Pin Power Color Moving Head

User Manual

Important Safety Information

Instructions pertaining to continued protection against fire, electric shock, and injury to persons are found in Appendix A. Please read all instructions prior to assembling, mounting, and operating this equipment.

Symbols

The following international caution and warning symbols appear in margins in this manual

CAUTION: This symbol appears next to Caution messages. Ignoring these messages could result in personal injury and/or damage to equipment.

WARNING: This symbol appears adjacent to high voltage warning messages. Ignoring these messages could result in serious personal injury.

This symbol indicates the minimum distance from a lighted object

Warranty information

Limited Warranty

Unless otherwise stated, your *product* is covered by a one year parts warranty to be counted from shipment date. The buyer must provide receipts or invoices for verification of purchase and date. If purchase date cannot be proved, date of manufacture will be used to determine warranty period.

Freight

All shipping costs will be paid by the purchaser. Under any circumstances freight collect shipments will be accepted.

Warranty will be absolutely invalid if the product is damaged, modified in any way, or if the item has been negligently repaired.

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Chapter 1
Product Overview

The LM-2013 Pin Power Color Moving Head is a very small sized and very powerful LED luminaire, only 3.6 kg. weight. Very narrow and bright beam; scan movement runs extremely fast. It covers the full spectrum of RGB color mixing, and provides color wheel effects. Smooth dimming from 0-100%; strobe with pulse and random effects. Due to its small size and light weight it can be installed almost anywhere; has a very low power consumption; suitable for both rental and installation applications. Easy set up and installation.

Features

Operation
- 540º/630º pan and 240º tilt movement
- RGB color mixing
- Smooth dimmer from 0 to 100%
- Auto-switching power supply
- 100-240 V AC power input
- CTC function, color wheel, strobe

Construction
- Neutrik PowerCon input & throughput
- 5 or 3 pin XLR DMX connectors
- Thermo plastic housing (black, red, blue, silver & white)

<u>Specifications</u>

Physical specifications

Fixture Dimensions: 242 mm x 130 mm x 289 mm
Fixture Weight: 3.6 kg

Shipping dimensions & weight

Single fixture carton

      Dimensions: 280 mm x 175 mm x 340 mm

      Weight: 4.1 kg

Four fixtures carton

      Dimensions: 595 mm x 365 mm x 360 mm

      Weight: 18 kg

Flight case dimensions (8 pcs/case):

      Dimensions: ??? mm x ??? mm x ??? mm

      Weight: ?? Kg (Case + 8 Fixtures)
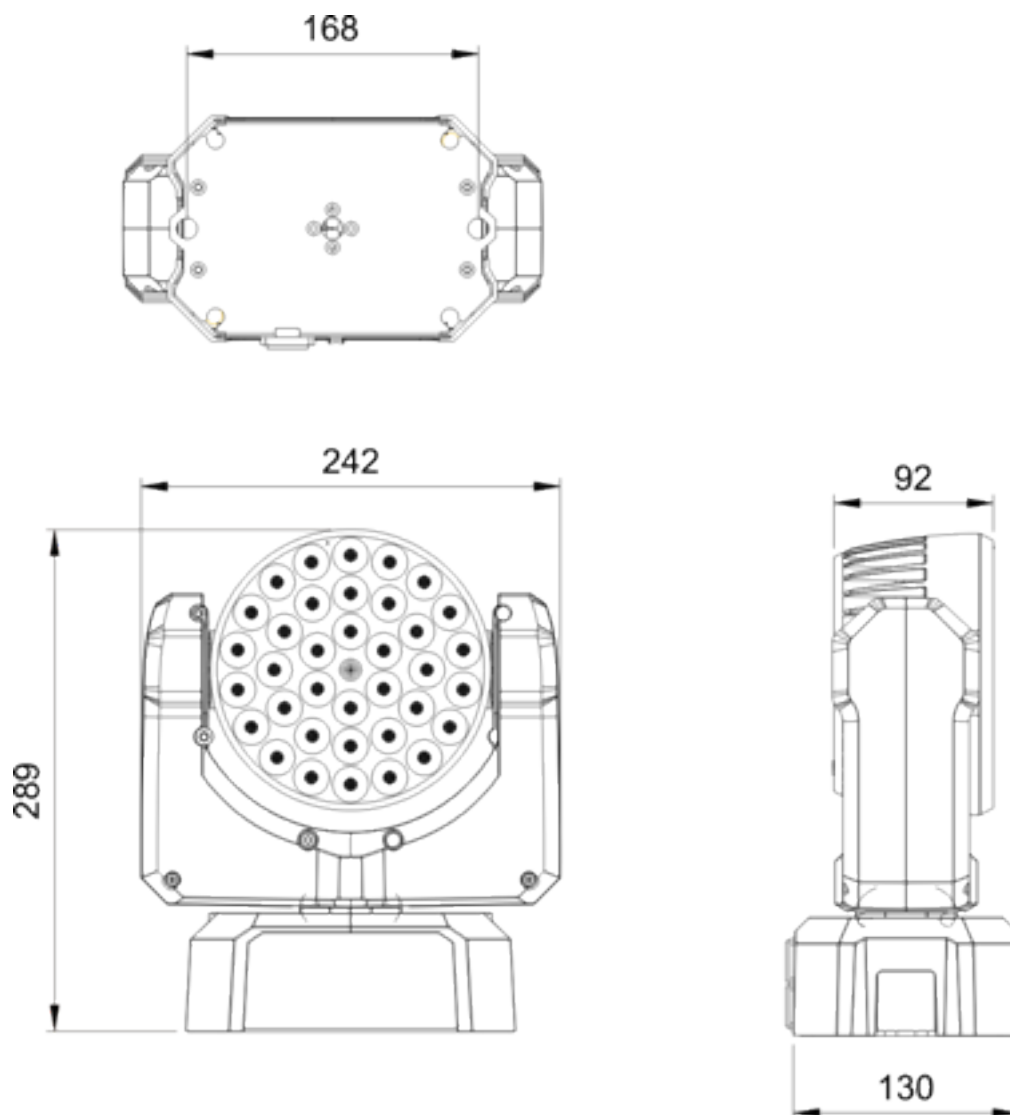
Mounting information

LM-2013 can be truss mounted using suitable clamps through the center hole on the fixture base. Clamps and accessories for truss mounting installation should be ordered separately. It can also stand upright on a suitable and stable surface.

Electrical/Optical information

- Power Input: 100-240 VAC; 50-60 Hz; 120 W
- Light Source: 36 pcs 3-watt RGB CREE XP-E LEDs
- Beam Angle: 8º
- Color Mixing: RGB

Operation

- Pan 540º or 630º (selectable); Tilt 240º
- Control: DMX 512
- Minimum distance to lighted object: 1 meter
- DMX connectors: 5-pin male and female XLR connectors
- Maximum ambient operating temperature: 40º C
- Minimum ambient operating temperature: -30º C

Chapter 2
Setup and Configuration

Use the following steps to set up and configure your fixture:

1. Unpack the fixture.
2. Install power cord cap for your location.
3. Mount the fixture upright or suspended from a standard truss.
4. Connect the fixture to a DMX controller via DMX cabling.
5. Connect the fixture to power.
6. Configure the fixture for DMX control.

Unpacking the fixture

The LM-2013 fixture is transported in a shipping box or flight case specifically designed to protect the product during transportation. When unpacking, inspect the fixture for physical damage of its components. Khroma Technologies Ltd. assumes no responsibility for products that are damaged during transport. Always transport a product in its shipping box or flight case.

Installing a power cable cab

The LM-2013 fixture is shipped without a power cable although it is ordered by customer. When installing the power cord, be sure you chose Neutrik PowerCon input connector as main power input and chose the correct cord cap for your area. Please note that our standard cores in the mains lead are colored according to the following criteria:

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

Mounting the fixture

The KL-3036-PPC fixture can be mounted suspended from a support system (as a truss) or freestanding on its base.

WARNING

This equipment is suitable for dry locations only. Do not expose this equipment to rain or moisture.

CAUTION:

Always use a secondary safety cable when mounting this fixture.This fixture must be installed and operated by trained personnel only.

Mantain a minimum distance of 1 meter from a lighted object

Mounting the fixture upright

To mount the fixture upright, place the fixture on a stable non-flammable surface that will support more than the 3.6 kg weight of the fixture. If the surface is above floor height, use safety cables to secure the fixture to the surface.Mounting the fixture on a truss

To mount the fixture upright, place the fixture on a stable non-flammable surface that will support more than the 3.6 kg weight of the fixture. If the surface is above floor height, use safety cables to secure the fixture to the surface.

Safety Cable

We strongly recommends that you use a safety cable when mounting any fixture. You must supply your own safety cable and verify that the cable is capable of supporting the weight of the fixture. You can order safety cables from your Conic Lighting Designs dealer/distributor. (see *Related Products and Accessories* on page 5).

Clamp

You must supply your own clamps and verify the clamp is capable of supporting the weight of the fixture. You can order C-clamps for truss mounting from your Conic Lighting Designs dealer/distributor (see *Related Products and Accessories* on page 5).

Mounting Procedure

To mount fixtures on a truss:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.

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

3. Attach suitable clamp through the center hole on the base of the fixture.

4. Tighten the clamps firmly to the fixture's base and to the support.

5. Loop one or more suitable safety cables around the support, through the side holes in the fixture's base.

Holes for attaching clamps & safety wires
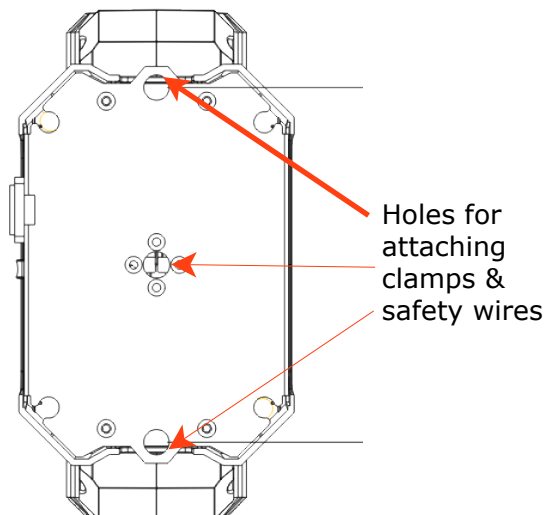
Linking Fixtures

LM-2013 fixtures operate on a standard DMX512 link controlled by a DMX console. The number of fixtures on a link will be determined by the combined number of channels required by all the fixtures. A KL-3036-PPC fixture using Standard protocol requires a maximum of 12 channels on a DMX512 link. Attach the fixture to the link using data-grade cable and 5-pin XLR cable connectors.

Cable Connectors

LM-2013 fixture accepts 5-pin XLR cable connectors. Cabling must have a male XLR connector on one end of the cable and a female XLR connector on the other end.

Pin one is the common (cable shield), pin two is the data complement (negative), pin three is the data true (positive). Pins four and five are not used, but they allow a secondary data link to pass through the fixture.
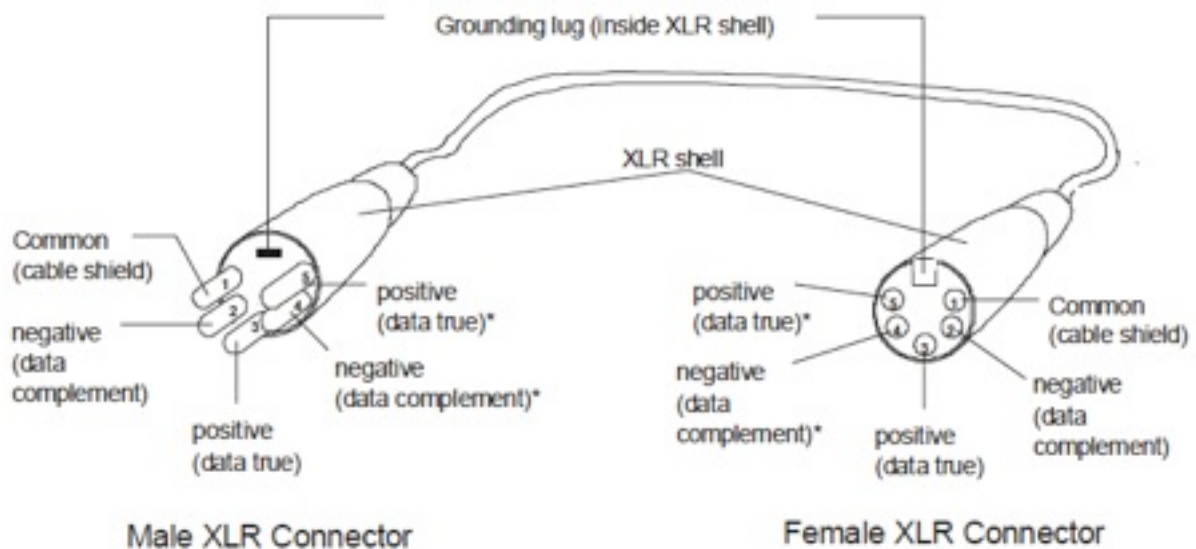
Test each cable with a voltage/ohm meter (VOM) to verify correct polarity and to make sure that the negative and positive pins are not grounded or shorted to the shield or to each other.

CAUTION:

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

Connecting to the Link

To link one or more fixtures to a DMX controller:

1. Connect the male XLR connector of a DMX Data cable to the controller's DMX Data Out connector.

2. Connect the Data cable's female XLR connector to the Data In connector of the first (or next) fixture on the DMX link.

3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.

4. Terminate the link by installing a 120 ohm, 1/4 watt (minimum) terminator in the fixture's Data Out (female) cable connector in the last fixture on each DMX link. A terminator on the last fixture of the link

To construct a terminator:

1. Disassemble a male 5-pin XLR connector.

2. Solder a 120 ohm resistor, minimum of 1/4 watt, between Pin 2 and Pin 3.

3. Reassemble the XLR connector.

prevents data reflection, which can corrupt the data communication on the link.
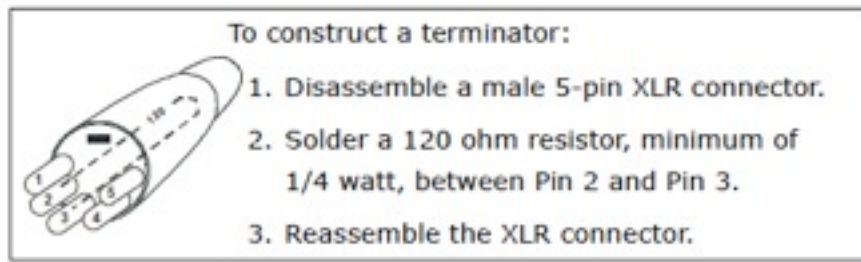
Powering On the Fixture

CAUTION:
Do not power on the fixture until verifying that the line cord cap is suitable for the power source in your location. For more information, see Installing a Power Cord Cap on page 8.

To power on the fixture, simply connect it to a 100-230 V AC power source.

Once the fixture is connected to a power source, it automatically begins a homing procedure to verify the major functions of the fixture.

Setting the DMX Start Channel

Each fixture requires a block of consecutive channels on a 512-Channel DMX link. The number of channels depends on the protocol you are using.

To set the Start Channel on an fixture:

1. Access the LM-2013 fixture's menu system via the display on the fixture's head. For a detailed description of the menu system, see *Chapter 3: The Menu System*.

2. Press and hold the **Menu** button until AddR appears on the display. Press the **Enter** button to select.

3. The display will show the start channel currently assigned to the fixture.

4. Use the **Up** and **Down** arrow buttons to select a new DMX start channel. The display will show a new option ready for selection.

5. Press the **Enter** button to store the new DMX Start channel. The display will stop flashing when a new option is entered.

When setting the Start channel on a fixture, remember:

- A fixture's physical location on the link does not have to coincide with the order of channel range assignments in the link.
- The fixture's channel range must not overlap any other device's channel range on the link. When two devices on the same DMX link have overlapping channel ranges, one or both devices will be disabled or behave erratically. The single exception would be if two or more fixtures need to respond to controller commands in exactly the same way. In that case, those fixtures must be the same type and must share the *entire* channel range.

Shutting Down the Fixture

To shoot down a fixture you can simply disconnect it from power.

Chapter 3
The Menu System

Menu navigation

Access the menu system via the four menu navigation buttons on the fixture. The display will show the menu items you can select from the menu map.

> **To access the menu system:** press the corresponding button until desired menu appears on the display.

> **To scroll the menu items:** press the up and down buttons.

> **To return to the previous option _without changing_ the value:** press the <Set/Esc> button.

Menu map

Level 1	Level 2	Level 3	Level 4	Description
SET	Reset Machine	ON		Resets the fixture
		OFF		
	Load Parameter	ON		Sets factory defaults ON
		OFF		Sets factory defaults OFF
	Master / Alone	Master mode		Sets the fixture in Master mode
		Alone mode		Sets the fixture in stand-alone mode
	Auto / Sound	Auto mode		Sets the fixture to Auto mode
		Sound Mode		Sets the fixture to Sound mode
	Mic Sense	00 to 99%		Sets the mic level sensitivity
	TC Switch	TC Switch Mask	ON	Enables self protection against over heat
			OFF	Disables self protection against over heat
		TC Switch Temp	Cap	Shows the current setting for temp value
			Set	Sets the temperature value for self-protection
	Scan Setting	Reverse Pan	ON	Sets reverse Pan ON
			OFF	Sets reverse Pan OFF
		Reverse Tilt	ON	Sets reverse Tilt ON
			OFF	Sets reverse Tilt OFF
		Pan degree	630	Sets the pan degree to 630°
			540	Sets the pan degree to 540°
		Scan Blackout	ON	The fixture will go to blackout when moving
			OFF	The fixture will not go to blackout when moving
		Feed back	ON	Fixture will auto recover XY position
			OFF	Fixture will not auto recover XY position
	Dimmer curve	Square law		Sets dimming to a square law curve
		Inv. Square law		Sets dimming to inverted square law curve
		S-Curve		Sets dimming to a S-curve
	Dimmer speed	Dimmer Smooth		Sets dimming speed to smooth
		Dimmer Fast		Sets dimming speed to fast
	DMX Reset	Enabled		DMX reset is enabled
		Disabled		DMX reset is disabled

Level 1	Level 2	Level 3	Level 4	Description
	Fan	Regulated		Sets the cooling fan speed to auto regulated
		Full		Sets the cooling fan speed to maximum
	Information	Time		Sets the time
		Date		Sets the date
		Use time		Shows the fixture used time
DMX Menu	DMX Address	XXX		Changes the existing DMS start channel
	No DMX signal	Stop Run		Turns LEDs off after DMX data is lost
		Hold Run		Keeps LED state until shutdown if no DMX data
		Auto Run		Activates Auto mode if DMX data is lost
		Sound Run		Activates sound mode if DMX data is lost
	DMX Channels	HSV Mode		Selects HSV protocol
		STAGE Mode	12 Channels	Selects 12 channels protocol
			9 Channels	Selects 9 channels protocol
			8 Channels	Selects 8 channels protocol
			5 Channels	Selects 5 channels protocol
Macro Menu	Step quantity	62		Sets number of steps of the macros
	Program Step ##	Change Color		
		Twinkling		
		Fade		
Manual Dimmer	Light switch	ON		
		OFF		
	Light Red	000		
	Light Green	000		
	Light Blue	000		
	Light Strobe	000		
	Scan Pan	128		
	Scan Tilt	128		
	Scan Pan Fine	000		
	Scan Tilt Fine	000		

Menu options

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

The SET Menu

Reset Machine

When you set this menu item on, the fixture performs a reset.

Selecting the *OFF* option will have no effect. To reset the fixture:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *Reset Machine* menu. Press <Enter>.
3. Scroll to *ON* to reset the fixture.
4. Press <Enter>.

Load Parameter

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

> Reverse Pan: OFF
>
> Reverse Tilt: OFF
>
> Pan Degree: 540º
>
> Dimming curve: Square law
>
> Dimmer speed: Smooth.
>
> DMX Reset: Enabled
>
> Fan Speed: Auto regulated.
>
> No DMX signal: Stop Run
>
> DMX Channels: Stage 12 channels

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

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *Load Parameter* menu. Press <Enter>.
3. Scroll to *ON* to restore the factory option defaults.
4. Press <Enter> to store.

Master / Alone

The Master/Alone menu option sets the fixture mode to master or stand alone. To set the fixture to any of the two modes:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *Master/Alone* menu. Press <Enter>.
3. Scroll to *the desired mode*.
4. Press <Enter> to store.

Auto / Sound

The Auto/Sound menu option sets the fixture mode to Auto run mode or to sound mode. To set the fixture to any of the two modes:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *Auto/Sound* menu. Press <Enter>.
3. Scroll to *the desired mode*.
4. Press <Enter> to store.

Mic Sense

The Mic.Sense menu option sets the fixture's built-in microphone sensitivity level. To set the fixture's mic sensitivity:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *Mic.Sense* menu. Press <Enter>.
3. Scroll to *the desired value*.
4. Press <Enter> to store.

TC Switch

Through the TC Switch menu option, user can set the fixture's self protection behavior-in case of over heat to adapt it to the ambient conditions. As this is a very important decision that can damage the fixture, this option is protected by a password, that will be only given to the user upon request. The submenus accessible are:

TC Switch Mask

It enables or disables the over-heat protection. To set Tc Switch Mask on:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *TC Switch* menu. Press <Enter>.
3. Scroll to *TC Switch Mask.* Press <Enter>
4. Scroll to *ON.*
5. Press <Enter> to store.

TC Switch Temp

It sets the temperature value for the fixture to self-protect. To see the current settings for temperature value:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *TC Switch* menu. Press <Enter>.
3. Scroll to *TC Switch Temp.* Press <Enter>
4. Scroll to *CAP*. Press <Enter>.

To change the self protection temperature value: (password protected)

1. Press <Set/Esc> until SET appears on the display. Press <Enter>
2. Scroll to the *TC Switch* menu. Press <Enter>.
3. Scroll to *TC Switch Temp.* Press <Enter>
4. Scroll to *Set*. Press <Enter>.
5. Scroll to the desired temperature value.
6. Press <Enter> to store.

Scan setting

The Scan setting menu sets the behavior of the fixture scan movement. To access and change the different scan settings and values:

Reverse Pan

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Scan Setting* menu. Press <Enter>. Scroll to the *Reverse Pan* menu. Press <Enter>.

3. Scroll to ON. Press <Enter> to store.

Reverse Tilt

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Scan Setting* menu. Press <Enter>. Scroll to the *Reverse Pan* menu. Press <Enter>.

3. Scroll to the *Reverse Tilt* menu. Press <Enter>.

4. Scroll to ON. Press <Enter> to store.

Pan degree

Through this option you can set the degrees for pan movement. You can chose between 540º or 630º. To set it:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Scan Setting* menu. Press <Enter>. Scroll to the *Reverse Pan* menu. Press <Enter>.

3. Scroll to the *Pan degree*. Press <Enter>.

4. Scroll to the desired pan degree value. Press <Enter> to store.

Scan Blackout

When this option is set to on, the fixture will go to blackout during scan movement. Otherwise, the behavior will be normal.

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Scan Setting* menu. Press <Enter>. Scroll to the *Reverse Pan* menu. Press <Enter>.

3. Scroll to the *Scan blackout*. Press <Enter>.

4. Scroll to ON. Press <Enter> to store.

Feed Back

Feed Back menu option enables/disables pan/tilt position feedback/correction system. To enable it:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Scan Setting* menu. Press <Enter>. Scroll to the *Reverse Pan* menu. Press <Enter>.

3. Scroll to the *Feed Back*. Press <Enter>.

4. Scroll to ON. Press <Enter> to store.

Dimmer curve

The fixture provides three dimming styles for user convenience. See Chapter 5 for detailed information on dimming curves. To change the dimmer curve style:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Dimmer curve* menu. Press <Enter>.

3. Scroll to *the desired value*.

4. Press <Enter> to store.

Dimmer speed

This option swaps between smooth and fast dimming. To change speed:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Dimmer Speed* menu. Press <Enter>.

3. Scroll to *the desired value*.

4. Press <Enter> to store.

DMX Reset

When this option is enabled, you'll be able to perform a reset from a lighting console. To enable the DMX reset:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *DMX Reset* menu. Press <Enter>.

3. Scroll to *Enable*. Press <Enter> to store.

Fan

Through this option you can choose the fan cooling speed. It can be auto regulated by temperature control and maximum speed. To change fan behavior:

1. Press <Set/Esc> until SET appears on the display. Press <Enter>

2. Scroll to the *Fan Speed* menu. Press <Enter>.

3. Scroll to *the desired value*.

4. Press <Enter> to store.

Information

This option shows information on the fixture as date, time, working time, ...

The DMX Menu

To access DMX Menu press <Up>.

DMX Address

The DMX start channel identifies each fixture on a DMX link. You must assign a DMX start channel to each fixture on the link.

The DMX Address menu allows you to change the DMX start channel that is currently assigned to the fixture. Be sure you do not overlap fixture channel ranges when changing the DMX start channel.

To change the DMX start channel:

1. Press <Up> until *DMX Menu* appears on the display. Press <Enter> to select.

2. Scroll the DMX menu until *DMX Address* appears on the display. Press <Enter> to select.

3. Scroll to select a new DMX start channel.

4. Press <Enter> to accept the new DMX start channel.

No DMX signal

This option sets the behavior of the fixture in case of DMX data loss. To change to the desired fixture behavior:

1. Press <Up> until *DMX Menu* appears on the display. Press <Enter> to select.

2. Scroll the DMX menu until *No DMX signal* appears on the display. Press <Enter> to select.

3. Scroll the menu until *the* desired behavior appears on the display. Press <Enter> to store.

You can choose between the following fixture behaviors in case of data loss

Stop Run: The fixture will stop running.

Hold Run: Last fixture state will be kept.

Auto Run: The fixture will be set to Auto Mode.

Sound Run: The fixture will be set to Sound Mode.

DMX Channels

Use this menu item to change the current protocol option:

HSV Mode

1. Press and hold <Menu> until *DMX Menu* appears on the display. Press <Enter> to select.

2. Scroll the DMX menu until *DMX channels* appears on the display. Press <Enter> to select.

3. Scroll the menu until *HSV Mode* appears on the display. Press <Enter> to store.

Stage Mode

You can choose between four stage modes: 12, 9, 8 and 5 DMX channels;

1. Press and hold <Menu> until *DMX Menu* appears on the display. Press <Enter> to select.

2. Scroll the DMX menu until *DMX channels* appears on the display. Press <Enter> to select.

3. Scroll the menu until *Stage Mode* appears on the display. Press <Enter> to select.

4. Scroll the menu until the desired number of channels mode appears on the display. Press <Enter> to store.

The MACRO Menu

You can set up macros manually though this menu option. To access the Macro Menu press <Up>

Step quantity

Sets the number of steps for the macro. Maximum steps is 62.

Program step number

Through the Program step number you select each step of the macro and set the effect to be performed by the light.

1. Scroll <Macro Menu> to the desired step. Press <Enter>.

2. Scroll to the desired effect (*Change color, Twinkling or Fade*). Press <Enter> to store.

Manual Dimmer Menu

Manual dimmer menu provides manual control over the fixture. The items you can control though manual dimmer menu are:

Light switch, Light Red, Light Green, Light Blue, Light Strobe, Scan Pan, Scan Tilt, Scan Pan Fine, Scan Tilt Fine

Chapter 4
DMX Programming Basics

DMX Programming Overview

DMX512 Links

A lighting console typically uses a DMX512 protocol to communicate with automated lighting fixtures and conventional dimmers. This protocol consists of 512 unique channels of control per output link (universe). Typically a lighting fixture or device will use a channel for each parameter's function. Each channel consists of 256 values ranging from 0 to 255. The lighting console is programmed to transmit a corresponding DMX value for the desired function of each parameter. All DMX values are stored within in the lighting console, and typically are referred to as cues, scenes, or presets. A lighting console locates a device on the link by it's DMX Start Channel.

8-bit vs. 16-bit DMX Parameters

Most parameters of an automated light use one channel of DMX providing 256 values of control (0-255). This is known as 8-bit DMX. Although most parameters use 8-bit DMX, several require a more accurate range of values than can be provided with a single DMX channel.

By utilizing two DMX channels for a single parameter, 65535 values become available for controlling and adjusting parameter functions. This is known as 16-bit DMX. You can adjust 16-bit DMX values in both coarse and fine increments. The first channel of the pair provides coarse control changes of the DMX value in increments of 256. The second channel provides fine control and changes of the DMX value in increments of 1.

Individual access of the two DMX channels used with 16-bit parameters varies by lighting console. Most modern DMX consoles bind these two channels into a single 16-bit parameter to accurately perform 16-bit crossfades. Consult your lighting console manual for further information.

Determining a DMX Start Channel

The DMX Start Channel is the first channel of a device's channel range on a DMX link. There are 512 available channels on each DMX universe divided among all the devices in a particular universe. A device must have a unique DMX Start Channel number in order to respond independently to controller commands.

To determine each device's DMX Start Channel, identify the footprint of every device on the universe. The device's footprint is the number of consecutive DMX channels a device requires and is determined by the channels in the fixture's protocol. The fixture's DMX channel range must not overlap any other device's channel range on the link. When two devices on the same DMX universe have overlapping channel ranges, one or both devices will be disabled or behave erratically.

Select the protocol level in the fixture's onboard menu system. The tables on the following pages list the parameters included in each protocol mode.

Protocol modes

You can choose from several protocol modes for variable programming styles. Khroma Technologies Limited is distributing the detailed DMX protocols as requested to console manufacturers to ensure that the fixture libraries are created in a method that allows optimum control of the fixture. The charts below provide only an outline of each channel's function. If your console does not provide a library for Conic Lighting Designs™ and/or Khroma Technologies Ltd. fixtures, please contact the console manufacturer to have one created or contact your dealer/distributor to get the latest version available for the luminaire you are using.

DMX Protocols

HSV mode: 7 channels

Ch. #	Function	DMX Value	Description
1	Hue	000-255	0 to 100% Hue
2	Saturation	000-255	0 to 100% Saturation
3	Value	000-255	0 to 100% Value
4	Pan	000-255	Pan 0 to 540º/630º[1]
5		000-255	Pan fine
6	Tilt	000-255	Tilt 0 to 240º
7		000-255	Tilt fine

Stage mode 12 channels

Ch. #	Function	DMX Value	Description
1	Strobe	000-019 020-064 065-069 070-084 085-089 090-104 105-109 110-124 125-129 130-144 145-149 150-164 165-169 170-184 185-189 190-204 205-255	Shutter open Strobe1(fast to slow) Shutter open Strobe2:opening pulse(fast to slow) Shutter open Strobe3: closing pulse (fast to slow) Shutter open Strobe4:random strobe(fast to slow) Shutter open Strobe5:random opening pulse(fast to slow) Shutter open Strobe6: random closing pulse (fast to slow) Shutter open Strobe7:burst pulse(fast to slow) Shutter open Strobe8:random burst pulse (fast to slow) Shutter open
2	Dimmer	000-255	0 to 100% intensity
3	Pan	000-255	Pan 0 to 540º/630º [1]
4		000-255	Pan fine
5	Tilt	000-255	Tilt 0 to 240º
6		000-255	Tilt fine

Ch. #	Function	DMX Value	Description
7	Control settings	000-009	No function
		010-014	Reset the fixture (value must be held for 8 seconds)[2]
		015-039	No function
		040-044	Pan and Tilt speed is NORMAL
		045-049	Pan and Tilt speed is FAST
		050-054	Pan and Tilt speed is SLOW
		055-059	No function
		060-064	Fan mode set to maximum cooling speed
		065-069	No function
		070-074	Fan mode set to auto (thermostatically regulated)
		075-109	No function
		110-114	Fast dimming
		115-119	No function
		120-124	Smooth dimming
		125-249	No function
		250-255	Illuminate display
8	Color wheel effect	000-009	RGB Dimmer channels are enabled
		010-014	Moroccan pink
		015-019	Pink
		020-024	Special rose pink
		025-029	Follies pink
		030-034	Fuchsia pink
		035-039	Surprise pink
		040-044	Congo Blue
		045-049	Tokyo Blue
		050-054	Deep Blue
		055-059	Just Blue
		060-064	Medium Blue
		065-069	Double CT Blue
		070-074	Slate Blue
		075-079	Full CT Blue
		080-084	Half CT Blue
		085-089	Steel Blue
		090-094	Lighter Blue
		095-099	Light Blue
		100-104	Medium Blue Green
		105-109	Dark Green
		110-114	Primary Green
		115-119	Moss Green
		120-124	Fern Green
		125-129	JAS Green
		130-134	Lime Green
		135-139	Spring Yellow
		140-144	Deep Amber
		145-149	Chrome Orange
		150-154	Orange
		155-159	Gold Amber
		160-164	Millennium Gold
		165-169	Deep Golden Amber
		170-174	Flame Red
		175-179	Open
		180-255	No function
9	Red	000-255	Red 0 to 100% intensity
10	Green	000-255	Green 0 to 100% intensity
11	Blue	000-255	Blue 0 to 100% intensity
12	Color temperature control	000-019	No function
		020-255	Color temperature from 10000K to 2500K

Stage mode 9 channels

Ch. #	Function	DMX Value	Description
1	Red	000-255	Red 0 to 100% intensity
2	Green	000-255	Green 0 to 100% intensity
3	Blue	000-255	Blue 0 to 100% intensity
4	Dimmer	000-255	0 to 100% intensity
5	Strobe	000-019 020-064 065-069 070-084 085-089 090-104 105-109 110-124 125-129 130-144 145-149 150-164 165-169 170-184 185-189 190-204 205-255	Shutter open Strobe1(fast to slow) Shutter open Strobe2:opening pulse(fast to slow) Shutter open Strobe3: closing pulse (fast to slow) Shutter open Strobe4:random strobe(fast to slow) Shutter open Strobe5:random opening pulse(fast to slow) Shutter open Strobe6: random closing pulse (fast to slow) Shutter open Strobe7:burst pulse(fast to slow) Shutter open Strobe8:random burst pulse (fast to slow) Shutter open
6	Pan	000-255	Pan 0 to 540º/630º[1]
7		000-255	Pan fine
8	Tilt	000-255	Tilt 0 to 240º
9		000-255	Tilt fine

Stage mode 8 channels

Ch. #	Function	DMX Value	Description
1	Red	000-255	Red 0 to 100% intensity
2	Green	000-255	Green 0 to 100% intensity
3	Blue	000-255	Blue 0 to 100% intensity
4	Dimmer	000-255	0 to 100% intensity
5	Pan	000-255	Pan 0 to 540º/630º[1]
6		000-255	Pan fine
7	Tilt	000-255	Tilt 0 to 240º
8		000-255	Tilt fine

Stage mode 5 channels

Ch. #	Function	DMX Value	Description
1	Red	000-255	Red 0 to 100% intensity
2	Green	000-255	Green 0 to 100% intensity
3	Blue	000-255	Blue 0 to 100% intensity
4	Pan	000-255	Pan 0 to 540º/630º[1]
5	Tilt	000-255	Tilt 0 to 240º

Notes:
1. Pan degree is set through the SET menu, see *Chapter 3* for detailed information.
2. Only if the SET menu option DMX reset is enabled.

Chapter 5
Fixture control

Pan and Tilt

LM-2013 fixtures have a pan range of 540º or 630º (selectable through menu options) and a tilt range of 240º.

In HSV Mode, Stage 12 Channels mode, Stage 9 Channels mode and Stage 8 Channels mode, 2 channels for pan and 2 channels for tilt are used to provide 16.bit position adjustment to a fraction of a degree.

Dimming

Overall intensity can be adjusted from 0 to 100% using electronic dimming. User can choose between three dimming options

- Square Law: dimming is finer at low levels and coarser at high levels.
- Inverse Square Law: dimming is coarser at low levels and finer at high levels.
- S-Curve: dimming is finer at low levels and high levels and coarser at medium levels.

Independently of the selected dimming curve, you can also choose between smooth or fast dimming

Color wheel

A very complete color wheel is provided for user convenience. This color wheel has priority over red, green and blue channels, so it must be set to a DMX value between 0 and 9 to be able to control the RGB dimming chanonic Lighting Designs

Appendix
Important Safety Information

Warning: For Continued Protection Against Fire

1. This equipment is designed for use with specified LED only. Use of any other type LED may be hazardous and may void the warranty.
2. Do not mount on a flammable surface.
3. Maintain minimum distance of 1.0 meter from combustible materials.
4. Replace fuses only with the specified type and rating.
5. Observe minimum distance to lighted objects of 1 meter.
6. This equipment is designed for connection to branch circuit having a maximum overload protection of 20 A.

Warning: For Continued Protection Against Electric Shock

1. If this equipment was received without a line cord plug, attach the appropriate line cord plug according to the following code:
   - brown–live
   - blue–neutral
   - green/yellow–earth
2. In different countries, the colors of the cores in the mains lead of this equipment may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:
3. This equipment must be earthed.
4. Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.
5. Disconnect power before servicing.
6. Refer servicing to qualified personnel only.

Warning: For Continued Protection Against Injury To Persons

1. Use secondary safety cable when mounting fixtures.
2. Equipment surfaces may reach very high temperatures. Allow a minimum of 10 minutes for cooling before handling.onic Lighting Designs