PROCEDURES

Powering Up the Luminaire

When AC power is applied, the luminaire will begin a calibration sequence which moves its pan, tilt, and all beam control mechanisms. After calibration, the luminaire head will either stop at its "home" position (which positions the pan axis at mid-rotation and the head parallel to the yoke with the lens pointing away from the luminaire upper enclosure) or move to its current DMX-defined position if DMX512 data is present. The beam control mechanisms will also move to their "home" or DMX-defined positions. The lamp is set to OFF in the default mode.

The luminaire also contains an on-board battery so that it can be addressed and configured without being connected to main power (refer to "Wake Switch" on page 30).

CAUTION: Before applying power, be sure the luminaire is hung or positioned so that the head and yoke can move freely without restriction. Refer to clearances in **Figure 2-6** on page 16.

To power up:

Step 1. At each luminaire, connect power. Allow luminaire to complete its calibration sequence.

Step 2. For normal power up, the Menu Touchscreen "Home" screen will display **Status OK**. The Home screen will also display the luminaire's DMX address and lamp information.

Step 3. Check Comm LED for proper operation. Refer to "Comm LED Operation" on page 23.

Step 4. To strike lamp, send appropriate command from console or follow steps provided in "Starting the Lamp" on page 26.

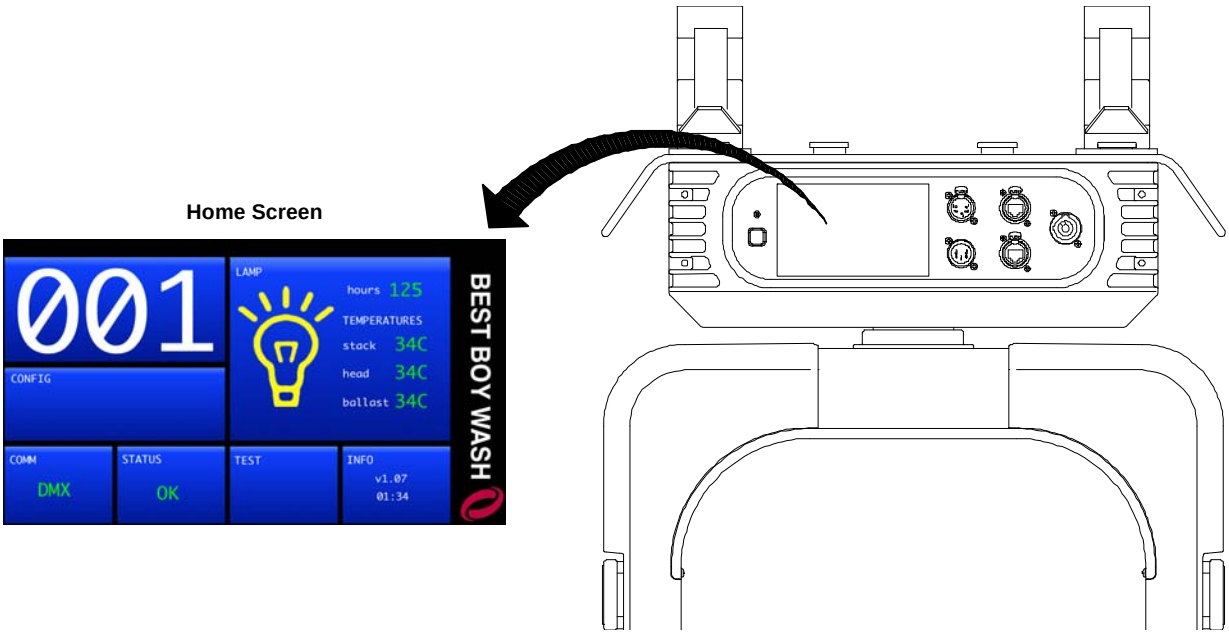


Figure 2-12: Menu Touchscreen at Power Up

Note: Refer to "Menu System" on page 30 for more information about the Menu Touchscreen.

Comm LED Operation

The Comm LED - located on the upper enclosure connector panel - indicates system control status. This can be used determine if the luminaire is receiving a control signal. LED indications are as follows:

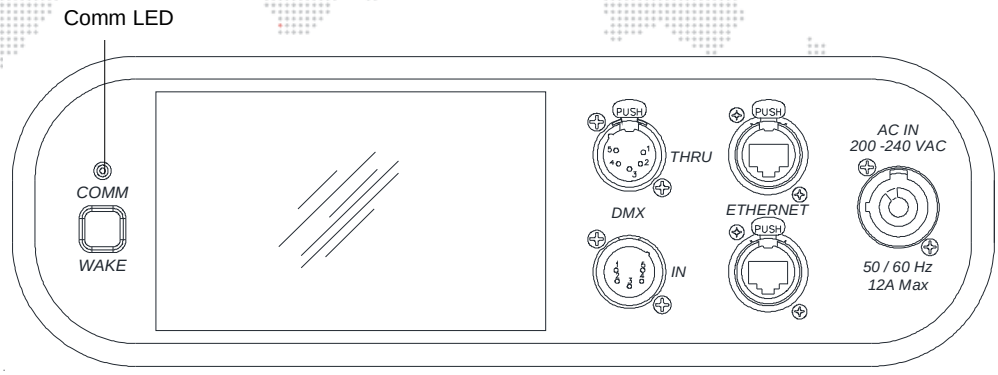


Figure 2-13: Comm LED

- **Green** - The Comm LED will light green if there is incoming communication.
- **Red** - The Comm LED will light red if there is no incoming communication.
- **Blink** - The Comm LED will blink (either red or green) if an error is detected.

Bypassing Calibration

If the menu screen is touched (in the center) and held during startup, the luminaire will present a menu that provides the option to bypass calibration. This feature allows the luminaire to skip the calibration sequence so that it can be powered up in the case for configuration purposes.

To bypass calibration:

Step 1. Connect power to luminaire.

Step 2. At startup, touch center of menu screen and hold until Bypass Calibration menu appears.

Step 3. Press Yes to bypass calibration. (The menu will automatically dismiss if no selection is made within 5 seconds.)

Step 4. Proceed with programming of starting address or other options.

Setting a Starting Address

The method for setting a DMX starting address is the same whether the luminaire is being controlled by DMX512 or Ethernet (Art-Net/sACN). The only difference is that the Home screen will display the Comm as either "DMX," "ArtNet," or "sACN," depending on the control input.

The DMX starting address is programmed at the Menu Touchscreen. *The luminaire retains its address even if power is removed.*

Note: Refer to your console operating instructions for specific information regarding its addressing requirements.

DMX Comm

The starting address for DMX512 systems can be set from the HOME screen.

To program a starting address:

Step 1. At Home screen, press address number panel.

Step 2. At numeric keypad, enter new starting address and press ENTER.

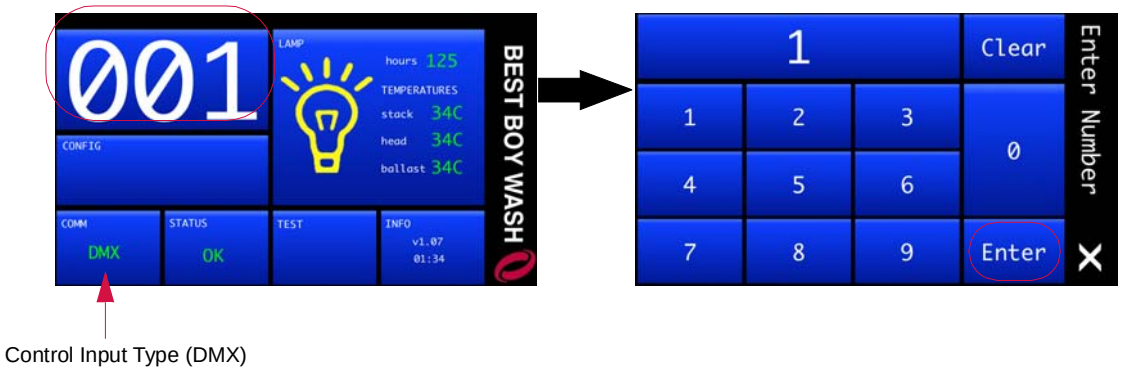


Figure 2-14: Setting Starting Address (DMX Control)

Note: Refer to "Menu System" on page 30 for more information about the Menu Touchscreen.

Ethernet Comm

The starting address for Ethernet (Art-Net/sACN) systems can be set from the HOME screen.

To program a starting address:

Step 1. At Home screen, press address number panel.

Step 2. At numeric keypad, enter new starting address and press ENTER.

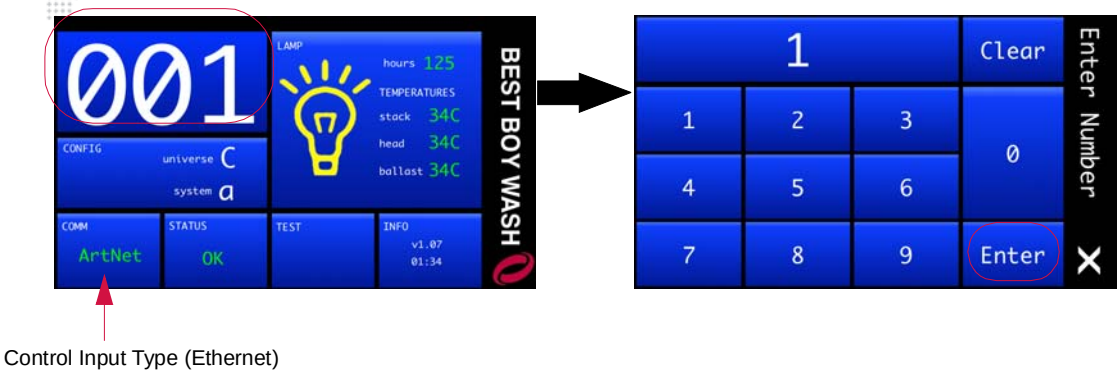


Figure 2-15: Setting Starting Address (Ethernet Control)

To select an Art-Net or sACN universe:

If using Ethernet control, a universe must be selected in addition to the DMX address. The universe can be selected and displayed in either alphabetic or numeric mode (using the UNIV FORMAT screen). The alpha mode is useful to differentiate universes from DMX addresses and is the standard on PRG console systems. The valid universes for Art-Net are 0-255 (A-IV), and the valid universes for sACN are 1-63999 (B-CPQN).

To set the Universe and Universe Format, press the CONFIG panel at the Home screen:

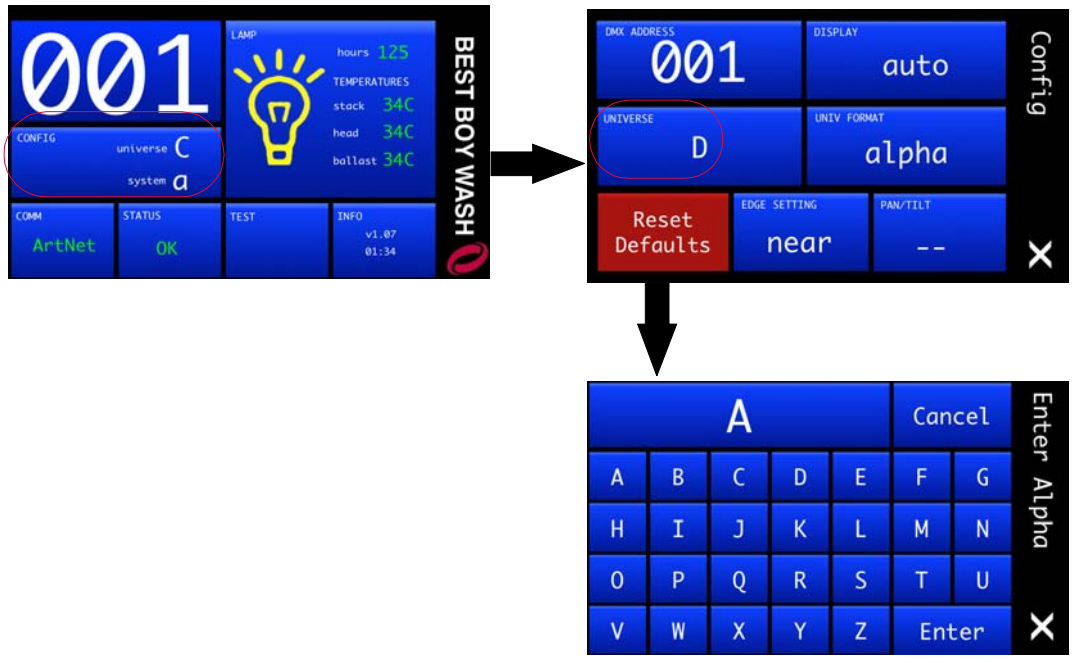


Figure 2-16: Selecting a Universe (Ethernet Control)

Note: Refer to "Menu System" on page 30 for more information about the Menu Touchscreen.

Starting the Lamp

The lamp can be started (turned on) via console command or at the luminaire itself using the Menu Touchscreen.

To start lamp using Menu Touchscreen:

Step 1. At Home screen, press LAMP panel.

Step 2. At Lamp screen, current lamp status (ON/OFF) will be displayed. Press START to bring up YES/NO options.

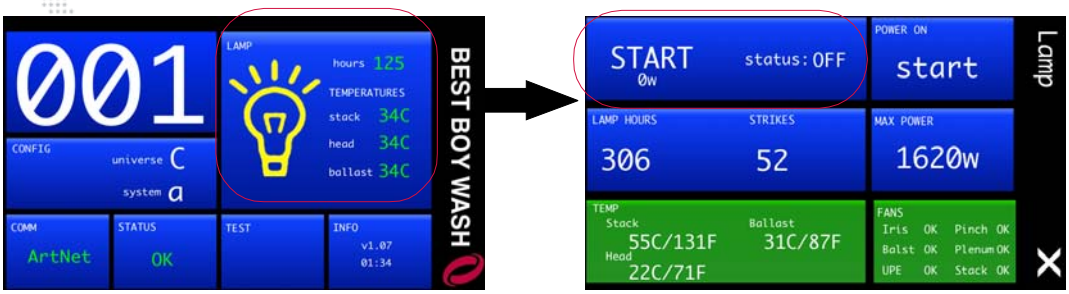


Figure 2-17: Starting the Lamp

Step 3. Press YES to start lamp.

Step 4. Exit Lamp screen by pressing (X).

Lamp Power Up Setting

The luminaire can be configured to power up with its lamp on or off via the Lamp screen. For details about all lamp configuration options, refer to "Lamp Screen" on page 33.

Configuring Comm Loss Setting

The Communication screen includes a "Comm Loss" setting. This setting will configure how long to wait before the fixture fades to black upon loss of comm data.

To configure the Comm Loss setting:

Step 1. At Home screen, press COMM panel.

Step 2. At Communication screen, press COMM LOSS panel.

Step 3. Set Trigger Fade After to No Fade, 30 Seconds or 60 Seconds.

Step 4. Exit Communication screen by pressing (X).

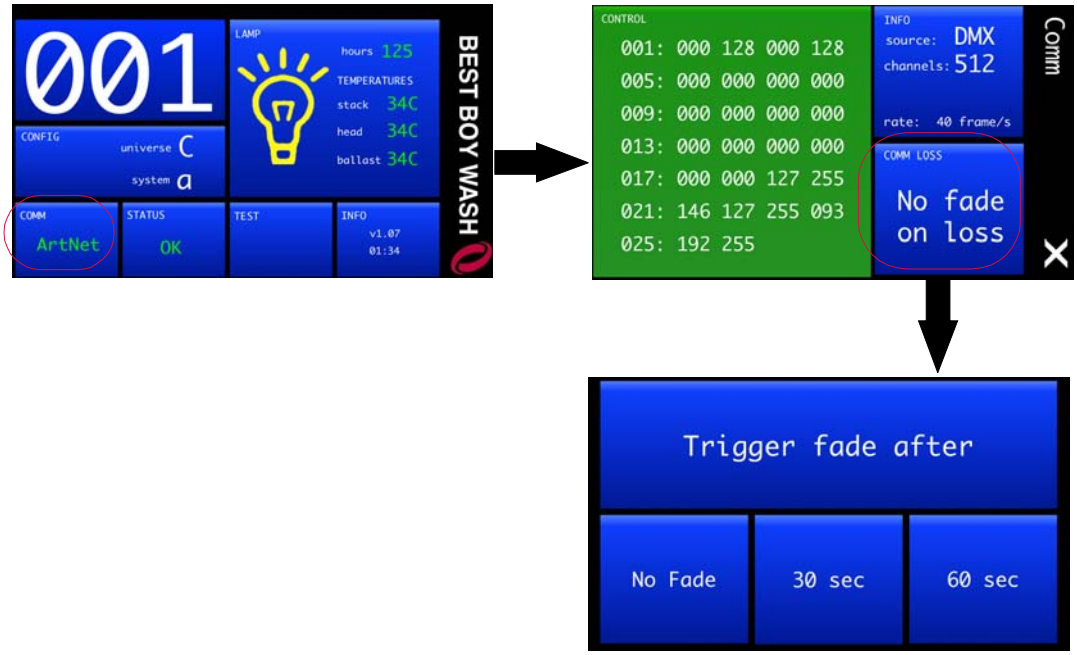


Figure 2-18: Configuring Comm Loss Setting

Note: Comm Loss can also be configured with Control Channel commands. Refer to "Control Channels" on page 41.

Configuring Universe, Comm, and Other Options

Other luminaire configurations can be set using the menu screens available at the Menu Touchscreen. Refer to "Menu System" on page 30 for complete instructions on using these features.

Notes

3.

OPERATION

This chapter contains instructions for using the menu system and controlling the luminaire by DMX512.

+ MENU SYSTEM

+ DMX512 OPERATION

MENU SYSTEM

Using the Menu Touchscreen

The menu system is a set of software screens used to configure, address, report status, and test the luminaire. These functions are controlled at the Menu Touchscreen as shown in **Figure 3-1**.

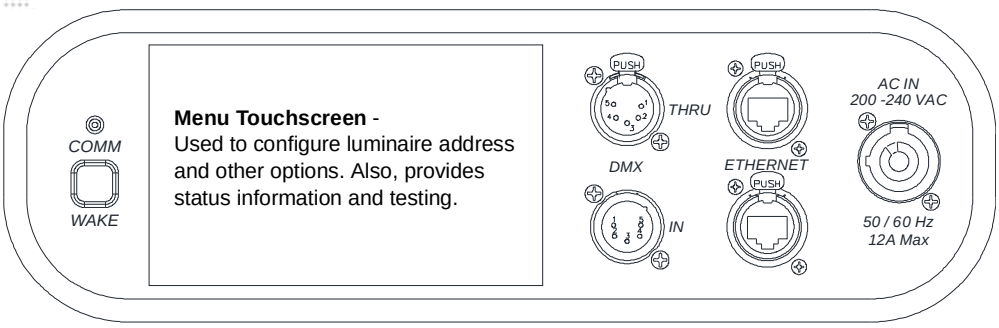


Figure 3-1: Menu Touchscreen

Color Codes

The menu panels are color coded as follows:

- **Blue** - function control panels. These are configurable functions which will open a sub-menu when touched.
- **Green** - informational panels. These display status info and will not open further menus when touched.
- **Red** - important control panels. These are configurable functions which will open a sub-menu when touched. Activating these functions will affect important luminaire settings.

Navigation

To navigate the menus, press the blue or red areas of the touchscreen. To exit a menu, press anywhere on the menu's title bar (not just the 'x' itself).

Screen Saver Mode

The menu will automatically return to the Home screen, from a sub-menu, if inactive for 45 seconds. The display will go into screen saver mode (backlight off) if inactive for five minutes.

The menu will automatically jump to the Status screen and wake up the display when a mechanism status changes (error, calibration, etc.).

Bypass Calibration

If the menu screen is touched (in the center) and held during startup, the luminaire will present a menu that provides the option to bypass calibration. This feature allows the luminaire to skip the calibration sequence so that it can be powered up in the case for configuration purposes. (Refer to "Bypassing Calibration" on page 23.)

Wake Switch

The Best Boy Wash Luminaire contains an on-board battery so that it can be addressed and configured without being connected to main power. A Battery Wake Switch, located near the menu touchscreen, can be used to access the menu system as required.

- Press the switch to bring up the power down menu.
- Select power down Yes or No.

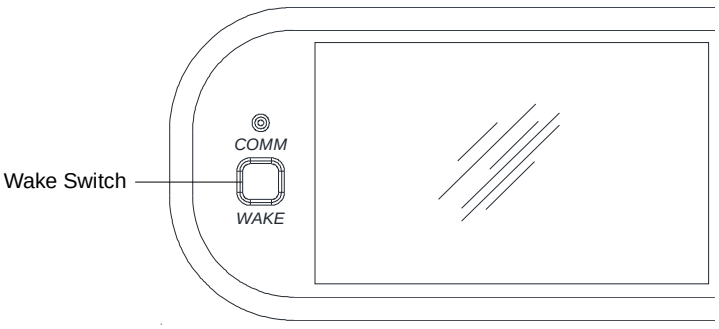


Figure 3-2: Wake Switch

Menu System Overview

The menu system consists of a hierarchy of menu levels. Sub-menus, options, and alpha/numeric keypads may be accessed by pressing the blue and red areas of these main screens. Pressing the right bar (X) while at a sub-menu will return to the previous screen.

When power is applied to the luminaire, the Menu Touchscreen will display an initialization screen during calibration. After calibration is complete, the Home screen will be displayed.

The main menu structure is illustrated below:

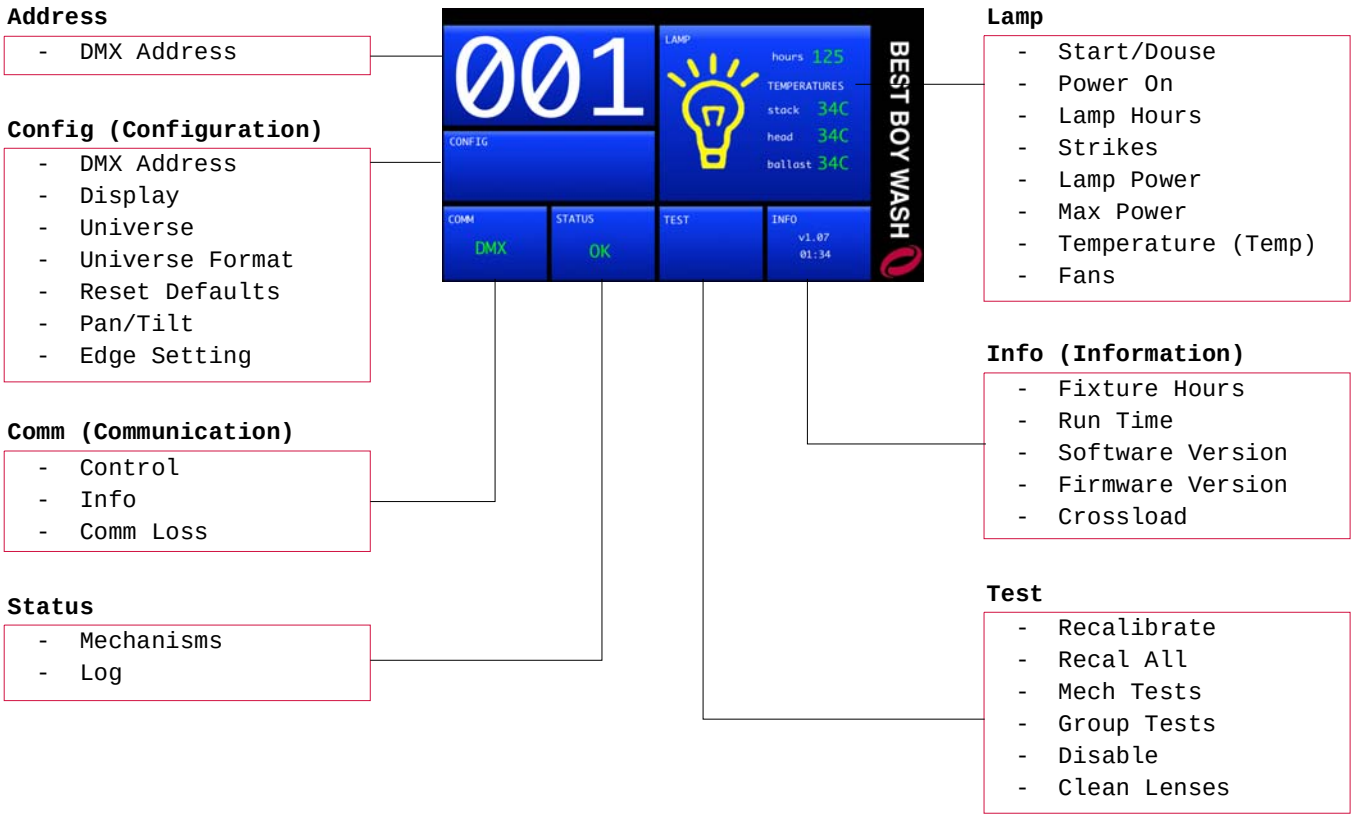
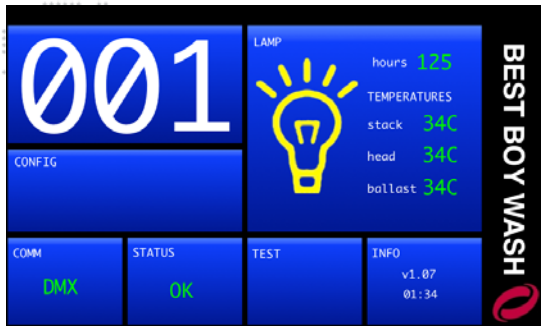


Figure 3-3: Menu Structure

Home Screen

The Home screen consists of several sections (referred to as "panels") which provide status and configuration information. Pressing the panels on the touchscreen will open the applicable sub-menus.

DMX



Ethernet (Art-Net)

Ethernet (sACN)

Address (#)

The large number is the current DMX or Ethernet (Art-Net/sACN) address of the luminaire.

Press panel to bring up the numeric keypad for editing.

LAMP

- **Lamp Status** - displays lamp on/off status, hours, and temperatures. The lamp icon color indicates status of lamp: off = gray icon, on = yellow icon (shown in example at right), error = red icon.
- **Lamp Hours** - displays total lamp hours. Lamp hours are shown in green if under threshold, yellow at 650 hours, and red at 750 hours. *It is mandatory that the lamp be changed before 750 hours.*
- **Temperatures** - displays luminaire head temperatures. The temperatures are shown in green if under limit, yellow if close to the limit, and red if over the limit.

Press panel to open Lamp Screen.

CONFIG

- **Universe** - displays current Art-Net (alpha A-IV or numeric 0-255) or sACN (alpha B-CPQN or numeric 1-63999) universe, if present.
- **System/Priority** - displays current Art-Net system or sACN priority if either is present.

Press panel to open Configuration Screen.

COMM

- **Comm** - displays currently active input protocol: Artnet (green/red), sACN (green/red), DMX (green), or NONE (red). Ethernet control is shown in green when the fixture's universe is present, and red if absent.

Press panel to open Communication Screen.

STATUS

- **Status** - displays fixture status: CAL (yellow), OK (green), or ERR (red).

Press panel to open Status Screen.

TEST

Press panel to open Test Screen.

INFO

- **Run Time** - displays current software version and run time in *hours:minutes* format.

Press panel to open Information Screen.

Lamp Screen

+ **Start/Douse** - displays current lamp status and power setting. Press START/DOUSE to bring up Yes/No options (depending on current lamp state).
+ **Power On** - sets option to strike lamp automatically upon power up. Press to bring up Wait/Start options.
+ **Lamp Hours**- displays total lamp hours. Lamp hours are shown in green if under threshold, yellow at 650 hours, and red at 750 hours. *It is mandatory that the lamp be changed before 750 hours.* Press to bring up Reset Lamp Hours Yes/No options. Press Yes to reset lamp hours.
+ **Strikes** - displays number of times the lamp has been struck. Press to bring up Reset Lamp Hours Yes/No options.
+ **Lamp Power** - displays lamp power status as a percentage.
+ **Maximum Power** - sets maximum lamp wattage. Press to bring up Max Lamp Power options.
+ **Temp** - displays temperatures in Celsius and Fahrenheit. The temperature is shown in white if under limit, yellow at 87°C, and red at 95°C. At 105°C the lamp will douse.
+ **Fans** - displays fan status as OK if fan is running, ERR (red) if fan is not running, or OFF (gray) if shut off due to extended idle period.

Press (X) to return to Home Screen.

Configuration Screen

+ **DMX Address** - displays current DMX512 address. Press to bring up numeric keypad for inputing the address.
+ **Display** - configures display direction of the Menu Touchscreen. Press to bring up Auto/Up/Down options.
+ **Universe** - displays current universe. Press to bring up alpha keypad or numeric keypad (based on universe format selection).
+ **Universe Format** - displays alpha/numeric universe format. Press to bring up Alpha/Numeric options.
+ **Edge Setting** - displays the current near/far edge setting. (Near = Near Focal Plane, Far = Far Focal Plane.) Press to bring up Near or Far options.
+ **Pan/Tilt** - displays summary of pan/tilt settings:
  swap = pan/tilt is swapped.
  invert = pan or tilt is inverted.
  free = "free" control is enabled (for operating fixture as a follow spot).
  Press to bring up Pan/Tilt Screen.
+ **Reset Defaults** - resets all configuration settings and address to default values. Press to bring up "Reset All Defaults" Yes/No options. Default settings are as follows:

  - Address: 001
  - Universe: A
  - Universe Setting: alpha
  - Comm Fade Out: no fade
  - Lamp Power Up: wait
  - Max Lamp Power: 1620
  - P/T: standard (not inverted, swapped, or free)
  - Display: auto
  - Edge: near

Press (X) to return to Home Screen.

Pan/Tilt Screen

- **Invert Pan / Invert Tilt** - displays current invert settings. Press to bring up Invert Yes/No options. When inverted, pan/tilt will move in the opposite direction.
- **Swap** - displays current swap setting. Press to bring up Swap Pan/Tilt Yes/No options. When swapped, the pan channel will control tilt and vice versa.
- **Free Mode: Pan & Tilt** - displays the current Free Mode setting. (Free Mode allows the luminaire to be used as a follow spot.) Press to bring up options: None, Pan, Tilt, or Both.

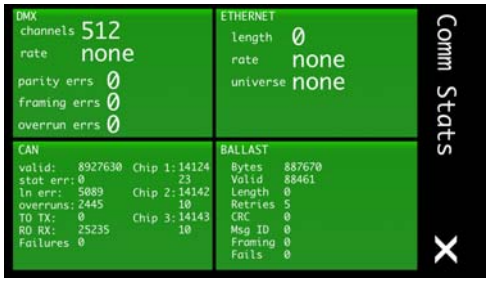
Once configured, any Pan/Tilt settings will be displayed in the CONFIG panel of the Home screen as shown in the example to the right.

The Pan/Tilt settings will be retained even if the luminaire is powered off.

Press (X) to return to Lamp Screen.

Communication Screen

- **Control** - displays current DMX512 control values. Values will be highlighted in green when changing.
- **Info** - displays current source (DMX512 or Art-Net/Ethernet), number of bytes in the frame, update rate, and universe number (if Art-Net). Press INFO to bring up the Comm Stats screen.
- **Comm Loss** - configures how long to wait before the fixture fades to black upon loss of comm data. Press COMM LOSS to bring up "Set Trigger Fade After" option. Set to No Fade, 30 Seconds or 60 Seconds. (Also refer to "Configuring Comm Loss Setting" on page 27.)



Press (X) to return to Home Screen.

Status Screen

- **Mechanisms** - displays mechanism status. Mechanism names will be shown in yellow while calibrating, then change to green if okay or red if an error exists. Locked mechanisms will be shown in white. Press to bring up Test Screen.
- **Log** - displays system status log. The log entries are stored in persistent memory and are retained through power down. Use touchscreen arrows to scroll up or down. Press CLR to bring up Clear Log Yes/No options. Press the LOG panel itself to scroll directly to the bottom, displaying the most recent log entries.

The log entries are stored in persistent memory and are retained even if the luminaire is powered off.

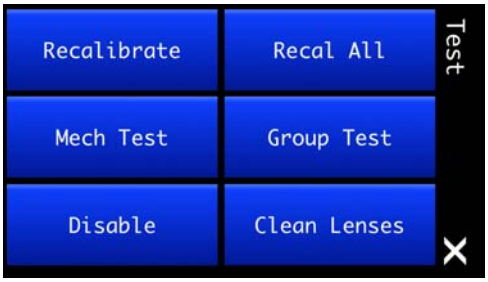
Press (X) to return to Home Screen.

Information Screen

+ **Fixture Hours** - displays total number of hours that the fixture has been operated.
+ **Run Time** - displays current run time in *hours:minutes* format.
+ **Software Version** - displays current version of operating software and boot.
+ **Firmware Version** - displays current firmware version of Head and Yoke controllers.
+ **Crossload** - allows the luminaire to send its software version out over the DMX512 and Ethernet lines to other connected luminaires in the daisy-chain. (See "Software Crossload" on page 56 for more explanation of this function.)

Press (X) to return to Home Screen.

Test Screen



+ **Recalibrate** - press to bring up Recalibration Screen. (During recalibration, intensity goes out until all mechanism calibrations are complete and back in position, then fades in.)
+ **Recal All** - press to bring up Recalibrate All Yes/No options.
+ **Mech Test** - press to bring up Mechanical Tests Screen. (See "Mechanical Tests" on page 53 for more explanation.)
+ **Group Test** - press to bring up Group Tests screen, which allows multiple luminaires to be run through a configurable test sequence when chained together via DMX512 or Ethernet. (See "Group Tests" on page 54 for more explanation.)
+ **Disable** - press to bring up Disable Screen, which allows specific mechanisms to be disabled during testing. Disabled mechanisms are automatically re-enabled after a power cycle.
+ **Clean Lenses** - press to bring up Cleaning Lenses screen. This feature will position lenses so that all surfaces may be cleaned with a cloth. (Note that pressing the buttons does not actually clean the lenses.)

Press (X) to return to Home Screen.

Test Sub-Menu Screens

Recalibrate Screens - Specifies a specific mechanism for recalibration.

Disable Screen - Specifies mechanisms to be excluded from tests.

Group Tests Screen - Allows multiple luminaires to be tested when daisy-chained together.

Mechanical Tests Screen - Specifies mechanisms to be tested.

DMX512 OPERATION

DMX Channel Mapping

Table 3-1: Best Boy Wash DMX Channel Mapping

Channel	Function	Description	8-Bit	16-Bit
1	**INTENSITY**	Intensity Adjustment	home: 0	
		Out	0	
		Full	255	
2	**PAN**	Pan linear coarse adjustment	home: 127	32768
		0°	0	
		615°	255	
3	Pan Fine	Pan fine adjustment	home: 0	
4	**TILT**	Tilt linear coarse adjustment	home: 127	32768
		0°	0	
		260°	255	
5	Tilt Fine	Tilt fine adjustment	home: 0	
6	**CYAN**	Cyan Color Mix	home: 0	
	Mix	[Mode: Continuous]	0-255	
		Open	0	
		Full	255	
	Wheel Spin	[Mode: Spin]	0-255	
		Clockwise	0-126	
		Fast	0	
		Slow	126	
		Stop	127-128	
		Counter-Clockwise	129-255	
		Slow	129	
		Fast	255	
7	**YELLOW**	Yellow Color Mix	home: 0	
	Mix	[Mode: Continuous]	0-255	
		Open	0	
		Full	255	
	Wheel Spin	[Mode: Spin]	0-255	
		Clockwise	0-126	
		Fast	0	
		Slow	126	
		Stop	127-128	
		Counter-Clockwise	129-255	
		Slow	129	
		Fast	255	
8	**MAGENTA**	Magenta Color Mix	home: 0	
	Mix	[Mode: Continuous]	0-255	
		Open	0	
		Full	255	
	Wheel Spin	[Mode: Spin]	0-255	

Table 3-1: Best Boy Wash DMX Channel Mapping (Continued)

Channel	Function	Description	8-Bit	16-Bit
		Clockwise	0-126	
		Fast	0	
		Slow	126	
		Stop	127-128	
		Counter-Clockwise	129-255	
		Slow	129	
		Fast	255	
9	**COLOR MIX CONTROL**	Sets color mix control mode	home: 0	
		Continuous	0-9	
		Spin Cyan	10-19	
		Spin Yellow	20-29	
		Spin Magenta	30-39	
		Spin ALL mixers	40-49	
		Reserved	50-255	
10	**COLOR TEMPERATURE**	Linear color temperature adjustment	home: 64	
		8000K	0	
		Open	64	
		4500K	128	
		3800K	191	
		2900K	255	
11	**COLOR**	Color Wheel Choice	home: 0	
	Color Choice	[Mode: Continuous, Discrete, Strobe]	0-255	
		Open	0	
		Open / Color 1	21	
		Color 1	43	
		Color 1 / Color 2	64	
		Color 2	86	
		Color 2 / Color 3	107	
		Color 3	129	
		Color 3 / Color 4	150	
		Color 4	172	
		Color 4 / Color 5	193	
		Color 5	215	
		Color 5 / Open	236	
		Open	255	
	Wheel Spin	[Mode: Spin]	0-255	
		Clockwise	0-126	
		Fast	0	
		Slow	126	
		Stop	127-128	
		Counter-Clockwise	129-255	
		Slow	129	
		Fast	255	

Table 3-1: Best Boy Wash DMX Channel Mapping (Continued)

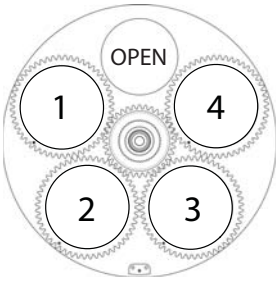
Channel	Function	Description	8-Bit	16-Bit
12	**COLOR CONTROL**	Sets Designer Wheel control mode	home: 0	
		Continuous	0-9	
		Discrete	10-19	
		Spin	20-39	
		Strobe Random - Slow	40-43	
		Strobe Random - Medium	44-46	
		Strobe Random - Fast	47-49	
		Linear Strobe Rate	50-255	
		Slow	50	
		Fast	255	
13	**GOBO**	Gobo Choice / Modifier	home: 0	
		*Discrete Choice*	0-49	
		Open	0-9	
		Gobo 1	10-19	
		Gobo 2	20-29	
		Gobo 3	30-39	
		Gobo 4	40-49	
		Wheel Spin	50-255	
		Clockwise	50-150	
		Fast	50	
		Slow	150	
		Stop	151-153	
		Counter-Clockwise	154-255	
		Slow	154	
		Fast	255	
14	**GOBO INDEX**	Gobo Index Modifier	home: 96	24575
		Index Position	0-191	0-49151
		0°	0	0
		180°	96	24575
		360°	191	49151
		Index Rotation	192-255	49152-65535
		Clockwise	192-222	49152-57087
		Fast	192	49152
		Slow	222	57087
		Stop	223-224	57088-57599
		Counter-Clockwise	225-255	57600-65535
		Slow	225	57600
		Fast	255	65535
15	Gobo Index Fine	Gobo Index fine adjustment	home: 0	
16	**ZOOM**	Zoom coarse adjustment	home: 94	home: 24064
		10° (narrow)	0	0
		60° (wide)	255	65535
17	Zoom Fine	Zoom fine adjustment	home: 0	

Table 3-1: Best Boy Wash DMX Channel Mapping (Continued)

Channel	Function	Description	8-Bit	16-Bit
18	**BEAM IRIS**	Iris control	home: 255	
		Small	0	
		Large	255	
19	**STROBE**	Strobe adjustment	home: 0	
		Open	0-9	
		Closed	10-19	
		Pulse Clockwise	20-39	
		Fast	20	
		Slow	39	
		Pulse Counter-Clockwise	40-59	
		Slow	40	
		Fast	59	
		Ceiling Fan Clockwise	60-79	
		Fast	60	
		Slow	79	
		Ceiling Fan Counter-Clockwise	80-99	
		Slow	80	
		Fast	99	
		Slow Random	100-102	
		Medium Random	103-106	
		Fast Random	107-109	
		Speed	110-255	
		Slow	110	
		Fast	255	
20	**MACRO**	Macro Control	home: 0	
	Macro control overrides the DMX control for that parameter.	None	0	
		Iris - square wave	1	
		Iris - sine wave	2	
		Iris - sawtooth	3	
		Iris - reverse sawtooth	4	
		Iris close	5	
		Iris open	6	
		Zoom/Iris close	7	
		Zoom/Iris open	8	
		Zoom Sine Wave	9	
		Zoom Sawtooth	10	
		Zoom Reverse Sawtooth	11	
21	**MACRO SPEED**	Macro Speed control	home: 0	
		Speed Range	0-246	
		Slow	0	
		Fast	246	
		Random Speed - Slow Rate	247-249	
		Random Speed - Medium Rate	250-252	
		Random Speed - Fast Rate	253-255	

Table 3-1: Best Boy Wash DMX Channel Mapping (Continued)

Channel	Function	Description	8-Bit	16-Bit
22	FOCUS TIME	Refer to "Timing Channels" on page 42	home: 255	
23	COLOR TIME		home: 255	
24	IMAGE TIME		home: 255	
25	BEAM TIME		home: 255	
26	CONTROL	Control Channels	home: 0	
	All values must be held for a minimum of 3 seconds to take effect.	Idle	0	
		Recalibrate: All	10	
		Recalibrate: Mechanisms with Errors	11	
		Recalibrate: Zoom	12	
		Recalibrate: Color	14	
		Recalibrate: Gobo Wheel	16	
		Recalibrate: Dimmer/Strobe/Iris	18	
		Recalibrate: Pan/Tilt	19	
		Lamp: Douse	20	
		Lamp: Start	30	
		Lamp Power Limit: Full	40	
		Lamp Power Limit: Mid	45	
		Lamp Power Limit: Low	50	
		Edge: Near Focal Plane	78	
		Edge: Far Focal Plane	79	
		Gobo: Set Zero Position	80	
		Display: Turn Backlight On	90	
		Display: Turn Backlight Off	95	
		Pan/Tilt: Free Motion On	108	
		Pan/Tilt: Free Motion Off	112	
		No Fade Out	114	
		Fade Out After 30s	116	
		Fade Out After 60s	118	
		Clear Logs	120	
		Invert Pan On	122	
		Invert Pan Off	124	
		Invert Tilt On	126	
		Invert Tilt Off	128	
		Swap Pan/Tilt On	130	
		Swap Pan/Tilt Off	132	

Special Notes

Macros

The Best Boy Wash Luminaire offers 11 pre-defined sequences, called Macros, which allow for quick and easy control of luminaire functions such as iris, zoom, framing, and more. Macro control overrides the DMX control for that parameter. For example, if an iris macro is running, then the DMX control for iris will not have any effect. Some macros also control multiple functions.

Gobo: Set Zero Position

Set Zero Position allows adjustment of the gobo wheel home position. Refer to "Gobo Set Zero Position" on page 46.

Timing Channels

Channel Functions

Timing channel control improves the timed moves of certain groups of parameters. Four timing channels are provided for this purpose: Focus, Color, Beam, and Image.

Timing channels support time values of up to six minutes.

Table 3-2: Timing Channel Allocations

Channel Function	Timing Channel
Pan	Focus
Tilt	
Cyan	Color
Yellow	
Magenta	
Color Wheel	
Zoom	Beam
Iris	
Rotating Gobo Wheel	Image
Gobo Index	

Timing Channel Mapping

Refer to the **Timing Channels Table** starting on the next page. The following guidelines apply:

+ A timing value of zero is full speed.
+ A time value of 100% (or 255 in DMX) causes the associated parameter(s) to follow cue fade time (console time) rather than the timing channel.
+ Timing channels can be set in either % or 0-255 (DMX) modes, with the values assigned - as shown in the tables.

Table 3-3: Timing Channels

% Value	DMX	= Seconds
	0	Full Speed
	1	0.2
	2	0.4
1	3	0.6
	4	0.8
2	5	1
	6	1.2
	7	1.4
3	8	1.6
	9	1.8
4	10	2
	11	2.2
	12	2.4
5	13	2.6
	14	2.8
6	15	3
	16	3.2
	17	3.4
7	18	3.6
	19	3.8
8	20	4
	21	4.2
	22	4.4
9	23	4.6
	24	4.8
10	25	5
	26	5.2
	27	5.4
11	28	5.6
	29	5.8
	30	6
12	31	6.2
	32	6.4
13	33	6.6
	34	6.8
	35	7.0
14	36	7.2
	37	7.4
15	38	7.6
	39	7.8
	40	8
16	41	8.2
	42	8.4
17	43	8.6
	44	8.8
	45	9
18	46	9.2
	47	9.4
19	48	9.6
	49	9.8
	50	10
20	51	10.2

Table 3-3: Timing Channels (Continued)

% Value	DMX	= Seconds
	52	10.4
	53	10.6
21	54	11
	55	11
22	56	12
	57	12
	58	13
23	59	13
	60	14
24	61	14
	62	14
	63	15
25	64	15
	65	16
26	66	16
	67	16
	68	17
27	69	17
	70	18
28	71	18
	72	18
	73	19
29	74	19
	75	20
30	76	20
	77	20
	78	21
31	79	21
	80	21
	81	22
32	82	22
	83	23
33	84	23
	85	23
	86	24
34	87	24
	88	25
35	89	25
	90	25
	91	26
36	92	26
	93	27
37	94	27
	95	27
	96	28
38	97	28
	98	29
39	99	29
	100	29
	101	30
40	102	30
	103	30
	104	31

Table 3-3: Timing Channels (Continued)

% Value	DMX	= Seconds
41	105	31
	106	32
42	107	32
	108	32
	109	33
43	110	33
	111	34
44	112	34
	113	34
	114	35
45	115	35
	116	36
46	117	36
	118	36
	119	37
47	120	37
	121	38
48	122	38
	123	38
	124	39
49	125	39
	126	39
	127	40
50	128	40
	129	41
51	130	41
	131	41
	132	42
52	133	42
	134	43
53	135	43
	136	43
	137	44
54	138	44
	139	45
55	140	45
	141	45
	142	46
56	143	46
	144	47
57	145	47
	146	47
	147	48
58	148	48
	149	49
59	150	49
	151	49
	152	50
60	153	50
	154	50
	155	51
61	156	51
	157	52

Table 3-3: Timing Channels (Continued)

% Value	DMX	= Seconds
62	158	52
	159	52
	160	53
63	161	53
	162	54
64	163	54
	164	54
	165	55
65	166	55
	167	56
66	168	56
	169	56
	170	57
67	171	57
	172	58
68	173	58
	174	58
	175	59
69	176	59
	177	59
	178	60
70	179	60
	180	65
71	181	65
	182	65
	183	70
72	184	70
	185	75
73	186	75
	187	75
	188	80
74	189	80
	190	85
75	191	85
	192	85
	193	90
76	194	90
	195	95
77	196	95
	197	95
	198	100
78	199	100
	200	110
79	201	110
	202	110
	203	120
80	204	120
	205	120
81	206	130
	207	130
	208	140
82	209	140
	210	140

Table 3-3: Timing Channels (Continued)

% Value	DMX	= Seconds
	211	150
83	212	150
	213	160
84	214	160
	215	160
	216	170
85	217	170
	218	180
86	219	180
	220	180
	221	190
87	222	190
	223	200
88	224	200
	225	200
	226	210
89	227	210
	228	210
	229	220
90	230	220
	231	230
91	232	230
	233	230
	234	240
92	235	240
	236	250
93	237	250
	238	250
	239	260
94	240	260
	241	270
95	242	270
	243	270
	244	280
96	245	280
	246	290
97	247	290
	248	290
	249	300
98	250	300
	251	310
99	252	310
	253	310
	254	310
100	255	Follows Cue Data

Gobo Set Zero Position

The Gobo Set Zero command allows adjustment of the gobo wheel's home position. When this command is issued, the luminaire sets the current wheel position as the "zero" position and stores this offset so it will be retained at the next startup. This allows correction for a sensor that may be slightly out of position causing the gobo wheel to not be perfectly centered and therefore obstructing part of the beam in the open position.

To set zero position:

Step 1. Using console, move wheel into desired center position.

Step 2. Execute Set Zero Position command (Control Channel DMX value 80). The luminaire will now remember the setting as the new zero position.

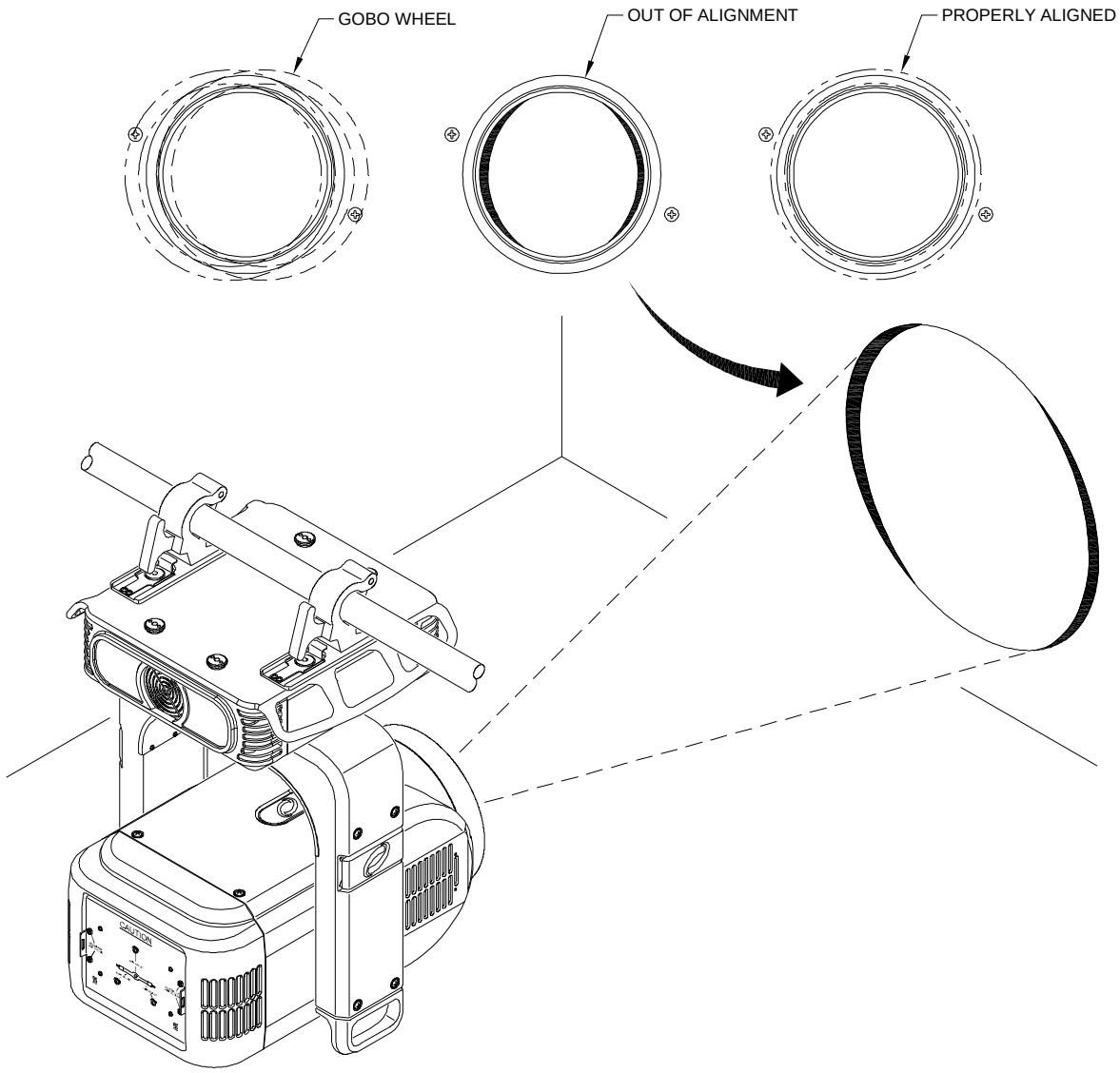


Figure 3-4: Gobo Alignment

4.

TROUBLESHOOTING AND MAINTENANCE

This chapter provides a basic troubleshooting guide, along with procedures for testing, proper handling, and routine maintenance.

+ TROUBLESHOOTING
+ TESTING
+ SOFTWARE UPDATE
+ EQUIPMENT HANDLING
+ ROUTINE MAINTENANCE

TROUBLESHOOTING

Troubleshooting Guide

The following table provides a list of common start-up problems and possible solutions.

Symptom	Solution(s)	Refer to...
No power to luminaire.	Ensure power cable is properly connected to Neutrik input connector.	page 10
	Ensure power is switched on at source (mains, disconnect box, etc.)	n/a
No console control.	Ensure DMX512 or Ethernet data cable is properly connected.	page 20
	Ensure DMX512 address setting is correct.	page 24
DMX512 control not working correctly throughout daisy-chain.	Ensure data cables are correctly configured.	page 20
	Ensure termination connector is installed at last luminaire in data link.	page 12
Lamp does not strike at power-up.	Configure lamp to start at power-up.	page 33
Comm LED is red indicating that no valid DMX or Ethernet signal is detected.	Ensure DMX512 or Ethernet data cable is properly connected. Check console.	page 20
No Ethernet control.	Ensure that luminaire is not also receiving a DMX signal. If both valid DMX and Ethernet control are being received, DMX control will take precedence.	page 23
Beam obstructed by gobo in open position.	Set new gobo zero position.	page 46
Luminaire won't take software update.	Remove active control (DMX512 or Art-Net).	page 56
Comm LED flashing red or green.	Indicates an internal error on the fixture. Check Status screen to isolate.	page 49

Errors

Status Indications

The STATUS panel at the Home screen will report overall luminaire conditions as follows:

+ CALIBRATION (yellow)
+ OK (green)
+ ERROR (red)
+ LOCKED (white)

Pressing the STATUS panel will bring up a detailed Status screen as shown below:

The Status screen will indicate which specific mechanisms, if any, have errors. It also provides a log of system activity. The Status screen operates as follows:

+ **Mechanisms** - displays mechanism status. Mechanism names will be shown in yellow during calibration, green if okay, and red if an error exists. If an error exists, press the Mechanisms panel to bring up the Recalibration screen. Try recalibrating the mechanism(s) that is reporting the error.
+ **Log** - displays system status log. Use touchscreen arrows to scroll up or down. Press the log panel itself to scroll all the way back to the most recent log entries. Press CLR to bring up Clear Log Yes/No options.

Comm LED

In the case of a mechanism error, the Comm LED on the input panel will flash either red or green (depending on the comm state).

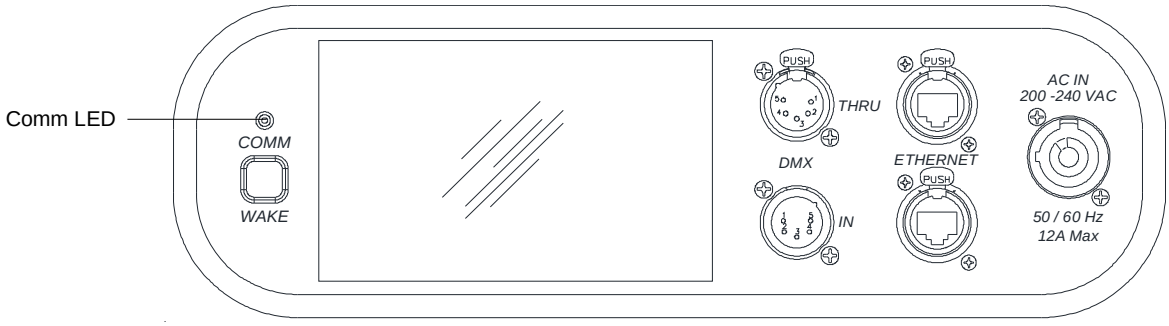


Figure 4-1: Comm LED

Mechanism Errors

Errors will be shown after the mechanism code, for example: PAN:Comm Error.

Error Code	Explanation	Solution
Cal Error	Error resetting position values in motion processor at beginning of calibration	Check CAN cables/connections, motor control board
Cal Timeout	An action during calibration took longer than expected	Check CAN cables/connections, motor control board
Comm Error	Error communicating with motion processor	Check CAN cables/connections, motor control board
Get Position Error	Error when retrieving current position from motion processor	Check CAN cables/connections, motor control board
Init Error	Error during initialization of motion processor	Check CAN cables/connections, motor control board
Motion Error	Mechanism's actual position is too far from its commanded position	Check mechanism motion
No Sensor	During calibration, no sensor was found in the range of travel	Check for mechanism motion, sensor operation
No Stop	Mechanism which calibrates to a physical stop did not find that stop	Check mechanism
Sensor Stuck	During calibration, could not find either edge of the sensor or the sensor did not turn off as expected	Check for mechanism motion, sensor operation
Spin Error	Error while sending spin command to motion processor	Check CAN cables/connections, motor control board
Stop Spin Error	Error while sending stop spin command to motion processor	Check CAN cables/connections, motor control board

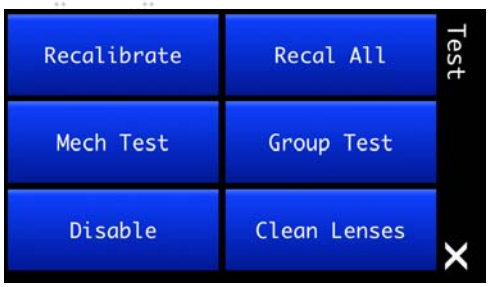
Other Errors

Error Code	Explanation	Solution
Ballast Errors: Parity, Overrun, Bad Header, Msg Too Long	Various ballast errors	Check ballast comm cable/connections
Ballast Heat Sink Over Temp	Ballast too hot	Check fans
Ballast Lamp EOL H/L Voltage Limit	Lamp life limit exceeded	Check lamp
Ballast Line Voltage Low	Wrong voltage to strike	Check power connection
Ballast Short Detected	Short circuit on ballast output	Check wiring
Ballast Timeout: Lamp Strike	Lamp failed to strike	Check igniter, lamp
CAN Comm Error	Stopped receiving CAN messages from motion processor	Check CAN cables/connections, motor control board
Crossload Timeout	Crossload execution took too long due to error	Remove any incoming DMX, retry
Current Foldback Error	Short in the drive circuitry or an electrical problem with motor	Check motor, motor cabling
Data Not Crossload Format	Data in memory is not proper format for crossload	Load software via computer
DMX Busy: Cancel Crossload	Cannot execute crossload with traffic on DMX line	Remove incoming DMX control for cross load
DMX: UART transmit error	Transmit buffer busy when trying to send	Remove any incoming DMX, retry
Drive Fault	Fault detected in a drive mechanism	Check mechanism
Fan Error	Fan not running properly	Check fan, fan cabling
Gobo Out of Zero Range	When zeroing gobo wheels, the wheel is too far away from zero to set the position	Move wheel closer to home position before zero command
Lamp EOL Voltage Limit	Lamp at end of life	Check and replace lamp
Lamp Off	Fan Error: Cannot strike lamp while any fan is in error state	Check fan, fan cabling
Lamp Off: Over Temperature	Head temperature too high	Check fans
Lamp Over Threshold	Lamp hours above recommended maximum	Change lamp
No Current Cal Values	Channel had trouble retrieving calibration values for motor channel	Check CAN cables/connections, motor control board
PMD Motion Error	Mechanism's actual position is too far from its commanded position	Check mechanism motion
Temp Over Threshold	Temperature too high	Check fans/filters

TESTING

Test Screen

The Test menu provides options for using the luminaire's self-test features.



+ **Recalibrate** - press to bring up Recalibration Screen. (During recalibration, intensity goes out until all mechanism calibrations are complete and back in position, then fades in.)
+ **Recal All** - press to bring up Recalibrate All Yes/No options.
+ **Mech Test** - press to bring up Mechanical Tests Screen. (See "Mechanical Tests" on page 53 for more explanation.)
+ **Group Test** - press to bring up Group Tests screen, which allows multiple luminaires to be run through a configurable test sequence when chained together via DMX512 or Ethernet. (See "Group Tests" on page 54 for more explanation.)
+ **Disable** - press to bring up Disable Screen, which allows specific mechanisms to be disabled during testing.
+ **Clean Lenses** - press to bring up Cleaning Lenses screen. This feature will position lenses so that all surfaces may be cleaned with a cloth. (Note that pressing the buttons does not actually clean the lenses.)

Test Sub-Menu Screens

Recalibrate Screens - Specifies a specific mechanism for recalibration.

Disable Screen - Specifies mechanisms to be excluded from tests.

Group Tests Screen - Allows multiple luminaires to be tested when daisy-chained together.

Mechanical Tests Screen - Specifies mechanisms to be tested.

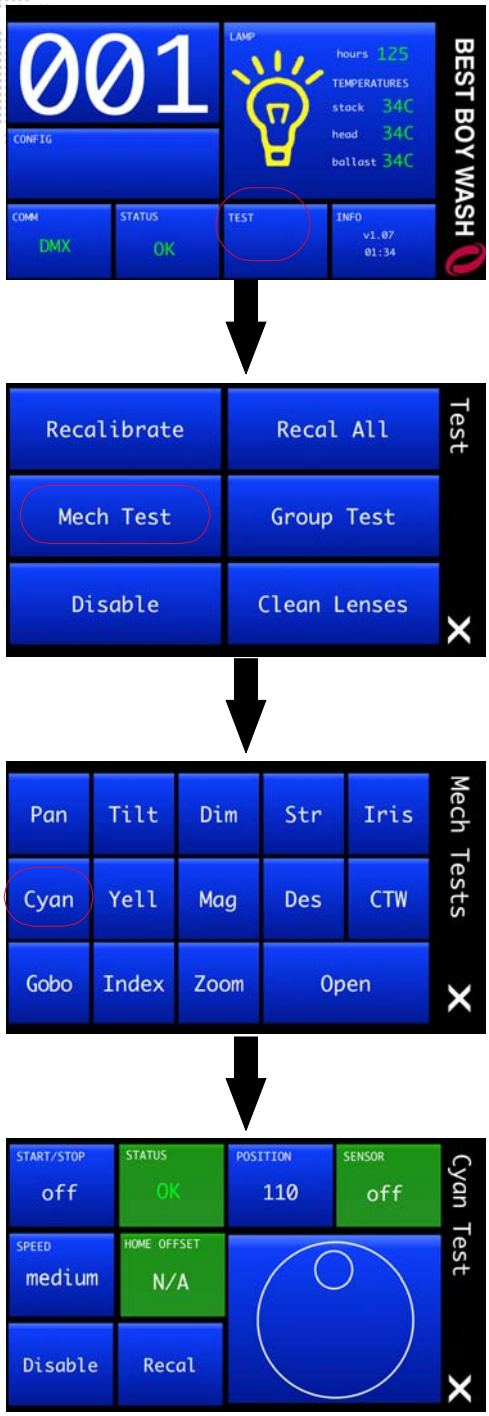
Mechanical Tests

The Mechanical Tests menu provides a method for exercising all luminaire mechanisms individually. Each mechanism has a similar Test screen. Cyan is shown in the example to the right.

The following test functions are available:

- **Test Chase** - The mechanism will move back and forth between two positions. The START/STOP button starts and stops the motion, and the SPEED button sets the rate of the motion. For mechanisms with sensors, one of the positions will be on the sensor and the other position will be off.
- **Manual Control** - The virtual knob on the right side of the screen moves the mechanism through its range of travel, manually.
- **Manual Position Entry** - Press POSITION to enter a value for the mechanism's position.
- **Feedback** -The current status of the mechanisms encoder (POSITION) and sensor (SENSOR) are shown (if available for that mechanism). STATUS indicates whether the mechanism is in an error state or normal operating state.
- **Utility Functions** - Press **Recalibrate** to recalibrate the mechanism or **Disable** to turn off the motor control to allow the mechanism to move freely.
- **Configuration Information** - HOME OFFSET indicates whether the home position* has been adjusted to fine tune sensor positions (applies to gobo wheel only; refer to Control Channel settings in "DMX Channel Mapping" on page 37).

* Due to small variations in sensor and sensor board positions, the open position on a gobo wheel might not be precisely aligned with the optical axis, creating a slight blockage on one side of the open beam. Adjust the wheel position via DMX to get the proper alignment and send the HOME OFFSET command to store the current position as the new "home" position. This position is stored in persistent memory and will be used going forward as the home position.



Group Tests

The Group Test menu allows multiple Best Boy Wash Luminaires to be run through a configurable test sequence when chained together via DMX512 or Ethernet. (Refer to "Connecting Power and Data" on page 20 for more information about daisy-chaining.)

To perform a group test:

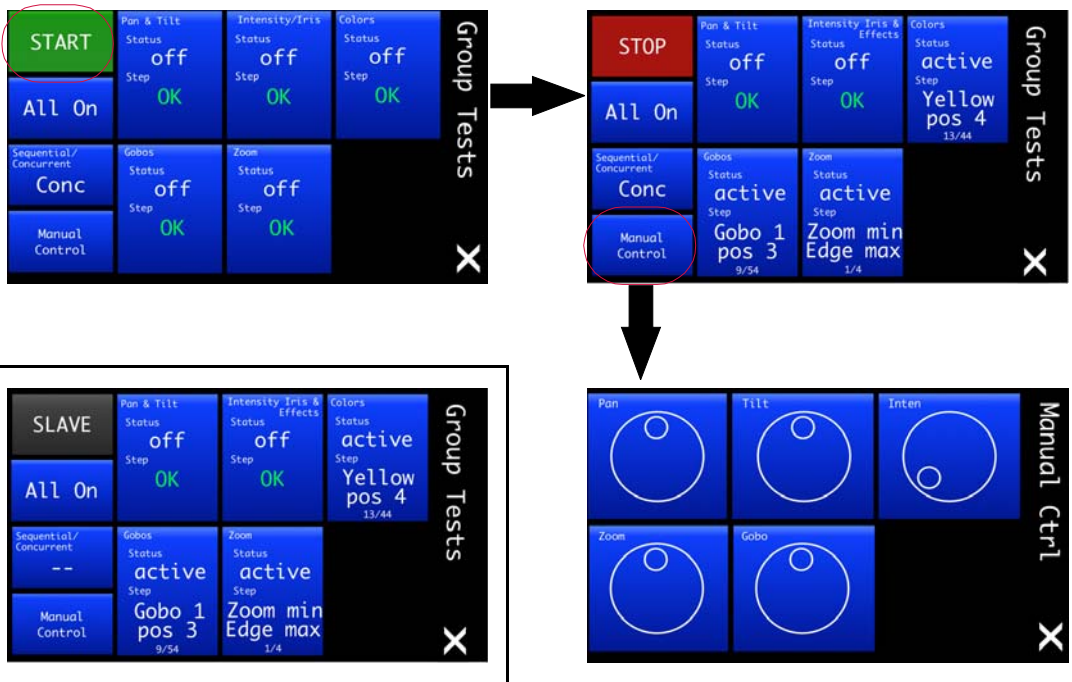
Step 1. At Group Test screen, select options to run: Pan/Tilt, Intensity, Colors, Gobos, and or Zoom.

Step 2. Select test option: Concurrently (all selected tests are run at once) or Sequentially (tests are run one at a time as each one finishes).

Step 3. Press START to begin testing. All luminaires connected to the main fixture (now referred to as the "Master") will become "Slaves" and follow the test routine set on the Master in an endless loop.

Step 4. To stop the test sequence, press STOP on the Master.

While in group test, a Master can manually change certain values by using the Manual Control screen. From here, parameters that are not active in the test sequence can be adjusted. For example, if a test were running on gobos and colors, it is possible to adjust the pan and tilt to point the Master and all Slaves to a position where it will be easier see the output of the fixtures.



Slave fixtures will display "SLAVE" in the Group Tests screen as shown.

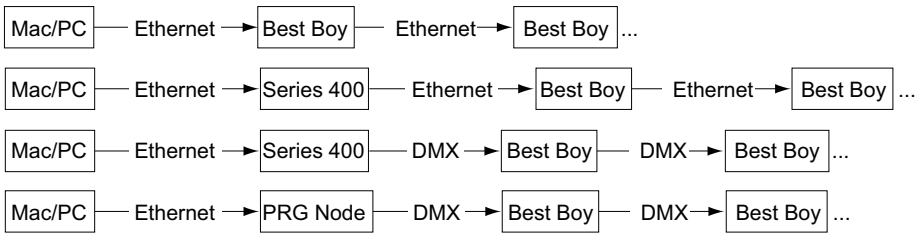
SOFTWARE UPDATE

Software Update Using LumLoader Application

Introduction

The LumLoader application allows you to update the software in a Best Boy Wash Luminaire. The update will be sent over an Ethernet connection. The luminaire can take the Ethernet input directly, or the update can be translated to DMX512 signal with an appropriate device, either Series 400® or a PRG Node (with the required software update). The fixtures can be daisy-chained to load multiple fixtures at once.

Supported configurations:



Note: There should be no active control (DMX512 or Ethernet) during the update process.

Preparation - Java

The loader (LumLoader) is a Java application which can be run on a Mac or a PC computer.

Note: Microsoft Windows® and new Mac computers do not come with the required Java run-time library installed, so you may need to go to the Sun website (java.com/getjava/) to download Java.

Selecting an Ethernet Interface

Connect the computer to the system, and start the LumLoader application. When the application starts, it will ask which active Ethernet port should be used. Select the appropriate port. You may be able to differentiate the ports by IP address, compared with your network setup. Typically the en0 is the first built-in Ethernet port, and other interfaces could include additional network ports or wireless adapters.

Selecting the Module

The loader can support multiple versions of software, so make sure the appropriate version is selected. The default version will typically be fine.

Download the Software

Press "Start Download" to initiate the update. You should see the luminaires immediately drop into the startup screen and erase flash, which takes about 30 seconds. Then the new module is sent out, the screen indicates "Loading", and when complete they will go back to the main menu and start calibration.

If the fixture already has the update software version, it will not attempt the update.

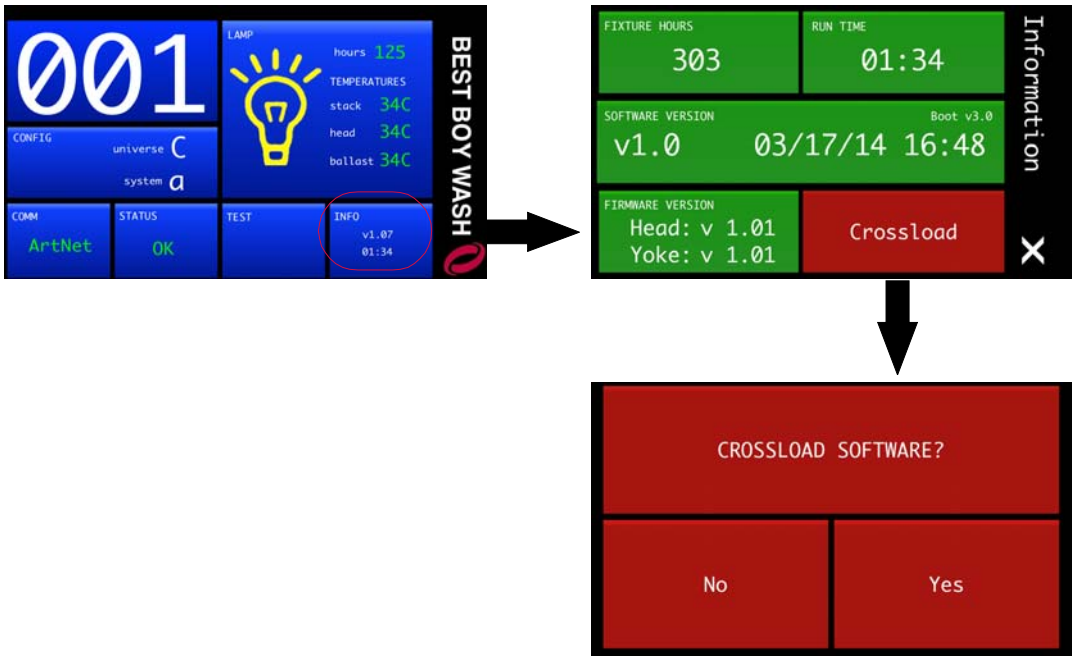
Troubleshooting

- If the LumLoader application does not start up, make sure the Java library is installed.
- Make sure the network port is active before starting the application. Sometimes it takes several seconds for the operating system to recognize the network link.
- Make sure there is only one instance of the LumLoader application running.
- Wireless should be disabled on the computer.

Software Crossload

The Information menu provides a method for sending a luminaire's current software version to all connected luminaires. (Luminaires can be daisy-chained via DMX512 or Ethernet.)

To initiate the software crossload, press **Crossload Software** at the Information screen. At confirmation screen, press "Yes." If a connected luminaire already has that software version, it will do nothing. If it does not have the same version, it will go into the boot screen and start updating.



Note: There should be no active control (DMX512 or Ethernet) during the update process.

EQUIPMENT HANDLING

Proper Lamp Servicing and Operation

Servicing

+ When handling a lamp, hold it by the metal ends while wearing cotton gloves or finger cots. Do not touch the glass envelope (bulb). If you touch the glass with bare fingers, wipe off any fingerprints with alcohol.

Heat

+ When lamps are lit, the interior of the luminaires becomes very hot. To aid in the airflow circulation within the luminaires, after dousing the lamps, wait 5 minutes before removing power to the luminaires. This will provide enough time for the equipment fan to cool off the unit.

Lamp Life

+ When operating arc lamps, allow luminaires to operate for at least 3 minutes. It takes about 3 minutes for the fill components (mercury and halogen-metal compounds) in the lamp tubes to vaporize completely. If the lamps are switched off earlier than 3 minutes, the fill components are partially vaporized. The inadequately vaporized fill components and the electrode material (tungsten) are deposited in the areas of the lamp tubes that have remained cool. As a result, the lamp tubes blacken prematurely and reduce the service lives of the lamps.
+ If system will be unattended for more than 3-4 hours, luminaire lamps should be doused.
+ The lamp indicator (available on the menu Home screen) displays total lamp hours. Lamp hours are shown in green if under threshold, yellow at 650 hours, and red at 750 hours. *It is mandatory that the lamp be changed before 750 hours.*

CAUTION: It is mandatory that the lamp be changed before 750 hours.

ROUTINE MAINTENANCE

Replacing Lamp

Parts:

71.2550.1500 / 2.3749H-03 1 EA LAMP, HTI 1500W/D7/60 OSRAM

Tools:

Cotton gloves or finger cots
Alcohol wipe (supplied with new lamp)

WARNING: Remove power from luminaire before performing any maintenance procedures.

CAUTION: Refer to "Proper Lamp Servicing and Operation" on page 57 before handling the lamp.

CAUTION: Wear cotton gloves or finger cots while servicing lamp. Touching the lamp glass with bare fingers will leave oil and cause the lamp to explode or burn out early. Clean with alcohol wipe after installing.

To replace lamp:

Step 1. If luminaire is powered-up, douse lamp and allow fans to run for at least 5 minutes.
Step 2. Remove power from luminaire.
Step 3. At lamp access door, loosen four captive screws (two on each side). Refer to **Figure 4-2** on next page.
Step 4. Pull lamp box out of head assembly and rotate 90 degrees to access lamp.
Step 5. Grasp lamp at metal ends and carefully remove from lamp box.
Step 6. While holding new lamp at metal ends, install lamp so that nipple faces rear of luminaire (towards reflector).
Step 7. Ensure lamp base is fully seated so that it touches contacts on both ends of socket.
Step 8. Using supplied alcohol wipe, carefully - but thoroughly - clean glass bulb.
Step 9. Re-insert lamp box into head and tighten four captive screws.
Step 10. Reset Lamp Hours. (Refer to "Lamp Screen" on page 33.)
Step 11. Optimize lamp. (Refer to "Adjusting Lamp" on page 60.)

CAUTION: Allow lamp to cool before servicing.

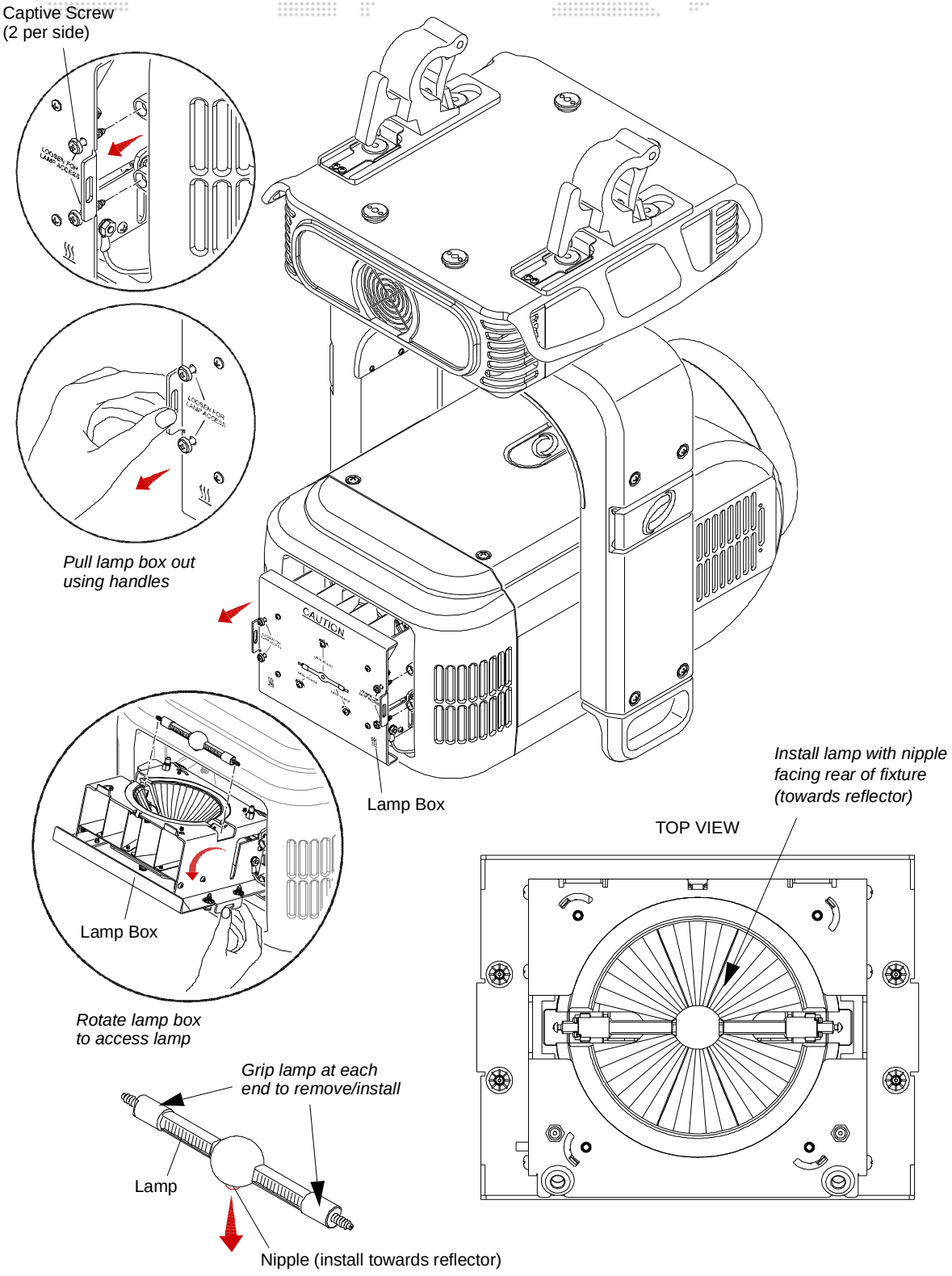


Figure 4-2: Replacing the Lamp

Adjusting Lamp

After a new lamp is installed, the lamp must be aligned to optimize the beam. Adjustment controls are located on the backcap.

Tools:

#2 Phillips screwdriver

optional: 5/16"-1/2" telescoping gauge (http://www.mcmaster.com/#inside-micrometers/=r6gx02 - item # 2081A6)

WARNING: Backcap may be HOT during lamp operation.

To adjust lamp:

Step 1. Power up luminaire and allow to warm up for at least ten minutes.

Step 2. Set intensity to 100%.

Step 3. Position beam on a white wall at a distance of 10' to 20'.

Step 4. At backcap, use three adjustment screws to optimize beam (**Figure 4-3**).

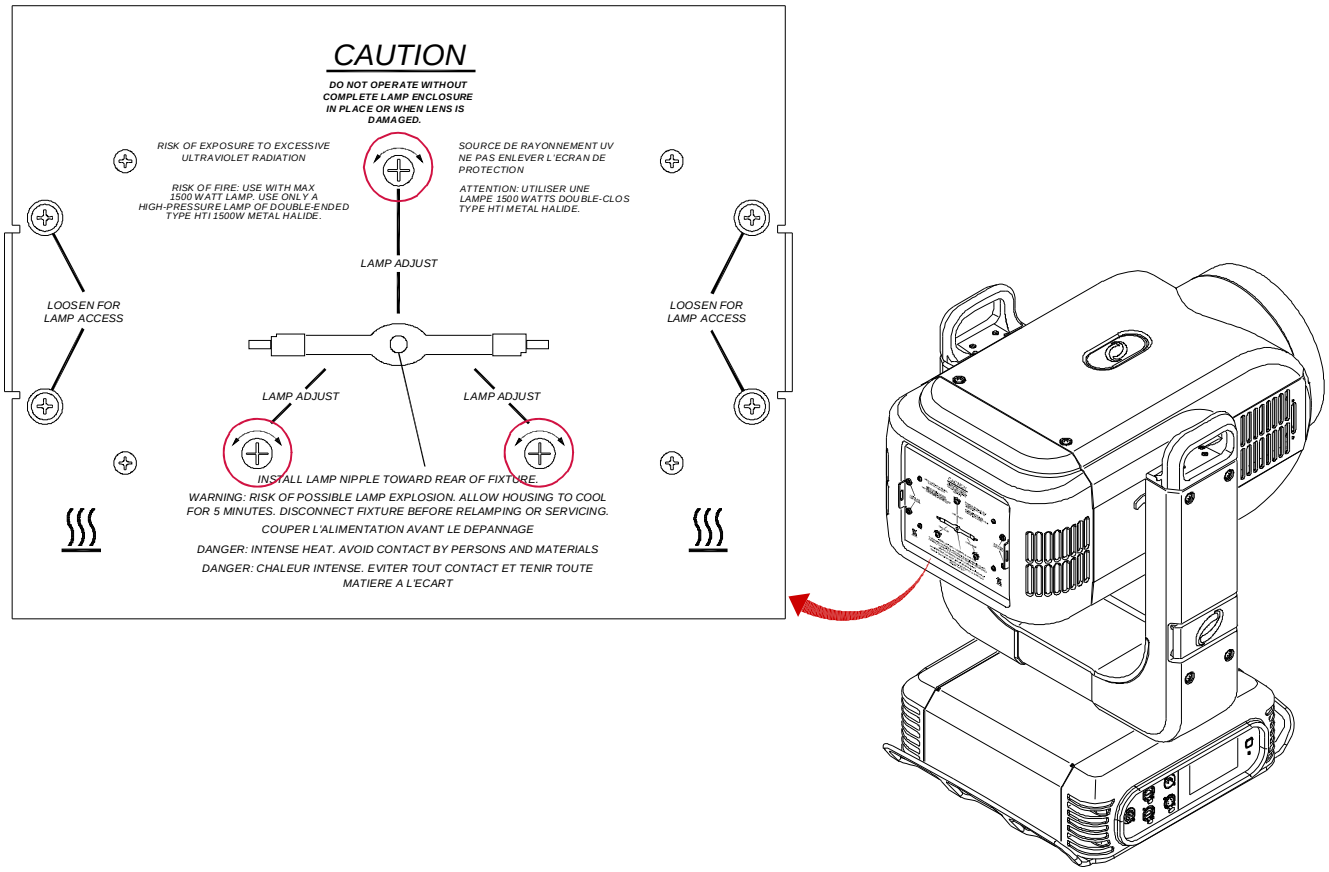


Figure 4-3: Adjusting the Lamp

Note: Be sure to reset Lamp Hours when installing a new lamp.

CAUTION: Allow lamp to cool before servicing.

Step 5. (Optional) Lamp alignment can be double-checked and/or adjusted by measuring the distance of the lamp plate from the rear door.

a. First, open the lamp access door (refer to "Replacing Lamp" on page 58).

b. Then use a telescoping gauge tool to measure the distance at three places. These should all be 0.388" as shown in **Figure 4-4**. Adjust the lamp plate as necessary using the three lamp adjustment screws.

c. When finished, close lamp access door.

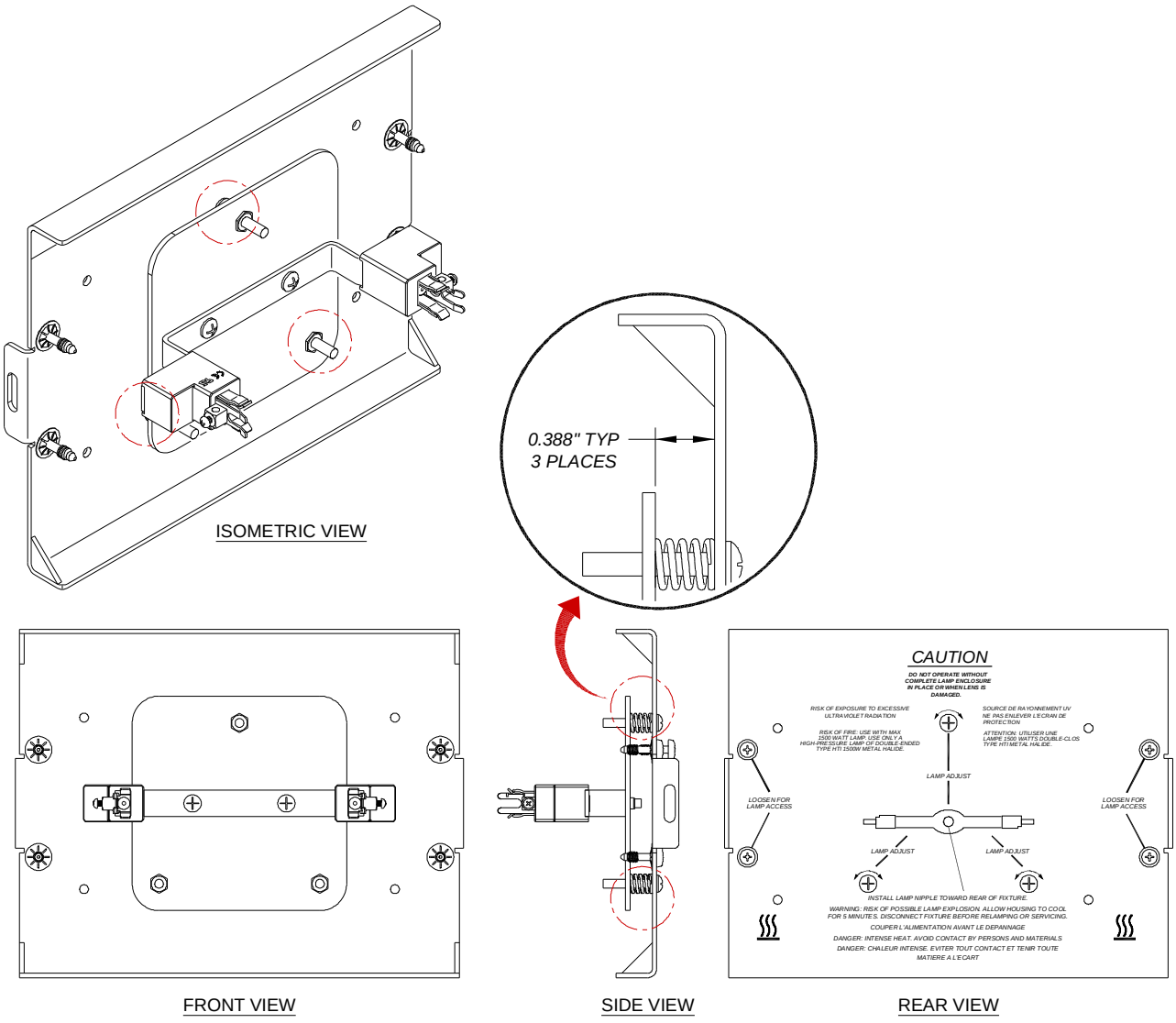


Figure 4-4: Measuring Lamp Alignment Position

Removing Head Covers

To access some interior head components, one or both of the Head Covers may need to be removed.

Parts:

21.9815.0630 2 EA ASSY, HEAD COVER

Tools:

#2 Phillips screwdriver

To remove Head Covers:

Step 1. At cover, loosen four captive screws (**Figure 4-5**). (Cover will still be secured by a safety lanyard.)

Step 2. Unclip lanyard to completely remove cover.

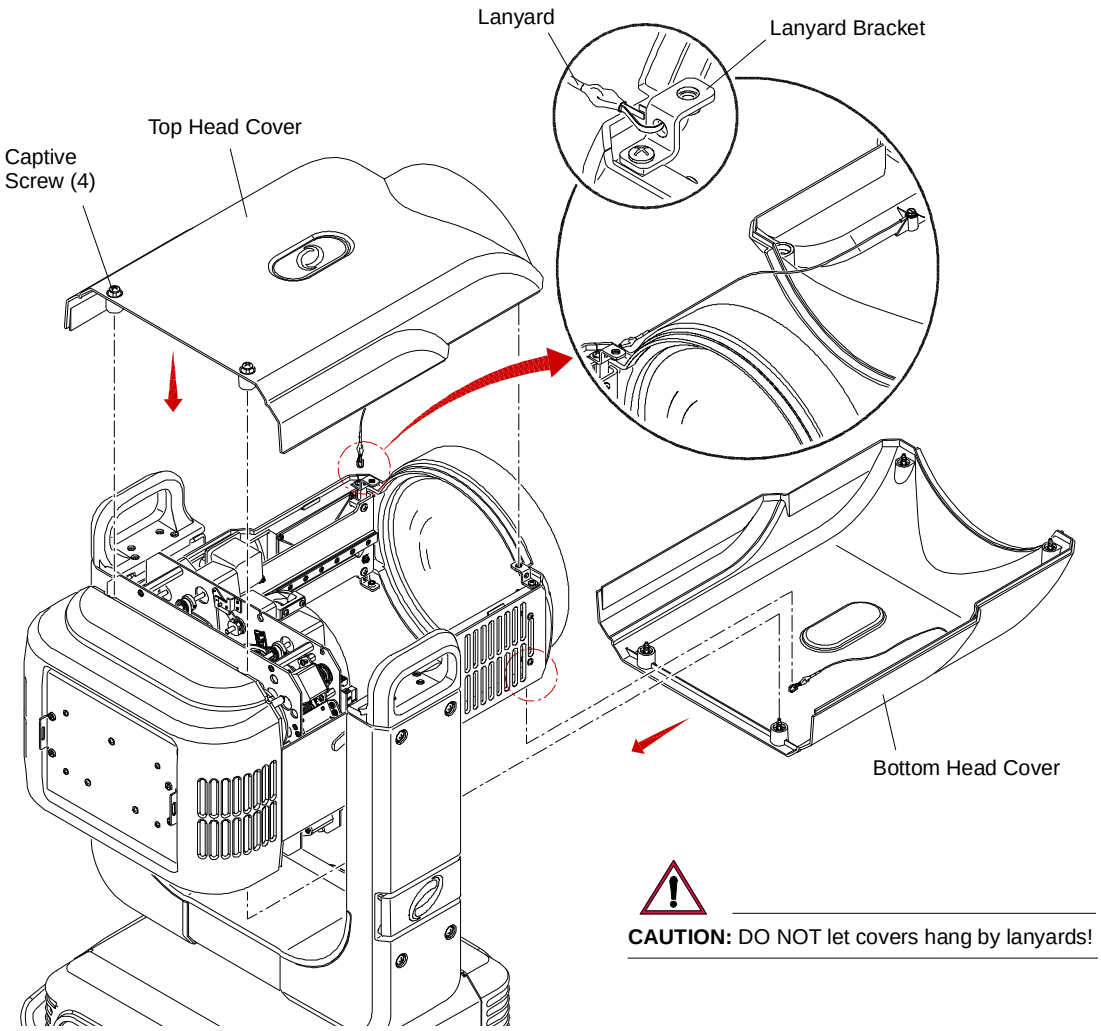


Figure 4-5: Removing Head Covers

Step 3. Replace covers as follows:

a. Attach lanyard clip.

b. Fit cover in place.

c. Tighten four captive screws.

Cleaning Intake Filters

The filters should be cleaned or replaced when they become dirty. The frequency will depend on how often and in what conditions the luminaire is used.

Parts:

10.9815.0661	2 EA	HEAD, AIR FILTER, FOAM
55.9815.0052.0	2 EA	O-RING, FOAM FILTER RETAINING (as needed)

Tools:

#2 Phillips screwdriver
Compressed air *and/or* water

To clean or replace filters:

WARNING: Remove power from luminaire before performing any maintenance procedures.

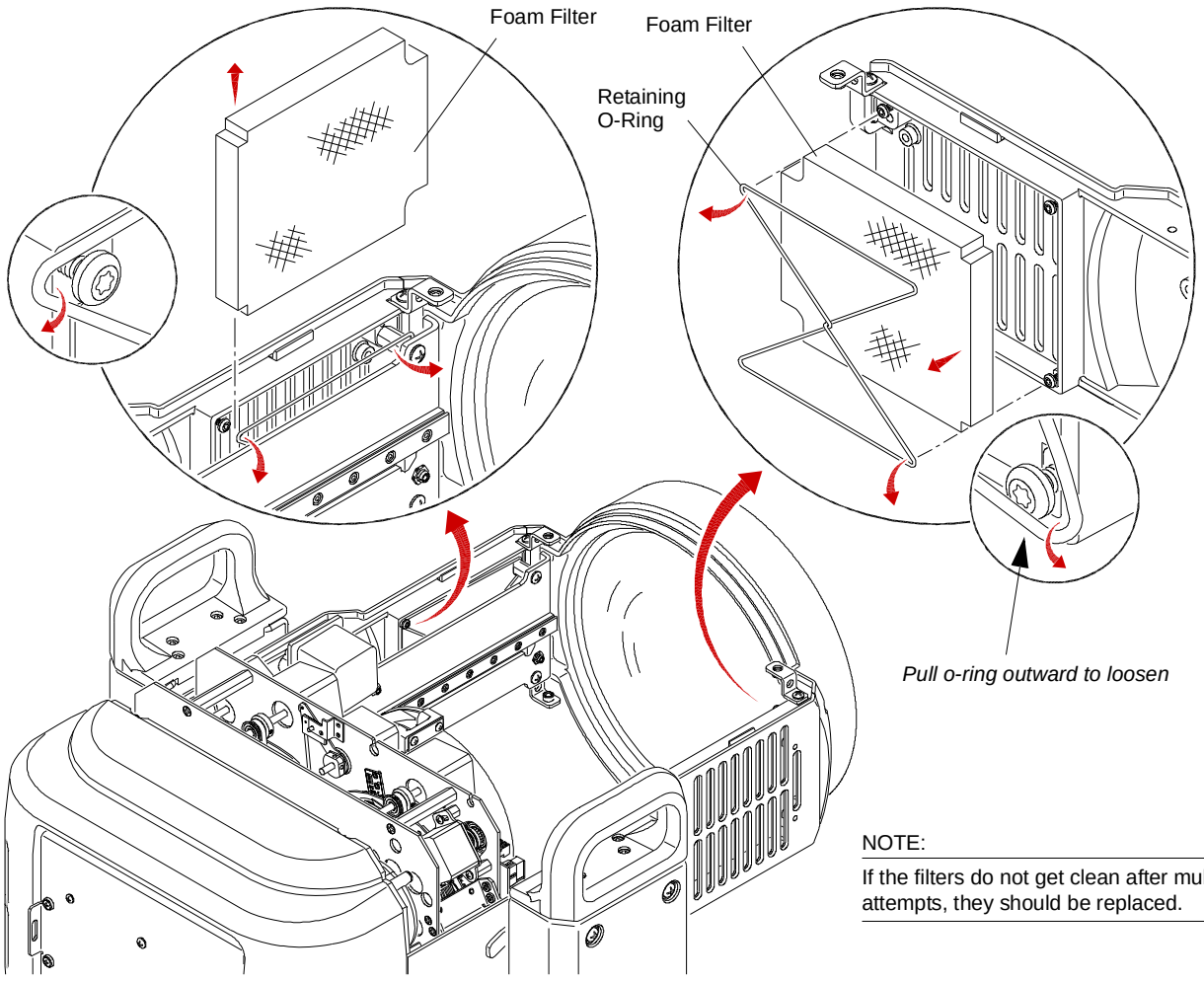
Step 1. Remove power from luminaire.

Step 2. Remove Head Covers. (Refer to "Removing Head Covers" on page 62.)

Step 3. At each Foam Filter, remove retaining o-ring and remove filter (**Figure 4-6**).

Step 4. Clean filters with compressed air and/or by washing with water. Replace as necessary.

Step 5. Re-install components.



NOTE:
If the filters do not get clean after multiple attempts, they should be replaced.

Figure 4-6: Removing Air Filters

Cleaning Lenses, Frosted Glass, and Front Lens

Tools & Supplies:

(2) Micro Fiber cloths (06.6085.0001.0)
OptiMax™ Ultra Pure Cleaning Solution (06.6084.0001.0)
Cotton gloves or finger cots
#2 Phillips screwdriver
3/16" flat screwdriver

To clean internal lenses, frosted glass, and front lens:

CAUTION: Use caution when handling lenses and glass. Avoid scratching optical surfaces.

CAUTION: Use ONLY OptiMax™ Ultra Pure Cleaning Solution to clean optical components. DO NOT use Window Cleaner on lenses! Wear cotton gloves or finger cots when handling lenses/glass.

CAUTION: When cleaning, do not allow the cleaning cloth to come into contact with the lens carrier rail. The rail has lubrication that will contaminate the cleaning cloth. Wear cotton gloves or finger cots.

Step 1. Apply power to luminaire and set intensity to 20%. (A beam will be necessary to see dirt and dust on the lenses.)

Step 2. Remove Head Covers to access interior lenses. (Refer to "Removing Head Covers" on page 62.)

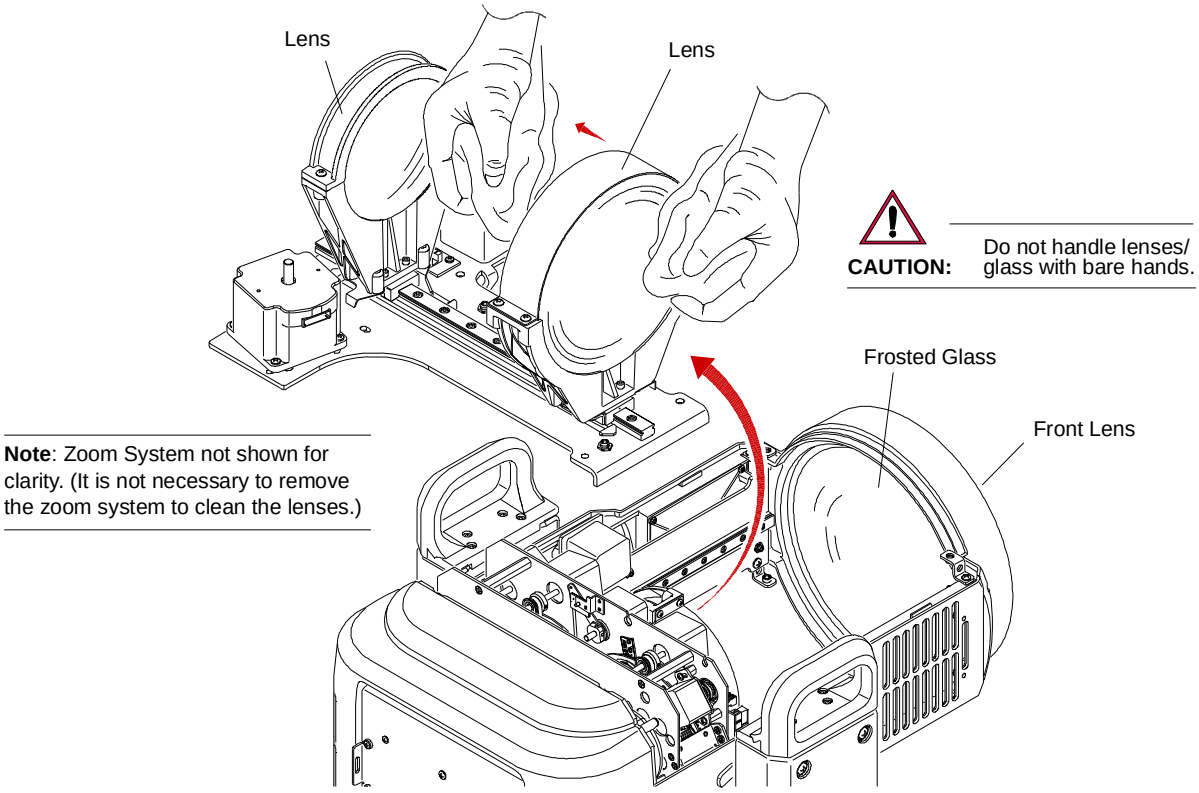
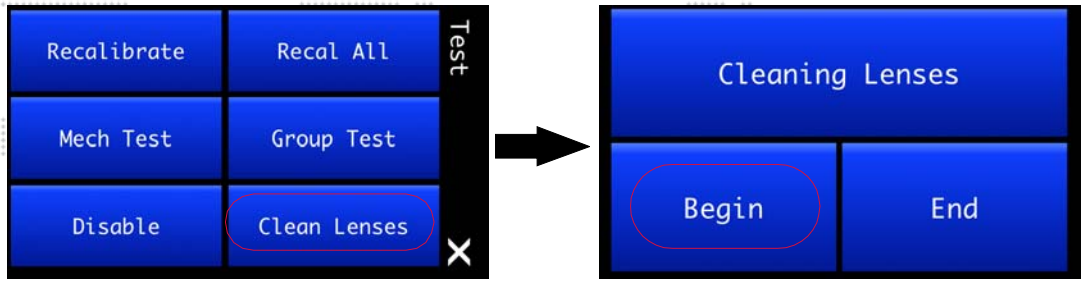


Figure 4-7: Cleaning Lenses and Frosted Glass

Step 3. At TEST menu, press "Clean Lenses." The Cleaning Lenses menu will open.

Step 4. Press "Begin" to position lenses for cleaning.



Step 5. If lenses are only dusty, use Micro Fiber cloth to carefully wipe lens surfaces. If further cleaning is required, use OptiMax™ Ultra Pure Cleaning Solution and a Micro Fiber cloth to clean. *DO NOT use window cleaner!*

Step 6. Use same technique to clean inside of Frosted Glass.

CAUTION: Be extremely careful when removing Front Lens in next step. The glass can be easily chipped or cracked. Wear cotton gloves or finger cots when handling the glass.

Step 7. To clean Front Lens and outside of Frosted Glass, do the following:

a. Position luminaire head so that Front Lens is facing upward. (To prevent it from falling onto the floor when the Retaining Ring is removed in the next step.)

b. Insert flat screwdriver under notch in Front Lens Retaining Ring (**Figure 4-8**). Carefully remove Retaining Ring.

c. Remove Front Lens and place facedown on a Micro Fiber cloth.

d. Using OptiMax™ Ultra Pure Cleaning Solution and a Micro Fiber cloth, clean both sides of Front Lens. *DO NOT use window cleaner!*

e. Using OptiMax™ Ultra Pure Cleaning Solution and a Micro Fiber cloth, clean outside of Frosted Glass. *DO NOT use window cleaner!*

f. Replace Front Lens by doing steps in reverse. Ensure gasket under Front Lens is not damaged or missing.

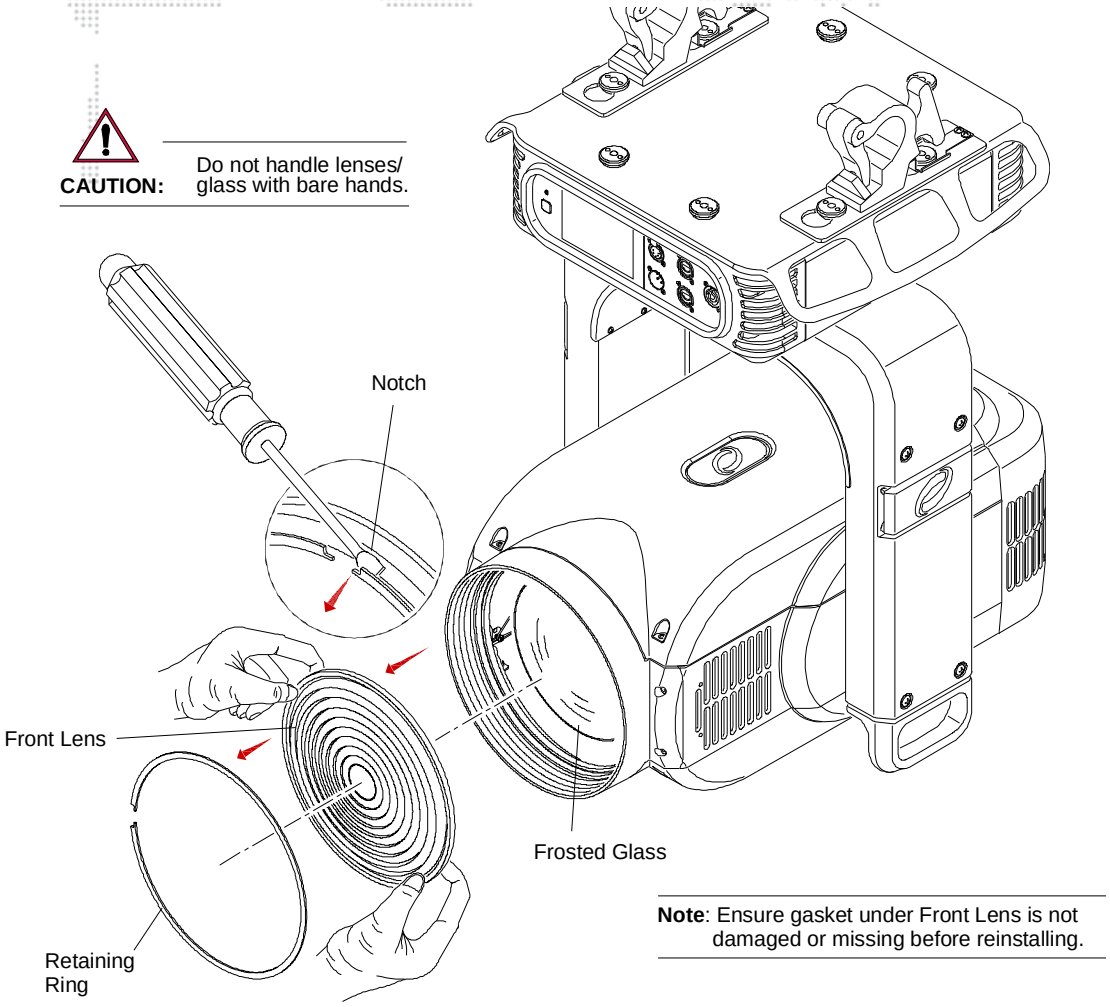
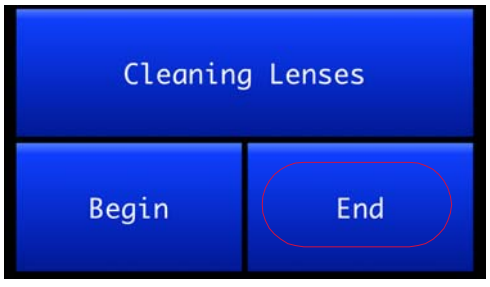


Figure 4-8: Cleaning Front Lens and Frosted Glass

Step 8. At menu, press "End." This will return the lenses back to normal operation.



Step 9. Replace Head Cover.

Cleaning Luminaire Exterior

Tools:

Lint-free cloth
Window cleaner
Vacuum cleaner with brush nozzle or compressed air
#2 Phillips screwdriver

To clean luminaire:

WARNING: Remove power from luminaire before this procedure.

CAUTION: Use ONLY OptiMax™ Ultra Pure Cleaning Solution to clean optical components. DO NOT use Window Cleaner on lens!

Step 1. Remove power from luminaire.

Step 2. Using vacuum cleaner with brush nozzle or compressed air, clean dust from external components. *If using compressed air to clean out luminaire, DO NOT allow fans or blower to spin at high speeds, as this will damage their bearings.*

Step 3. Using window cleaner and a clean, lint-free cloth, wipe outside surface of luminaire. *DO NOT use window cleaner on lens!*

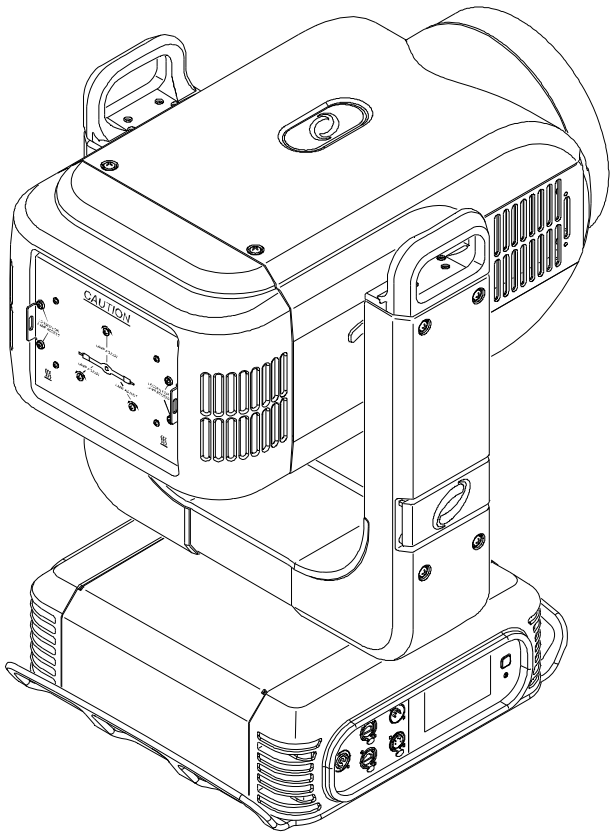


Figure 4-9: Luminaire Exterior

Replacing Front Lens

Two types of front lenses are available for the Best Boy Wash lumnaire: the Standard Fresnel Lens and a Narrow Fresnel Lens. The narrow lens can be identified in two ways:

1) By a white paint dot near the "PRG" on the inside of the glass.
2) By a raised circle feature in the center of the lens output surface.

   Note: The first 100 Narrow Fresnel Lenses produced do not include the “raised feature."

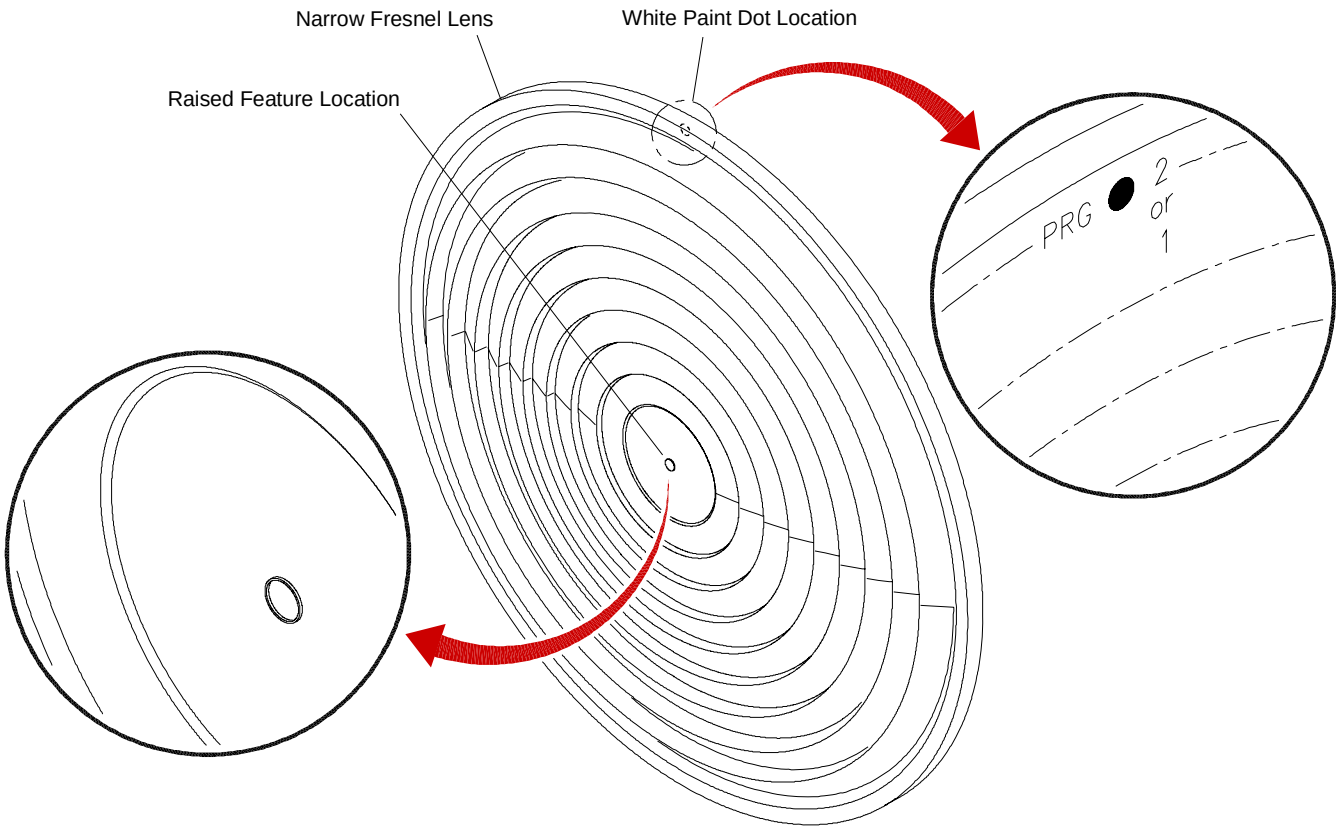


Figure 4-10: Identifying the Narrow Fresnel Lens

Parts:

42.9815.0110 / 3749H-24	1 EA	FRESNEL LENS, *or*
42.9815.0113 / 3749H-20	1 EA	FRESNEL LENS, NARROW

Tools & Supplies:

3/16" flat screwdriver
Cotton gloves or finger cots

WARNING: Remove power from luminaire before performing any maintenance procedures.

To replace front lens lens:

Step 1. If luminaire is powered-up, douse lamp and allow fans to run for at least 5 minutes.

Step 2. Remove power from luminaire.

CAUTION: Be extremely careful when removing Retaining Ring and Front Lens in next step. The lens can be easily chipped or cracked. Wear cotton gloves or finger cots when handling the lens.

Step 3. Position luminaire head so that Front Lens is facing upward. (To prevent it from falling onto the floor when the Retaining Ring is removed in the next step.)

Step 4. Insert flat screwdriver under notch in Retaining Ring (**Figure 4-11**). Carefully remove Retaining Ring.

Step 5. Remove Front Lens.

Step 6. Replace Front Lens by doing steps in reverse. Ensure gasket under lens is not damaged or missing.

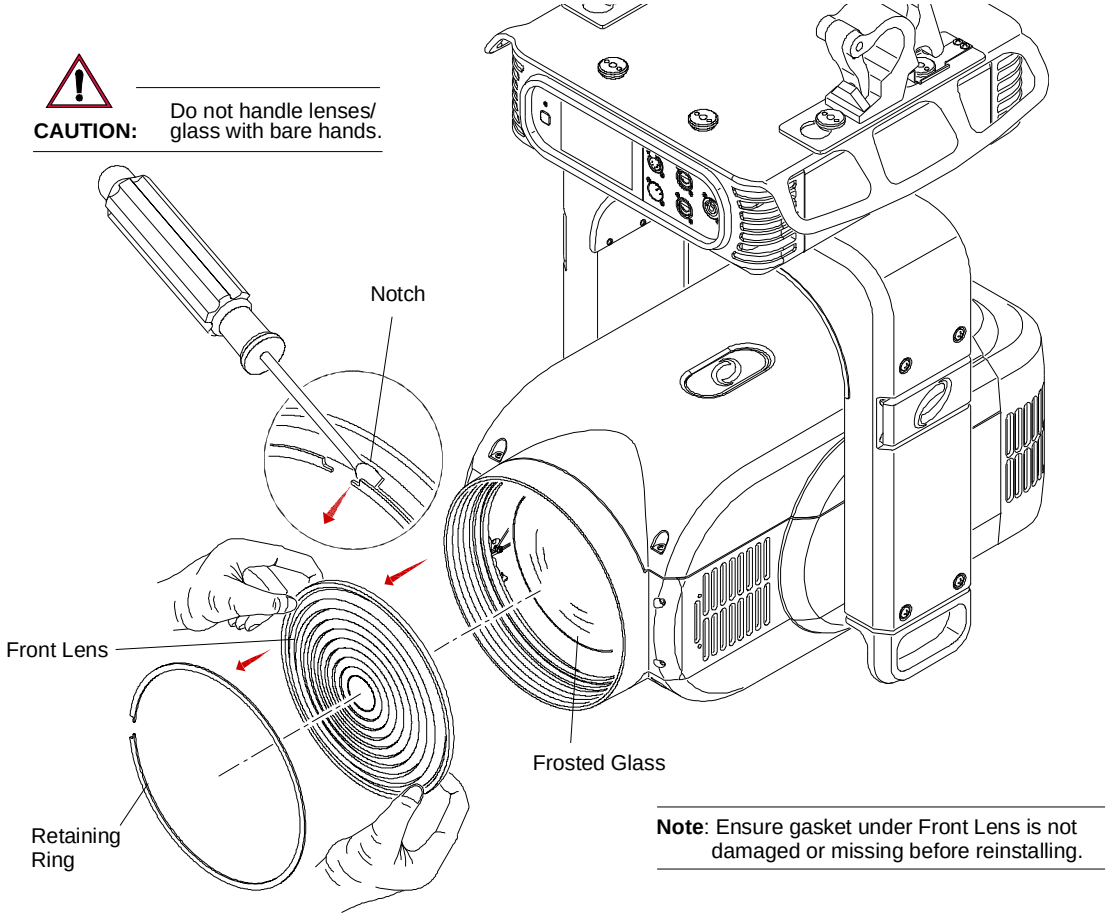


Figure 4-11: Replacing Front Lens (Standard or Narrow)

Replacing a Gobo

Parts:

Standard or Custom Gobo(s), as required. (Refer to "Gobo Wheel Configuration" on page 8.)

Tools:

#2 Phillips screwdriver
Hook & Pick tool
Cotton gloves or finger cots

WARNING: Remove power from luminaire before performing any maintenance procedures.

To replace a gobo:

Step 1. Remove power from luminaire.

Step 2. Rotate Head Assembly so that text on backcap is readable (**Figure 4-12**).

Step 3. Remove Top Head Cover. (Refer to "Removing Head Covers" on page 62.)

Step 4. Remove Wheel Stack as follows:

a. Disconnect one cable.

b. At Wheel Stack, loosen captive screws (**Figure 4-12**).

c. Gently push lenses out of the way so they will not interfere with removal of the Wheel Stack Assembly.

d. Grasp Wheel Stack Assembly on either side and lift straight up and out of luminaire head.

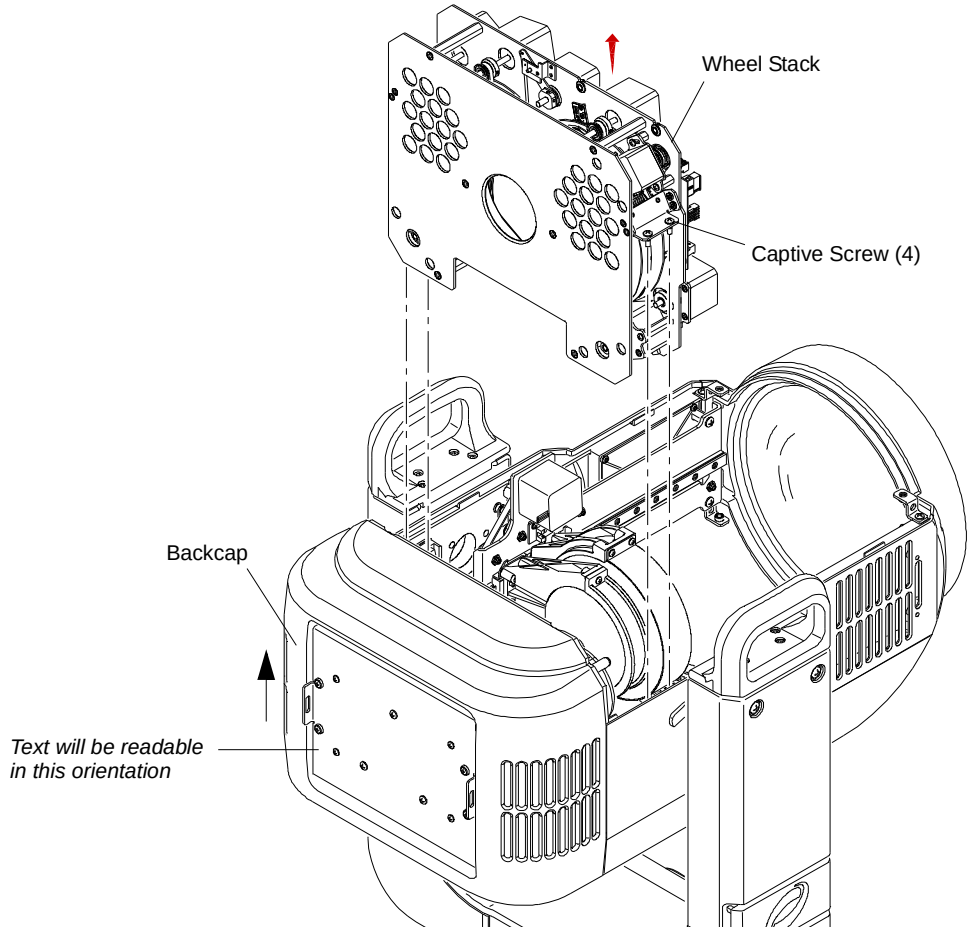


Figure 4-12: Removing Wheel Stack

CAUTION: Do not touch gobos with bare fingers. Wear cotton gloves or finger cots when handling.

Step 5. Rotate Gobo Wheel so that desired gobo is accessible (**Figure 4-13**).

Step 6. Rotate gobo to align magnet with alignment mark on sun gear.

Step 7. Using hook & pick tool, carefully pull out retaining ring and remove gobo.

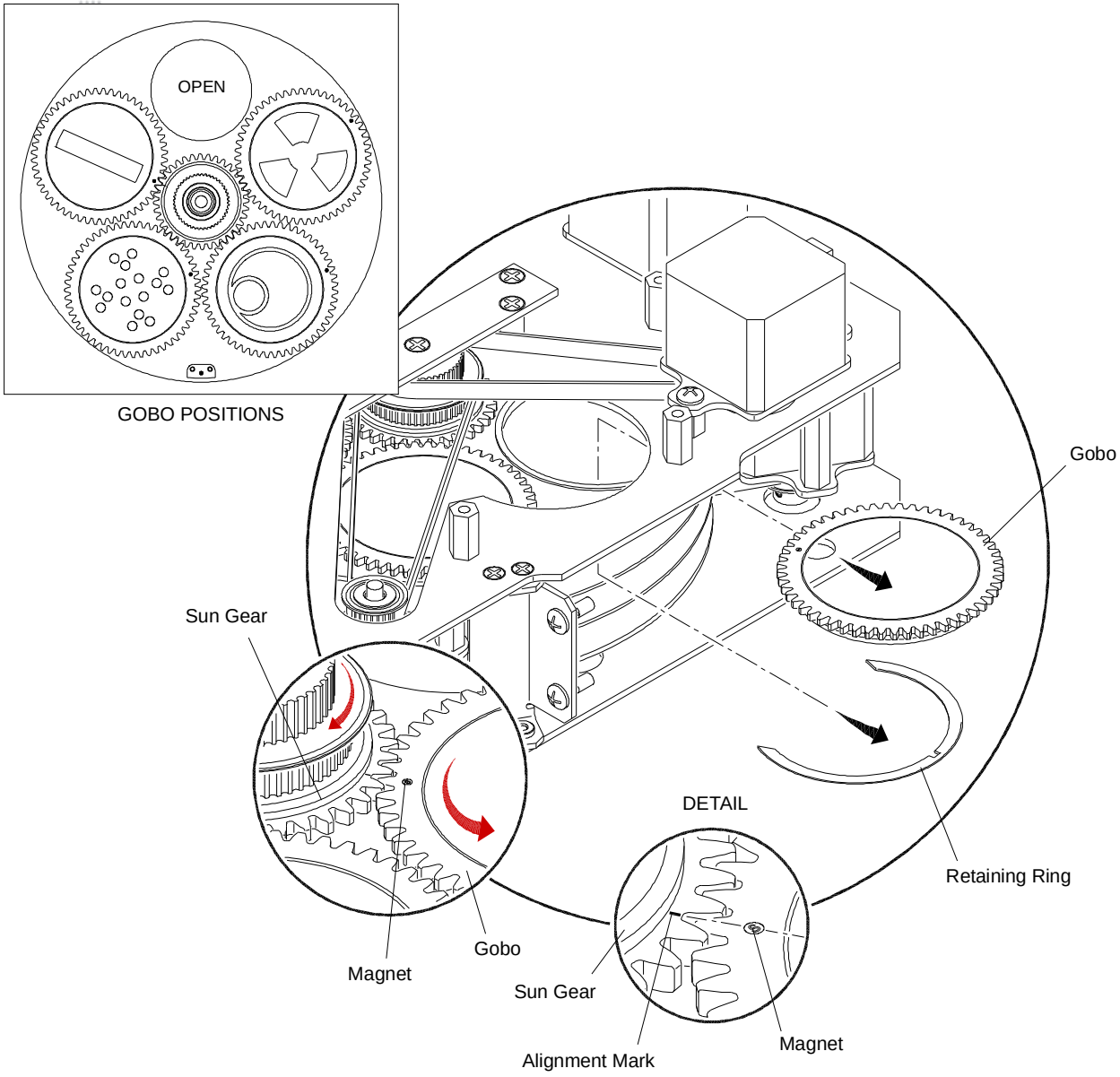


Figure 4-13: Replacing a Gobo

Step 8. Install new gobo by aligning its magnet with alignment mark on sun gear (as shown in **Figure 4-13**) and then inserting into place.

Step 9. Replace retaining ring.

Step 10. When finished, rotate gobo wheel as a visual test. When properly installed, the gobo magnet for each installed gobo should be positioned in the same approximate position as the gobo wheel is spun around. Adjust as necessary.

Step 11. Replace Head Cover.

Notes

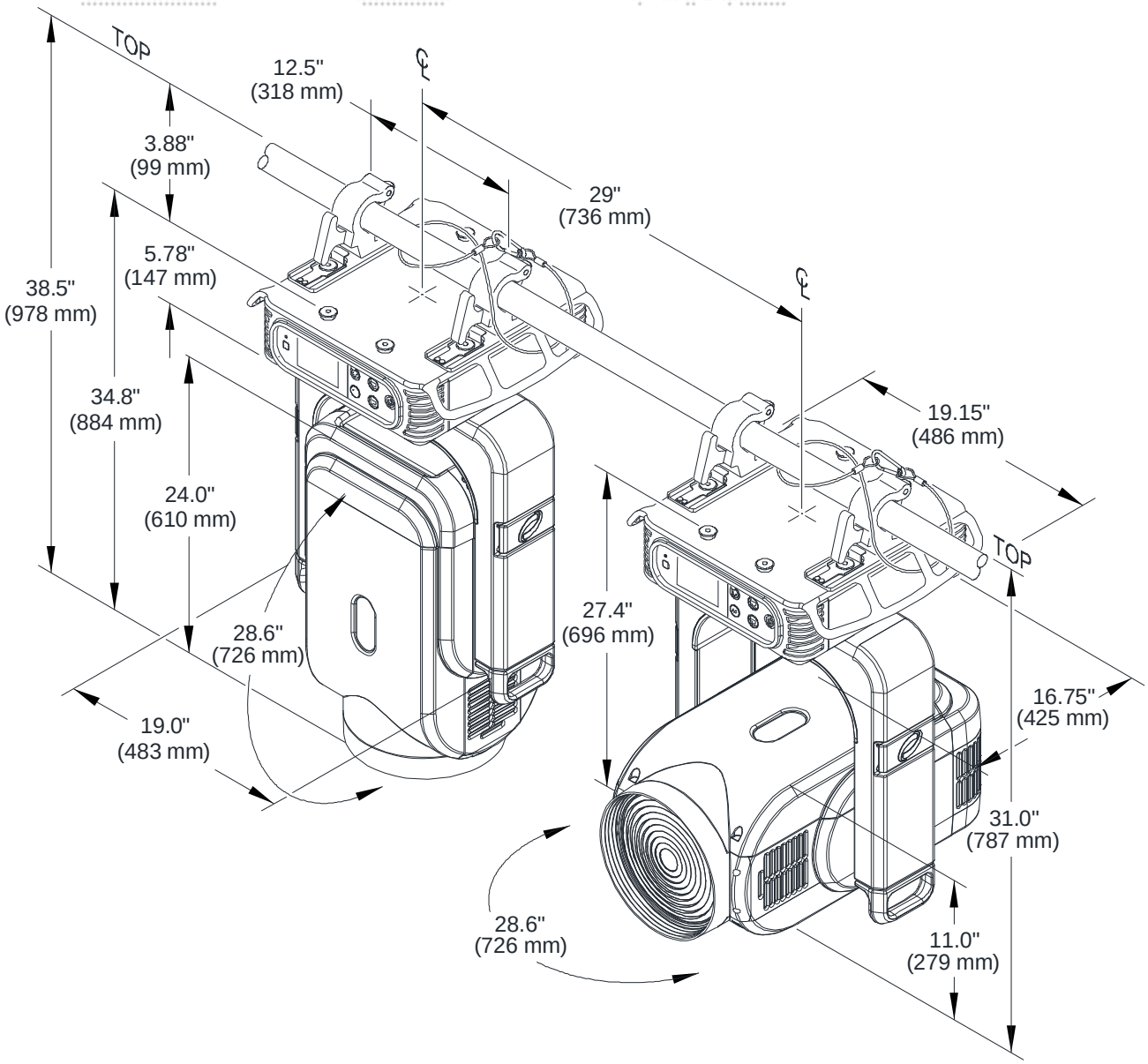
A.

TECHNICAL SPECIFICATIONS

+ BEST BOY WASH LUMINAIRE
+ BEST BOY WASH ROAD CASE
+ AC LINE CURRENT / POWER VS. VOLTAGE
+ PHOTOMETRIC DATA

Best Boy Wash Luminaire

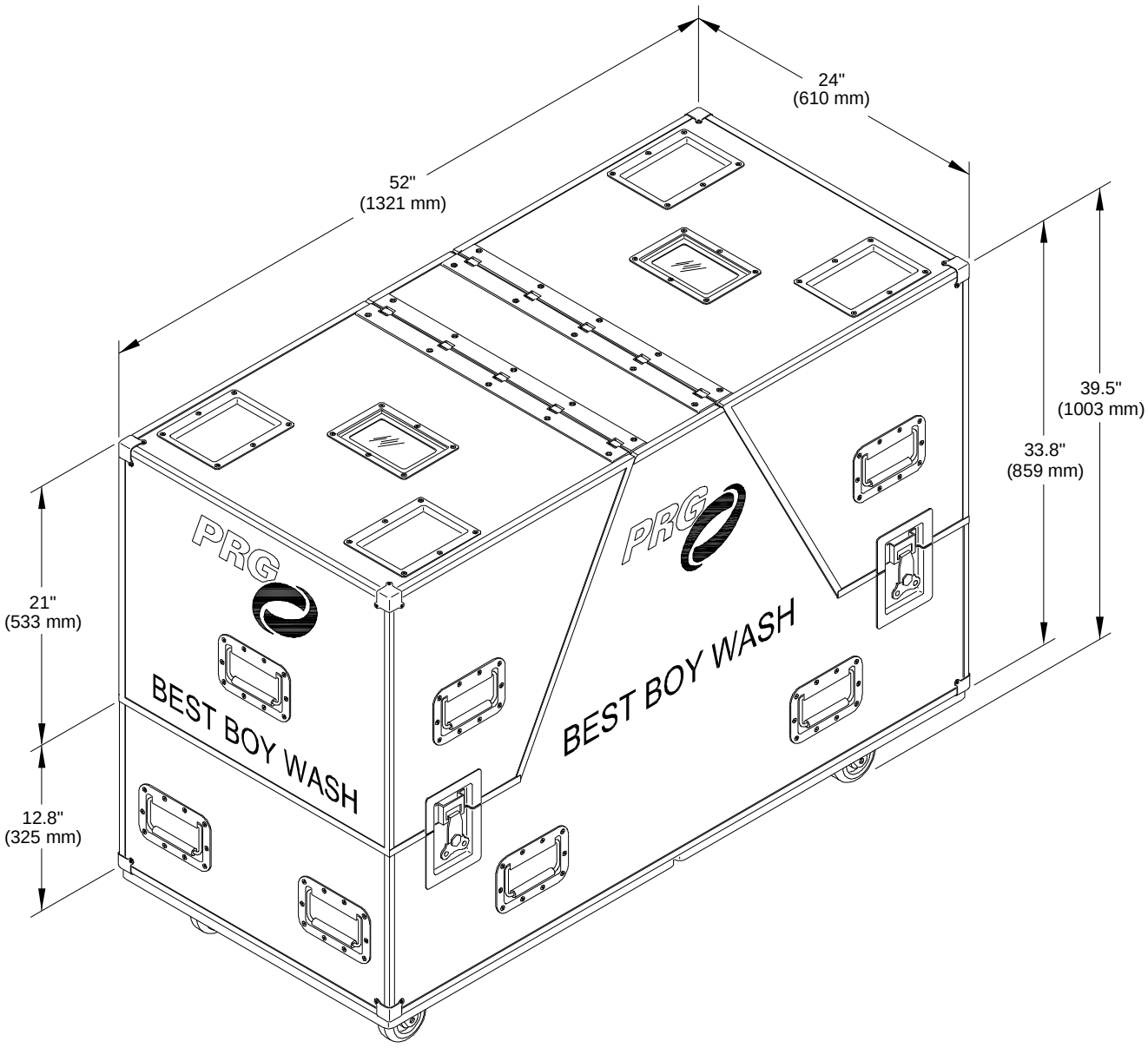
SOURCE:	HTI 1500 lamp optics optimized for 60,000 lumens
OUTPUT:	60,000+ lumens
POWER DRAW:	10.5 Amps at 208V, 8.75 Amps at 240V. Auto-sensing voltage input range is 170V to 270V.
POWER FACTOR:	0.99
REFLECTOR:	Precision glass reflector with cold mirror coating
ZOOM RANGE:	Standard Fresnel Lens - 6:1 from a narrow beam of 10° to a wide flood of 60° Narrow Fresnel Lens - 4.6:1 from a narrow beam of 8° to a wide flood of 37°
BEAM SIZE CONTROL:	In addition to the zoom optics, a mechanical iris provides continuous beam size control for both rapid changes and smooth, timed beam angle changes
DIMMING:	Gray-scale glass dimmer for full-field dimming from 0% to 100% with accurate slow-speed control and fast bumps
STROBE:	Lightning fast strobe wheel
COLOR:	CMY color system featuring three (3) crossfading color wheels of Cyan, Magenta, and Yellow, plus one (1) fixed wheel with five (5) fixed filters
COLOR TEMP CONTROL:	Adjustable color temperature wheel, range from 3,200K all the way up to 8,000K. Also includes a minus green filter on the fixed color wheel
ROTATING GOBOS:	One (1) indexable, rotating gobo wheel with four (4) gobos
OPERATING TEMP:	0° to 120°F (18° to 49°C)
CONTROL:	Compatible with all PRG consoles and a wide variety of DMX512 and Art-Net consoles
ON-BOARD CONTROL:	Built-in LCD touchscreen display allows for on-board fixture control and feedback. On-board battery power allows for the fixture address and configurations to be set without having to apply AC power to the luminaire
DMX CHANNELS:	26 channels
PAN & TILT:	Three-phase stepper motors
RANGE:	Pan - 540°, Tilt - 260°
POSITIONING:	Can be mounted in any orientation
SPACING:	Hangs on 29 inch (736 mm) centers
WEIGHT:	88 lbs (39.9 kg) without hooks


TOP
12.5"
(318 mm)
3.88"
(99 mm)
29"
(736 mm)
5.78"
(147 mm)
38.5"
(978 mm)
34.8"
(884 mm)
19.15"
(486 mm)
24.0"
(610 mm)
TOP
27.4"
(696 mm)
28.6"
(726 mm)
16.75"
(425 mm)
19.0"
(483 mm)
31.0"
(787 mm)
28.6"
(726 mm)
11.0"
(279 mm)

Best Boy Wash Road Case

EMPTY WEIGHT: 171 lbs (77.56 kg)

LOADED WEIGHT: 389 lbs (176.45 kg)



AC Line Current / Power vs. Voltage

TEST	VOLTS	FREQ	AMPS	VA	POWER	PF
1	170	50Hz	12.53	2130	2124	0.997
2	180	50Hz	11.79	2122	2115	0.996
3	200	50Hz	10.56	2110	2100	0.995
4	200	60Hz	10.53	2106	2096	0.995
5	210	60Hz	10.01	2104	2091	0.994
6	220	50Hz	9.56	2103	2088	0.993
7	230	50Hz	9.13	2100	2083	0.992
8	240	50Hz	8.74	2098	2080	0.990
9	240	60Hz	8.74	2098	2078	0.990
10	250	50Hz	8.38	2095	2074	0.989
11	260	50Hz	8.06	2093	2065	0.986
12	270	50Hz	9.09	2455	2059	0.838
13	270	60Hz	9.08	2449	2065	0.841

Under-Voltage Lock-Out (UVLO)

Ballast UVLO = 135V/50Hz 170V to recover

24VDC LVS UVLO = 75V/50Hz 85V to recover

Photometric Data

Standard Fresnel: Narrow Field of View

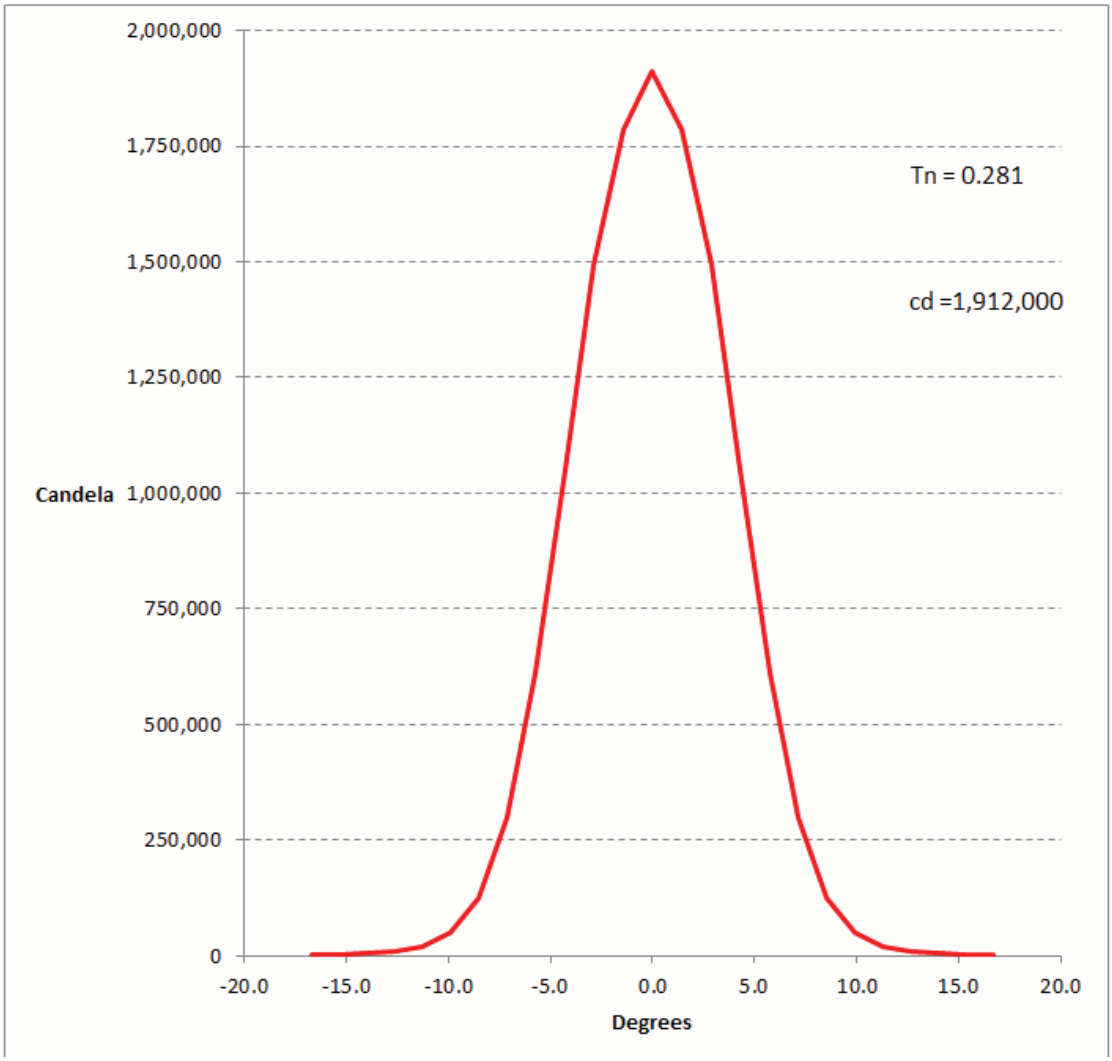
Fresnel Lens (42.9815.0110 / 3749H-24)

Iris Full Open
9º Beam Angle
53,000 Total Lumens

Throw Dist. (Ft)	20	30	50	75	100
Beam Dia. (Ft)	5.6	8.4	14.1	21.1	28.1
Illuminance (fc)	4780	2124	765	340	191
---	---	---	---	---	---
Throw Dist. (m)	5	10	20	25	30
Beam Dia. (m)	1.4	2.8	5.6	7.0	8.4
Illuminance (lux)	76480	19120	4780	3059	2124

Multiply throw distance by Tn to find beam diameter.

Divide cd (candela) by distance squared to find center beam illuminance.
Distance in feet = foot candles
Distance in meters = lux



Standard Fresnel: Medium Field of View

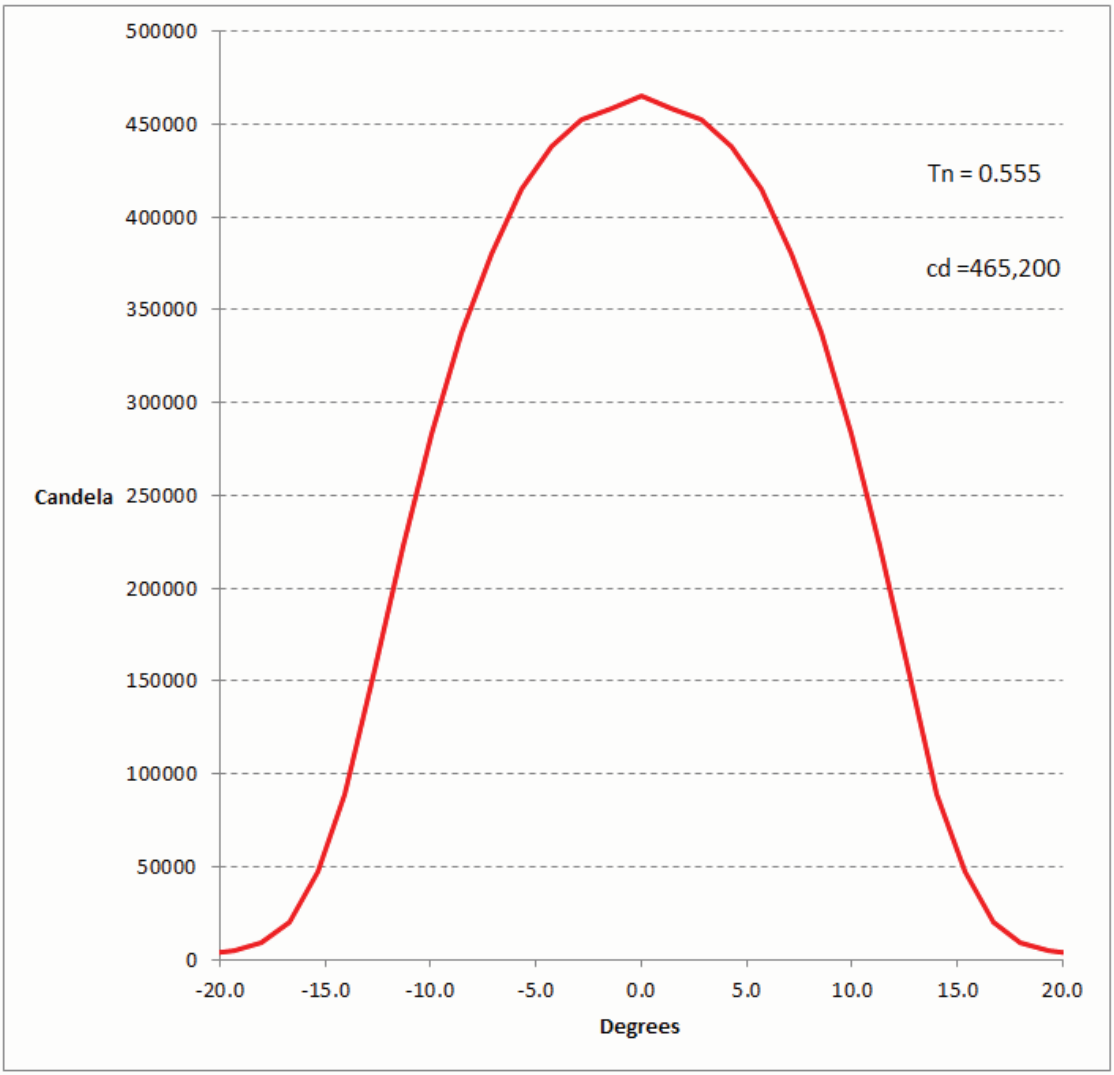
Fresnel Lens (42.9815.0110 / 3749H-24)

Iris Full Open
22º Beam Angle
60,600 Total Lumens

Throw Dist. (Ft)	20	30	50	75	100
Beam Dia. (Ft)	11.1	16.7	27.8	41.6	55.5
Illuminance (fc)	1163	517	186	83	47
---	---	---	---	---	---
Throw Dist. (m)	5	10	20	25	30
Beam Dia. (m)	2.8	5.6	11.1	13.9	16.7
Illuminance (lux)	18608	4652	1163	744	517

Multiply throw distance by Tn to find beam diameter.

Divide cd (candela) by distance squared to find center beam illuminance.
Distance in feet = foot candles
Distance in meters = lux



Standard Fresnel: Wide Field of View

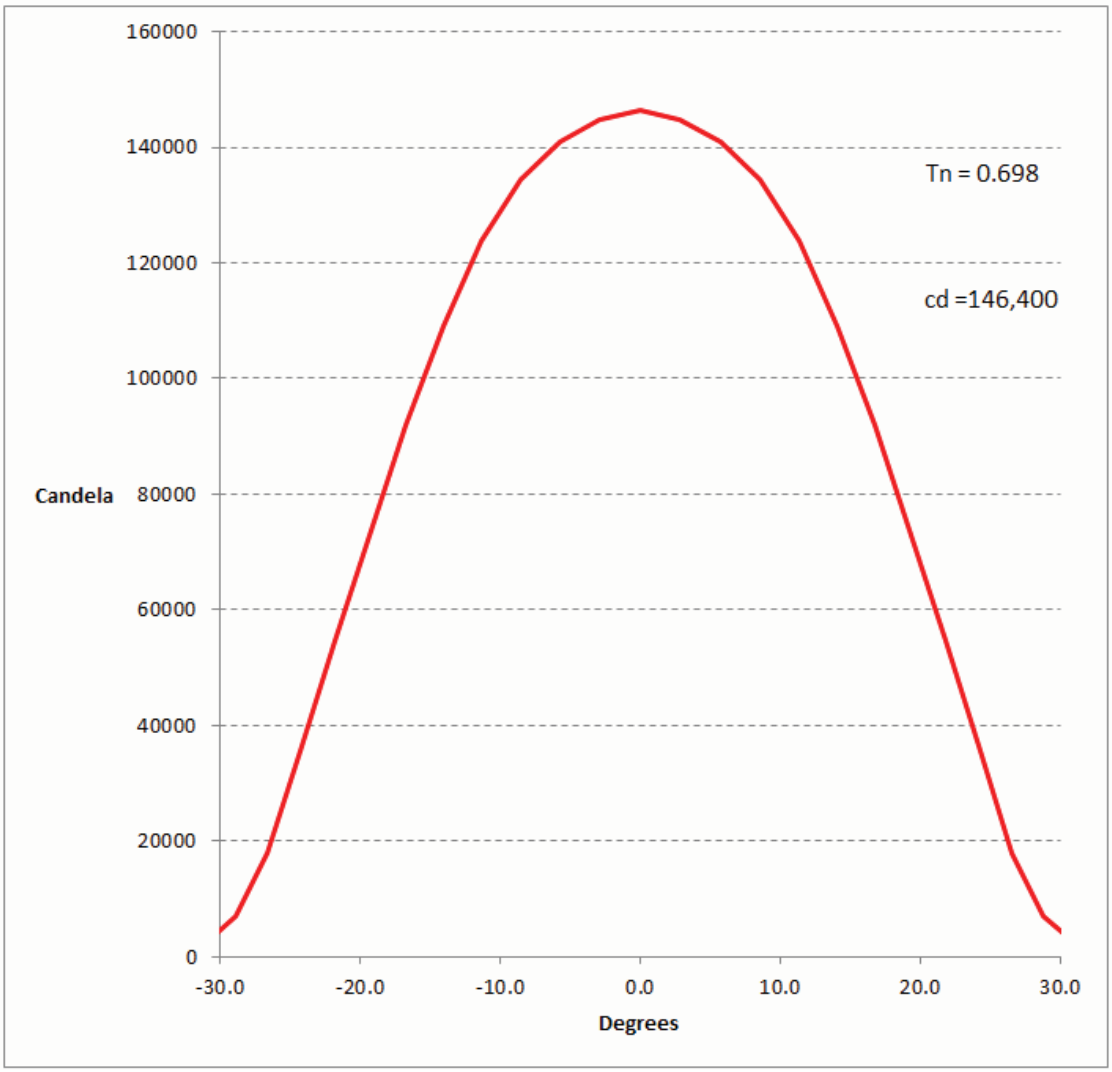
Fresnel Lens (42.9815.0110 / 3749H-24)

Iris Full Open
40° Beam Angle
62,800 Total Lumens

Throw Dist. (Ft)	20	30	50	75	100
Beam Dia. (Ft)	14.0	20.9	34.9	52.4	69.8
Illuminance (fc)	366	163	59	26	15
---	---	---	---	---	---
Throw Dist. (m)	5	10	20	25	30
Beam Dia. (m)	3.5	7.0	14.0	17.5	20.9
Illuminance (lux)	5856	1464	366	234	163

Multiply throw distance by Tn to find beam diameter.

Divide cd (candela) by distance squared to find center beam illuminance.
Distance in feet = foot candles
Distance in meters = lux



Narrow Fresnel: Narrow Field of View

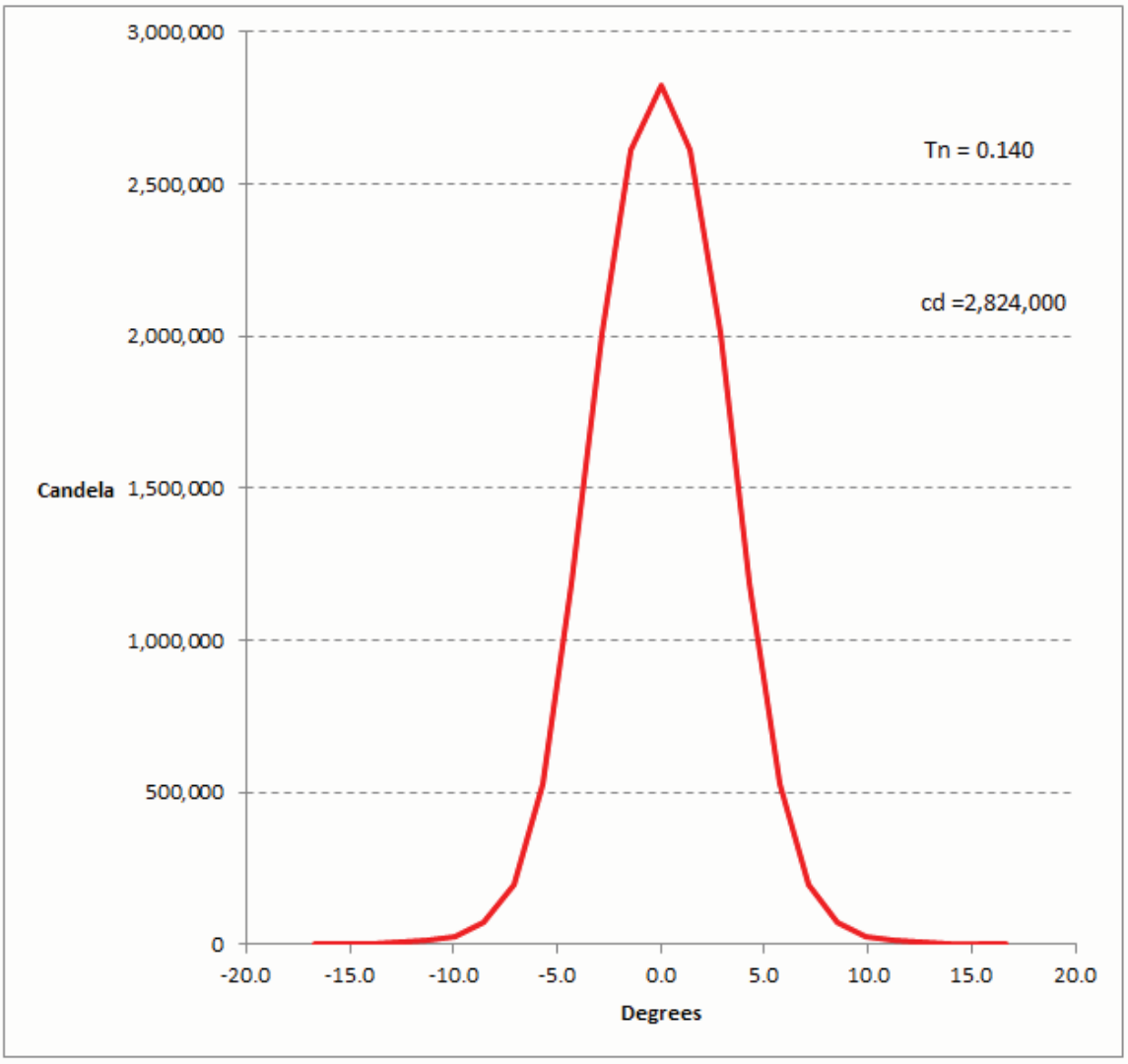
Narrow Fresnel Lens (42.9815.0113 / 3749H-20)

Iris Full Open
8º Beam Angle
56,500 Total Lumens

Throw Dist. (Ft)	20	30	50	75	100
Beam Dia. (Ft)	2.8	4.2	7.0	10.5	14.0
Illuminance (fc)	7,060	3,138	1,130	502	282
---	---	---	---	---	---
Throw Dist. (m)	5	10	20	25	30
Beam Dia. (m)	0.7	1.4	2.8	3.5	4.2
Illuminance (lux)	112,960	28,240	7,060	4,518	3,138

Multiply throw distance by Tn to find beam diameter.

Divide cd (candela) by distance squared to find center beam illuminance.
Distance in feet = foot candles
Distance in meters = lux



Narrow Fresnel: Medium Field of View

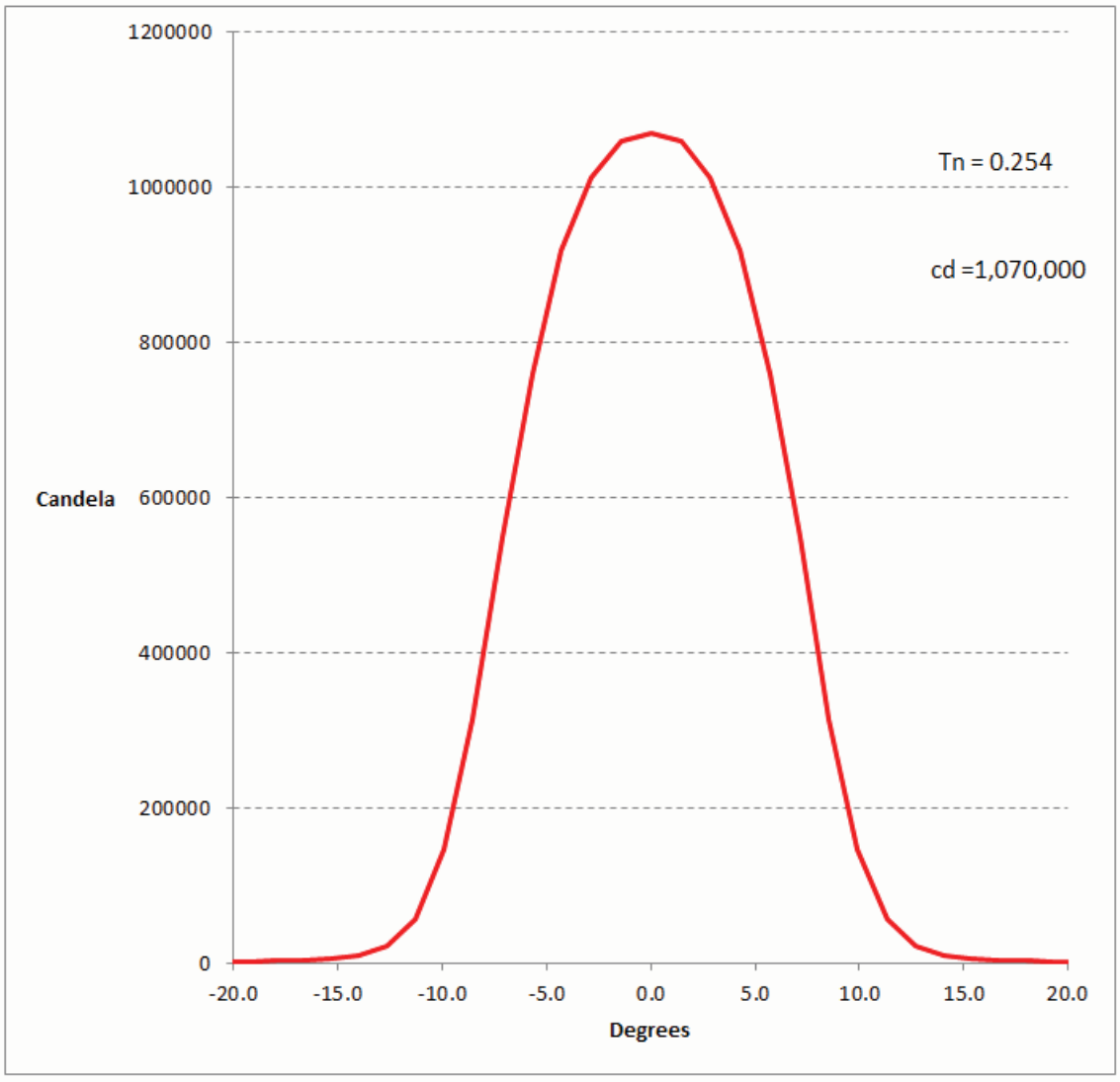
Narrow Fresnel Lens (42.9815.0113 / 3749H-20)

Iris Full Open
14.5º Beam Angle
61,300 Total Lumens

Throw Dist. (Ft)	20	30	50	75	100
Beam Dia. (Ft)	5.1	7.6	12.7	19.1	25.4
Illuminance (fc)	2,675	1,189	428	190	107
---	---	---	---	---	---
Throw Dist. (m)	5	10	20	25	30
Beam Dia. (m)	1.3	2.5	5.1	6.4	7.6
Illuminance (lux)	42,800	10,700	2,675	1,712	1,189

Multiply throw distance by Tn to find beam diameter.

Divide cd (candela) by distance squared to find center beam illuminance.
Distance in feet = foot candles
Distance in meters = lux



Narrow Fresnel: Wide Field of View

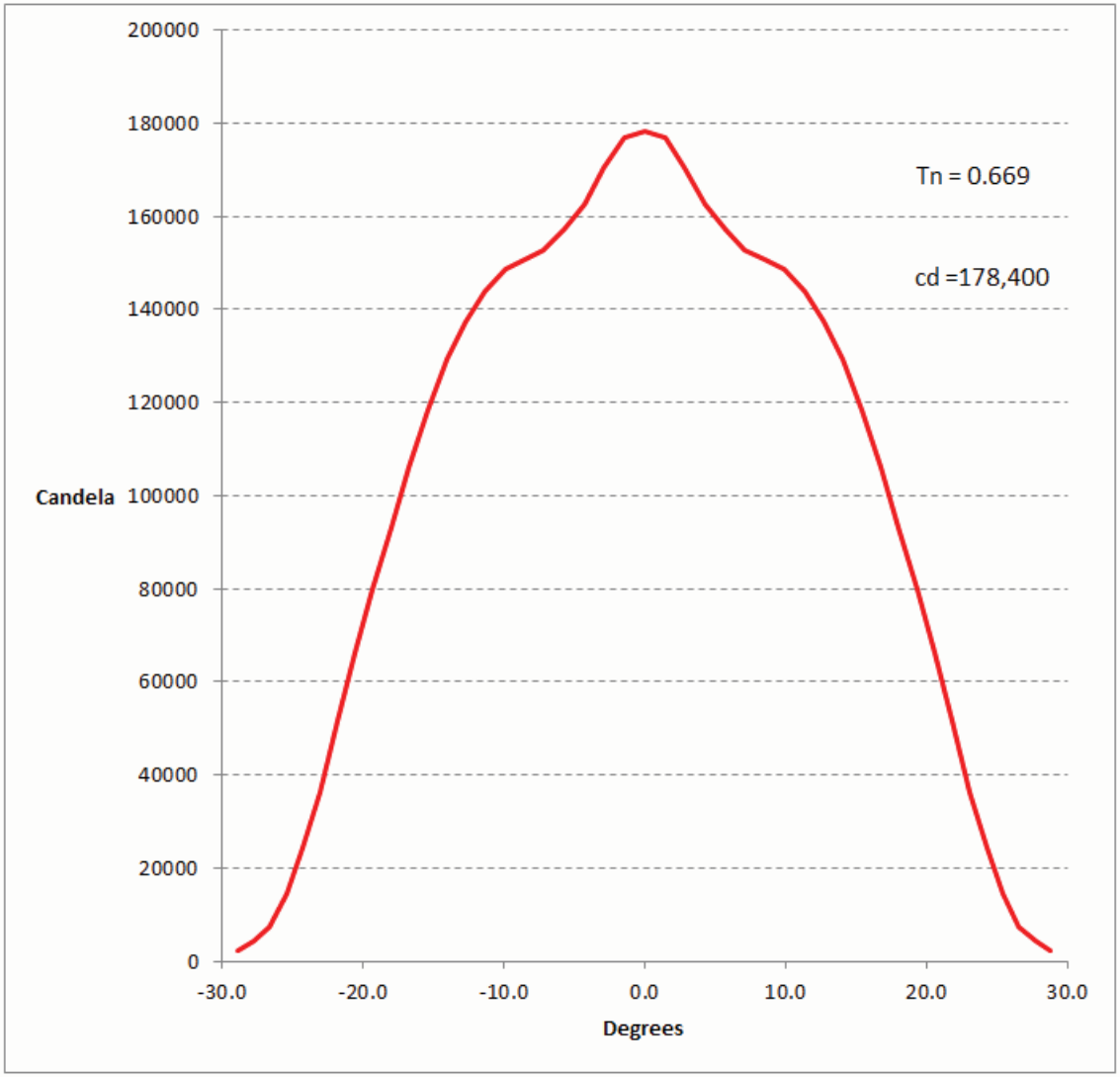
Narrow Fresnel Lens (42.9815.0113 / 3749H-20)

Iris Full Open
37° Beam Angle
64,200 Total Lumens

Throw Dist. (Ft)	20	30	50	75	100
Beam Dia. (Ft)	13.4	20.1	33.5	50.2	66.9
Illuminance (fc)	446	198	71	32	18
---	---	---	---	---	---
Throw Dist. (m)	5	10	20	25	30
Beam Dia. (m)	3.3	6.7	13.4	16.7	20.1
Illuminance (lux)	7,136	1,784	446	285	198

Multiply throw distance by Tn to find beam diameter.

Divide cd (candela) by distance squared to find center beam illuminance.
Distance in feet = foot candles
Distance in meters = lux



Notes

B.

GLOSSARY

This glossary provides useful terms associated with operating the Best Boy Wash Luminaire.

Glossary of Terms

8-Bit DMX

The universally accepted lighting control protocol in the entertainment industry. A console uses this protocol to control specific devices in a lighting system. A DMX512 channel packet is eight bits of absolute parameter data. 8-bit refers to the resolution of the signal: 256 step resolution, providing channel values from 0 through 255. A DMX512 data packet is a group of 512 data channels.

16-Bit DMX

To smooth out the movement of automated luminaires, the industry has adopted 16-bit DMX. This is not a change to the DMX512 specification, rather a change in the way luminaires and consoles treat DMX512 information. In practice, 16-bit DMX adds a DMX512 channel each to pan and tilt - pan coarse, pan fine, tilt coarse, tilt fine, instead of just pan and tilt. The console and luminaire combine these levels and increase the resolution of pan and tilt from 256 steps to a theoretical maximum 65,536 steps at the console level, resulting in the ability to position the luminaire more accurately.

Address

A numerical "name" given to a device on a DMX512 line indicating which of 512 possible channels it will respond to.

Align (lamp)

The process of adjusting the lamp within the reflector to obtain the desired output quality of the beam.

Art-Net

Protocol for sending DMX512 data over IP networks.

Attribute

An individual controllable aspect of a luminaire: pan, tilt, color, etc. Also known as "parameter."

Beam

1) The size, shape and sharpness of image of the light beam as projected on stage.
2) A function of the luminaire related to the size, shape, and sharpness of the light beam, specified by beam and edge data, and use of gobos (patterns) as required.

Channel

A control reference which collects a device's associated thumbwheel address(es) (device, lamp power, etc.) and maps them to a single selectable number. Channels are assigned via the patch setup. (Also referred to as a "Control Channel.")

Console Timing

Time value in seconds or minutes applied to an entire cue.

CMY

Acronym for "Cyan, Magenta, and Yellow."

DMX512

Digital multiplexing; an industry standard protocol. 8-bit protocol with a maximum of 256 steps of resolution per channel. Maximum of 512 controllable channels per DMX data stream.

DMX512 Cable

Industry standard cable consists of two twisted pair and a shield, and 5-pin XLR style connectors.

The pin out is: pin 1 = common (shield), pin 2 = data -, pin 3 = data +.

The second pair (pins 4 & 5) may be used for a secondary data link.

DMX512 Universe

A group of up to 512 DMX channels. Consoles may have more than one universe, usually labeled in groups of 512.

Douse
To de-energize a luminaire lamp. (Douse is unrelated to intensity states.)

Ethernet
Networking technology used to connect local area networks (LANs) via CAT5 cable or wireless.

Fixture Orientation
Based on the direction the pigtail points as it exits the fixture.

Flipped Focus
When one or more fixtures inadvertently move differently from others in the system.

Focus
The point to which the light beam is directed. Also, a function of the luminaire related to the direction of the beam as specified by pan and/or tilt data.

Gobo
A removable piece of glass or metal which contains a pattern used to create backgrounds or textures when projected onto scenery or cycloramas. Gobos typically contain geometrical shapes or natural elements such as fire, stars, or leaves.

Hard Reset
Restarts luminaires and reloads operating system and cue data.

Home Position
Pan and Tilt values at 50%. Also called “Zero Position” or a "50/50" cue or group.

Indexing
A function of a rotating gobo mechanism.

Intensity
A value placed on the relative brightness of a lighting fixture; 100% is considered "full," and 0% is considered "out."

Iris
A motor controlled mechanism which is used to adjust the beam diameter.

Lamp
Light source consisting of filament or electrodes, base, and envelope or "bulb."

Luminaire Calibration
The process of a luminaire finding its end stops for all parameters.

Macro

A pre-defined sequence that allows for quick and easy control of luminaire functions such as iris, zoom, framing, and more.

Palette
Term for groups of groups; i.e. all the color groups would be considered the Color Palette, all the beam groups would be the Beam Palette, etc.

Pan
The movement of the luminaire around the axis of the yoke.

Parameter
An individual controllable aspect of a luminaire: pan, tilt, color, etc. Also known as "Attribute."

Patch
The act of assigning a DMX512 channel to a control channel on a console.

Reply
Digital data signals transmitted from each luminaire to the console. Only one luminaire may transmit at a time, in response to a request from the console.

Signal
Control protocol from a lighting console or interface.

Splitter (Isolator)
Device used to optically isolate and split a DMX512 signal. *Note: A DMX "two-fer" cannot be used to divide a signal.*

Start
To energize a luminaire arc lamp (applies to arc-lamp luminaires only).

Strobe
A special lighting effect which produces multiple rapid bursts of high intensity light.

Terminate/Termination
Termination refers to the dampening of DMX signal at the end of the transmission line. Termination is created by placing a 100 ohm resistor between pins 2 and 3 of the DMX line. Often, there is a switch on DMX devices to do this internally. If not, a terminator is provided in the form of an XLR connector with the proper resistor between pins 2 and 3 to be placed in the DMX Thru port on the device.

Tilt
The movement of the luminaire around the axis of the tilt tube.

Time
Control of the duration of the change of the variable parameters of some automated luminaires and other devices in a lighting system.

Timing Channel
A Timing Channel is used in lieu of cue fade rate to determine the time it will take a luminaire to move from one setting to another. For example, a cue in which a luminaire pans from one side of stage to the other may look "steppy" if cue fade rate is used, because of the nature of the DMX512 signal. To overcome this, a timing channel allows the luminaire to calculate the move "in time," effectively smoothing out the movement.

Zero Position
Pan and Tilt values at 50%. Also called "Home Position" or a "50/50" cue or group.

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