



**PHX Series LED Luminaires  
Installation & User's Manual**

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The material in this manual is for information purposes only and is subject to change without notice. Altman Lighting assumes no responsibility for any errors or omissions which may appear in this manual.

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## Our Commitment

Altman Lighting continually engages in research related to product improvement. New materials, production methods and design refinements are introduced into existing products without notice as a routine expression of the philosophy. For this reason any current Altman Lighting product may differ in some respect from its published description, but will always equal or exceed the original design specifications unless otherwise noted.

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PHX Series LED Luminaire Installation & User's Manual

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# IMPORTANT INFORMATION

## Product Safety Notices

When using electrical equipment, basic safety precautions should always be followed including the following:



- a. **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
- b. Do not use outdoors unless the product is specified to operate in outdoor environments.
- c. Do not mount near gas or electric heaters.
- d. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- e. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- f. Do not use this equipment for other than intended use.
- g. Refer service to qualified personnel.

**SAVE THIS DOCUMENT FOR FUTURE REFERENCE.**

## Warnings



**WARNING: RISK OF ELECTRICAL SHOCK!** You must have access to a main circuit breaker or other power disconnect device before installing any wiring. Be sure that power is disconnected by removing fuses or turning the main circuit breaker off before installation. Installing the device with power on may expose you to dangerous voltages and damage the device. It is always recommended that a "lock out tag" device is installed on the appropriate circuit disconnect prior to beginning electrical work of any kind. A qualified electrician must perform this installation.

**WARNING:** Insulation between low-voltage supply and control conductors is provided by basic insulation.

**WARNING:** Refer to National Electrical Code® and local codes for cable specifications. Failure to use proper cable can result in damage to equipment or danger to personnel.

**WARNING:** This equipment is intended for installation in accordance with the National Electric Code® and local regulations. It is also intended for installation in indoor applications only. Before any electrical work is performed, disconnect power at the circuit breaker or remove the fuse to avoid shock or damage to the control. It is recommended that a qualified electrician perform this installation.

**WARNING:** This Lighting Fixture IS NOT for residential installation or use.

**WARNING:** The structure where fixture(s) is to be mounted must be capable of supporting the weight of the fixture and its accessories. This fixture is for temporary, portable mounting only.

**WARNING:** The light source contained in this luminaire shall only be replaced by the manufacturer or his service agent or a similar qualified person.

**THIS PRODUCT MUST BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE INSTALLATION CODE BY:**

**A PERSON FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THE PRODUCT AND THE HAZARDS INVOLVED.**

**CE PRODUIT DOIT ÊTRE INSTALLÉ SELON LE CODE D'INSTALLATION PERTINENT, PAR UNE PERSONNE.**

**CONSULT A QUALIFIED ELECTRICIAN TO ENSURE CORRECT BRANCH CIRCUIT CONDUCTOR.**

**CONSULTER UN ÉLECTRICIEN QUALIFIÉ POUR VOUS ASSURER QUE LES CONDUCTEURS DE LA DÉRIVATION SONT ADÉQUATS.**

## FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Altman Lighting Product Warranty

### Warranty Term

Altman Lighting, Inc., a subsidiary of Altman Stage Lighting Company, Inc., herein referred to as Altman, warrants each new product (except for spare parts or products Altman does not manufacture for a period of TWO (2) years from date of shipment to correct by repair or replacement any part defect due to faulty material or workmanship. Under these same terms products with an LED light source shall be warranted for a period of FIVE(5) years and ONE(1) Day.

Altman warrants for NINETY (90) days any spare part it manufactures. On spare parts or products Altman does not manufacture, including, but not limited to, lamps, sockets, lenses, roundels, electronics, ignitors, ballasts, etc.; Altman will grant the same warranty given Altman by its vendors.

Altman assumes no responsibility for damage or faulty performance caused by misuse, improper installation, careless handling or where repairs have been attempted by others.

This warranty is in lieu of all warranties or guarantees expressed or implied and no representative or person is authorized to assume Altman any other liability with the sale of Altman's products.

For complete warranty terms and conditions, please refer to our web site at [www.altmanlighting.com](http://www.altmanlighting.com).

### Warranty Service

In order to request warranty service, you must receive a Return Material Authorization (RMA number prior to return.

Return shipments must be visibly marked with the RMA number; the product must be returned (*shipping prepaid*) to the factory at:

**Altman Lighting Inc.**  
**Attention: RMA # \_\_\_\_\_**  
**57 Alexander Street**  
**Yonkers, NY 10701**

The return must be within THIRTY (30) days of receiving the RMA from Altman.

# TABLE OF CONTENTS

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Have a question regarding this manual? .....	Inside Front Cover
Our Commitment .....	Inside Front Cover
<b>Important Information</b>	
Product Safety Notices.....	1
Warnings .....	1
FCC NOTICE .....	1
Altman Lighting Product Warranty.....	2
Warranty Term.....	2
Warranty Service .....	2
<b>Table Of Contents</b>	
<b>Preface</b>	
About this Manual .....	5
Accessories.....	5
Included Accessories - Fixed Focus Models .....	5
Included Accessories - Zoomable Focus Models .....	6
Available Accessories - Fixed Focus Pattern Holders .....	6
Available Accessories - Zoomable Focus Pattern Holders.....	6
Other Available Accessories.....	6
<b>PHX Series LED Luminaires Overview</b>	
PHX Series LED Luminaire Components .....	7
Fixed Focus Models.....	7
Zoomable Focus Models .....	7
<b>Installation and Set Up</b>	
Power Requirements.....	8
Connecting Power.....	8
Connecting to the DMX512 Network.....	9
XLR Connectors .....	9
Installation .....	9
Installing C-Clamp .....	10
Installing Safety Cable .....	10
Using and Installing Fixture Features and Accessories .....	11
Focus Adjustment (Fixed Focus Models) .....	11
Focus and Zoom Adjustment (Zoomable Focus Models).....	11
Rotating Shutter Assembly (All Models) .....	12
Shutter Movement .....	12
End of Lens Accessory Holder .....	13
Drop In Iris Slot (All Models).....	14
Gobo / Soft Focus Lens Adapter Slot (All Models) .....	14
Yoke Assembly .....	15
Setting Tilt Angle.....	15
Short Yoke Position .....	15
<b>Operation</b>	
Overview .....	17
Menu System .....	17
Setting DMX Address .....	17
Menu Options and Settings .....	17
Player / Programming Cues.....	20

DMX Maps .....	21
Fixed White DMX Maps (3000K and 5600K LEDs) .....	21
Tunable White DMX Maps (3000K - 5600K LEDs) .....	21
Color DMX Maps (RGBW, RGBA, and RGBL LEDs) .....	22
RDM Control and Tables.....	24
PHX1 150W Fixtures.....	24
PHX2 250W and PHX3 340W Fixtures.....	25
<b>Cleaning and Care</b>	
Special Cleaning and Care Instructions .....	26
Lens Cleaning.....	26
Front Lens (Exterior) .....	26
Front Lens (Interior) .....	26
Service and Maintenance .....	27
<b>Troubleshooting</b>	
Troubleshooting Guide .....	28
<b>Technical Specifications</b>	
PHX Series LED Luminaire Common Specifications .....	29

# PREFACE

## About this Manual

The document provides installation and operation instructions for the following products PHX Series LED Luminaires:

PHX Models	Wattage	LED Array(s)	Available Lenses	Body Color/Finish
PHX1	150 Watts	RGBA	Fixed Lenses: 5°, 10°, 19°, 26°, 36°, 50°  Zoom Lenses: 15° to 35° (15Z) and 30° to 55° (30Z)	Black (B) or White (W)
		RGBW		
		3K (White)		
		5K (White)		
		3K5K (Tunable White)		
PHX2	250 Watts	RGBA		
		RGBW		
		3K (White)		
		5K (White)		
		3K5K (Tunable White)		
PHX3	340 Watts	RGBL		

**Note:** Model numbers are as follows: PHX[Number]-[LED Array]-[Lens]-[Body Color]. Example: PHX2-RGBW-19-B, PHX ellipsoidal, 250W, RGBW LEDs, 19 degree lens, fixture/lens body color is black.

Please read all instructions before installing or using this product. *Retain this manual for future reference.*



**IMPORTANT!** This manual covers the all PHX Series LED Luminaire models. Because these fixtures are configured at the time of ordering, please refer to the current product specification sheet for the model numbers and descriptions.

## Accessories

Contact your Authorized Altman Lighting Dealer for price and availability of all accessories for PHX Series LED Luminaires. Additional information can be found on the Altman Lighting web site at [www.altmanlighting.com](http://www.altmanlighting.com).

### Included Accessories - Fixed Focus Models

Part Number	Description
4.5-CF*	Color frame, 6-1/4 inch x 6-1/4 inch (included with 19°, 26°, 36°, 50° models)
10-CFB	Black color frame, 12 inch x 12 inch (included with 10° models)
12-CFB	Color frame, 14 inch x 14 inch (included with 5° models)
510	Malleable iron pipe clamp
SC-36-BK	36-inch black safety cable with spring clamp
PHXZ-SFLGSB	PHX soft focus lens with B-size pattern holder
PCL-PBG-12-*	5-foot, 20A PowerCON connector with parallel blade U ground (Edison)

\* Specify color at time of ordering by adding the following code for color: B = Black or W = White.

## Included Accessories - Zoomable Focus Models

Part Number	Description
6-CF*	Color frame, 7-1/2 inch x 7-1/2 inch
510	Malleable iron pipe clamp
SC-36-BK	36-inch black safety cable with spring clamp
PHXZ-SFLGSB	PHX soft focus lens with B-size pattern holder
PCL-PBG-12-*	5-foot, 20A PowerCON connector with parallel blade U ground (Edison)

\* Specify color at time of ordering by adding the following code for color: B = Black or W = White.

## Available Accessories - Fixed Focus Pattern Holders

Part Number	Description
PHX-PHGSA	A Size Steel Pattern Holder (100mm OD/75mm IA)
PHX-PHGSB	B Size Steel Pattern Holder (86mm OD/64.5mm IA)
PHX-PHGSA-GLS	A Size Glass Pattern Holder (100mm OD/75mm IA)
PHX-PHGSA-GLS	A Size Glass Pattern Holder (100mm OD/75mm IA) for Iris Slot
PHX-PHISB	B Size Steel Pattern Holder (86mm OD/64.5mm IA)
PHX-PHISA-GLS	A Size Glass Pattern Holder (100mm OD/75mm IA) for Iris Slot
PHX-PHISB-GLS	B Size Glass Pattern Holder (82mm OD/ 64.5mm IA) for Iris Slot
PHX-PHIS86-GLS	B Size Glass Pattern Holder (86mm OD/ 64.5mm IA) for Iris Slot

**Note:** Fixed focus pattern holders are sold separately.

## Available Accessories - Zoomable Focus Pattern Holders

Part Number	Description
PHXZ-PHGSA	A Size Steel Pattern Holder (100mm OD/75mm IA)
PHXZ-PHGSA-3T	A Size Steel Pattern Holder (100mm OD/75mm IA) 3 Tab Style
PHXZ-PHGSA-GLS	A Size Glass Pattern Holder (100mm OD/75mm IA)
PHXZ-PHGSA-GLS	A Size Glass Pattern Holder (100mm OD/75mm IA) for Iris Slot
PHXZ-PHISB	B Size Steel Pattern Holder (86mm OD/ 64.5mm IA)
PHXZ-PHISB-GLS	B Size Glass Pattern Holder (82mm OD/ 64.5mm IA) for Iris Slot
PHXZ-PHIS86-GLS	B Size Glass Pattern Holder (86mm OD/ 64.5mm IA) for Iris Slot

**Note:** Zoomable focus pattern holders are sold separately.

## Other Available Accessories

Part Number	Description
PCL-2P&G-12-5-*	5-foot, 20A PowerCON with 2P&G stage pin connector, male
PCL-TLG-12-5-*	5-foot, 20A PowerCON with L5-20P twist locking ground connector, male
PCL-BARE-12-5-*	5-foot, 20A PowerCON with bare end lead (no connector)
510-HD	Heavy Duty Malleable Iron Pipe Clamp
6-DN	7-1/2 inch x 7-1/2 inch with 3 inch hole donut, black (For 19°, 26°, 36°, 50° and zoom models)

\* Specify color at time of ordering by adding the following code for color: B = Black or W = White.

**Note:** Other available accessories are sold separately.

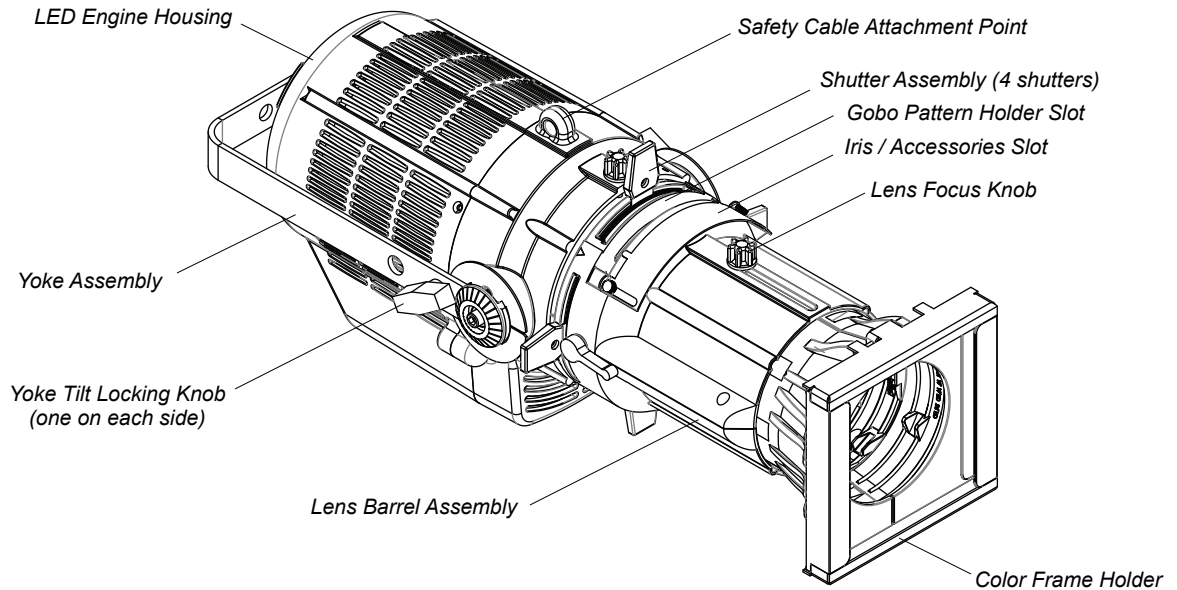


# PHX SERIES LED LUMINAIRES OVERVIEW

## PHX Series LED Luminaire Components

### Fixed Focus Models

Figure 1 shows the basic features of fixed focus models.

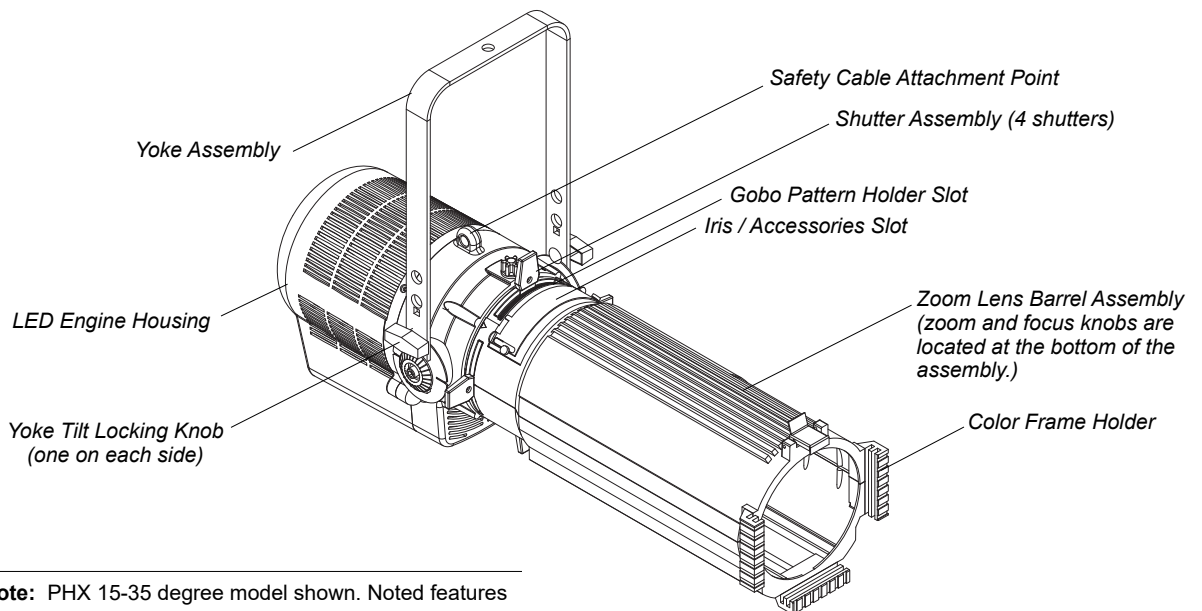


**Note:** PHX 19-degree model shown. Noted features similar for all fixed focus models.

Figure 1: Fixed Focus Model Features

### Zoomable Focus Models

Figure 2 shows the basic features of zoomable focus models.



**Note:** PHX 15-35 degree model shown. Noted features similar for all zoomable focus models.

Figure 2: Zoomable Focus Model Features

# INSTALLATION AND SET UP

## Power Requirements



**WARNING!** PHX Series LED Luminaires should be connected to a constant circuit or a relay device. They should never be connected to a dimmer or circuit controlled by a dimmer. Read this section carefully on how to properly connect your fixture.



**WARNING!** When using the daisy-chain connection method, only connect your PHX LED Luminaire to AC output connection of other PHX LED Luminaires. **DO NOT CONNECT OTHER TYPES OF LUMINAIRES OR DEVICES!** The maximum allowable number of PHX LED Luminaires that can be daisy-chained on one power feed should not exceed the first fixture's 16 Amp output power rating. Refer to **Table 1** for maximum number of PHX LED Luminaires on one daisy chain power feed.

**Table 1: Daisy Chain Limits of PHX Series LED Luminaires**

Model	Voltage	Number of Units (maximum)	Total Amperage
PHX1 LED Luminaires	120VAC	10	12.5 Amps
	230VAC	20	13.0 Amps
PHX2 LED Luminaires	120VAC	6	14.0 Amps
	230VAC	12	13.0 Amps
PHX3 LED Luminaires	120VAC	5	14.6 Amps
	230VAC	10	14.7 Amps



**WARNING!** The wiring information in **Table Note:** is shown for field wiring information and must be performed by a qualified and licensed electrician. Before performing any field wiring, refer to and read the warnings contained in "**Important Information**" on page 1.

## Connecting Power

Units are powered via an AC input cable from 100 to 240VAC, 50/60Hz and draw approximately:

- PHX1 LED Luminaires: 150 Watts
- PHX2 LED Luminaires: 250 Watts
- PHX3 LED Luminaires: 340 Watts

of power. **Table 2**, outlines the wire colors and their purpose.

**Table 2: AC Input Wiring**

Wire Color	Purpose
Brown or Black	Main / (L)ine
Blue or White	(N)eutral
Green/Yellow or Green	Ground / Earth

**Note:** See **Figure 3** on **page 9** for wiring connections.



**IMPORTANT!** The PHX Series LED Luminaire must be connected to and properly grounded to an viable earth ground.

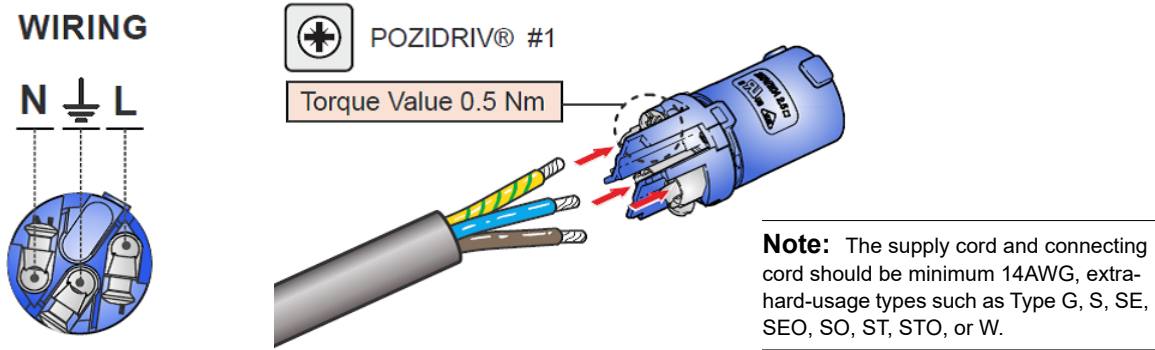


Figure 3: PowerCON (Blue AC Input) Connector Wiring

## Connecting to the DMX512 Network

Basic DMX512 installation consists of connecting multiple DMX controlled PHX Series LED Luminaires together (up to 32 Total devices per DMX string) in “daisy-chain” fashion. A cable runs from the DMX512 control source to the DMX INPUT connection on the first luminaire. From the DMX OUTPUT of the first luminaire, another cable runs to the DMX INPUT connector on the next luminaire (or DMX512 device to be controlled), and so on.



**IMPORTANT!** At the end of each DMX Daisy chain, it is highly recommended that a DMX TERMINATOR (Altman Lighting part number DMX-MPHX-TERM) is utilized on the last luminaire (or device) in the chain.

For more information on installing DMX512 control systems, the following publication is available for purchase from the United States Institute for Theatre Technology (USITT), “Recommended Practice for DMX512: A Guide for Users and Installers, 2nd edition” (ISBN: 9780955703522). USITT Contact Information: [www.usitt.org](http://www.usitt.org).

## XLR Connectors

For wiring 5-pin XLR connectors for DMX Input / Output, refer to **Table 3**.

Table 3: DMX 5-Pin XLR Connector Wiring

DMX Signal	XLR Connector*
Common (Drain)	Pin 1
DMX -	Pin 2
DMX +	Pin 3

**Note:** \* Only those pins shown are used. Remaining pins on connectors are not used.

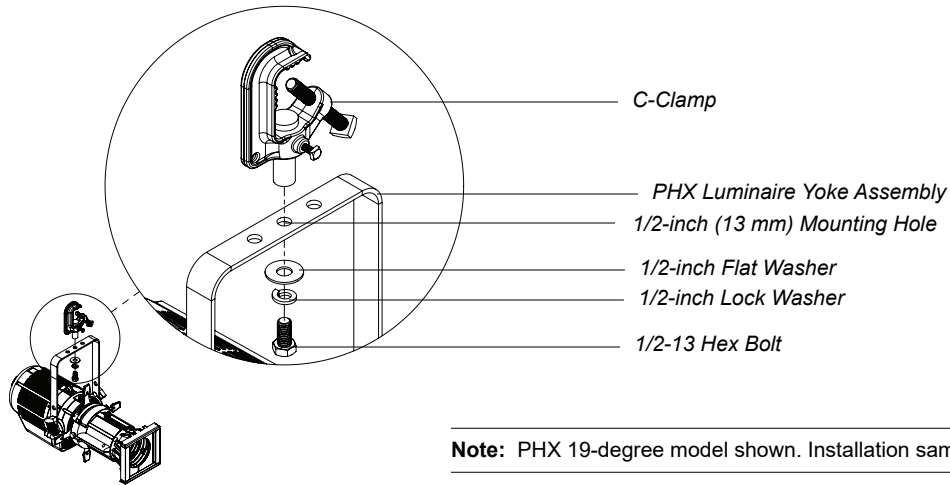
## Installation

Installing and using any PHX Series LED Luminaire is the same as most theatrical fixtures. Installers and users of these fixtures should adhere to all local and national safety codes when installing them. The PHX Series LED Luminaire are supplied with a c-clamp and safety cable (see “**Accessories**” on page 5 for additional information). These items, as well as the luminaire itself, should be inspected periodically to make sure they are in good working order.

This section provides a basic overview of how to install the PHX Series LED Luminaire in truss or on pipe using the provided c-clamp.

## Installing C-Clamp

The provided c-clamp should be installed as shown in **Figure 4**. Only use the hardware supplied with the c-clamp.



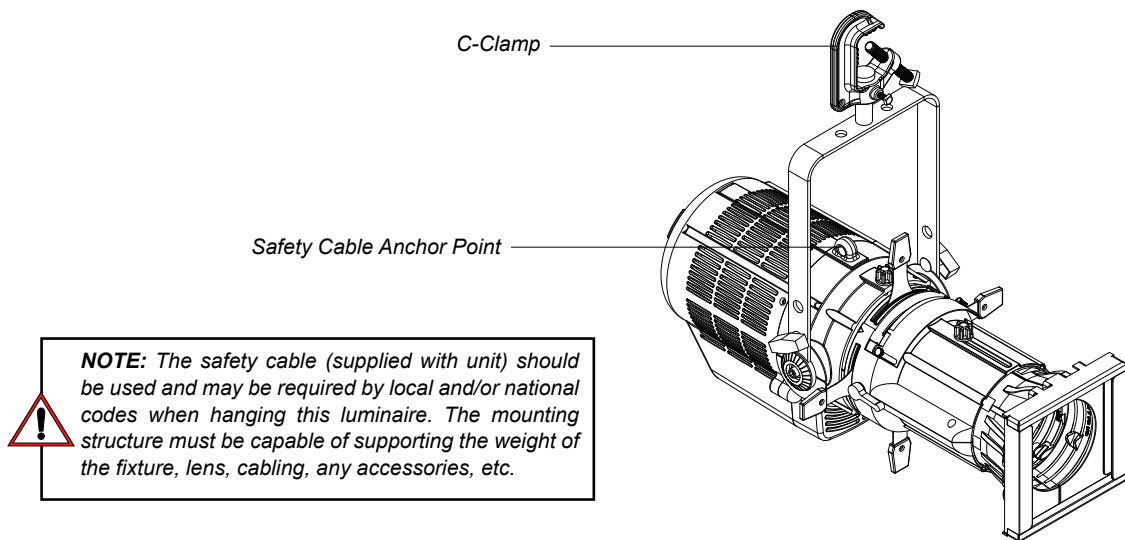
**Figure 4: C-Clamp Installation**

### To Install the c-clamp:

- Step 1. With luminaire on a flat, steady surface, position yoke assembly for easy access as illustrated in **Figure 4**.
- Step 2. Place on 1/2-13 hex bolt, in this order, the 1/2-inch lock washer and then the 1/2-inch flat washer.
- Step 3. Insert bolt into hole on yoke assembly.
- Step 4. Position c-clamp over bolt and thread bolt into c-clamp.
- Step 5. Tighten bolt.

## Installing Safety Cable

The provided safety cable should be installed in accordance to local and national codes.



**Note:** PHX 19-degree model shown. Installation same for all models.

**Figure 5: Safety Cable Installation**

## Using and Installing Fixture Features and Accessories

PHX Series LED Luminaires accept a variety of accessories and has several on-board features. This section will describes what accessories can be used, how to install them and how to use the various features of the fixture.



**CAUTION:** When installing accessories, it is best practice to do so with the fixture on a flat and stable work surface. If this is not possible, when installing accessories when the fixture is mounted above, be sure to install the accessory with no one below the fixture in the event the accessory is dropped.

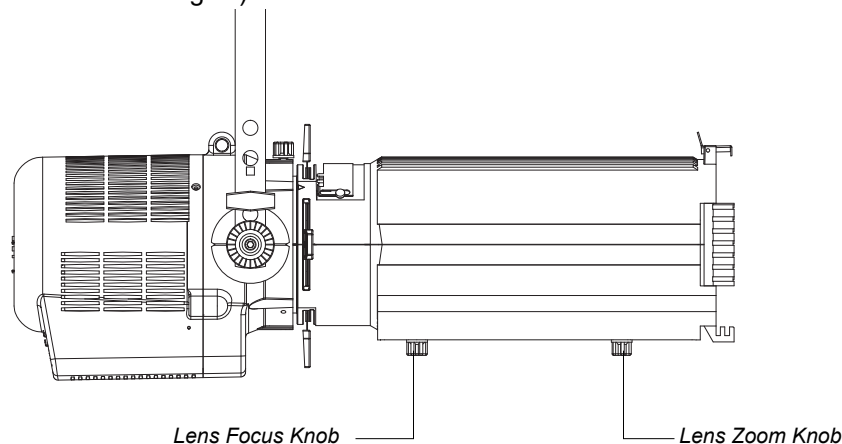
**Note:** There are many aftermarket accessories for Altman Lighting products available through third-party suppliers. When considering these aftermarket accessories, we suggest that you consult with your Altman Regional Sales Manager beforehand regarding capability and effects on product performance.

### Focus Adjustment (Fixed Focus Models)

Focusing PHX Series LED Luminaires is straight forward. Position the fixture as needed, loosen, but do not remove, the lens focus knob (refer to **Figure 1 on page 7**) and slide lens forwards or backwards until desired focus is achieved. Once focus is set, hand-tighten lens focus knob.

### Focus and Zoom Adjustment (Zoomable Focus Models)

Zoomable models offer users the ability to zoom the lens to various beam angles (refer to the model purchased for available beam angles).



**Figure 6: Zoomable Models - Zoom and Focus Knobs**

#### Setting Zoom (Beam Angle)

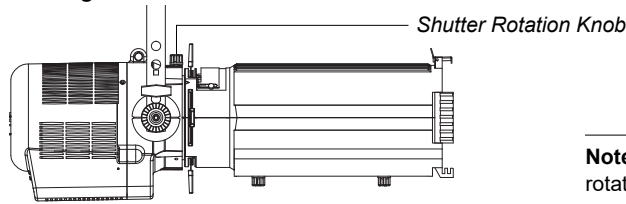
Position the fixture as needed, loosen, but do not remove, the lens zoom knob (refer to **Figure 6**). Slide lens forwards or backwards until desired zoom is achieved. After zoom is set as desired, hand-tighten the zoom knob. Once beam angle is set, hand-tighten lens zoom knob. Proceed to adjust focus (if required).

#### Setting Focus

To set the beam focus on zoomable models, loosen, but do not remove, the lens focus knob (refer to **Figure 6**) and slide lens forwards or backwards until desired focus is achieved. Once focus is set, hand-tighten lens focus knob.

## Rotating Shutter Assembly (All Models)

If rotating the shutter assembly is required, loosen, but do not remove, shutter rotation lock knob (see **Figure 7**) on fixture. Using both hands, rotate the shutter assembly (in either direction) until in the desired position. Hand-tighten shutter rotation lock knob.

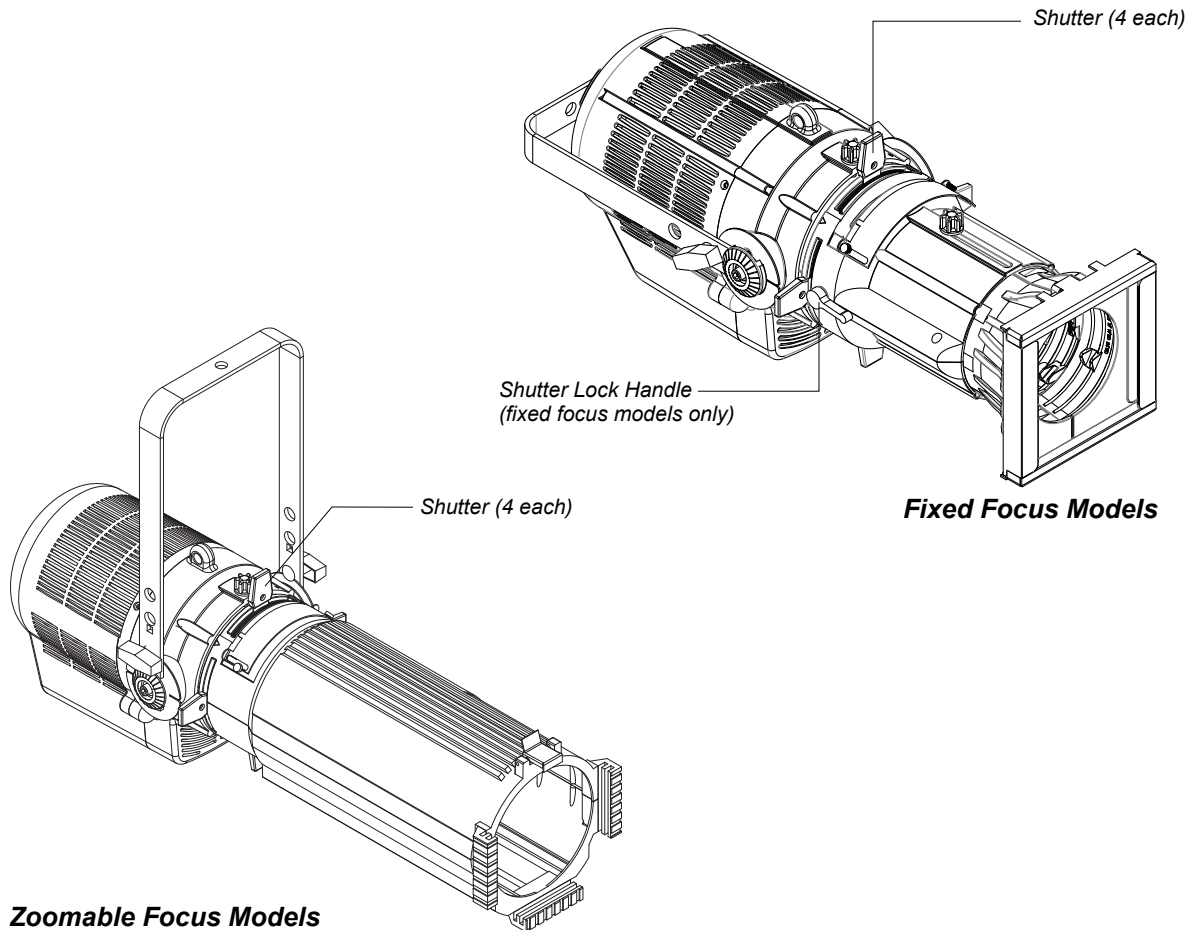


**Note:** PHX zoomable model shown. Shutter rotation same for all models.

**Figure 7: Shutter Rotation Knob**

## Shutter Movement

Each PHX LED Luminaire offers four (4) shutter blades that can be moved in or out of the fixture's light beam. To set the shutters, first set the beam as needed (refer to "**Focus Adjustment (Fixed Focus Models)**" on page 11 or "**Focus and Zoom Adjustment (Zoomable Focus Models)**" on page 11 as applicable), disengage the shutter lock, move shutters as desired.



**Figure 8: Shutters**

**Note:** On fixed focus units, the shutters can be locked into position by engaging the shutter lock (see **Figure 8**) on side of the luminaire. Users will know when the shutter lock is engaged when the shutter, when grabbed by the hand, does not easily move.

## Accessory Holder

Each PHX Series LED Luminaire is equipped with an end of lens accessory holder to hold the supplied color frame. Please note which model you have. The accessory holder for fixed focus and zoomable models are different and are operated differently.

### Accessory Holder (Fixed Focus Models)

On fixed focus models, the accessory holder latch is opened by sliding the cover to the side, lift up on the cover, insert accessory, and close the cover. Make sure the retaining cover locks back in place.

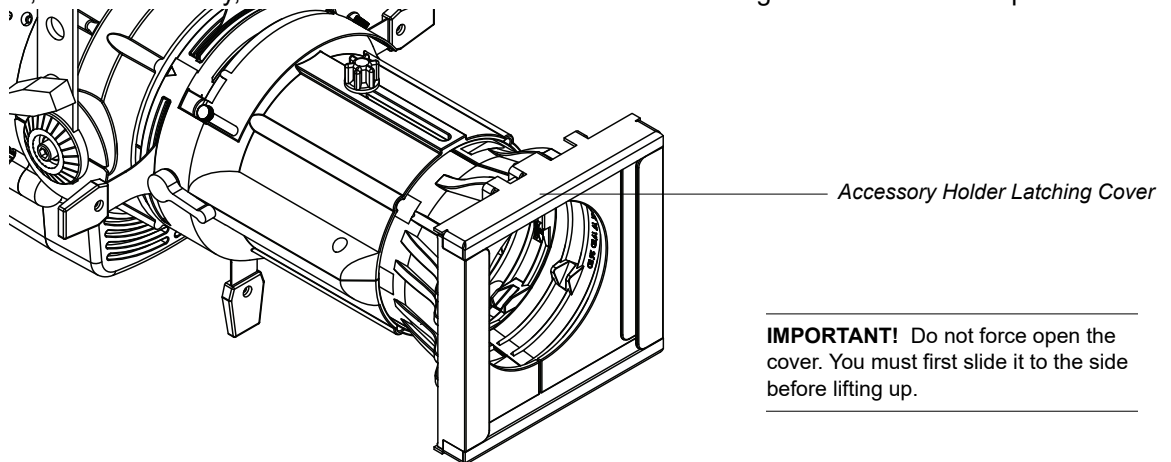


Figure 9: Accessory Holder Latching Cover (Fixed Focus Models)

### Accessory Holder (Zoomable Focus Models)

On zoomable focus models, the accessory holder has a small latch that is released by sliding it to the side, lift up on the latch, insert accessory, and close the latch make sure the retaining latch locks back in place.

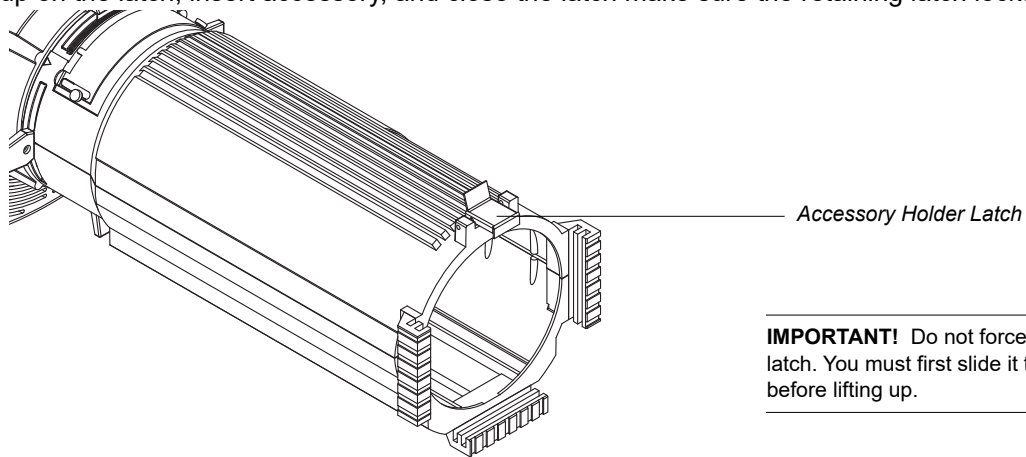


Figure 10: Accessory Holder Latch (Zoomable Models)

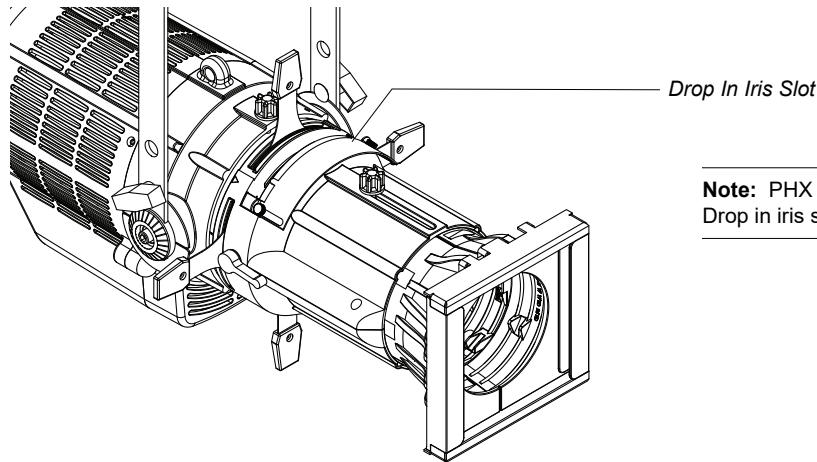


## Drop In Iris Slot (All Models)

Each PHX LED Luminaire's lens has a large opening for a drop in iris or motorized pattern device / gobo rotator (by others). This slot has a retractable cover in order to prevent light leak when not in use and should be closed as far as possible when in use.



**IMPORTANT!** To avoid damage to the fixture, insert the flat side of the accessory towards the shutters.



**Note:** PHX fixed focus model shown.  
Drop in iris slot same for all models.

Figure 11: Drop In Iris Slot

## Gobo / Soft Focus Lens Adapter Slot (All Models)

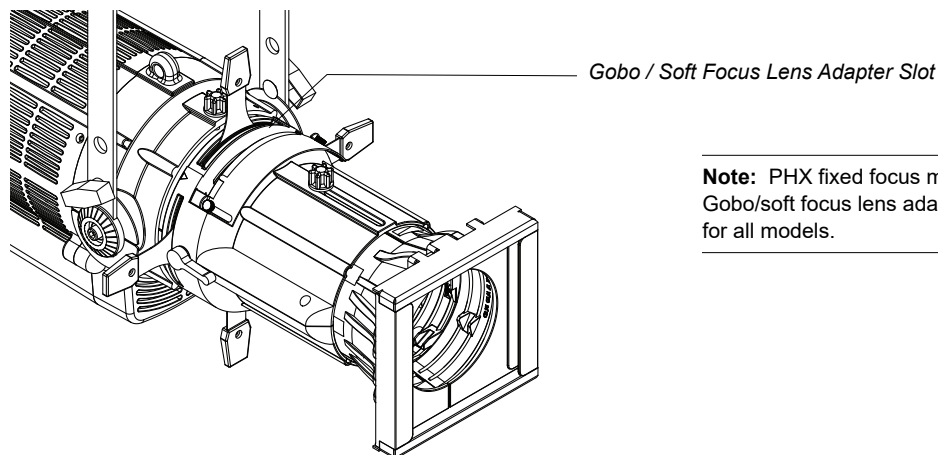
Each PHX LED Luminaire's lens has an opening for a gobo holder (templates and gobos by others or for the soft focus lens adapter (supplied with unit).

You must follow the gobo manufacturer's instructions on how to handle and use a gobo in your fixture. Always place the most reflective side towards the light source.

The unit is also supplied with a soft focus lens. The soft focus lens is a pattern holder with a special lens material that allows the LED fixture to appear like a conventional ellipsoidal. The matte side of the material should face the LED light source - shiny side towards the front of the lens.



**IMPORTANT!** DO NOT sandwich metal gobos in the soft focus lens pattern holder or damage may occur.



**Note:** PHX fixed focus model shown.  
Gobo/soft focus lens adapter slot same for all models.

Figure 12: Gobo / Soft Focus Lens Adapter Slot

Additional notes on next page.



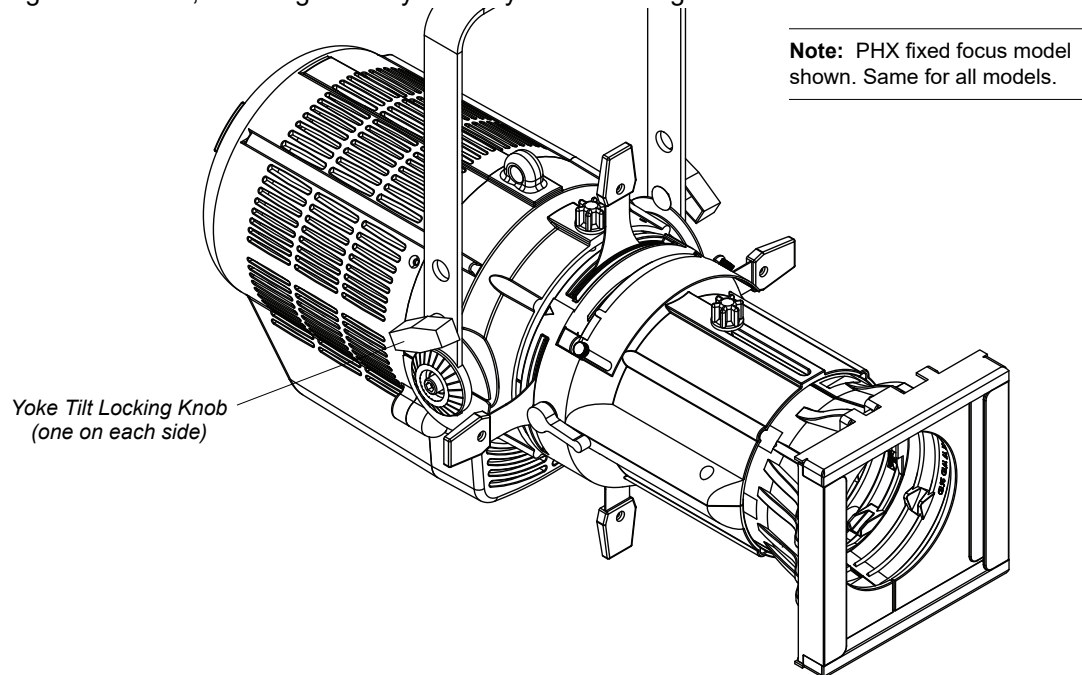
**Notes:**

- Recommended practice when using metal gobos - depending upon the complexity of the pattern - it may be possible to view an afterimage of the gobo if shutters are used in conjunction with the gobo. If an afterimage is seen, it is recommended to black out the steel pattern using high temperature black spray paint or request this process from the gobo manufacturer.
- If the image requires extremely sharp-focused edges it is always recommended that a Donut is installed to help with image quality.
  - For fixed focus units 19, 26, 36, and 50 degree models, use part number 4.5-DN
  - For zoomable focus models, use part number 6-DN
  - For 10 degree models, use part number 10-DN
  - For 5 degree models, use part number 12-DN

## Yoke Assembly

### Setting Tilt Angle

The yoke assembly is easily set as needed. Simply loosen (but do not remove) both yoke tilt locking knobs, set tilt angle as desired, and retighten - by hand - yoke tilt locking knobs.



**Figure 13: Yoke Assembly**

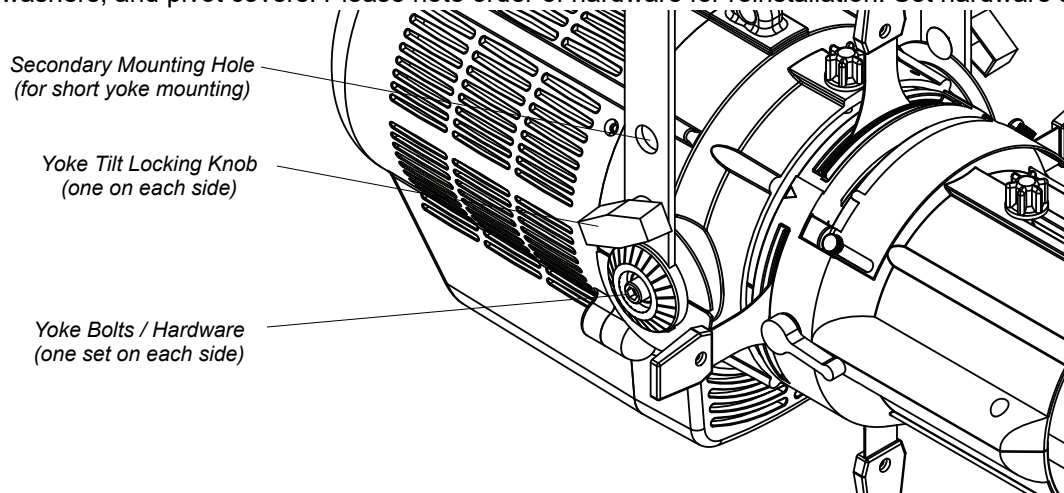
### Short Yoke Position

The yoke assembly has two sets of mounting holes to decrease the distance of the hanging position. To set the unit to a short yoke position, you will need a 1/4-inch hex head (Allen) wrench (by others).

**To reposition the yoke assembly to short yoke position:**

- Step 1. Place fixture on a flat, sturdy work surface. Remove power from fixture.
- Step 2. At yoke tilt lock knobs, remove both tilt lock knobs and associated hardware. Set aside for reinstallation.

Step 3. As shown in **Figure 14**, using a 1/4-inch hex head wrench (by others), remove yoke bolts, cup washers, and pivot covers. Please note order of hardware for reinstallation. Set hardware aside.



**Figure 14: Yoke Hardware**

- Step 4. Position yoke assembly so secondary mounting holes are aligned with fixture yoke mounting position.
- Step 5. Reinstall yoke bolts, cup washers, and pivot covers in order removed in Step 3.
- Step 6. Reinstall tilt lock knobs and associated hardware in order removed in Step 2. Washer is positioned between handle and yoke assembly.

# OPERATION

## Overview

All PHX Series LED Luminaires have an onboard menu system that allow users to control a variety of luminaire features or setup the luminaire for standalone operation or control via DMX. This section covers the onboard menu system and DMX mapping for all models.

## Menu System

The menu buttons are outlined below.

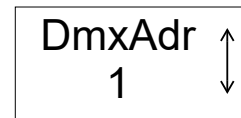
**Table 4: PHX Series LED Luminaire Menu Buttons**

Button Label	Control / Function
MENU	Move to previous menu and cancel current action
ENTER	Select / enter into an option, accept a current action
UP	Scroll up through options and selections
DOWN	Scroll down through options and selections

## Setting DMX Address

*To set the fixture’s DMX address:*

- Step 1. Power fixture and wait until fixture booting is completed. When complete, LCD display will go blank.
- Step 2. Press ENTER button. When “DMX Control” appears, press ENTER button.
- Step 3. As illustrated in **Figure 15**, LCD display will show “DmxAdr” (with a number underneath), press ENTER button.



**Figure 15: DMX Address**

**Note:** An up/down arrow will appear next to the number letting you know the unit is in DMX address setting mode.

- Step 4. Using UP and DOWN buttons, scroll and select desired DMX address.
- Step 5. Once desired DMX address appears, either:
  - a. Press ENTER to confirm DMX address. **OR**,
  - b. Press MENU to back out of DMX address setting.

Once DMX address is set, the unit is ready to connect to DMX network for control. For DMX connections and connecting to a DMX network, refer to **"Connecting to the DMX512 Network" on page 9**.

## Menu Options and Settings

**Table 5, “Menu Options and Settings,” on page 17** describes the available menu options and settings. Not all options and settings are available for all models in the PHX series and are noted.

**Note:** \* When DMX signal is restored to the fixture, the fixture will respond to DMX commands.

Table 5: Menu Options and Settings

Main Menu	Sub Menu	Options	Description / Notes
DMX Control	DMXAdr <b>(Default is 001)</b>	001-512	Sets DMX address for the fixture.
	DMX Mode <b>(Default is 8 bit)</b>	8 Bit	Uses one (1) DMX channel per color.
		8 Bit + M	Uses one (1) DMX channel per color plus intensity (master channel).
		16 Bit	Uses two (2) DMX channels per color (high and low bytes).
		8 Bit + M	Uses two (2) DMX channels per color (high and low bytes) plus intensity (master channel).
	Smoothing <b>(Default is OFF)</b>	ON	Smoothing is selectable as ON or OFF and provides a smooth transition ramp from one level to another, this is similar to how an incandescent lamp behaves. This helps to eliminate the "Digital Linear Dimming" at the bottom end of the dimming curve.
		OFF	
	DMX Loss <b>(Default is OFF)</b>	OFF	When DMX signal is lost, unit turns off.*
		Preset (cue)	When DMX signal is lost, unit will goto cue 1.*
		Hold	When DMX signal is lost, unit will hold its last setting (look).*
Player <i>(For more information on Player, see "Player / Programming Cues" on page 19)</i>	Player <b>(Default is OFF)</b>	OFF	Turns off player.
		ON	Turns on player.
	Edit Presets	Edit Cue 1 - Enable ON/OFF - Set color(s) level	Enables or disable cue(s). Provides user-selectable settings for each cue: <ul style="list-style-type: none"><li>• Settings for Color(s) levels of Red, Green, Blue, White or Amber or Lime, (DMX value of 000 to 255) <i>and</i>,</li><li>• Delay of cue (1 second to 99 minutes). <b>Default delay is 2 seconds.</b></li></ul>
		Edit Cue 2 - Enable ON/OFF - Set color(s) level	
		Edit Cue 3 - Enable ON/OFF - Set color(s) level	
		Edit Cue 4 - Enable ON/OFF - Set color(s) level	
		Edit Cue 5 - Enable ON/OFF - Set color(s) level	
Fact. (Factory) Presets	Set?	Resets player settings to factory defaults.	
Set <i>(continued on next page)</i>	Fan <b>(Default is Auto)</b> <i>Note: this menu item is not present in PHX1 fixtures.</i>	Low	Sets fan on low speed
		ON	Turns fan on.
		Auto	Fan operates according to the fixture's current operating temperature.

Table 5: Menu Options and Settings

Main Menu	Sub Menu	Options	Description / Notes
Set <i>(continued from previous page)</i>	Dim Mode <i>(Default is Normal)</i>	Normal	Fixture dimming will be normal, optimized for live performance
		Fast	Fixture dimming is be faster than normal. PWM is increased from Normal for optimized dimming with higher PWM for combination of live and video productions
		Video	Fixture dimming will be optimized for video camera applications.
	Display <i>(Defaults are Back Light: ON and Flipped: Auto)</i>	Back Light - ON <i>(always on)</i> - Auto-60 <i>(60 sec.)</i> - Auto-30 <i>(30 sec.)</i> - Auto-10 <i>(10 sec.)</i> - Auto-5 <i>(5 sec.)</i> - Off	Sets the LCD display backlight to either always on or off or to a set number of seconds after the last button press.
		Flipped - Auto - Flipped - Normal	Sets the LCD display orientation to auto rotate (when the fixture is inverted), set to flipped (180 degrees from normal) or set to normal.
	Dim Curve <i>(Default is Square)</i>	Log	When set to Log, the dimming curve, (also called a Incandescent curve by some manufacturers), sets the luminaire to mimic a dimming effect that is perceived as naturally following an incandescent lamp fade.
		Square	When set to Square, the dimming curve (also called standard by some manufacturers) results in a dimming effect that follows a slow or soft bottom-end response and follows a linear line at the top end.
		Linear	When set to Linear, the dimming curve is in direct relationship to the DMX value. For example, if the DMX value of the DMX slider is at 25% of its range, then the signal to the luminaire (and its output) will also be at 25%.
	x-Load Software	Confirm	used for loading software from one PHX to the next using the DMX daisy chain. Note, this is for software update only and will not transfer fixture settings from one luminaire to another.

Table 5: Menu Options and Settings

Main Menu	Sub Menu	Options	Description / Notes
Info	LED Temp	--	Displays the current operating temperature of the LED in °C
	Hours	--	Displays the number of hours the luminaire has been powered. This does not reflect the number of hours the LEDs have been on.
	Serial Number	--	Displays the luminaire's serial number.
	LED SN	--	Displays the LED engine serial number.
	SFT Ver ( <i>software version</i> )	--	Displays the software version loaded in the luminaire.

## Player / Programming Cues

The Player allows users to pre-program and the playback cues (up to five) on the fixture automatically. The cues can run as short as one (1) second or as long as 99 minutes. You can choose any of the colors available on your fixture as desired within the cues to create any look. There is also an option of putting a delay in between your cues.

### **To program cues for the Player:**

- Step 1. Make sure luminaire is powered.
- Step 2. Press ENTER button to turn on LCD display.
- Step 3. Press DOWN button to scroll to Player option.
- Step 4. Press ENTER button to enter Player settings.
- Step 5. Press DOWN button to turn Player on by pressing MENU once to on option.
- Step 6. Press UP or DOWN buttons to scroll to "Edit Presets".
- Step 7. Press ENTER button to go to "Edit Cue".
- Step 8. Press UP or DOWN buttons to scroll to cue to be edited.
- Step 9. Press ENTER button to select "Cue 1".
- Step 10. Press ENTER button to enable (option on) Cue 1.
- Step 11. Press MENU button to back out of selection.
- Step 12. Select and edit color intensity for Cue 1.
  - a. Scroll to Red and press ENTER button. Red color is ready to be edited.
  - b. Press UP button to desired intensity (0-255).
  - c. Once intensity is set, press ENTER button to confirm (save color intensity setting).
  - d. Press MENU button to return to color selection.
  - e. Repeat these steps for all colors as desired.

---

**Note:** Once Cue 1 is programmed, repeat steps above for any additional cues you wish to edit.

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## DMX Maps

This section provides DMX maps for all versions of PHX LED Luminaires. Please refer to the map specific to the fixture you have.

Master Channel is selectable as ON or OFF and provides a Master Fade channel that dims all four (4) colors proportionally at the same time in order to maintain the color. This adds an intensity channel at the end of the DMX string.

### Fixed White DMX Maps (3000K and 5600K LEDs PHX 1 & 2 Series)

Table 6, Table 7 on page 20, Table 8 on page 20, and Table 9 on page 20 show the DMX map options for fixed white LED fixtures in 8-bit and 16-bit modes with master channel off and on.

**Table 6: Fixed White, 8-Bit Mode, Master Channel OFF**

DMX Channel	Channel Description	DMX Range	Description
1	White	0 - 255	8-bit control of intensity

**Table 7: Fixed White, 8-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
1	White	0 - 255	8-bit control of intensity
2	Master Channel	0 - 255	8-bit control of master channel

**Table 8: Fixed White, 16-Bit Mode, Master Channel OFF**

DMX Channel	Channel Description	DMX Range	Description
1	White (low byte)	0 - 65535	16-bit control of intensity
2	White (high byte)		

**Table 9: Fixed White, 16-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
1	White (low byte)	0 - 65535	16-bit control of intensity
2	White (high byte)		
3	Master (low byte)	0 - 65535	16-bit control of master channel;
4	Master (high byte)		

### Tunable White DMX Maps (3000K - 5600K LEDs)

Table 10, Table 11, Table 12, and Table 13 on page 21 show the DMX map options for tunable white LED fixtures in 8-bit and 16-bit modes with master channel off and on.

**Table 10: Tunable White, 8-Bit Mode, Master Channel OFF**

DMX Channel	Channel Description	DMX Range	Description
1	3000K White	0 - 255	8-bit control of 3000K LEDs
2	5600K White	0 - 255	8-bit control of 5600K LEDs

**Table 11: Tunable White, 8-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
1	3000K White	0 - 255	8-bit control of 3000K LEDs
2	5600K White	0 - 255	8-bit control of 5600K LEDs
3	Master Channel	0 - 255	8-bit control of master channel

**Table 12: Tunable White, 16-Bit Mode, Master Channel OFF**

DMX Channel	Channel Description	DMX Range	Description
1	3000K White (low byte)	0 - 65535	16-bit control of 3000K white LEDs
2	3000K White (high byte)		
3	5600K White (low byte)	0 - 65535	16-bit control of 5600K white LEDs
4	5600K White (high byte)		

**Table 13: Tunable White, 16-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
1	3000K White (low byte)	0 - 65535	16-bit control of 3000K white LEDs
2	3000K White (high byte)		
3	5600K White (low byte)	0 - 65535	16-bit control of 5600K white LEDs
4	5600K White (high byte)		
5	Master Channel	0 - 255	8-bit control of master channel

### Color DMX Maps (RGBW, RGBA, and RGBL LEDs)

Table 14, Table 15, Table 16, and Table 17 on page 22 show the DMX map options for fixtures with color LEDs in 8-bit and 16-bit modes with master channel off and on.

**Table 14: Color LEDs, 8-Bit Mode, Master Channel OFF**

DMX Channel	Channel Description	DMX Range	Description
1	Red	0 - 255	8-bit control of Red LEDs
2	Green	0 - 255	8-bit control of Green LEDs
3	Blue	0 - 255	8-bit control of Blue LEDs
4 (depends on fixture)	White	0 - 255	8-bit control of White LEDs
	Amber	0 - 255	8-bit control of Amber LEDs
	Lime	0 - 255	8-bit control of Lime LEDs

**Table 15: Color LEDs, 8-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
1	Red	0 - 255	8-bit control of red LEDs
2	Green	0 - 255	8-bit control of green LEDs
3	Blue	0 - 255	8-bit control of blue LEDs



**Table 15: Color LEDs, 8-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
4 <i>(depends on fixture)</i>	White	0 - 255	8-bit control of white LEDs
	Amber	0 - 255	8-bit control of amber LEDs
	Lime	0 - 255	8-bit control of lime LEDs
5	Master Channel	0 - 255	8-bit control of master channel

**Table 16: Color LEDs, 16-Bit Mode, Master Channel OFF**

DMX Channel	Channel Description	DMX Range	Description
1	Red (low byte)	0 - 65535	16-bit control of red LEDs
2	Red (high byte)		
3	Green (low byte)	0 - 65535	16-bit control of green LEDs
4	Green (high byte)		
5	Blue (low byte)	0 - 65535	16-bit control of blue LEDs
6	Blue (high byte)		
<i>For RGBW Fixtures</i>			
7	White (low byte)	0 - 65535	16-bit control of white LEDs
8	White (high byte)		
<i>For RGBA Fixtures</i>			
7	Amber (low byte)	0 - 65535	16-bit control of amber LEDs
8	Amber (high byte)		
<i>For RGLB Fixtures</i>			
7	Lime (low byte)	0 - 65535	16-bit control of lime LEDs
8	Lime (high byte)		

**Table 17: Color LEDs, 16-Bit Mode, Master Channel ON**

DMX Channel	Channel Description	DMX Range	Description
1	Red (low byte)	0 - 65535	16-bit control of red LEDs
2	Red (high byte)		
3	Green (low byte)	0 - 65535	16-bit control of green LEDs
4	Green (high byte)		
5	Blue (low byte)	0 - 65535	16-bit control of blue LEDs
6	Blue (high byte)		
<i>For RGBW Fixtures</i>			
7	White (low byte)	0 - 65535	16-bit control of white LEDs
8	White (high byte)		
<i>For RGBA Fixtures</i>			
7	Amber (low byte)	0 - 65535	16-bit control of amber LEDs
8	Amber (high byte)		
<i>For RGLB Fixtures</i>			
7	Lime (low byte)	0 - 65535	16-bit control of lime LEDs
8	Lime (high byte)		

Table 17: Color LEDs, 16-Bit Mode, Master Channel ON

DMX Channel	Channel Description	DMX Range	Description
9	Master (low byte)	0 - 65535	16-bit control of master channel;
10	Master (high byte)		

## RDM Control and Tables

PHX Series LED Luminaires are fully RDM compliant. This section outline the RDM features available for all models. Please refer to the table specific for the model you have.

- For PHX1 (150W) LED Luminaires, refer to [Table 18, “Supported RDM Parameter IDs \(PID\) for PHX1 LED Fixtures,” on page 23.](#)
- For PHX2 (250W) and PHX3 (350W) LED Luminaires, refer to [Table 19, “Supported RDM Parameter IDs \(PID\) for PHX2 and PHX3 LED Fixtures,” on page 24.](#)

### PHX1 150W Fixtures

Table 18: Supported RDM Parameter IDs (PID) for PHX1 LED Fixtures

Category	Support Parameters	PID	Get	Hex	Set
Manufacturer Specific PIDs	Smoothing	0xA104	ON...01	4F 6E 20 20 20 20 20 20	1
			OFF...00	4F 66 66 20 20 20 20 20	0
	DMX Loss	0x9023	OFF...00	4F 66 66 20 20 20 20 20	0
			HOLD...01	4F 6F 6C 64 20 20 20 20	1
			PRESET...02	50 72 65 73 65 74 20 20	2
	DMX Resolution	0xA100	8-Bit...00	38 2D 62 69 74 20 20 20	0
			16-Bit...01	31 36 2D 62 69 74 20 20	1
	Dimming Curve	0xA450	LINEAR...00	4C 69 6E 65 61 72 20 20	0
			SQUARE...01	53 71 75 61 72 65 20 20	1
			LOG...02	4C 6F 67 20 20 20 20 20	2
	Fixture Serial Number	0XA501	Example: 78426155	37 38 34 32 36 31 35 38	XXXX
	LED Serial Number	0XA502	Example: w ww	57 20 20 57 57 00 00 96	XXXX
	LCD Display Backlight	0xA430	ON...01	4F 6E 20 20 20 20 20 20	0
AUTO-5s...01			41 75 74 6F 2D 35 73 20	1	
AUTO-10s...02			41 75 74 6F 2D 31 30 73	2	
AUTO-30s...03			41 75 74 6F 2D 33 30 73	3	
AUTO-60s...04			41 75 74 6F 2D 36 30 73	4	
ESTA Defined PIDs	Device Model Description	0x0080	Phoenix 150W		XXXX
	Manufacturer Label	0x0081	Altman Lighting		XXXX
	Software Version-Label	0x00C0	VX.X		XXXX
	DMX Personality	0x00E1	See DMX Resolution Above		
	DMX_START_ADDRESS	0x00F0	0-512	0000-0200	0000-0512
	Sensor Definition	0x0200		00 00 01 00 00 00 00 64 00 0A 00 64 00 4C 45 44 20 20 20	XXXX
	Sensor Value	0x0201		00 00 18 00 00 00 00 00	XXXX
	IDENTIFY_DEVICE	0x1000	0-512		0-512
	Reset Device	0x1001	xxxx		XXXX
	Device Hours	0x0400	xxxx		XXXX

## PHX2 250W and PHX3 350W Fixtures

Table 19: Supported RDM Parameter IDs (PID) for PHX2 and PHX3 LED Fixtures

Category	Support Parameters	PID	Get	Hex	Set
Manufacturer Specific PIDs	Smoothing	0xA104	ON...01	4F 6E 20 20 20 20 20 20	1
			OFF...00	4F 66 66 20 20 20 20 20	0
	DMX Loss	0x9023	OFF...00	4F 66 66 20 20 20 20 20	0
			HOLD...01	4F 6F 6C 64 20 20 20 20	1
			PRESET...02	50 72 65 73 65 74 20 20	2
	DMX Resolution	0xA100	8-Bit...00	38 2D 62 69 74 20 20 20	0
			16-Bit...01	31 36 2D 62 69 74 20 20	1
	Dimming Curve	0xA450	LINEAR...00	4C 69 6E 65 61 72 20 20	0
			SQUARE...01	53 71 75 61 72 65 20 20	1
			LOG...02	4C 6F 67 20 20 20 20 20	2
	Fixture Serial Number	0XA501	Example: 78426155	37 38 34 32 36 31 35 38	XXXX
	LED Serial Number	0XA502	Example: w ww	57 20 20 57 57 00 00 96	XXXX
	LCD Display Backlight	0xA430	ON...01	4F 6E 20 20 20 20 20 20	0
			AUTO-5s...01	41 75 74 6F 2D 35 73 20	1
			AUTO-10s...02	41 75 74 6F 2D 31 30 73	2
			AUTO-30s...03	41 75 74 6F 2D 33 30 73	3
			AUTO-60s...04	41 75 74 6F 2D 36 30 73	4
	Dimming Mode	0x9021	NORMAL...00	4E 6F 72 6D 61 6C 20 20	0
			FAST...01	46 61 73 74 20 20 20 20	1
			VIDEO...02	56 69 64 65 6F 20 20 20	2
Fan Speed Mode	0xA420	AUTO...00	41 75 74 6F 20 20 20 20	0	
		ON...01	4F 6E 20 20 20 20 20 20	1	
ESTA Defined PIDs	Device Model Description	0x0080	Phoenix 250W or Phoenix 350W		XXXX
	Manufacturer Label	0x0081	Altman Lighting		XXXX
	Software Version-Label	0x00C0	VX.X		XXXX
	DMX Personality	0x00E1	See DMX Resolution Above		
	DMX_START_ADDRESS	0x00F0	0-512	0000-0200	0000-0512
	Sensor Definition	0x0200		00 00 01 00 00 00 00 64 00 0A 00 64 00 4C 45 44 20 20 20	XXXX
	Sensor Value	0x0201		00 00 18 00 00 00 00 00 00	XXXX
	IDENTIFY_DEVICE	0x1000	0-512		0-512
	Reset Device	0x1001	xxxx		XXXX
	Device Hours	0x0400	xxxx		XXXX

## CLEANING AND CARE

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**WARNING!** All cleaning should be performed with power completely removed from the luminaire. Never remove protective covers when luminaire is powered. Wear appropriate protective eye wear and gloves when cleaning the fixture. All service and maintenance, other than described herein, should be performed by a qualified technician or Authorized Service Center. **AT NO TIME SHOULD THE LED BE TOUCHED.**

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### Special Cleaning and Care Instructions

Being a solid-state fixture, and unlike most fixtures, the PHX Series LED Luminaire requires very little routine maintenance by the user. This section covers portions of the luminaire that can be removed for cleaning.

The PHX Series LED Luminaire requires special care when it comes to cleaning front lens assembly. Additional care needs to be taken with the plastic components because they are much easier to scratch or damage than glass.

The following is a list of cleaning materials required to care for your PHX Series LED Luminaire:

- Lint free lens tissue
- Lint or powder free gloves
- Reagent grade isopropyl alcohol\*
- A mild soap solution.

**Note:** \*Reagent grade isopropyl alcohol is good to use on the PHX Series LED Luminaire plastic optics with anti-reflection coatings.

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If the lens is still dirty after using isopropyl alcohol, for instance if fingerprints or oil is just redistributed and not cleaned off the optic, then a mild soap and water solution can be used to gently wash the lens. Repeat the cleaning with isopropyl alcohol to eliminate streaks and soap residue.

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**WARNING!** Under no circumstances should ammonia-based cleaners, acetone, or other harsh solvents be used on or near the PHX Series LED Luminaire. These types of cleaners or solvents can permanently damage the optics or housings of the fixture.

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If you have any questions regarding the use or care of your PHX Series LED Luminaire, please contact Altman Lighting technical support or your local Authorized Dealer.

**Routine Preventative Maintenance:** Regular routine maintenance should be performed **at least twice a year**. Additional inspections and cleaning may be necessary and more often depending upon the the environment and hours of use of each luminaire. (see previous page for cooling fin location (Heat Sink Location))

1. Turn off luminaire and allow to cool completely.
2. Check for excessive dust or debris in the heat sink area of the luminaire
3. Wipe and remove all debris, dirt, dust from the cooling fins  
(a can of clean compressed air can be used to blow out from one side of the luminaire to the other.)



**Do not blow dust into the open cavity of the PHX Luminaire.**

NOTE: keeping these components clean will facilitate efficient cooling and extend LED life.

Using a second lint-free lens tissue, wipe off any alcohol residue.

## Lens Cleaning

### Front Lens (Exterior)

***To clean the exterior front lens:***

- Step 1. Turn off luminaire and allow to cool completely.
- Step 2. Apply a small amount of reagent grade isopropyl alcohol to lint-free lens tissue.
- Step 3. Wipe all debris, dirt, fingerprints, etc. from lens.
- Step 4. Using a second lint-free lens tissue, wipe off any alcohol residue.

### Front Lens (Interior)

***To clean the interior of front lens:***

- Step 1. Turn off luminaire and allow to cool completely.
- Step 2. Remove lens assembly.
- Step 3. Apply a small amount of reagent grade isopropyl alcohol to lint-free lens tissue.
- Step 4. Wipe all debris, dirt, fingerprints, etc. from lens.
- Step 5. Using a second lint-free lens tissue, wipe off any alcohol residue.
- Step 6. Once lens is completely dry, reinstall lens assembly.

## Service and Maintenance

For all other service and maintenance issues, please contact your local Altman Lighting office or an Authorized Service Center.



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**WARNING!** Failure to follow the previous instructions and/or Disassembly (other than as described herein), alterations, unauthorized service, etc. will void the product warranty. Contact your local Altman Lighting office or an Authorized Service Center for technical support and service.

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# TROUBLESHOOTING

## Troubleshooting Guide

The chart below provides possible causes and remedies for various error messages and/or symptoms. If this chart is unable to address your issue, please contact your authorized dealer or Altman customer service at 1.914.476.7987 or [customerservice@altmanlighting.com](mailto:customerservice@altmanlighting.com) for assistance.



**WARNING!** Any service and maintenance (including troubleshooting), other than described herein should be performed by an Authorized Altman Lighting Dealer or Service Center.

Description	Symptom	Possible Cause/Remedy
No light output.	Fixture will not produce or output light and connected to power. Internal LED is illuminated.	Unit Setting is at 0% local control... Unit Setting is at 0% DMX control... Set intensity level above 0% or adjust to a higher intensity.
LOW light output.	Fixture produces low light output and connected to power.	Mains Dim Unit fade pot set to 0, turn local control to 100%. Mains Dim unit - check connected dimmer for upper threshold settings.
No power at luminaire.	Luminaire does not power up	Circuit not energized... verify circuit breaker is turned on. Not plugged in... ensure A/C cable is connected to power source. Power cable wired incorrectly... verify power cable and connector are wired correctly. See <a href="#">"Connecting Power"</a> on page 8 for more information.
DMX data control issues.	Fixture will not respond to DMX commands.	Not detecting DMX data... Disconnect and reconnect DMX input cable. Unit is not set to proper DMX address - check settings. Check all DMX connections (at control source and luminaire). DMX data cable not wired correctly or has a broken conductor... check DMX data cable for proper wiring. See <a href="#">"Connecting to the DMX512 Network"</a> on page 9 for more information.
Imperfections in light beam.	Beam appears fuzzy, distorted, low intensity, etc.	Check lens for dirt, obstructions, cracks or chips, shutter positions, etc.
No RDM control.	Luminaire does not respond to RDM commands.	Luminaire is in Player mode - turn Player mode off...see <a href="#">"Player / Programming Cues"</a> on page 20.  Turn off or disable control network's auto discovery.  Check all DMX connections (at control source and luminaire). DMX data cable not wired correctly or has a broken conductor... check DMX data cable for proper wiring. See <a href="#">"Connecting to the DMX512 Network"</a> on page 9 for more information.

## TECHNICAL SPECIFICATIONS

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### PHX Series LED Luminaire Common Specifications

Input Voltage:	120-240VAC 50/60Hz
Light Engine:	PHX1 (150W): 3000K (White), 5600K (White), 3000K to 5600K (Tunable White), RGBA, and RGBW. PHX2 (250W): 3000K (White), 5600K (White), 3000K to 5600K (Tunable White), RGBA, and RGBW. PHX3 (350W): RGBL
Control:	DMX512A, RDM, and Onboard Menu (Local)
Cooling:	PHX1(150W) Convection Cooled (no fan) PHX2 (250W) and PHX3 (340W) Active Cooling
Ambient Temperature:	0 to 40 degrees C (32 to 104 degrees F) PHX1 & 2 0 to 50 degrees C (32 to 122 degrees F) PHX3
Compliance:	cETLus Listed and CE Marked

**Note:** Basic model specifications shown. For specific model specifications, features, sizes/weights, and accessories, refer to the product specification sheet or visit the Altman Lighting web site at [www.altmanlighting.com](http://www.altmanlighting.com).





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