VL2000™ Spot Luminaire

USER'S MANUAL

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Introduction

About This Manual

This manual provides necessary information regarding safety, installation, operation and routine maintenance for the VARI∗LITE® VL2000™ Spot Luminaire. Familiarizing yourself with this information will help you to get the most out of your product.

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.

This manual covers the following models:

Model	Part Number	Source
VL2000™ Spot Luminaire	20.9673.0001	Arc

Additional Documentation

A service manual for extended maintenance of the VL2000 spot luminaire is available in both printed and electronic (PDF) formats:

- VL2000 Spot Luminaire Service Manual (02.9673.0010)
  - Testing, Troubleshooting, Component Replacement and Illustrated Parts Breakdown.

Note: Performing maintenance procedures may void the product warranty. Refer to the Vari-Lite Limited Warranty card included in the product shipping package for more information.

For more information regarding DMX512 systems, refer to the following document available from United States Institute for Theatre Technology, Inc. (USITT):

- Digital Data Transmission Standard for Dimmers & Controllers plus AMX 192 Analog Multiplex Data Transmission Standard for Dimmers & Controllers. (A copy of Recommended Practice for DMX512 is included.)

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Text Conventions

The following styles and meanings are used throughout this manual:

Style	Meaning
[Button]	Front panel button. Example: Press [Menu].
[Up] / [Down] arrows	Press either [Up] or [Down] arrow button at Menu Display.
MENU	LCD Menu Display read-out. Example: Press [Up] / [Down] arrows until LAMP appears.

Customer Service

Our Goal

At Vari-Lite, we are committed to providing you the highest quality in customer service. Our comprehensive resources are available to help your business succeed and ensure you get the full benefit of being a Vari-Lite customer. Whether your needs are telephone troubleshooting assistance, product training or technical service, our full-time staff of experienced professionals are on-hand to provide support.

How to Reach Us

For assistance in your area, call the dealer from which your product was purchased.

or

Contact an Authorized Service Center.

or

Contact the Vari-Lite Customer Service Department, 9am -6pm CST Monday through Friday, at the following:

> phone: 1-877-VARI-LITE (1-877-827-4548)
>
> email: customerservice@vari-lite.com

Additional Resources

For additional resources and documentation, please visit our website at www.vari-lite.com and follow the Support link.

CHAPTER 1.

Description

This chapter contains descriptions of luminaire features and components, along with a list of accessories which are available.

- **Features**

- **Components**

Features

Overview

The VL2000 spot luminaire contains the following standard features:

- Variable beam focus to soften the edges of gobos or spots and enable gobo morphing.

- Full field dimmer to allow smooth timed fades and fast blackouts.

- A mechanical iris which provides continuous beam size control for both rapid beam size changes and smooth timed beam angle changes.

- Rotatable gobo wheel which contains five individually rotatable, indexable gobos.

- Two, 12-position wheels, each providing 11 easily loaded positions (and 1 open) for interchangeable dichroic color and gobo selections.

- Zoom optics system with a zoom angle of 2.8 to 1.

- Power factor corrected arc power supply for a Philips arc lamp.

- 700 watt arc source.

- Faceted reflector designed for an optimal flat field.

- Control by DMX512 protocol.

- Two truss hook brackets for versatile hanging configurations.
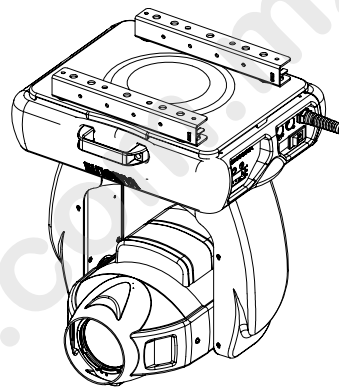
Components

Included Items

The following illustration shows all items included with the luminaire:

Quick Start Sheet

Warranty Card

User's Manual

Mounting Brackets

VL2000 Spot Luminaire
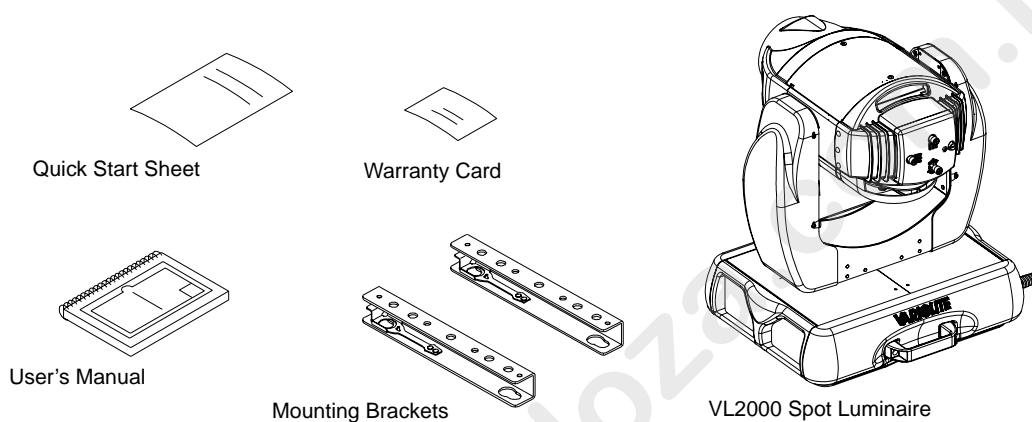
Figure 1-1: VL2000 Spot Luminaire Packing List

Replacement Items/Accessories

The following optional and/or replacement items can be ordered directly from Vari-Lite. (Please order by Vari-Lite part number.)

Vari-Lite Part No.	Accessory
20.9625.0132	Plastic Road Case (Two Hole)
22.9620.0194	Safety Cable Assembly
23.9623.0177	DMX Termination Male Connector Assembly
25.9661.0056	Loopback Connector Assembly
25.9661.0057	DMX Termination Female Connector Assembly
28.9661.054	Luminaire Programming (XLR5) Kit
55.6841.0001	Mega Claw Truss Hook, 2" Round
55.6840.0001	Mega Clamp Truss Hook, Round and Square
71.2528.0700	700 Watt Short-Arc Lamp

VL2000 Spot Luminaire

The following illustration shows the major luminaire components and controls.

Truss Hook
Bracket Assembly

Upper Enclosure
Assembly

Removable Lamp Assembly
(to access lamp for replacement)

AC Input Cable

Yoke
Assembly

Head Assembly

Beam Adjustment Controls

Vertical

Horizontal

Focus

Captive Knob
for lamp access
(does not adjust
beam)

Input Panel Components

Product Label ID

Power and Data
LED Indicators

Menu Display

Main Power
Switch

15 A

PWR
Tx
Rx

AC IN   DATA IN   DATA THRU

MENU   ENTER

VARI∗LITE®

AC Input Cable

Data In

Data Thru

Figure 1-2: External Components and Controls

LED Indicators

The LED indicators report the status of power and data to the luminaire.

Indicates DC power is being
supplied via AC Input when lit

Indicates data is being
transmitted when flashing

PWR ○

Tx ○

Rx ○

MENU   ENTER

Indicates data is being
received when flashing fast;
when flashing in 2 sec. heartbeat,
indicates luminaire is idle
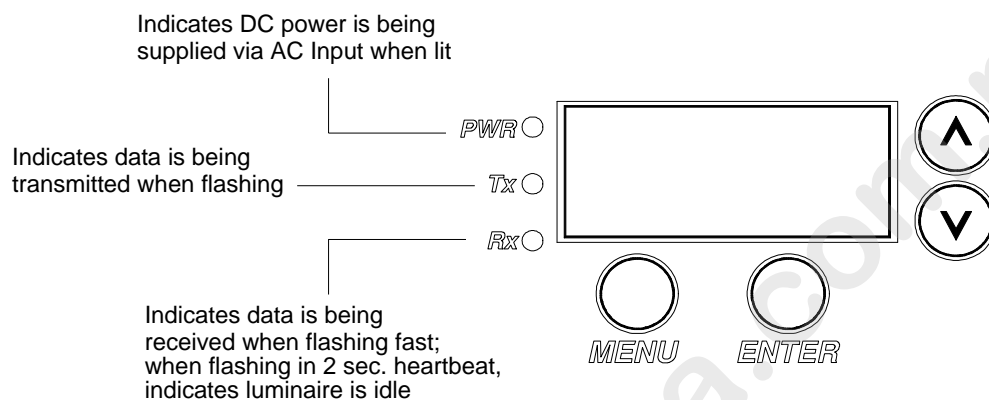
Figure 1-3: LED Indicator Overview

Notes

CHAPTER 2.

Installation

This chapter contains instructions for installation of the luminaire. It includes 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**

- **Powering Up**

- **Addressing**

Power and Data Cabling Requirements

Power

The luminaire requires standard AC power distribution from 100-240 VAC, 50/60 Hz. Three amps to twelve amps will be required depending on the AC supply voltage and product model.

Depending on the application, the luminaire's AC input cable may require a different connector. If required, install a new connector meeting your requirements using the following wire color code reference:

Wire*	Connection
Green/Yellow	AC Ground
Blue	AC Neutral
Brown	AC Line

* International (Harmonized) Standard

WARNING: DO NOT connect to three-phase service in countries with 240 volt power.

For single-phase power at 100 to 240 volts RMS:

Connection	Pin
AC Neutral	X
AC Line	Y
Ground (Earth)	G
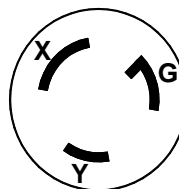
For three-phase power at 208 volts RMS:

Connection	Pin
Phase 1	X
Phase 2	Y
Ground (Earth)	G
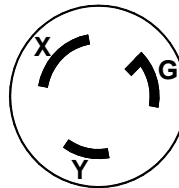
Current vs. Voltage

The following table provides the luminaire's current draw at specific voltages. Current is calculated with the lamp on and all motors sequencing.

Table 2-1: Current vs. Voltage

Voltage @ 60Hz	Current
90.0	11.8
100.0	10.6
110.0	9.5
120.0	8.5
130.0	7.9
140.0	7.2
180.0	5.5
190.0	5.2
200.0	4.9
210.0	4.7
220.0	4.5
230.0	4.3
240.0	4.1
250.0	3.9

Data Cables
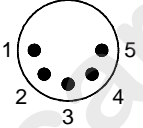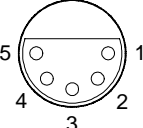
The luminaire is equipped with two, 5-pin XLR connectors for DATA IN and DATA THRU (out) applications. DATA IN requires a 5-pin, female XLR connector and DATA THRU requires a 5-pin, male XLR connector. When purchasing or constructing data cables, it is important that not only the correct cable type be 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 min. gauge for runs up to 1000 feet (300m).

- 22 AWG min. 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.

Refer to the USITT Recommended Practice for DMX512 guide for additional information regarding DMX512 systems. How to obtain a copy is detailed in "Additional Documentation" on page 1.

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

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

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

Male Termination Connector

A male XLR 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:

Solder resistors across pins 2 & 3, and 4 & 5

• 5-pin, male XLR connector.

• Two 1/4W 5% 120 ohm resistors.
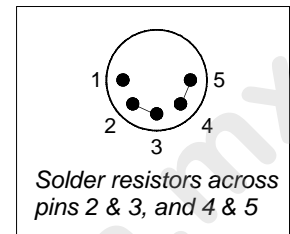
Note: A male termination connector is available as an accessory from Vari-Lite. See "Replacement Items/Accessories" on page 5.

Loopback Connector

When transferring software versions from luminaire to luminaire, a loopback connector is required at the first luminaire in the data link.

To construct your own connector, you will need the following components:

Solder wires across pins 2 & 4, and 3 & 5

• 5-pin, female XLR connector.

• Two small segments of 22AWG wire.
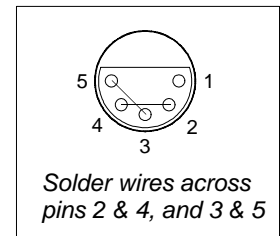
Note: A loopback connector is available as an accessory from Vari-Lite. See "Replacement Items/Accessories" on page 5.

Installation Procedures

Installing Lamp

In the event the lamp was packed separately during shipment, it will be necessary to install in the luminaire before use.

WARNING: Ensure that power is removed from luminaire when installing lamp.

CAUTION: Wear cotton gloves or other covering while installing lamp. Touching lamp glass with bare fingers will leave oil and may cause the lamp to explode or reduce lamp life. If touched, use alcohol and cotton cloth to thoroughly clean glass portion of lamp.

To install lamp:

Step 1. Ensure power is removed from luminaire.

Step 2. Remove lamp from shipping box.

Step 3. At backcap, using slotted screwdriver (or fingers) turn captive knob until loose.

Step 4. Slide backcap away from head assembly (it will remain attached by tether and lamp wires.).

CAUTION:
Ensure lamp is seated straight in socket before re-installing backcap.

Captive Knob

Backcap Assembly
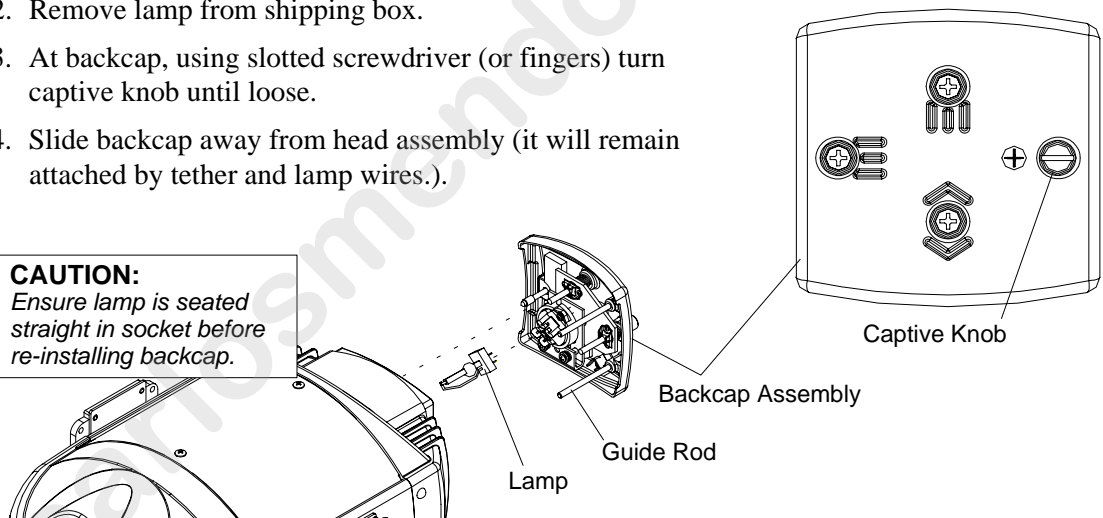
Guide Rod

Lamp

Figure 2-1: Installing Lamp

Step 5. Install lamp by pressing into socket. Ensure lamp is fully seated in socket and parallel to guide rods. (Lamp can be damaged when inserted through reflector if not parallel to guide rods.)

Step 6. Align guide rods in guide holes and slide backcap into head assembly. Re-tighten captive knob.

Note: After installing a new lamp, it is necessary to adjust the beam for optimum performance. This procedure is covered in .

Hanging the Luminaire

The VL2000 spot luminaire can be hung horizontally or vertically from any structure designed to work with the type of load created by this moving luminaire. Two mounting bracket assemblies (provided) are used to attach truss hooks or other mounting hardware as required. Many compatible truss hooks are available from different manufacturers for your particular needs.

A minimum of one hook per truss hook bracket is required. If mounting method does not use truss hooks, two attachment points per truss hook bracket are required. When attaching more than one point on a single bracket, the attach points must be spaced as far apart as possible using the supplied mounting holes.

Install mounting hardware and brackets:

Step   1.   Install truss hooks on two provided truss hook brackets as required.

Mega Claw Truss Hook
(not provided)

Bracket

**Example Truss
Hook Installation**

Truss Hook Hardware
(not provided)
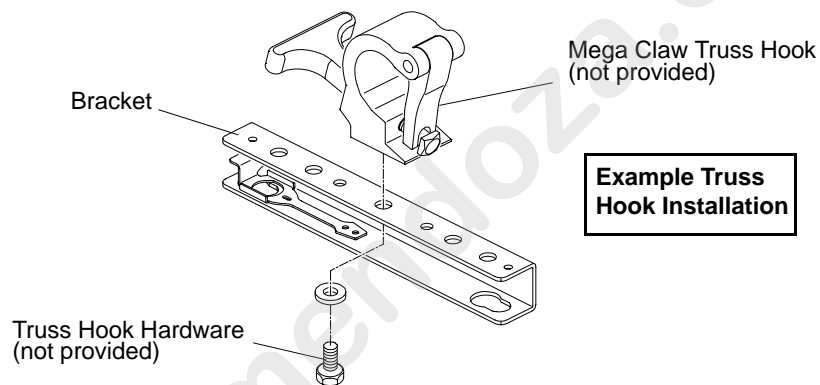
Figure 2-2: Installing Truss Hooks

Note: Various types of truss hooks can be used. The Mega Claw truss hook (as shown in the example above) as well as many other standard hooks, can be ordered separately.

Step   2.   Determine required configuration of bracket installation. Brackets may be installed in either orientation as shown.
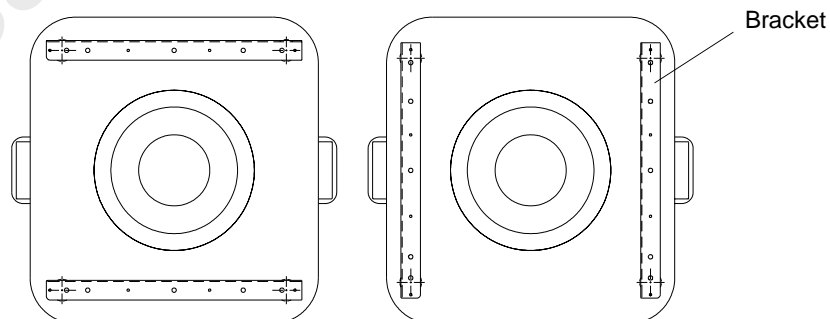
Bracket

Figure 2-3: Bracket Orientation Options

Step 3. While pulling up on locking mechanism release, fit keyed holes onto raised mounting buttons at bottom of enclosure. Slide forward and release locking mechanism to lock in place. Ensure brackets are locked securely. (Always face brackets in same direction as shown.)

WARNING: Ensure that the bracket locking mechanism is fully seated after the bracket is installed on the luminaire.

Locking Mechanism

Truss Hook Bracket

Keyed Hole

Press up when installing or releasing

Face brackets in same direction for all configurations

Raised Mounting Button

Once fitted over buttons, slide forward to lock in place

Locked
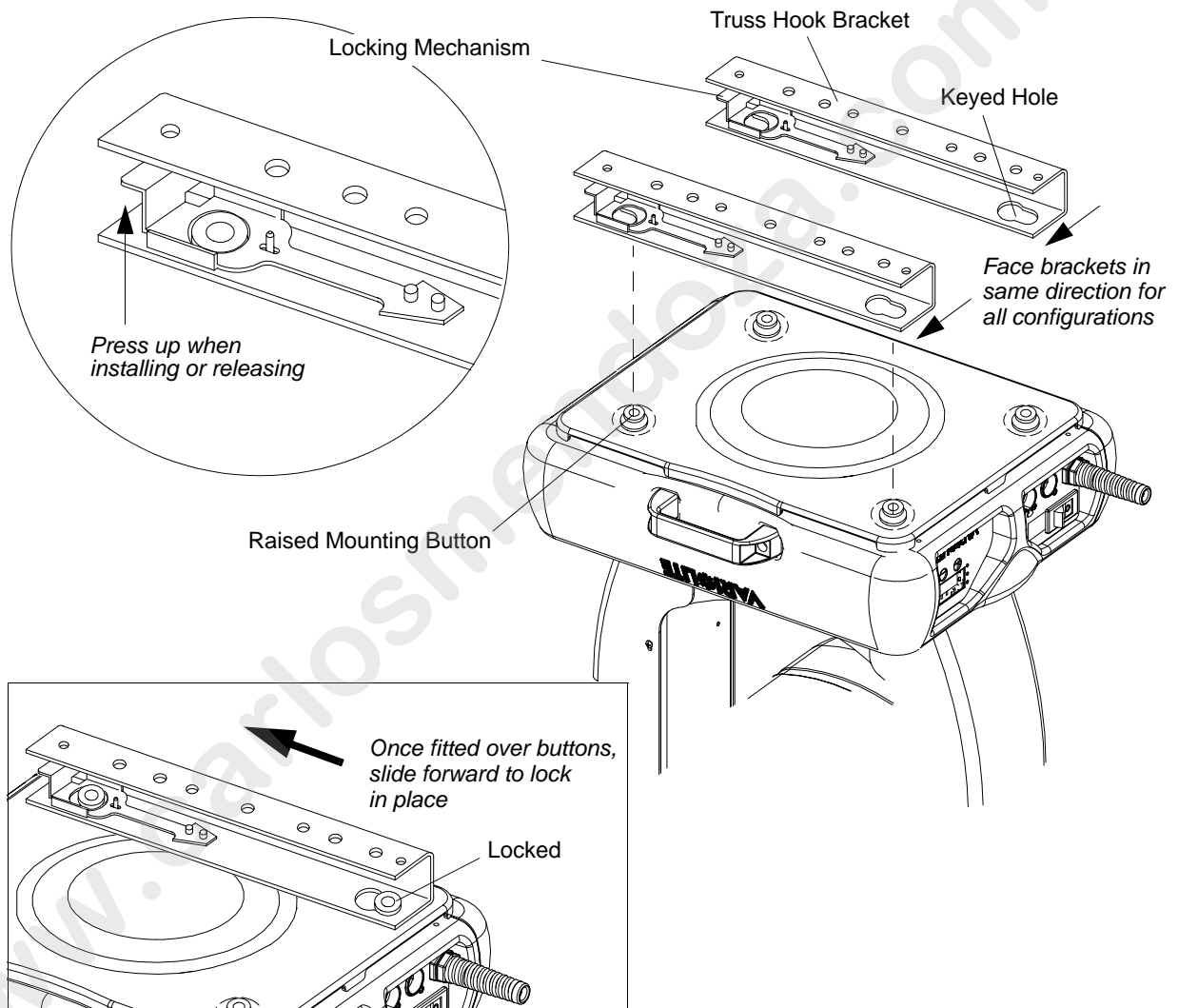
Figure 2-4: Installing Brackets on Luminaire Enclosure

Installing in Truss:

Step 1. Using two people, lift luminaire into mounting position.

Step 2. Secure in place with truss hook. Ensure truss hook hardware that locks hook in place (e.g. wing bolt) is properly tightened and that luminaire is fully supported.

Step 3. Attach safety cable (as required) as follows:

a. Connect one end of cable to luminaire handle.

b. Loop at least once around truss/pipe and attach other end of cable to other handle.

Step 4. Connect power and data cables according to procedure given in "Connecting Data and Power" on page 19.

Safety Cable:
Recommended for hanging installations.
May be required by local codes.

19"
(48.3cm)

17.25"
(43.8cm)

**
25.375"
(64.5cm)

*
27.125"
(68.9cm)

Handles are
approved for
safety cable
anchor points

***
18.5"
(47cm)

* *From lens to top of bracket*

** *From lens to base of enclosure*

*** *Head Swing Diameter*
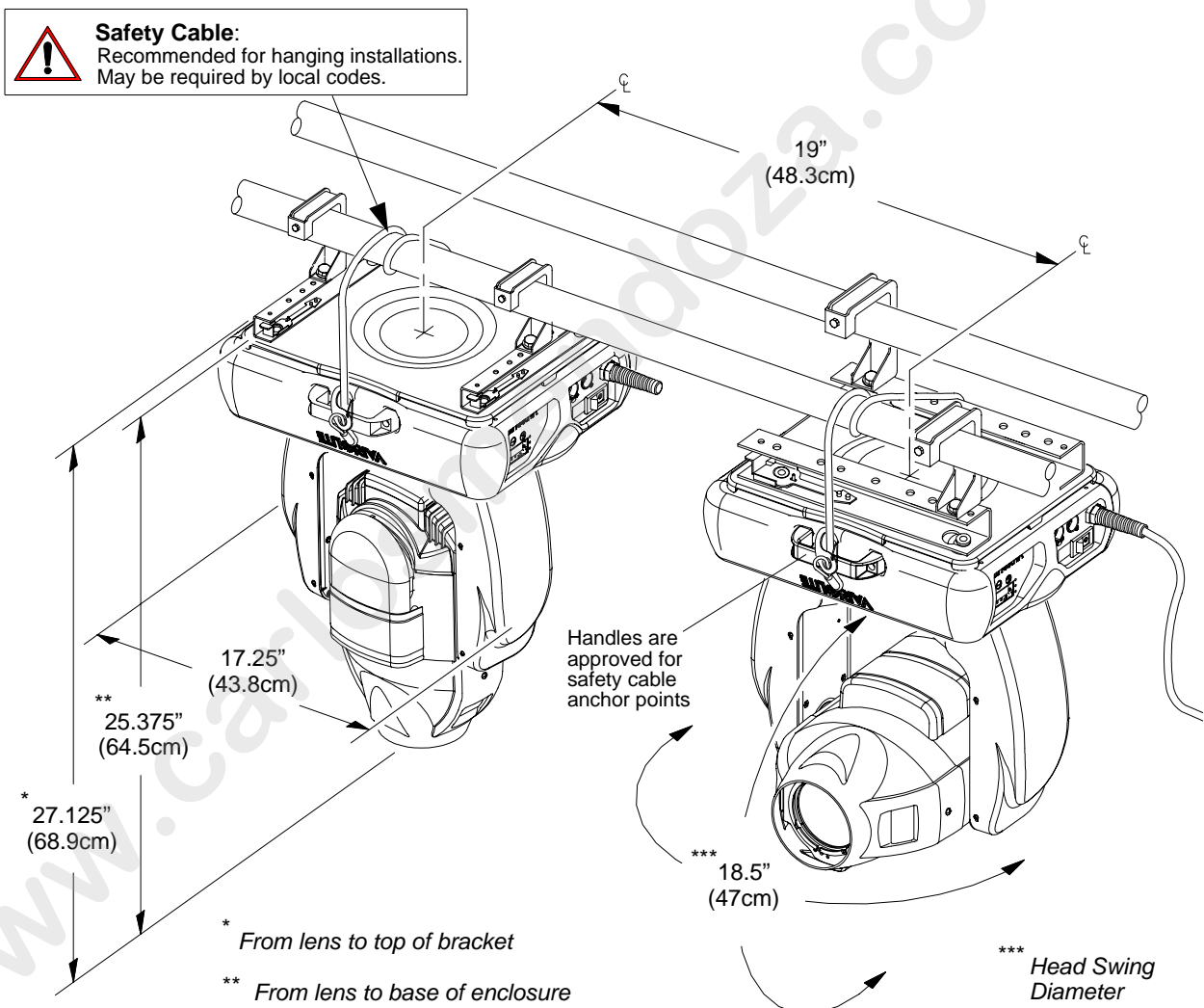
Figure 2-5: Hanging Dimensions and Clearances

Floor Mounting the Luminaire

The luminaire enclosure is sufficient to stabilize the luminaire in a floor installation, provided that the mounting surface is flat and sturdy.

Connecting Data and Power

A maximum of 32 luminaires may be connected in any one DMX data link.

Note: This 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.

To connect power and data:

Step 1. Connect data cable from console to first luminaire in chain at DATA IN connector.

Step 2. If required, connect additional data cables from DATA THRU connectors to DATA IN connectors of remaining luminaires in link.

Step 3. At last luminaire in link, install male termination connector at DATA THRU connector. (Luminaires and other devices on the same DMX chain may not function properly without termination.)

Data Thru   Data Thru

Data In
from console   Termination
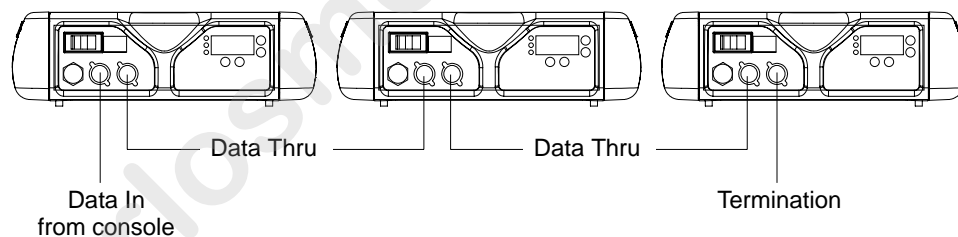
Figure 2-6: Data Link

Step 4. Connect AC Input Cable connector to power input source.

Step 5. Dress AC input and data cables and secure them so that they will not interfere with luminaire head and yoke movement.

Powering Up

Power-Up Procedure

Since Lamp On is the default state, the lamp will strike when the luminaire is powered up for the first time. When AC power is applied, the luminaire will immediately begin a calibration sequence that steps it through full pan and tilt movements. The internal color, gobo, and beam mechanisms will also move through a full range of motion. 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 DMX data is present. All internal mechanisms also move to their "home" or DMX-defined positions.

Subsequently, depending on the luminaire's setting for Lamp Power-Up State (refer to "Menu System Functions" on page 53), when power is applied, the arc lamp will either **a)** "strike" or ignite - Lamp On (*default*), **b)** await calibration and then strike - Cal On, or **c)** await manual command to strike - Lamp Off.

⚠ **CAUTION:** Before applying power, be sure the luminaire is hung or positioned so that the head and yoke can move freely without restriction.

To power up:

Step 1. At each luminaire, apply power by switching power switch to "l" (ON) position. Luminaire will automatically step through following procedure:

    a. If Lamp Power-Up State is set to Lamp On, lamp will strike (ignite).

    b. Luminaire will cycle through calibration and stop at "home" position.

    c. If Lamp Power-Up State is set to Cal On, lamp will strike (ignite) at end of calibration sequence.

Align Lamp for Flat Field

The design of the VL2000 spot luminaire optical system is based on a flat field. A flat field is one where there is no detectable hot spot.

After a new lamp is installed, it will be necessary to align the lamp to optimize the beam for the flat field. Knobs located at the luminaire's backcap will allow adjustment.

⚠ **WARNING:** Backcap and adjustment knobs will be HOT during lamp operation. Wear gloves and/or use tools to prevent burns.

To align lamp:

Step 1. Using internal menus select Lamp test to set beam. See "Menu System Functions" on page 53 for more information. (If using console, set intensity to 100%, open beam size iris and focus for hard edge.)

Step 2. Position beam on a white wall at a distance of 10' to 20'.

Step 3. At backcap, using Vertical and Horizontal knobs, adjust hot spot to center of beam.

Step 4. Using Focus knob, adjust beam for best spot.

Vertical

Horizontal   Focus

Captive Knob for lamp access
(does not adjust beam)

REARVW
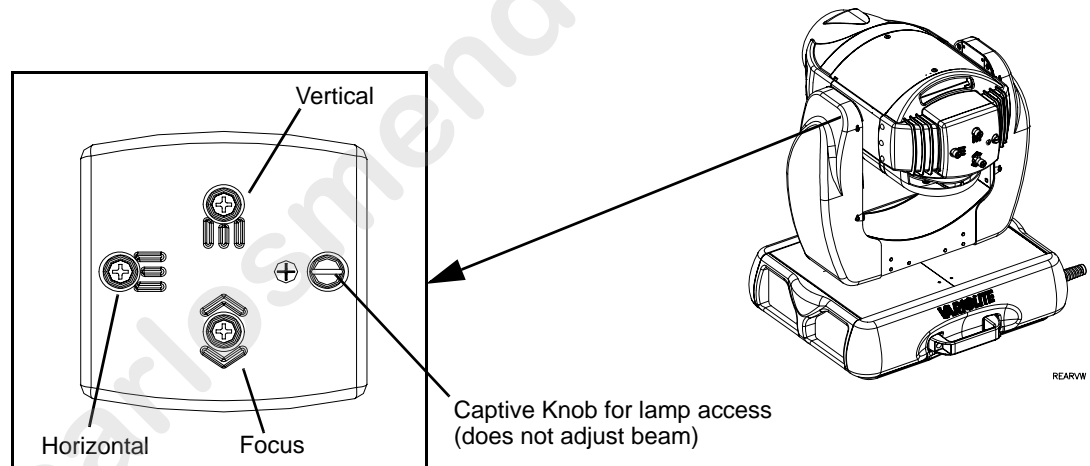
Figure 2-7: Lamp Alignment Controls

Set DMX Mode

The luminaire provide four modes for DMX operation. The mode is set using the Menu Display.

- **8-bit Standard** - provides one 8-bit DMX channel for control of each luminaire function.
- **8-bit Enhanced** - provides additional channels for timing control.
- **16-bit Standard** - provides 16-bit control for pan/tilt.
- **16-bit Enhanced (default)** - provides 16-bit control for pan/tilt and additional channels for timing control.

To set the mode:

Step 1. Press [Menu].

Step 2. Press [Up] or [Down] button until DMX appears. Press [Enter].

Step 3. Press [Up] or [Down] to until desired mode is reached (8, 16, E 8, or E 16). Press [Enter] to set mode.

See for more information.

Note: Which mode is used may also be determined by the profile available in the DMX control console. For best control, response, smoothest movement and transitions, the 16-bit Enhanced mode is recommended. The 8-bit modes are supported for older style consoles with a limited number of DMX channels available, and if profiles are not supported. The 16-bit mode is supported for DMX consoles that do not provide access to the timing channels through either their architecture or their profiles. For more information see .

Addressing

Program Starting Address

The address setting for DMX console or Virtuoso console controlled systems is entered using the Menu Display. (Refer to "Menu System" chapter on page 47 for detailed instructions.)

The luminaire retains the DMX and Virtuoso addresses that are stored even if power is removed.

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

Program a DMX or Virtuoso starting address:

Step   1. Press [Menu].

Step   2. Press [Up] / [Down] arrows until ADDR (Address) appears. Press [Enter].

Step   3. Press [Up] / [Down] arrows to access DMX (DMX console control) or VIRT (Virtuoso console control). Press [Enter].

Step   4. Press [Up] / [Down] arrows to enter starting address.

Step   5. Press [Enter] to set.

Program Starting Address Without Calibrating the Luminaire

It is possible to bypass the calibration sequence and go directly to the Menu Display programming in order to pre-program an address setting.

Program starting address without calibrating luminaire:

• While powering up luminaire, press and hold [Menu]. Program address as in Program Starting Address above.

Note: The luminaire will require a reset to restore control.

Notes

CHAPTER 3.

Operation

This chapter contains instructions for operating the luminaire using DMX control and for updating the internal software.

- **Color/Gobo Control**

- **DMX Modes**

- **DMX Mapping**

- **Luminaire Timing**

- **Updating Software**

Color/Gobo Control

Color/Gobo Wheel Positions

The standard configurations for color and fixed gobo wheels are: all color filters installed on Wheel 1 (wheel nearest lamp) and all gobos installed on Wheel 2 (wheel nearer to front lens). These wheels each have 12 positions, one being open.

All rotating gobos are installed on the Rotating Gobo Wheel (nearest to front lens). This wheel has six positions, one being open.

Color and gobo wheels offer partial frame control and various spin rates in either direction.
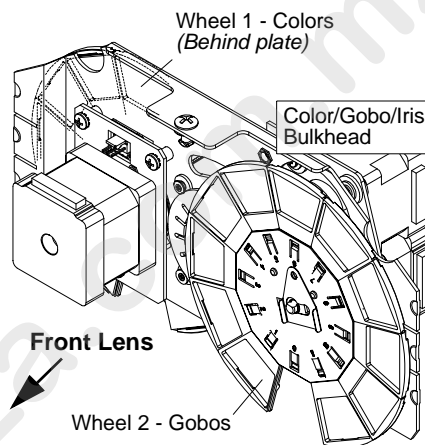
Figure 3-1: Color/Gobo Bulkhead

Standard Colors and Gobos

The following illustrations show the color and gobo standard configurations.

Standard Colors - Wheel 1 (Color Wheel)
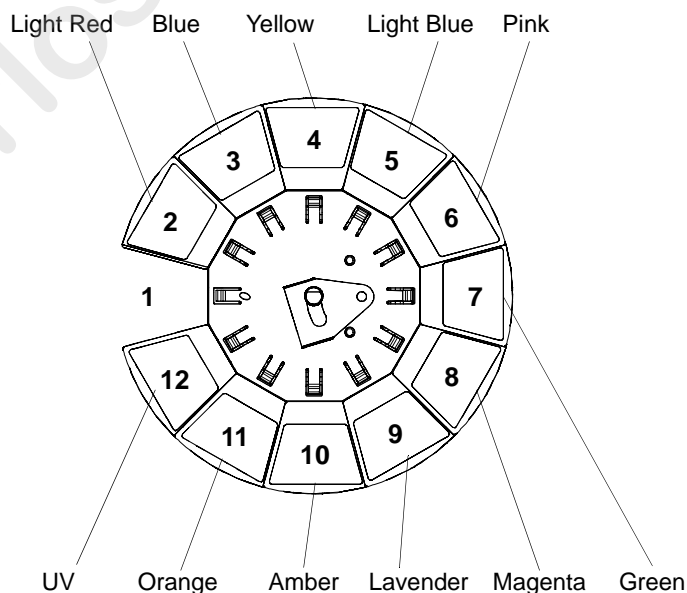
Figure 3-2: Standard Colors - Wheel 1 (Color Wheel)

Standard Gobos - Wheel 2 (Fixed Gobo Wheel)

Pebbles Dust Breakup Medium Circles Night Sky Leaves

Alpha Rays Liquid Breakup Tribal Breakup Block Breakup Wave Vertical Bars
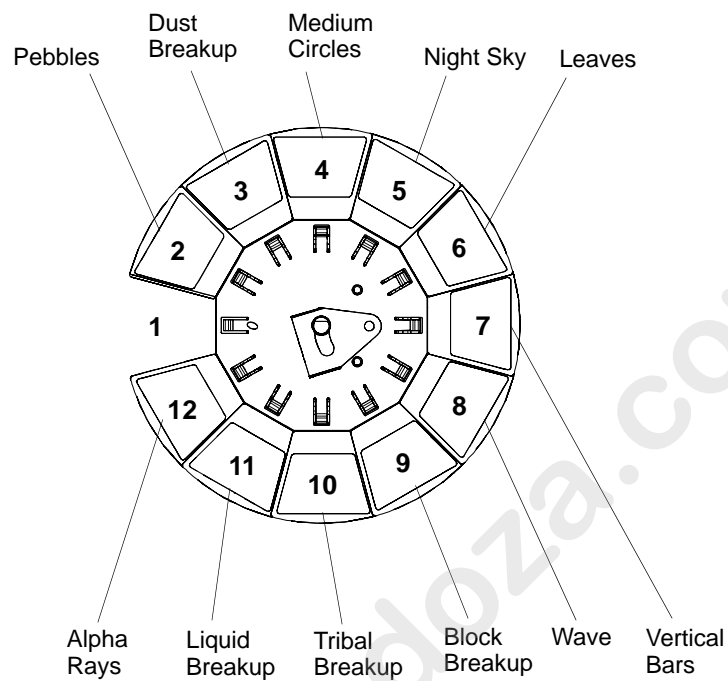
Figure 3-3: Standard Gobos - Wheel 2 (Fixed Gobo Wheel)

Standard Rotating Gobos

open

5 Facet Prism

Pinwheel

Spiral Stones

Circle of Ovals

Hypnospiral
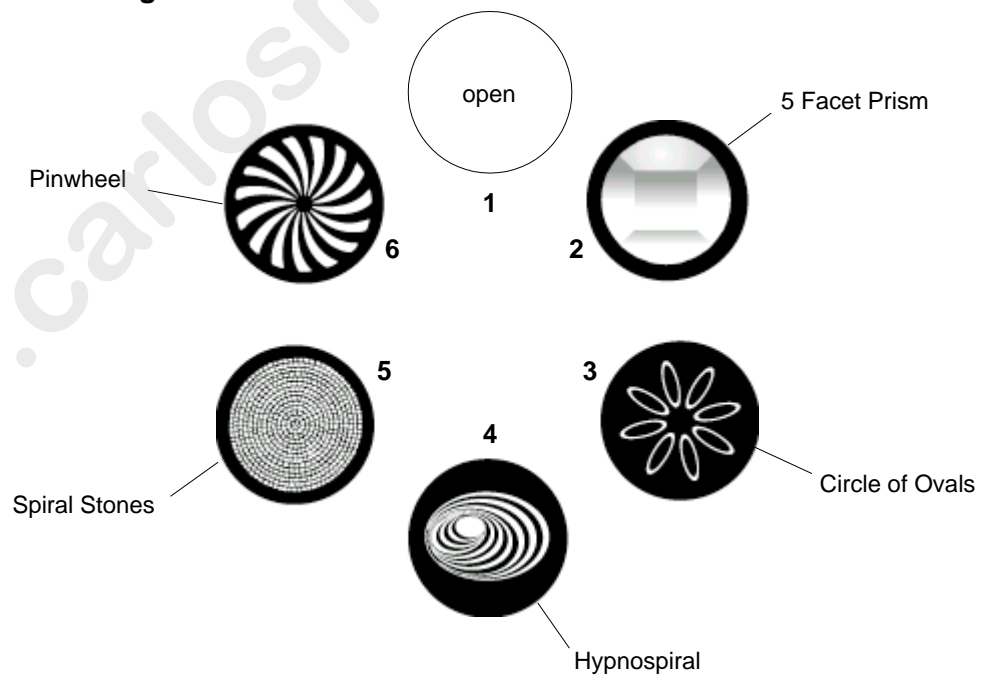
Figure 3-4: Standard Rotating Gobos

DMX Modes

8-Bit and 16-Bit Modes

These tables assume a DMX start address of 1. When a different starting address is used, this address becomes channel 1 function and other functions follow in sequence.

Standard 8-Bit (8)

Function	DMX Channel
Intensity	1
Pan	2
Tilt	3
Fixed Gobo	4
Color	5
Iris	6
Edge	7
Strobe	8
Zoom	9
Rot Wheel	10
Gobo Index	11
Control	12

Standard 16-Bit (16)

Function	DMX Channel
Intensity	1
Pan	2 - 3
Tilt	4 - 5
Fixed Gobo	6
Color	7
Iris	8
Edge	9
Strobe	10
Zoom	11
Rot Wheel	12
Gobo Index	13
Control	14

Enhanced 8-Bit (E 8)

Function	DMX Channel
Intensity	1
Pan	2
Tilt	3
Fixed Gobo	4
Color	5
Iris	6
Edge	7
Strobe	8
Zoom	9
Rot Wheel	10
Gobo Index	11
Focus Timing	12
Color Timing	13
Beam Timing	14
Control	15

Enhanced 16-Bit (E 16) - Default

Function	DMX Channel
Intensity	1
Pan	2 - 3
Tilt	4 - 5
Fixed Gobo	6
Color	7
Iris	8
Edge	9
Strobe	10
Zoom	11
Rot Wheel	12
Gobo Index	13
Focus Timing	14
Color Timing	15
Beam Timing	16
Control	17

DMX Mapping

Color and Gobo Control

Color/Gobo Wheels

Table 3-1: DMX Map For Color/Gobo Wheels

% Value	DMX (0-255)	Wheel Position
0	0	Open Frame 1
	1	
	2	
1	3	
	4	
2	5	
	6	
	7	
3	8	
	9	Half Frame
4	10	
	11	
	12	
5	13	
	14	
6	15	
	16	
	17	
7	18	Full Frame 2
	19	
8	20	
	21	
	22	
9	23	
	24	
10	25	
	26	Half Frame
	27	
11	28	
	29	
	30	
12	31	
	32	
13	33	

Table 3-1: DMX Map For Color/Gobo Wheels (Continued)

% Value	DMX (0-255)	Wheel Position
	34	
	35	
14	36	Full Frame 3
	37	
15	38	
	39	
	40	
16	41	
	42	
17	43	
	44	Half Frame
	45	
18	46	
	47	
19	48	
	49	
	50	
20	51	
	52	
	53	
21	54	Full Frame 4
	55	
22	56	
	57	
	58	
23	59	
	60	
24	61	
	62	Half Frame
	63	
25	64	
	65	
26	66	
	67	
	68	
27	69	
	70	
28	71	
	72	Full Frame 5
	73	
29	74	
	75	

Table 3-1: DMX Map For Color/Gobo Wheels (Continued)

% Value	DMX (0-255)	Wheel Position
30	76	
	77	
	78	
31	79	
	80	Half Frame
	81	
32	82	
	83	
33	84	
	85	
	86	
34	87	
	88	
35	89	
	90	Full Frame 6
	91	
36	92	
	93	
37	94	
	96	
38	97	
	98	Half Frame
39	99	
	100	
	101	
40	102	
	103	
	104	
41	105	
	106	
42	107	
	108	Full Frame 7
	109	
43	110	
	111	
44	112	
	113	
	114	
45	115	
	116	Half Frame
46	117	
	118	

Table 3-1: DMX Map For Color/Gobo Wheels (Continued)

% Value	DMX (0-255)	Wheel Position
	119	
47	120	
	121	
48	122	
	123	
	124	
49	125	
	126	Full Frame 8
	127	
50	128	
	129	
51	130	
	131	
	132	
52	133	
	134	Half Frame
53	135	
	136	
	137	
54	138	
	139	
55	140	
	141	
	142	
56	143	
	144	Full Frame 9
57	145	
	146	
	147	
58	148	
	149	
59	150	
	151	
	152	Half Frame
60	153	
	154	
	155	
61	156	
	157	
62	158	
	159	
	160	

Table 3-1: DMX Map For Color/Gobo Wheels (Continued)

% Value	DMX (0-255)	Wheel Position
63	161	
	162	Full Frame 10
64	163	
	164	
	165	
65	166	
	167	
66	168	
	169	
	170	Half Frame
67	171	
	172	
68	173	
	174	
	175	
69	176	
	177	
	178	
70	179	
	180	Full Frame 11
71	181	
	182	
	183	
72	184	
	185	
73	186	
	187	
	188	Half Frame
74	189	
	190	
75	191	
	192	
	193	
76	194	
	195	
77	196	
	197	Full Frame 12
	198	
78	199	
	200	
79	201	
	202	

Table 3-1: DMX Map For Color/Gobo Wheels (Continued)

% Value	DMX (0-255)	Wheel Position
	203	
80	204	
	205	
	206	Half Frame
81	207	
	208	
82	209	
	210	
	211	
83	212	
	213	
84	214	
	215	
	216	Spin F CCW
85	217	
	218	
86	219	
	220	
	221	
87	222	
	223	
88	224	
	225	Spin M CCW
	226	
89	227	
	228	
	229	
90	230	
	231	
91	232	
	233	Spin S CCW
	234	Stop
92	235	Stop
	236	Stop
93	237	Spin S CW
	238	
	239	
94	240	
	241	
95	242	
	243	
	244	

Table 3-1: DMX Map For Color/Gobo Wheels (Continued)

% Value	DMX (0-255)	Wheel Position
96	245	
	246	Spin M CW
97	247	
	248	
	249	
98	250	
	251	
99	252	
	253	
	254	
100	255	Spin F CW

Rotating Gobo Index/Rotation

Table 3-2: DMX Map for Gobo Index/Rotation

% Value	DMX (0-255)	Wheel Position
0-84	0-215	Index Position
85	216	Fast Spin CW
86-90	217-232	Variable Rates
91	233	Slow Spin CW
92	234-237	Stop
93	238	Slow Spin CCW
94-99	239-254	Variable Rates
100	255	Fast Spin CCW

Rotating Gobo Wheel

Table 3-3: DMX Map for Rotating Gobo Wheel

% Value	DMX (0-255)	Action
0	0	Position 1 (Open)
20	51	Position 2
40	102	Position 3
60	153	Position 4
80	204	Position 5
100	255	Position 6

Beam Control

Beam Iris

Table 3-4: DMX Map For Beam Iris

% Value	DMX Value	Action
0	0	Closed
100	255	Open

Edge

Table 3-5: DMX Map For Edge

% Value	DMX Value	Action
0	0	Blooms In
100	255	Blooms Out

Strobe

Table 3-6: DMX Map For Strobe

% Value	DMX Value	Action
0	0-2	Open
1	3-5	Closed
2	6-7	Slow Random
3	8-10	Med Random
4	11-12	Fast Random
5-100	13-255	Speed Range

Zoom

Table 3-7: DMX Map For Zoom

% Value	DMX Value	Action
0	0	Narrow
100	255	Wide

Luminaire Timing

Luminaire Timing Channel Information

Timing channel control improves the timed moves of certain groups of parameters. We provide three timing channels, one for Focus (Pan and Tilt), one for color parameters and one for beam parameters. Timing channels support time values of up to six minutes.

Table 3-8: Channel Function / Timing Channel Relationship

Channel Function	Timing Channel		
	Focus Time	**Color Time**	**Beam Time**
Pan (Hi Byte/Lo Byte)	♦		
Tilt (Hi Byte/Lo Byte)	♦		
Color		♦	
Gobo			♦
Rotating Gobo			♦
Index			♦
Iris			♦
Edge			♦
Zoom			♦

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.

Note: The particular storing syntax for your console, as well as instructions on how to write part cues, can be found in the operation manual for that console.

To use these channels, you must:

Step 1. Create the cue, including color, gobo, edge and diffusion as required.

Step 2. Decide which fixtures and which parameter groups will use timing channels.

Step 3. Assign a value to the particular timing channel(s) you wish to use (for timing information see chart on next page).

Step 4. Set console timing (or cue fade time) for parameters and timing channels to zero seconds.

Step 5. Store cue.

Note: Avoid changing timing channel values in a fading cue. This can cause unexpected behavior in the luminaire as the timing channel value is updated over time. Timing channel values and the final destination of the parameters affected by the timing channel should always be sent in a zero count.

Timing channels can be set in either % or 0-255 (DMX) modes, with the following values assigned:

Table 3-9: Timing Channels Map

% 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

Table 3-9: Timing Channels Map (Continued)

% Value	DMX	= Seconds
	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
	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

Table 3-9: Timing Channels Map (Continued)

% Value	DMX	= Seconds
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
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

Table 3-9: Timing Channels Map (Continued)

% Value	DMX	= Seconds
	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
62	158	52
	159	52
	160	53
63	161	53
	162	54
64	163	54
	164	54
	165	55

Table 3-9: Timing Channels Map (Continued)

% Value	DMX	= Seconds
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

Table 3-9: Timing Channels Map (Continued)

% Value	DMX	= Seconds
	208	140
82	209	140
	210	140
	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

<p style="text-align:center;">Table 3-9: Timing Channels Map (Continued)</p>

% Value	DMX	= Seconds
98	250	300
	251	310
99	252	310
	253	310
	254	310
100	255	Follows Cue Data

Control Channel Functions

The following control actions must be accomplished with zero time transition or with timing disabled. Discrete values must be used and not manual controls such as faders or encoders.

<p style="text-align:center;">Table 3-10: Control Channel Functions</p>

Control Channel Function	Control Channel Value		
	% Value	For 3 Secs or Greater	After 3 Secs
Display On	1	1-4	0
Luminaire Reset	33	81 - 87	0
Lamp Off	66	165 - 171	0
Lamp On	99	249 - 255	0

To use control channel functions:

Step   1. Select an action to be sent.

Step   2. Set control channel value for desired action (for example, 84 for reset). Hold value for 3 seconds.

Note: A numerical keypad is required for sending values. An encoder or fader does not allow for a "snap" value change, which is required to affect the control functions.

Step   3. Set control channel value to zero. (This must occur without any scaling values. Action will be voided if other values are detected between action value and zero.)

Updating Software

Reprogramming Luminaires

In some cases, it may be desirable to upgrade the luminaire's operating software. This process requires a PC, *VLDownload.exe*, .bin files and the Luminaire Programming Kit (28.9661.0054).

Components Overview

Computer Requirements
- PC running Windows 95/98, Windows NT (4.0 or higher), or Windows 2000. (Program is not compatible with Macintosh computers.)
- Serial communication port. (RS-232 only, USB not supported.)

VL Download Program
The *VL Download.exe* program allows you to transfer new versions of the operating software (.bin files) to the luminaires via the PC. The *VL Download.exe* and current .bin files are available from the Product Downloads page at www.vari-lite.com. Instructions for installing the program on your PC are also available on the Product Downloads page.

Luminaire Programming Kit
The luminaire programming kit allows you to connect your PC to the luminaire chain in order to update software.

Luminaire Programming Kit (28.9661.0054) components:
- 6-Ft. Serial Straight Thru DB9M-F Cable (46.6033.0006)
- RS-232 to RS-485 Interface Converter (46.6036.0001)
- 6-Ft. RJ45 to 5-Pin Female XLR Cable (25.9661.0055)

Reprogramming Procedure

Note: Up to 32 luminaires can be programmed at the same time if they are data linked together. Refer to "Connecting Data and Power" on page 19. (Programming more than 32 luminaires will require programming in batches of 32 or less.)

To update luminaire software:

Step 1. From Product Downloads page at www.vari-lite.com, download and install the *VLDownload.exe* program and required .bin files onto your PC (following instructions at the website).

Step 2. Assemble Luminaire Programming Kit components by connecting *Serial Straight Thru Cable* and *RJ45-to-XLR cable* to Interface Converter.
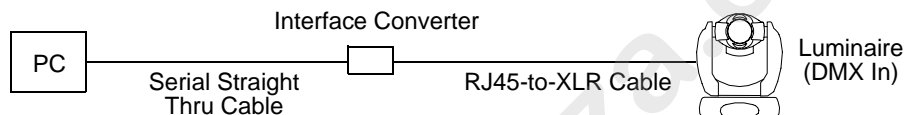

Figure 3-5: Hardware Setup

Step 3. Connect *Serial Straight Thru cable* to serial Comm Port of PC and connect *RJ45-to-XLR cable* to DMX In connector of luminaire.

Step 4. Apply power to PC and luminaire(s).

Step 5. Run *VLDownload.exe* program by selecting from Start menu Programs list or by selecting from C:\ProgramFiles\Vari-Lite\VLDownload Program directory. (Luminaire Software Download window will open.)

Step 6. At Select Comm Port section of window (refer to Figure 3-6 on next page), select serial Comm Port (Comm Port 1, Comm Port 2, Comm Port 3, or Comm Port 4) where *Serial Straight Thru Cable* is connected.

Note: DMX Data must be disconnected before downloading software to luminaires. (Do not merge with DMX signal.)

Step 7. At Select Software to Download section of window, select required luminaire software version to download by clicking its button or select Download All. (Software version is identified by the date and time: MM/DD/YY and HH:MM.) The buttons function as follows:

VL2000Spot button downloads the software to all VL2000 spot luminaires.

Download All button is the equivalent of executing all of the specific software version buttons shown in the window (if applicable). They will be executed one at a time in the order they appear in the window. This button can be used when any combination of VARI∗LITE luminaires are connected to the PC.

Note: Version dates shown in this graphic are for illustration purposes only and may not correspond to the version you are downloading.
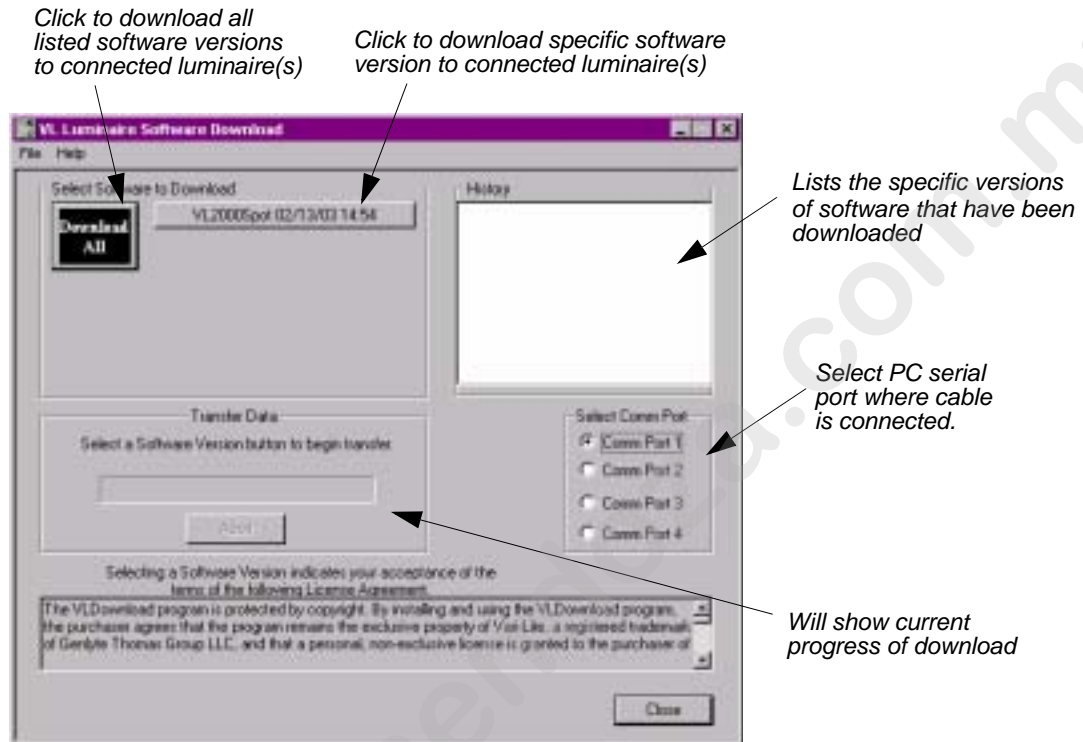
Click to download all listed software versions to connected luminaire(s)

Click to download specific software version to connected luminaire(s)

Lists the specific versions of software that have been downloaded

Select PC serial port where cable is connected.

Will show current progress of download

Figure 3-6: Download Interface Window

Step   8. Download will proceed. One of the following will occur:

Correct ☐▷ Luminaire's green Rx LED will blink rapidly and its menu will display number of blocks received (this number will vary depending on software version being downloaded). This indicates that data is being sent from PC to luminaire. However, if display does not show blocks as they are received, this indicates that the version being downloaded matches the one already installed or that the luminaire type does not match.

Trouble ☐▷ If luminaire's green Rx LED does not blink rapidly and its menu does not display blocks, this indicates that no data is being received. (Check cable connections, port selection, etc. and try again.)

Step   9. Click Close to exit.

Note: The History section of the window shows what specific types of luminaire software have been downloaded since the beginning of the session (window will reset once the program is closed and re-opened).

Verify software version at luminaire:

Step 1. At Menu Display, press [Menu].

Step 2. Press [Up] / [Down] arrows until Fixt appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until Ver appears. Press [Enter].

The first half of the version date will be displayed as MM/DD/YY (month/day/year): For example, 07/21/02 = July 21, 2002

Press [Up] / [Down] arrows to display second half of version date.

The second half of the version date will be displayed as XXX (time in 6 minute intervals): For example, 36.0 = 36 minutes

Transferring Software From Luminaire to Luminaire

It is possible to transfer specific software versions between luminaires. As in the case of installing new software versions, multiple luminaires can be programmed at the same time if they are data linked together (refer to "Connecting Data and Power" on page 19), however a maximum of 32 luminaires can be updated at once.

The transfer process can be used to download an earlier or later version of the *Luminaire Software* to other connected luminaires.

Hardware Requirements

Data cables used in this process must have two twisted pairs and a shield. It is also recommended that cables meet all other USITT DMX specification requirements. Refer to "Data Cables" on page 12.

Loopback and termination connectors are used in this process. Refer to "Male Termination Connector" on page 14 for more information regarding the construction of these connectors.

Transfer Procedure

This procedure is used to transfer software versions between luminaires.

Step 1. At master luminaire (first in link), install loopback connector into DATA IN XLR connector.

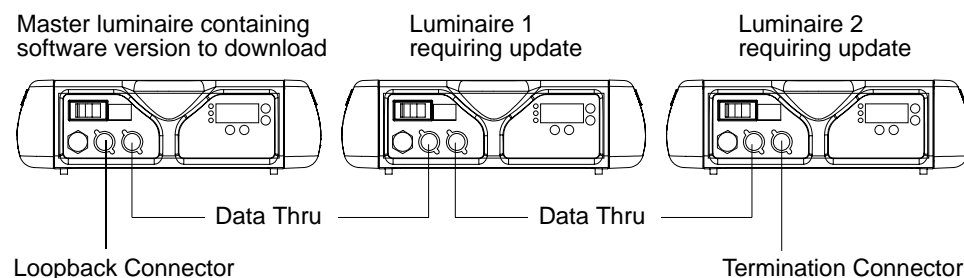Step 2. At last luminaire, install male termination connector into DATA THRU XLR connector.

Figure 3-7: Software Transfer Setup

Step   3. At master luminaire Menu Display, press [Menu].

Step   4. Press [Up] / [Down] arrows until Fixture appears.

Step   5. Press [Up] / [Down] arrows until Download appears. Press [Enter].

Step   6. OK? will be displayed. Press [Enter] to accept.

Step   7. Download will proceed. (Download will take 1-2 seconds.) One of the following will occur:

Correct ⟹ The receiving luminaire's green Rx LED will blink rapidly and its menu will display number of blocks received (this number will vary depending on software version being downloaded). This indicates that data is being sent from luminaire to luminaire. However, if display does not show blocks as they are received, this indicates that the version being downloaded matches the one already installed or that the luminaire type does not match.

Trouble ⟹ If the receiving luminaire's green Rx LED does not blink rapidly and its menu does not display blocks, this indicates that no data is being received. (Check cable connections, Loopback Connector, etc. and ensure ALL cabling is the 5-conductor type.)

Note: Without any data connected, the normal standby cycle of the Rx LED is 2 sec on, 2 sec off.

Note: The number of blocks displayed will be less in a luminaire-to-luminaire download than in a PC-to-luminaire download for the same software version.

Step   8. Once download is complete, luminaire will automatically recalibrate. Once recalibration is complete, luminaire is ready for operation with its new software version.

Verify software version at luminaire:

Step   1. At Menu Display, press [Menu].

Step   2. Press [Up] / [Down] arrows until Fixt appears. Press [Enter].

Step   3. Press [Up] / [Down] arrows until Ver appears. Press [Enter].

The first half of the version date will be displayed as MM/DD/YY (month/day/year): For example, 07/21/02 = July 21, 2002

Press [Up] / [Down] arrows to display second half of version date.

The second half of the version date will be displayed as XXX (time in 6 minute intervals): For example, 36.0 = 36 minutes

Notes

CHAPTER 4.

Menu System

This chapter contains instructions for operating the luminaire using the Menu Display feature.

- **Operation**

- **Display TestMapping**

- **Cues and Sequences**

- **Self Tests**

Operation

What Is the Menu System?

The menu system is a programmable set of commands used to configure, address, operate, and test the luminaire. The menu system is controlled at the Menu Display available at the enclosure input panel.
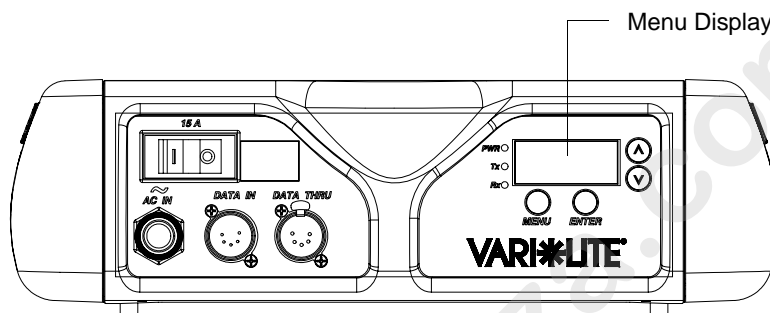
Menu Display

Figure 4-1: Menu Display Location

The menu system has seven main functions which are referred to as "1st level." Within these main functions, there can be up to four additional sub-functions (levels 2 thru 5), making five total levels.

Controls Operation

The menu system is controlled by four buttons. These buttons function as follows:

[Menu] button. Displays the menu, or if at first level, the current address.

[Enter] button. Selects the current menu option or stores current data value.

[Up] arrow. Scrolls menu options upward or increases current data value.*

[Down] arrow. Scrolls menu options downward or decreases current data value.*

Multi-Segment Display

Up / Increase *

Down / Decrease *

Displays the menu, or if at first level, the current address

MENU   ENTER

Selects the current menu option or stores current data value
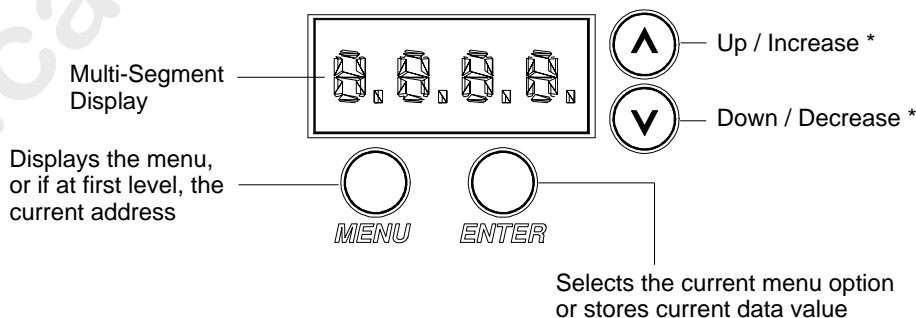
* The arrows will have opposite functions if luminaire is hung upside down in a hanging orientation and the Display Direction Orientation is "flipped." Refer to "Display Orientation" on page 49.

To enter the menu system, first press [Menu]. The functions displayed will be 1st level functions. Scroll through the 1st level functions by pressing [Up] / [Down] arrows. Once the desired function appears in the display, press [Enter]. You are now at the 2nd level. Once again, press the [Up] / [Down] arrows to scroll through 2nd level functions. Press [Enter] to access 3rd level functions and so forth. When the highest level for the function is reached, [Up] / [Down] arrows can be pressed to select a value or select a toggle activation such as ON/OFF. Press [Enter] to store the value or select an action.

For example, the Addr (Address) function has two sub-levels: DMX and VIRT (Virtuoso). Both of these 2nd level menus allow access to a 3rd level, which is a value in both of these functions. The Address function is a 3-level menu.

1st Level	2nd Level	3rd Level
Addr	DMX	XXX
	VIRT	XXXX
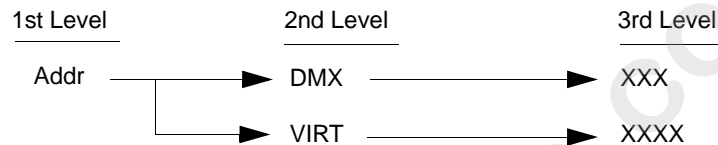
Display Orientation

To assist in reading the Menu System if the luminaire is installed in a hanging position, the display read-out orientation can be changed so that it still reads from left-to-right. Keep in mind that when the display read-out orientation is switched, the function of the [Up] / [Down] arrows are also switched respectively. In any case, when the display is in its readable orientation, the lower arrow button functions as down/decrease and the upper arrow button functions as up/increase.
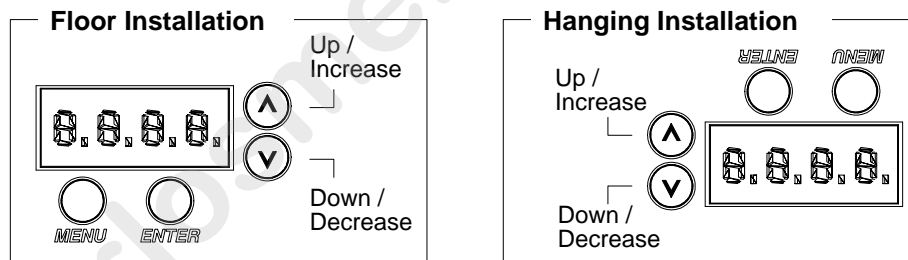
Figure 4-2: Display Orientation

The default setting for the display orientation is Auto, which will automatically detect the orientation of the luminaire and adjust the display accordingly. However, a fixed orientation can also be programmed.

To program a fixed display read-out orientation:

Step   1. Press [Menu].

Step   2. Press [Up] / [Down] arrows until CFG (Configuration) appears. Press [Enter].

Step   3. Press [Up]/ [Down] arrows to access DDir. Press [Enter].

Step   4. Press [Up] / [Down] arrows to select ⇑⇑ or ⇓⇓. When desired direction is reached, press [Enter].

Default State

The menu display's default state during normal operation is to display the address (Virtuoso or DMX). After 10 seconds of inactivity at the display, it will change to the default state.

After longer periods of inactivity, the menu display will switch to its off state. The default state for this feature is 5 minutes, however, different time lengths can also be programmed.

To program a different time length for menu off feature:

Step   1. Press [Menu].

Step   2. Press [Up] / [Down] arrows until CFG (Configuration) appears. Press [Enter].

Step   3. Press [Up] / [Down] arrows to access DisP (Display). Press [Enter].

Step   4. Press [Up] / [Down] arrows to select either 30s (30 sec.), 5M (5 minutes), 10M (10 minutes), or ON (on indefinitely). Press [Enter] to set.

Decimal Placement

A decimal to the right of a menu display readout can indicate two things:

• Virtuoso address - for example, XXXX.

• One of two pages - for example, the eight-digit luminaire ID number page 1: XXXX. and page 2: XXXX
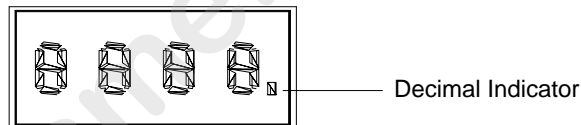
Figure 4-3: Decimal Indicator Location

Display Test

The Display Test will display every character on the menu display to check for missing characters.

The following procedure is used to test the display.

Step   1. Press [Menu].

Step   2. Press [Up]/[Down] until Test appears. Press [Enter].

Step   3. Press [Up]/[Down] until DISP appears. Press [Enter]. All segments in the alpha-numeric display should be lit.
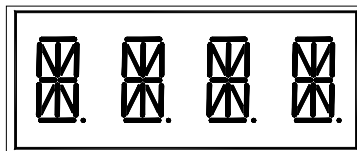
Figure 4-4: Display TestMapping

Shortcuts

A few button combinations are provided as shortcuts for frequently used menu functions. These shortcuts are as follows:

- Pressing [Enter] and [Up] at the same time = Lamp On
- Pressing [Enter] and [Down] at the same time = Lamp Off
- Pressing [Menu] and [Up] at the same time = Recalibrate
- Pressing [Menu] at Power up interrupts calibration. See "Program Starting Address Without Calibrating the Luminaire" on page 23 for more information.

Keep in mind that [Up] and [Down] arrows are dependent on the Display Orientation. Refer to "Display Orientation" on page 49.

Menu System Overview

The following is a graphic representation of the entire menu system.

Addr
- DMX — value
- VIRT — value

Man
- Pan — value
- Tilt — value
- Whl1 — value
- Whl2 — value
- Iris — value
- Dimm — value
- Strb — value
- Gobo — value
- IndX — value
- Edge — value
- Zoom — value
- Time
  - ITim — value
  - FTim — value
  - CTim — value
  - BTim — value

CFG
- LAMP
  - POWR
    - ON
    - OFF
  - P UP
    - L ON
    - LOFF
    - C ON
  - LHrs — # of hours
  - Strk — # of Strikes
  - RHrs — OK?
- P/T — Move
  - Enab
  - Dis
- DDir
  - Auto
  - ⇓⇓
  - ⇑⇑
- DisP
  - 5M
  - 10M
  - ON
  - 30s
- RDef — OK?

Cue
- FLTM — value
- Stor — cXX — cue #
- Mod — cXX — cue #
- Del — cXX — cue #
- PCue — cXX — cue #
- PSEQ
  - [Enter] = start
  - [Menu] = stop — ScXX
- DSEQ — OK?
- SEQ
  - ISEQ
  - MSEQ
- Auto
  - OFF
  - ON

DMX
- MODE
  - 8
  - 16
  - E 8
  - E 16
- DATA — cXXX — data
- P/T
  - SWAP
    - ON
    - OFF
  - InvP
    - ON
    - OFF
  - InvT
    - ON
    - OFF

Test
- MOVE
  - Dis
  - Enab
- ALL — ALL1/ALL2
- P/T — PT1/PT2/Pan1/Pan2/Pan3/Tlt1/Tlt2/Tlt3
- Dimm — Dim1/Dim2/Dim3/Str
- Cwhl — Cwl1/Cwl2/Cwl3
- FGob — FG 1/FG 2/FG 3
- RGob — RG 1/RG 2
- Iris — Irs1/Irs2
- EDGE — EDG1/EDG2
- Zoom — Zm 1/Zm 2/Zm 3
- LAMP — RTST
- Encr
  - Pan — value
  - Tilt — value
- Sens
  - Pan — STST
  - Tilt — STST
  - Whl1 — STST
  - Whl2 — STST
  - Dimm — STST
  - Gobo — STST
  - IndX — STST
- DISP — Lights all segments

Fixt
- STAT — scrolls errors or displays OK
- Cal — OK?
- Modl — model
- LId — pg. 1 — pg. 2
- Ver — pg. 1 — pg. 2
- FHrs — pg. 1 — pg. 2
- Dnld — OK?

Menu System Functions

Table 4-1: Menu System Chart

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Addr *Address*	**DMX** *DMX Address*	**XXX** *Address value*		
	VIRT *Virtuoso Address*	**XXXX.** *Address value*		
CFG *System Configuration*	**LAMP** *Lamp Options*	**POWR** *Lamp Power*	**ON** (default)	
			OFF	
		P UP *Lamp Power-up State*	**L ON** *Lamp On* (default)	
			LOFF *Lamp Off*	
			C ON *On after Calibration*	
		LHrs *Lamp Hours Used*	**XXXX** *Cumulative # of Operation Hours* (Not editable)	
		Strk *# of Lamp Strikes*	**XXXX** *# of Strikes* (not editable)	
		RHrs *Reset Lamp Hour and Lamp Strike Counters*	**OK?**	
	P/T *Pan and Tilt Options*	**Move** *Position Recovery*	**Enab** *Enable*	
			Dis *Disable*	
	DDir *Display Orientation*	**Auto** (default)		
		⇓⇓		
		⇑⇑		
	DisP *Display Illumination*	**30s** *OFF in 30 seconds*		
		5M *OFF in 5 minutes* (default)		
		10M *OFF in 10 minutes*		
		ON *ON indefinitely*		
	RDef *Reset Default Values*	**OK?**		
DMX *DMX Mode and Data*	**MODE**	**8** *Standard 8 bit*		
		16 *Standard 16 bit* (default)		
		E 8 *Enhanced 8 bit*		
		E16 *Enhanced 16 bit*		
	DATA	**cXXX** *DMX Channel*	**XXXX** *Data*	
	P/T *Pan/Tilt Options*	**SWAP** *Swap Pan & Tilt*	**ON**	
			OFF (default)	
		InvP *Invert Pan*	**ON**	
			OFF (default)	
		InvT *Invert Tilt*	**ON**	
			OFF (default)	

Table 4-1: Menu System Chart (Continued)

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Fixt	**STAT** *Status/Error Display*	Scrolls error messages * or displays **OK**		
	Cal *Recalibrate*	**OK?**		
	Modl *Luminaire Model Type*	**XXXX** *Model Type*		
	LId *Luminaire ID*	**XXXX.** *Luminaire ID Number* (Page 1)	**XXXX** *Luminaire ID Number* (Page 2)	
	Ver *Version*	**XX.XX.** *Version* (Page 1)	**XX.XX** *Version* (Page 2)	
	FHrs *Fixture Hours On*	**XXXX** *Hours*		
	Dnld *Download Program to Luminaires*	**OK?**		
Man *Manual Commands*	**Pan** *Pan Motor*	**XXXX** *Data*		
	Tilt *Tilt Motor*	**XXXX** *Data*		
	Whl1 *Wheel 1 (Color)*	**XXX** *Data*		
	Whl2 *Wheel 2 (Gobo)*	**XXX** *Data*		
	Iris *Iris*	**XXX** *Data*		
	Dimm *Dimmer*	**XXX** *Data*		
	Strb *Strobe*	**XXX** *Data*		
	Gobo *Rotating Gobo Select*	**XXX** *Data*		
	Indx *Rotating Gobo Index*	**XXX** *Data*		
	Edge *Edge*	**XXX** *Data*		
	Zoom *Zoom*	**XXX** *Data*		
	Time *Timing Data*	**ITim** *Dimmer/Intensity Time*	**XXX.X** *Data*	
		FTim *Focus Time*	**XXX.X** *Data*	
		CTim *Color Time*	**XXX.X** *Data*	
		BTim *Beam Time*	**XXX.X** *Data*	

Table 4-1: Menu System Chart (Continued)

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Cue *Cue* *Processing*	**FLTM** *Follow Time*	**XXX.X** *Data*		
	Stor *Store Cue*	**XX** *Cue # to Store* (Not editable – given next cue ID in list)		
	Mod *Modify Cue*	**XX** *List of Cues*		
	Del *Delete Cue*	**XX** *Cue # to Delete* (Not editable – given last cue ID in list)		
	PCue *Play Cue*	**XX** *List of Cues*		
	PSEQ *Play Sequence*	Press [Enter] to start Press [Menu] to stop		
	DSEQ *Delete Sequence*	**OK?**		
	SEQ *Sequence Playback Mode*	**ISEQ** *Individual Sequence* (default)		
		MSEQ *Master Sequence*		
	Auto *Autoplay at Power-Up*	**OFF** (default)		
		ON		
Test *System Test*	**MOVE** *Pan/Tilt Control*	**Dis** *Disable*	Press [Menu] to stop tests	
		Enab *Enable*		
	ALL *Test All Motors*	**ALL1** *All Synchronized Test*		
		ALL2 *All Test*		
	P/T *Pan/Tilt*	**PT 1** *Min/Max Fast Pan/TIlt test*		
		PT 2 *Min/Max SlowPan/Tilt test*		
		Pan1 *Min/Max Fast Pan Test*		
		Pan2 *Min/Max Slow Pan Test*		
		Pan3 *Pan Test*		
		Tlt1 *Min/Max Fast Tilt Test*		
		Tlt2 *Min/Max Slow Tilt Test*		
		Tlt3 *Tilt Test*		
	Dimm *Dimmer/Strobe*	**Dim1** *Min/Max Dimmer Test*		
		Dim2 *Min/Max Dimmer Test*		
		Dim3 *Dimmer Test*		
		Str *Strobe Test*		
	Cwhl *Color Wheel*	**Cwl1** *Color Wheel Test*		
		Cwl2 *Color Wheel Test*		
		Cwl3 *Color Wheel Test*		

Table 4-1: Menu System Chart (Continued)

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Test (cont.)	**FGob** *Fixed Gobo Wheel*	**FG 1** *Fixed Gobo Wheel Test*	Press [Menu] to stop tests	
		FG 2 *Fixed Gobo Wheel Test*		
		FG 3 *Fixed Gobo Wheel Test*		
	RGob *Rotating Gobo Wheel*	**RG 1** *Rotating Gobo Wheel Test*		
		RG 2 *Rotating Gobo Wheel Test*		
	Iris *Iris*	**Irs1** *Iris Test*		
		Irs2 *Iris Test*		
	EDGE *Egde*	**EDG1** *Edge Test*		
		EDG2 *Edge Test*		
	Zoom *Zoom*	**Zm 1** *Zoom Test*		
		Zm 2 *Zoom Test*		
		Zm 3 *Zoom Test*		
	LAMP *Lamp*	**RTST**		
	Encr *Encoders*	**Pan** *Pan Encoder*	**XXXX** *Data*	
		Tilt *Tilt Encoder*	**XXXX** *Data*	
	Sens *Sensors*	**Pan** *EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
		Tilt *EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
				FAIL
		Whl1 *Wheel 1 EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
				FAIL
		Whl2 *Wheel 2 EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
				FAIL
		Dimm *Dimmer/Strobe EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
				FAIL
		Gobo *Gobo Select EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
				FAIL
		Indx *Gobo Index EOT Sensor*	**STST** *Sensor Test in Progress*	**PASS**
				FAIL
	DISP *Display Test*	**X.X.X.X.** Ignites all 14 segments of each of the 4 characters and all 4 decimal points.		

*Refer to "Diagnostic Tests" on page 67 for more information.

Function Definitions

Each menu item is listed in the first column by its display abbreviation. The abbreviations appear in alphabetical order as opposed to their position in the menu display sequence for easy reference.

Table 4-2: Menu Fuction Definitions

Display	Definition	Purpose
8	Standard 8-bit	Configures luminaire for operation in standard DMX 8-bit mode.
16	Standard 16-bit	Configures luminaire for operation in standard DMX 16-bit mode.
10M	10 Minutes	Sets Menu Display to automatically shut off after 10 minutes of non-use.
30s	30 Seconds	Sets Menu Display to automatically shut off after 30 seconds of non-use.
5M	5 Minutes	Sets Menu Display to automatically shut off after 5 minutes of non-use.
Addr	Address	Accesses functions for setting luminaire starting address in either Virtuoso (**VIRT**) or DMX (**DMX**) controlled systems.
ALL	All Motors	Tests all internal motors.
Auto	Auto Detect *or* Auto Playback	Automatically detects required Menu Display orientation when selected (**DDir**) or initiates automatic playback of a cue sequence at power-up (**CUE**).
BTim	Beam Time	Accepts timing value for beam time.
C ON	On after Calibration	Configures arc luminaire so that lamp will strike after calibration procedure is complete.
Cal	Recalibrate	Recalibrates luminaire.
CFG	System Configuration	Accesses functions for setting lamp start up, pan/tilt, and Menu Display configurations. Also accesses lamp information such as number of strikes, and hours used, along with their respective reset function.
CTim	Color Time	Sets color time.
Cue	Cue Processing	Accesses cue store, modify, delete, and playback commands.
Cwhl	Color Wheel	Specifies Color wheel for testing.
cXXX	DMX Channel	Specifies DMX channel for display of current data value.
DATA	DMX Data	Accesses function for displaying DMX data by channel number.
DDir	Display Orientation	Accesses option to orient Menu display for reading correctly in either hanging or floor mounting installations.
Del	Delete Cue	Deletes cues by number. Cue number deleted is dependent on last cue ID in cue list since this field is not editable.
Dimm	Dimmer	Specifies dimmer mechanism for manual control (**Man**) or tests dimmer/strobe functions (**Test**).
Dis	Disable	Disables a function.
DISP	Display Test	Tests all 14 segments in the Display.
DisP	Display Illumination	Accesses options for Menu Display on and off times.

Table 4-2: Menu Fuction Definitions (Continued)

Display	Definition	Purpose
DMX	DMX	Accesses functions for setting DMX mode or pan/tilt options (1st level menu) or sets starting address for luminaire in DMX systems (**Addr**).
Dnld	Download	Downloads program to luminaires.
DSEQ	Delete Sequence	Deletes cue sequence.
E 16	Enhanced 16-bit	Configures luminaire for operation in enhanced DMX 16-bit mode.
E 8	Enhanced 8-bit	Configures luminaire for operation in enhanced DMX 8-bit mode.
Edge/ EDGE	Edge Motor	Specifies edge function for manual control or testing.
Enab	Enable	Enables a function.
Encr	Encoders	Accesses encoder choices for diagnostic testing.
FAIL	Test Fail	Indicates that sensor test has failed.
FGob	Fixed Gobo	Tests fixed wheel gobo function.
FHrs	Fixture Hours	Displays total number of hours luminaire has been powered on.
Fixt	Fixture	Access luminaire specification information such as model, serial number, software version, along with status information and download function.
FLTM	Follow Time	Accepts value for cue follow feature.
FTim	Focus Time	Accepts timing value for focus time.
Gobo	Gobo Select	Specifies rotating gobo select for manual control (**Man**) or gobo select EOT sensor for testing (**Test**).
Indx	Gobo Index	Specifies rotating gobo index for manual control (**Man**) or gobo index EOT sensor for testing (**Test**).
InvP	Invert Pan	Reverses pan action for special focus requirements.
InvT	Invert Tilt	Reverses tilt action for special focus requirements.
Iris	Iris Motor	Specifies iris mechanism for manual control or testing.
ISEQ	Individual Sequence	A sequence playback mode which will play the cues from each individual luminaire, if any. (In ISEQ, if the number of cues is different, it will only play as many as each luminaire has stored. The follow time is taken from the master luminaire.)
ITim	Intensity Time	Accepts timing value for intensity fade time.
L ON	Lamp is On	Configures arc luminaire so that lamp will strike upon power up.
LAMP	Lamp	Accesses lamp power up options and information (**CFG**) or sets beam for lamp alignment adjustment (**TEST**).
LHrs	Lamp Hours	Displays total number of lamp operating hours.
LId	Luminaire ID	Displays unique ID number for the luminaire which is used by Virtuoso consoles to identify the unit (in two pages).
LOFF	Lamp is Off	Configures arc luminaire so that lamp will await manual command before striking.
Man	Manual Commands	Accesses functions for controlling luminaire mechanisms and timing by entry of an absolute data value.
Mod	Modify Cue	Accepts cue number of cue to modify from cue list.

Table 4-2: Menu Fuction Definitions (Continued)

Display	Definition	Purpose
MODE	DMX Mode	Accesses functions for setting DMX mode to standard or enhanced 8-bit or 16-bit.
Modl	Model	Displays model number of luminaire. For example, 2413 (VL2413).
Move	Move	Enables and disables pan and tilt movement and auto-correction.
MSEQ	Master Sequence	A sequence playback mode which will replay the cues from the master luminaire.
NoPg	No Program	Indicates that there is no software present in the luminaire.
OFF	Off	Turns off a function.
OK	Okay	Indicates that luminaire is ready to accept commands.
OK?	Okay?	Prompt for pressing [Enter] before an action is executed.
ON	On Indefinitely	Sets Menu Display to stay on until programmed otherwise (**DisP**), turns on a function, or turns on a menu item.
P UP	Lamp Power Up	Accesses options for lamp power up: on, off, or after calibration.
P/T	Pan/Tilt	Accesses pan and tilt options for DMX function, system configuration, and testing.
Pan	Pan	Specifies pan function for manual control (**Man**) or pan encoder for testing (**Test**).
PASS	Test Pass	Indicates that sensor test has passed.
PCue	Play Cue	Accesses cue list for play back of cues by number.
POWR	Lamp Power	Accesses function to turn lamp on or off.
PSEQ	Play Sequence	Plays back cue sequence. Press [Enter] to start and [Menu] to stop.
RDef	Reset Default	Resets default system configuration values.
RGob	Rotating Gobo	Tests rotating gobo wheel.
RHrs	Reset Lamp Info	Resets lamp hour and lamp strike counters. For use when new lamp is installed.
RTST	Run-Test	Indicates that a system mechanism test is in progress.
Sens	Sensors	Accesses sensor choices for diagnostic testing.
SEQ	Sequence Play-back	Sets sequence playback mode to Individual (plays cues from each lumi-naire) or Master (all luminaires play same cue).
STAT	Status/Error Display	Allows scrolling through error list or displays **OK** if no errors.
Stor	Store Cue	Stores cue by number. Cue number stored is dependent on next cue ID in cue list since this field is not editable.
Str	Strobe	Specifies strobe function for manual control.
Strk	Strike	Displays total number of lamp strikes.
STST	Sensor Test	Indicates that a system sensor test is in progress.
SWAP	Swap	Swaps pan and tilt functions for special focus requirements such as moving mirror mechanisms.
Test	System Tests	Accesses diagnostic tests for internal mechanisms.

Table 4-2: Menu Fuction Definitions (Continued)

Display	Definition	Purpose
Tilt	Tilt	Specifies tilt function for manual control (**Man**) or tilt encoder for testing (**Test**).
Time	Timing Data	Allows manual setting of timing values for dimmer/intensity, focus, color, and beam.
Ver	Version	Displays current software version (in two pages).
VIRT	Virtuoso console	Sets starting address for luminaire in Virtuoso systems.
Whl1	Wheel 1 (Color)	Specifies wheel 1 for manual control or testing.
Whl2	Wheel 2 (Fixed Gobo)	Specifies wheel 2 for manual control or testing.
Zoom	Zoom	Specifies zoom function for manual control or testing.

Cues and Sequences

Overview

The luminaire has the ability to store and playback cues independent of a console. Cues are stored as numbers from 1 to 99 by using the Cue (Cue Processing) functions available in the menu system. This also allows you to create your own test sequences to be played back on a group of luminaires.

Refer to "Menu System Functions" on page 53 for a complete breakdown of Cue and Man (Manual Commands) functions.

Storing

The luminaire is able to store its current position into a cue; this information can be set via a console or by using the menu system Man (Manual Commands) function.

Playback

Cues can be joined into a sequence to be played back without a console. However, only one sequence can run at a time.

A sequence can either replay the cues stored in each luminaire or replay the cues stored in a master luminaire. Playing a cue sequence for all luminaires in the data link is triggered by a "master" luminaire using the PSEQ (Play Sequence) command. The cue follow time (FLTM) is taken from the luminaire that is running the sequence (it is possible to view the follow time of each cue by playing the cue PCUE and then viewing the cue follow time FLTM). A playback sequence can be set to start automatically after power up by setting the Auto (AutoPlay) feature to ON.

Note: Up to 32 luminaires can be linked together to run a sequence if they are data linked together. Refer to "Connecting Data and Power" on page 19.

Hardware Requirements

Data cables used in the multi-luminaire playback feature must have two twisted pairs and a shield. It is also recommended that cables meet all other USITT DMX specification requirements. Refer to "Data Cables" on page 12.

Loopback and termination connectors are used in this process. Refer to page 14 for more information regarding the construction of these connectors.

Cue Operations

The following section provides instructions for performing cue, sequence, and playback operations.

Note: The Mod, Del, PCue, PSEQ commands will all display "---" if no cues have been stored.

Note: After 10 seconds of inactivity at the display, it will change to the default state showing the address.

To use the menus:

The data stored by the luminaire is "last takes precedence." This means the last command received by the luminaire will be the basis of the cue to be stored.

To clear all input data and timing values from previous tests or cues, cycle power to the luminaire with DMX data cables disconnected. This will reset parameter's data and timing values to defaults.

Set position:

Step   1. Press [Menu].

Step   2. Press [Up]/ [Down] arrows until Man appears. Press [Enter].

Step   3. Press [Up]/ [Down] arrows until desired parameter appears. Press [Enter].

Step   4. Press [Up] / [Down] arrows to adjust value. (The values wrap from 0 to 255 in either direction. Pan and Tilt values operate in a range of 0-4095, and wrap also.) Press [Enter] to set value.

Step   5. Parameter timing can be set using the Time sub-functions. This allows timing to be added to Intensity, Pan & Tilt, Color, and Beam parameters.

Set follow time between cues:

The following procedure is used to set the follow time between each cue. The value can be different for each cue. The range is 0.0 to 365.9 seconds.

Step   1. Press [Menu].

Step   2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step   3. Press [Up] / [Down] arrows until FLTM appears. Press [Enter].

Step   4. Press [Up] / [Down] arrows to set value. Once the value is set press [Enter] button. The display will return to FLTM.

To store a cue:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until Stor appears. Press [Enter]. The number displayed is the cue number to be stored.

Step 4. Press [Enter] to store cue. (Number will increase by one for next cue to be stored.)

Step 5. Repeat for remaining cues.

To delete a cue:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until Del appears. Press [Enter]. The last cue number stored will be displayed and only the last cue will be deleted.

Step 4. Press [Enter] to delete cue. (There is no "undo" function.)

To play a cue:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until PCue appears. Press [Enter]. This allows the stored cues to be selected by using [Up] / [Down] arrows and then played by pressing [Enter]. (If there are no stored cues, "C --" will be displayed. If there is one or more cues, "C xx" will be displayed - where xx is the cue number from 1 to 99. Only cues in one luminaire will play.)

To edit or modify a cue:

Step 1. Recall cue to be changed from PCue.

Step 2. Change luminaire data to desired levels using Man (Manual Command) functions.

Step 3. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 4. Press [Up] / [Down] arrows until Mod appears. Press [Enter]. The number displayed is the same as the selected cue.

Step 5. Press [Enter] and changes will be saved.

To play cues as a sequence:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until PSEQ appears. Press [Enter] and the sequence will play. The active cue will be shown in the display. [Enter] to start, [Menu] to stop.

To change the follow time in a sequence:

The follow time is stored for each cue individually.

Step 1. Select cue to be changed from PCue.

Step 2. Go to Mod to modify active cue and press [Enter] to save the change.

Step 3. Set FLTM (Follow Time) to desired value (refer to "Set follow time between cues:" on page 62).

To delete a sequence and all cues:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until DSEQ appears. Press [Enter].

Step 4. OK? prompt will appear. Press [Enter] to delete stored sequence.

Choose Sequence Mode:

MSEQ will replay the cues from the master luminaire.

ISEQ will play the cues from each individual luminaire, if any. In ISEQ, if the number of cues is different, it will only play as many as each luminaire has stored. The follow time is taken from the master luminaire.

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until SEQ appears. Press [Enter].

Step 4. Press [Up] / [Down] arrows to toggle between ISEQ and MSEQ. Press [Enter] to select mode.

To make a sequence AutoPlay at power up:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Cue appears. Press [Enter].

Step 3. Press [Up] / [Down] arrows until Auto appears. Press [Enter].

Step 4. Use [Up] / [Down] arrows to toggle between OFF (the default) and ON. Press [Enter] to select the mode.

To store cues from a console:

Step 1. Clear memory by deleting cues or sequence, if required.

Step 2. Recall cue at the console.

Step 3. From Cue menu, set FLTM, then at Stor store cue. If each luminaire has separate data then store each cue into each luminaire. The sequence mode to use in this case would be ISEQ.

Self Tests

Running Parameter Tests

The luminaire is capable of running self tests by using the TEST menu functions. For complete details and values for each test refer to "Diagnostic Tests" on page 67.

Note: After 10 seconds of inactivity, the menu display will change to the default state showing the address.

When running tests on multiple luminaires, a loopback connector is required at the master luminaire (first in link) and a male termination connector is required at the last luminaire in the link. (Refer to page 14 for more information regarding the construction of these connectors.)

Master luminaire containing software version to download

Luminaire 1 requiring update

Luminaire 2 requiring update

Data Thru

Data Thru

Loopback Connector

Termination Connector
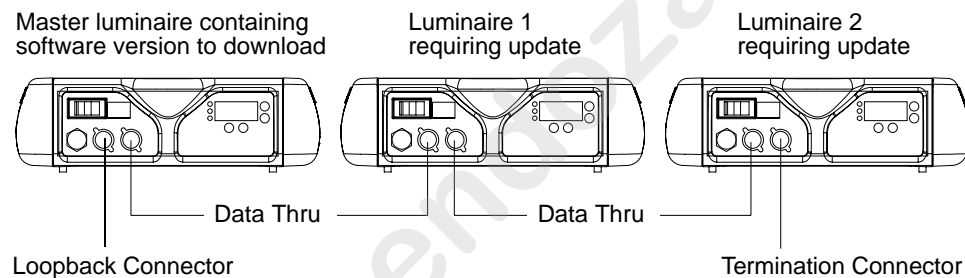
Figure 4-5: Test Setup

To run tests:

Step   1. Press [Menu].

Step   2. Press [Up] / [Down] arrows until Test appears. Press [Enter].

Step   3. Use [Up] / [Down] arrows to select a parameter to test. Refer to "Menu System Functions" on page 53 for a complete list of test parameters which can be chosen.

Step   4. Press [Enter] to run test.

Step   5. Press [Menu] to stop test at any time.

Movement Disable

The Movement option allows pan and tilt to be disabled so that the luminaire can be placed in any position for testing without movement occurring. In order to regain full control of the luminaire, Movement will need to be enabled after testing.

Note: When using the Movement option, pan and tilt will be disabled for all the luminaires that are linked.

To set movement option:

Step   1. Press [Menu].

Step   2. Press [Up] / [Down] arrows until Config appears. Press [Enter].

Step   3. Press [Up] / [Down] arrows until Pan/Tilt appears. Press [Enter].

Step   4. Movement will be displayed. Press [Enter].

Step   5. Use [Up] / [Down] arrows to select Enable or Disable. Press [Enter] to select.

Diagnostic Tests

The following diagnostic tests are available in the test menu. Time is specified for each action in the test, and the total time equals the time it takes to complete each action. If the time is zero the luminaire will perform the test at full speed.

Test Descriptions

ALL1 .... Tests low voltage power supplies by moving all motors at once.
ALL2 .... Tests all functions and provides a burn in or soak test.
Cwl1 .... Steps through each position of color wheel to verify order. The test then performs a Max forward spin, stops, and performs a Max reverse spin.
Cwl2 .... Tests color wheel stabilizers. Performs Max reverse spin, stops on a color, and then stops on the sensor.
Cwl3 .... Test color wheel stabilizers. Steps through selected colors.
Dim1 .... Fast dimmer test from full to closed.
Dim2 .... Slow dimmer test from full to closed.
Dim3 .... Tests different dimmer moves.
EDG1 .... Fast edge test from min to max.
EDG2 .... Slow edge test from min to max.
FG1 .... Fixed gobo test. Steps through every gobo, performs a max forward spin and a max reverse spin.
FG2 .... Fixed gobo test. Performs a max reverse spin, stops on a gobo, and then stops on the sensor.
FG3 .... Fixed gobo test. Steps through selected gobos.
Irs1 .... Fast iris test. Goes from min to max.
Irs2 .... Slow iris test. Goes from min to max.
PT1 .... Fast pan and tilt from stop to stop.
PT2 .... Slow pan and tilt from stop to stop.
Pan1 .... Fast pan only test from stop to stop.
Pan2 .... Slow pan only test from stop to stop.
Pan3 .... Tests different pan movements.
RG1 .... Rotating gobo test. Goes through wheel positions.
RG2 .... Rotating gobo test. Goes through index and rotation positions.
Tlt1 .... Fast tilt only test from stop to stop.
Tlt2 .... Slow tilt only test from stop to stop.
Tlt3 .... Tests different tilt movements.
Str .... Strobe test that tests 0-Open, 4-Closed, 11-Fast Random, 255-Max Strobe actions.
Zm 1 .... Slow zoom test.
Zm 2 .... Fast zoom test.
Zm 3 .... Tests different zoom movements.

The chart on the following page shows the 16-bit DMX values used in each test.

Table 4-3: Diagnostic DMX Values

Test Name	Parameters											
	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
ALL1	0	0	0	0	0	0	0	0	0	0	0	0/5
	65535	65535	255	255	255	255	255	255	255	255	255	0/5
ALL2	0	0	0	0	255	0	0	0	0	0	0	0/5
	65535	65535	0	0	0	0	0	0	0	0	0	0/5
	0	0	0	0	0	0	0	0	255	255	0	0/5
	65535	65535	0	0	0	0	0	0	255	255	0	0/5
	0	0	0	0	0	0	0	0	0	0	0	7/7 (P/T only)
	65535	65535	0	0	0	0	0	0	0	0	0	7/7 (P/T only)
	0	0	0	0	0	0	0	0	255	255	0	7/7 (P/T only)
	65535	65535	0	0	0	0	0	0	255	255	0	7/7 (P/T only)
	45167	27000	255	35	35	255	0	0	85	0	0	0/2
	45167	27000	255	143	143	255	0	0	85	0	11	0/2
	45167	27000	255	53	53	255	0	0	85	0	0	0/2
	45167	27000	255	179	179	255	0	0	85	0	255	0/3
	45167	27000	255	71	71	255	0	0	85	0	0	0/2
	45167	27000	255	161	161	255	0	0	85	0	0	0/2
	45167	27000	255	179	179	255	0	0	85	0	0	0/2
	45167	27000	255	53	53	255	0	0	85	0	0	0/2
	45167	27000	255	143	143	255	0	0	85	0	0	0/2
	45167	27000	255	0	0	255	102	0	215	0	0	0/2
	45167	27000	255	0	0	255	102	216	215	128	0	0/3
	45167	27000	255	0	0	255	102	0	215	255	0	0/2
	45167	27000	255	0	0	255	102	255	215	128	0	0/3

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Parameters											
	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
ALL2 (cont.)	45167	27000	255	0	0	255	153	107	215	128	0	0/2
	45167	27000	255	0	0	255	153	50	215	0	0	0/2
	45167	27000	255	0	0	255	153	120	215	255	0	0/3
	45167	27000	255	143	0	0	0	0	53	0	0	0/3
	45167	27000	255	0	0	255	0	0	53	0	0	0/2
	45167	27000	255	71	0	0	0	0	53	0	0	0/2
	45167	27000	255	0	0	255	255	0	255	0	0	0/3
	45167	27000	255	0	35	255	255	0	0	0	0	0/3
	45167	27000	255	0	35	255	255	0	255	0	0	0/4
	45167	27000	100	161	255	255	0	0	85	0	0	0/3
	45167	27000	200	216	161	255	0	0	85	0	0	0/3
	45167	27000	100	71	216	255	0	0	85	0	0	0/3
	45167	27000	200	255	71	255	0	0	85	0	0	0/2
PT 1	0	0	0	0	0	0	0	0	0	0	0	0/4.5
	65535	65535	0	0	0	0	0	0	0	0	0	0/4.5
PT 2	0	0	0	0	0	0	0	0	0	0	0	7/7
	65535	65535	0	0	0	0	0	0	0	0	0	7/7
Pan1	0	54957	0	0	0	0	0	0	0	0	0	0/4.5
	65535	54957	0	0	0	0	0	0	0	0	0	0/4.5
Pan2	0	54957	0	0	0	0	0	0	0	0	0	6.5/6.5
	65535	54957	0	0	0	0	0	0	0	0	0	6.5/6.5

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Parameters											
	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
Pan3	33511	54957	0	0	0	0	0	0	0	0	0	0/2
	22227	54957	0	0	0	0	0	0	0	0	0	0/2
	35511	54957	0	0	0	0	0	0	0	0	0	0/2
	22227	54957	0	0	0	0	0	0	0	0	0	0/2
	44423	54957	0	0	0	0	0	0	0	0	0	0/3
	39401	54957	0	0	0	0	0	0	0	0	0	0/2
	44423	54957	0	0	0	0	0	0	0	0	0	0/2
	34901	54957	0	0	0	0	0	0	0	0	0	0/2
	65535	54957	0	0	0	0	0	0	0	0	0	0/4
	0	54957	0	0	0	0	0	0	0	0	0	0/4
Tlt1	45167	0	0	0	0	0	0	0	0	0	0	0/2.2
	45167	65535	0	0	0	0	0	0	0	0	0	0/2.2
Tlt2	45167	0	0	0	0	0	0	0	0	0	0	4.5/4.5
	45167	65535	0	0	0	0	0	0	0	0	0	4.5/4.5
Tlt3	45167	32767	0	0	0	0	0	0	0	0	0	0/1.2
	45167	11207	0	0	0	0	0	0	0	0	0	0/1
	45167	4487	0	0	0	0	0	0	0	0	0	0/1
	45167	11207	0	0	0	0	0	0	0	0	0	0/1
	45167	4487	0	0	0	0	0	0	0	0	0	0/1
	45167	64555	0	0	0	0	0	0	0	0	0	0/1.5
	45167	54957	0	0	0	0	0	0	0	0	0	0/1.1
	45167	47677	0	0	0	0	0	0	0	0	0	0/1
	45167	54957	0	0	0	0	0	0	0	0	0	0/1
	45167	65535	0	0	0	0	0	0	0	0	0	0/1
Dim1	45167	27000	255	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	0	0	0	0	0	0	0	0	0	0/0.5
Dim2	45167	27000	255	0	0	0	0	0	0	0	0	4.5/4.5
	45167	27000	0	0	0	0	0	0	0	0	0	4.5/4.5

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Parameters											
	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
Dim3	45167	27000	255	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	128	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	80	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	100	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	40	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	50	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	40	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	60	0	0	0	0	0	0	0	0	0/0.5
	45167	27000	0	0	0	0	0	0	0	0	0	0/0.5
Str	45167	27000	0	0	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	0	0	4	0/1
	45167	27000	0	0	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	0	0	4	0/1
	45167	27000	0	0	0	0	0	0	0	0	11	0/4
	45167	27000	0	0	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	0	0	255	0/3
	45167	27000	0	0	0	0	0	0	0	0	4	0/1
	45167	27000	0	0	0	0	0	0	0	0	255	0/3

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
Cwl1	45167	27000	0	0	0	0	0	0	0	0	0	0/1
	45167	27000	0	17	0	0	0	0	0	0	0	0/1
	45167	27000	0	35	0	0	0	0	0	0	0	0/1
	45167	27000	0	53	0	0	0	0	0	0	0	0/1
	45167	27000	0	71	0	0	0	0	0	0	0	0/1
	45167	27000	0	89	0	0	0	0	0	0	0	0/1
	45167	27000	0	107	0	0	0	0	0	0	0	0/1
	45167	27000	0	125	0	0	0	0	0	0	0	0/1
	45167	27000	0	143	0	0	0	0	0	0	0	0/1
	45167	27000	0	161	0	0	0	0	0	0	0	0/1
	45167	27000	0	179	0	0	0	0	0	0	0	0/1
	45167	27000	0	197	0	0	0	0	0	0	0	0/1
	45167	27000	0	216	0	0	0	0	0	0	0	0/1.65
	45167	27000	0	179	0	0	0	0	0	0	0	0/1
	45167	27000	0	255	0	0	0	0	0	0	0	0/1.9
Cwl2	45167	27000	0	255	0	0	0	0	0	0	0	0/1.9
	45167	27000	0	35	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	0	0	0	0/1
Cwl3	45167	27000	0	125	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	71	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	197	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	107	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	89	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	179	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0	0	0/0.4

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Parameters											
	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
FG 1	45167	27000	0	0	0	255	0	0	85	0	0	0/1
	45167	27000	0	0	17	255	0	0	85	0	0	0/1
	45167	27000	0	0	35	255	0	0	85	0	0	0/1
	45167	27000	0	0	53	255	0	0	85	0	0	0/1
	45167	27000	0	0	71	255	0	0	85	0	0	0/1
	45167	27000	0	0	89	255	0	0	85	0	0	0/1
	45167	27000	0	0	107	255	0	0	85	0	0	0/1
	45167	27000	0	0	125	255	0	0	85	0	0	0/1
	45167	27000	0	0	143	255	0	0	85	0	0	0/1
	45167	27000	0	0	161	255	0	0	85	0	0	0/1
	45167	27000	0	0	179	255	0	0	85	0	0	0/1
	45167	27000	0	0	197	255	0	0	85	0	0	0/1
	45167	27000	0	0	216	255	0	0	85	0	0	0/1.65
	45167	27000	0	0	179	255	0	0	85	0	0	0/1
	45167	27000	0	0	255	255	0	0	85	0	0	0/1.9
FG 2	45167	27000	0	0	255	255	0	0	85	0	0	0/1.9
	45167	27000	0	0	35	255	0	0	85	0	0	0/1
	45167	27000	0	0	161	255	0	0	85	0	0	0/1
FG 3	45167	27000	0	0	125	255	0	0	85	0	0	0/0.4
	45167	27000	0	0	71	255	0	0	85	0	0	0/0.4
	45167	27000	0	0	197	255	0	0	85	0	0	0/0.4
	45167	27000	0	0	107	255	0	0	85	0	0	0/0.4
	45167	27000	0	0	89	255	0	0	85	0	0	0/0.4
	45167	27000	0	0	179	255	0	0	85	0	0	0/0.4
	45167	27000	0	0	0	255	0	0	85	0	0	0/0.4

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
RG 1	45167	27000	0	0	0	255	0	0	212	0	0	0/1
	45167	27000	0	0	0	255	51	0	212	0	0	0/1
	45167	27000	0	0	0	255	102	0	212	0	0	0/1
	45167	27000	0	0	0	255	153	0	212	0	0	0/1
	45167	27000	0	0	0	255	204	0	212	0	0	0/1
	45167	27000	0	0	0	255	255	0	212	0	0	0/1
RG 2	45167	27000	0	0	0	0	153	0	0	0	0	0/1
	45167	27000	0	0	0	0	153	107	0	0	0	0/1
	45167	27000	0	0	0	0	153	50	0	0	0	0/1
	45167	27000	0	0	0	0	153	204	0	0	0	0/1
	45167	27000	0	0	0	0	153	255	0	0	0	0/3
	45167	27000	0	0	0	0	153	175	0	0	0	0/2
	45167	27000	0	0	0	0	153	216	0	0	0	0/4
	45167	27000	0	0	0	0	153	232	0	0	0	0/1
	45167	27000	0	0	0	0	153	230	0	0	0	0/4
	45167	27000	0	0	0	0	153	234	0	0	0	0/4
	45167	27000	0	0	0	0	153	240	0	0	0	0/4
Irs1	45167	27000	0	0	0	0	0	0	30	0	0	0/1
	45167	27000	0	0	0	255	0	0	30	0	0	0/1
Irs2	45167	27000	0	0	0	0	0	0	30	0	0	4/4
	45167	27000	0	0	0	255	0	0	30	0	0	4/4
EDG1	45167	27000	0	0	0	255	0	0	0	0	0	0/1
	45167	27000	0	0	0	255	0	0	255	0	0	0/1
EDG2	45167	27000	0	0	0	255	0	0	0	0	0	7/7
	45167	27000	0	0	0	255	0	0	255	0	0	7/7

Table 4-3: Diagnostic DMX Values (Continued)

Test Name	Parameters											
	Pan*	Tilt*	Dim	CWhl	F. Gobo	Iris	R. Gobo	Index	Edge	Zoom	Str	time/total time
Zm 1	45167	27000	0	0	17	0	0	0	85	0	0	0/1
	45167	27000	0	0	17	0	0	0	85	255	0	0/1
	45167	27000	0	0	17	0	0	0	85	0	0	7/7
	45167	27000	0	0	17	0	0	0	85	255	0	7/7
Zm 3	45167	27000	0	0	17	0	0	0	85	0	0	0/3
	45167	27000	0	0	17	0	0	0	85	128	0	0/2
	45167	27000	0	0	17	0	0	0	85	0	0	0/2
	45167	27000	0	0	17	0	0	0	85	255	0	0/3
	45167	27000	0	0	17	0	0	0	85	128	0	0/2
	45167	27000	0	0	17	0	0	0	85	255	0	0/3

*Pan and Tilt values are 16-bit DMX and will be different from the values in the Man control display.

Notes

APPENDIX A.

Troubleshooting and Maintenance

This appendix provides instructions for troubleshooting and performing routine maintenance which may be necessary during the life of the luminaire.

- **Troubleshooting**

- **Routine Maintenance**

WARNING: All maintenance procedures are to be performed with power removed from the luminaire. Never open removable cover while lamp is in operation.

Troubleshooting

Error Messages

If a problem occurs during luminaire calibration, at the end of the calibration sequence the Menu Display will cycle through any applicable error message(s), one a time until the end of the list is reached. To review the error messages again, it will be necessary to access them using the Status function.

Refer to next page for a list of possible causes and remedies associated with the error messages.

To access error messages:

Step 1. Press [Menu].

Step 2. Press [Up] / [Down] arrows until Fixt (Fixture) appears. Press [Enter].

Step 3. Press [Up]/ [Down] arrows to access STAT. Press [Enter]. (Display will now scroll through any error messages or display OK if no errors.)

Table A-1: Error Messages

Display	Message...
OK	No Errors Found
B1M1 / Whl2 / NoSn	Aux Board 1, Motor 1 / Wheel 2 / Sensor Not Found
B1M1 / Whl2 / SAct	Aux Board 1, Motor 1 / Wheel 2 / Sensor Always Active
B1M2 / Dimm / NoSn	Aux Board 1, Motor 2 / Dimmer / Sensor Not Found
B1M2 / Dimm / SAct	Aux Board 1, Motor 2 / Dimmer / Sensor Always Active
B1M3 / Whl1 / NoSn	Aux Board 1, Motor 3 / Wheel 1 / Sensor Not Found
B1M3 / Whl1 / SAct	Aux Board 1, Motor 3 / Wheel 1 / Sensor Always Active
B2M1 / Gobo / NoSn	Aux Board 2, Motor 1 / Rotating Gobo Wheel / Sensor Not Found
B2M1 / Gobo / SAct	Aux Board 2, Motor 1 / Rotating Gobo Wheel / Sensor Always Active
B2M2 / Indx / NoSn	Aux Board 2, Motor 2 / Rotating Gobo Index / Sensor Not Found
B2M2 / Indx / SAct	Aux Board 2, Motor 2 / Rotating Gobo Index / Sensor Always Active
BRD1 / NO / COMM	Aux Board 1 Communication Failure
BRD2 / NO / COMM	Aux Board 2 Communication Failure
LAMP / STRK / FAIL	Lamp Strike Failure
PAN / ENCR / FAIL	Pan Encoder Failure
PAN / NO / SENS	Pan Sensor Not Found
PAN / SENS / ACTV	Pan Sensor Always Active
SRCH/FOR/BRD1	Attempting to communicate with Board 1
SRCH/FOR/BRD2	Attempting to communicate with Board 2
TILT / ENCR / FAIL	Tilt Encoder Failure
TILT / NO / SENS	Tilt Sensor Not Found
TILT / SENS / ACTV	Tilt Sensor Always Active
WAIT	Retrieving Current Status
WRNG / SW / PROG	Wrong Software Program

Troubleshooting Guide

If a problem is suspected, first try recalibrating the luminaire to prompt an error message. The chart below provides possible causes and remedies for various error messages and/or symptoms.

⚠ **CAUTION:** Some troubleshooting is included for reference only. Performing remedies marked by gray areas will void product warranty. Refer to the Vari-Lite Limited Warranty card included with the product.

Table A-2: Troubleshooting Guide

Error Display	Description	Possible Cause and Remedy

B1M1
Whl2
NoSn
	Aux Board 1, Motor 1,
	Wheel 2,
	Sensor Not Found
		Wheel 2 power not connected, motor not moving
		  - Connect wheel 2 motor power at motor
		Wheel 2 sensor not connected
		  - Connect wheel 2 sensor
		Wheel 2 movement restricted or impeded
		  - Remove obstruction

		Wheel 2 sensor is faulty
		  - Replace wheel 2 sensor assembly
		Aux Board 1 is faulty
		  - Replace aux board

B1M1 Whl2 SAct	Aux Board 1, Motor 1, Wheel 2, Sensor Always Active	Wheel 2 power not connected and wheel 2 aligned with sensor - Connect wheel 2 power at motor

		Wheel 2 not installed on motor shaft
		  - Install wheel 2 on motor shaft
		Wheel 2 not installed at correct height on motor shaft
		  - Fully seat wheel 2 as far down the motor shaft as possible

B1M2
Dimm
NoSn
	Aux Board 1, Motor 2,
	Dimmer,
	Sensor Not Found
		Dimmer power not connected, motor not moving
		  - Connect dimmer power at motor
		Dimmer sensor not connected
		  - Connect dimmer sensor
		Dimmer movement restricted or impeded
		  - Remove obstruction

		Dimmer sensor is faulty
		  - Replace dimmer sensor assembly
		Aux Board 1 is faulty
		  - Replace aux board

B1M2 Dimm SAct	Aux Board 1, Motor 2, Dimmer, Sensor Always Active	Dimmer power not connected and dimmer aligned with sensor - Connect dimmer power at motor
		Dimmer blade not installed on motor shaft - Install dimmer blade on motor shaft

Table A-2: Troubleshooting Guide (Continued)

Error Display	Description	Possible Cause and Remedy

B1M3
Whl1
NoSn
	Aux Board 1, Motor 3,
	Wheel 1,
	Sensor Not Found
		Wheel 1 power not connected, motor not moving
		  - Connect wheel 1 power at motor
		Wheel 1 sensor not connected
		  - Connect wheel 1 sensor
		Wheel 1 movement restricted or impeded
		  - Remove obstruction

		Wheel 1 sensor is faulty - Replace wheel 1 sensor assembly Aux Board 1 is faulty Replace aux board
B1M3 Whl1 SAct	Aux Board 1, Motor 3, Wheel 1, Sensor Always Active	Wheel 1 power not connected and wheel 1 aligned with sensor - Connect wheel 1 power at motor
		Wheel 1 not installed on motor shaft - Install wheel 1 on motor shaft

B2M1
Gobo
NoSn
	Aux Board 2, Motor 1,
	Rotating Gobo Wheel,
	Sensor Not Found
		Rotating gobo wheel power not connected, motor not moving
		  - Connect rotating gobo wheel power at motor
		Rotating gobo wheel sensor not connected
		  - Connect rotating gobo wheel sensor
		Rotating gobo wheel movement restricted or impeded
		  - Remove obstruction

		Rotating gobo wheel sensor is faulty
		  - Replace rotating gobo wheel sensor assembly
		Aux Board 2 is faulty
		  - Replace aux board

B2M1 Gobo SAct	Aux Board 2, Motor 1, Rotating Gobo Wheel, Sensor Always Active	Rotating gobo wheel power not connected and rotating gobo wheel aligned with sensor - Connect rotating gobo wheel power at motor

B2M2
Indx
NoSn
	Aux Board 2, Motor 2,
	Rotating Gobo Index,
	Sensor Not Found
		Rotating gobo index power not connected, motor not moving
		  - Connect rotating gobo index power at motor
		     Rotating gobo index sensor not connected
		  - Connect rotating gobo index sensor
		Rotating gobo index movement restricted or impeded
		  - Remove obstruction

		Rotating gobo index sensor is faulty
		  - Replace rotating gobo wheel sensor assembly
		Rotating gobo wheel has error preventing index to calibrate properly
		  - Ensure rotating gobo wheel is functioning properly
		Aux Board 2 is faulty
		  - Replace aux board

B2M2 Indx SAct	Aux Board 2, Motor 2, Rotating Gobo Index, Sensor Always Active	Rotating gobo index power not connected, rotating gobo wheel power not connected and both wheel and index aligned with sensor - Connect rotating gobo wheel and index power at motors

Table A-2: Troubleshooting Guide (Continued)

Error Display	Description	Possible Cause and Remedy

BRD1
NO
COMM
	Aux Board 1 Communication Failure	Aux input connector (J5) not connected to either aux board
		  - Connect aux input connector (J5) to either aux board
		Jumper/bridge connector (J1) between aux boards not connected
		  - Install jumper/bridge connector (J1) between aux boards

BRD2
NO
COMM
	Aux Board 2 Communication Failure	Aux input connector (J5) not connected to either aux board
		  - Connect aux input connector (J5) to either aux board
		Jumper/bridge connector (J1) between aux boards not connected
		  - Install jumper/bridge connector (J1) between aux boards

LAMP STRK FAIL	Lamp Strike Failure	Lamp failed to strike after repeated attempts - Replace lamp

PAN
ENCR
FAIL
	Pan Encoder Failure	Main board pan/tilt connector (J9) disconnected
		  - Connect main board pan/tilt connector (J9)
		Pan motor disconnected
		  - Connect pan motor power

		Encoder faulty - Replace pan end-of-travel/encoder sensor assembly

PAN
NO
SENS
	Pan Sensor Not Found	EOT flag attached to large pulley is not engaging the EOT sensor
		  - Ensure flag is attached to the large pulley
		  - Ensure that flag passes through the sensor at a depth sufficient to engage the sensor beam
		Pan belt disconnected, extremely loose or not installed properly
		  - Properly install belt between pan motor and large pulley

PAN
SENS
ACTV
	Pan Sensor Always Active	Main board pan/tilt connector (J9) disconnected
		  - Connect main board pan/tilt connector (J9)
		End-of-travel sensor connector (J2) disconnected
		  - Connect end-of-travel sensor connector (J2)

SRCH/FOR/ BRD1 BRD2	Searching for Board 1 or 2	Attempting to communicate with Board 1 or Board 2. System will return either OK or an error code.

TILT
ENCR
FAIL
	Tilt Encoder Failure	Main board pan/tilt connector (J9) disconnected
		  - Connect main board pan/tilt connector (J9)
		Tilt motor disconnected
		  - Connect tilt motor power

		Encoder faulty - Replace tilt end-of-travel/encoder sensor assembly

Table A-2: Troubleshooting Guide (Continued)

Error Display	Description	Possible Cause and Remedy

TILT
NO
SENS
	Tilt Sensor Not Found	EOT flag attached to large pulley is not engaging the EOT sensor
		  - Ensure flag is attached to the large pulley
		  - Ensure that flag passes through the sensor at a depth sufficient to engage the sensor beam
		Tilt belt disconnected, extremely loose or not installed properly
		  - Properly install belt between tilt motor and large pulley

TILT
SENS
ACTV
	Tilt Sensor Always Active	Main board pan/tilt connector (J9) disconnected
		  - Connect main board pan/tilt connector (J9)
		End-of-travel sensor connector (J2) disconnected
		  - Connect end-of-travel sensor connector (J2)

WAIT	Retrieving Current Status	System displays wait while getting status.
WRNG SW PROG	Wrong Software Program	Software installed does not match luminaire type - Download the correct software for the luminaire

Routine Maintenance

Lamp Replacement

⚠ **WARNING:** Remove power from luminaire before performing maintenance.

Tools:
  Screwdriver, slotted
  Cotton gloves

To replace lamp:

Step   1. Remove power from luminaire.

⚠ **WARNING:** Lamps will be extremely HOT after operation. Allow lamp to cool before replacing.

Step   2. At backcap, using slotted screwdriver (or fingers) turn captive knob until loose.

Step   3. Slide backcap away from head assembly (it will remain attached by tether and lamp wires).

Head Assembly

Captive Knob

Backcap Assembly

Guide Rod
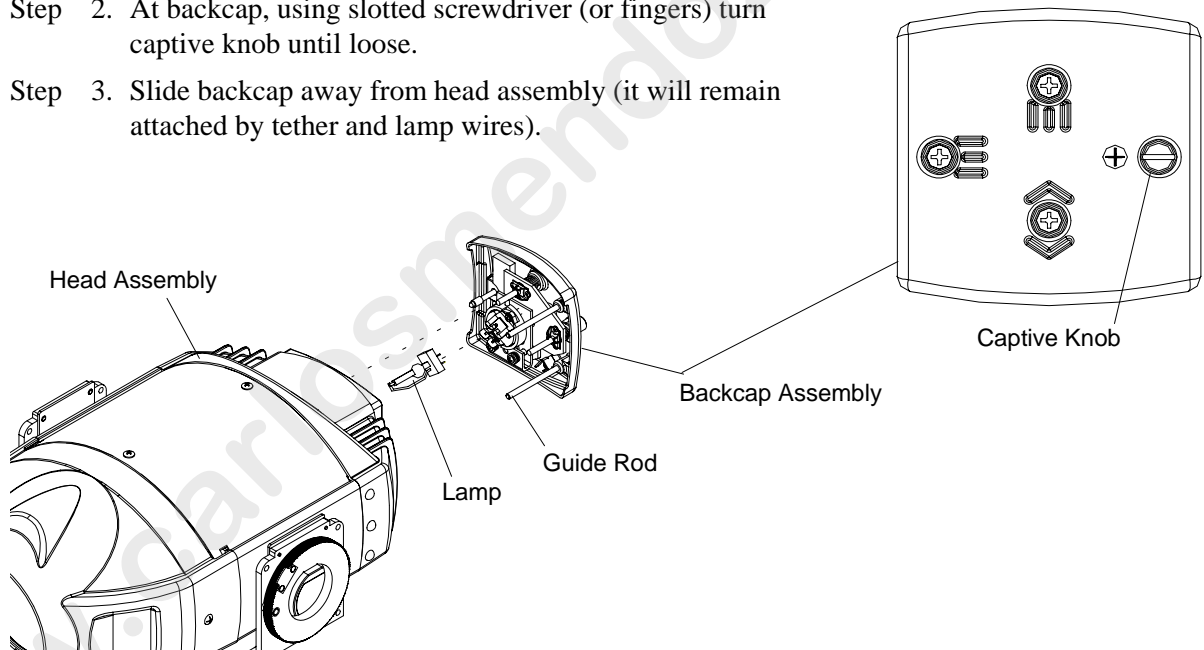
Lamp

Figure A-1: Replacing Lamp

⚠ **CAUTION:** Wear cotton gloves or other covering while servicing lamp. Touching lamp glass with bare fingers will leave oil and may cause the lamp to explode or reduce lamp life. If required, use alcohol and cotton cloth to thoroughly clean glass portion of lamp.

Step   4. Remove lamp by pulling straight out of socket.

Step   5. Install new lamp by pressing into socket. Ensure lamp is fully seated in socket and parallel to guide rods. (Lamp can be damaged when inserted through reflector if not parallel to guide rods.)

Step   6. Align guide rods in guide holes and slide backcap into head assembly. Re-tighten captive knob.

Step   7. If required, reset lamp hour and strike counters as follows. (Refer to "Menu System" chapter on page 47 for more information.)

   a.   Power up luminaire.

   b.   At Menu Display, press [Menu].

   c.   Press [Up] / [Down] arrows until CFG (Configuration) appears. Press [Enter].

   d.   Press [Up] / [Down] arrows until LAMP appears. Press [Enter].

   e.   Press [Up] / [Down] arrows to access RHrs. Press [Enter] to reset lamp hour and strike counters.

Step   8. Align lamp. Refer to "Align Lamp for Flat Field" on page 21.
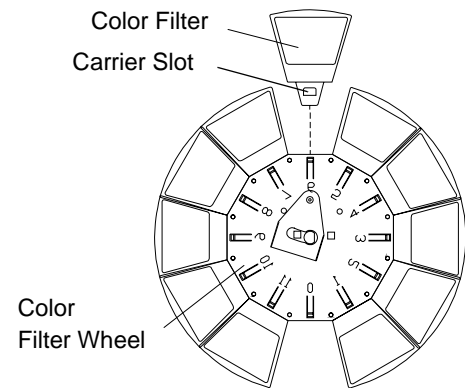
Color Filter Replacement

WARNING: Remove power from luminaire before performing maintenance.

Tools:
Screwdriver, Phillips #2
Cotton gloves

To remove and replace a color filter:

Step 1. Remove power from luminaire.

Step 2. At removable cover, using #2 Phillips screwdriver, turn two captive screws one-quarter turn and remove cover. (It will remain attached by tether and lamp wires.)
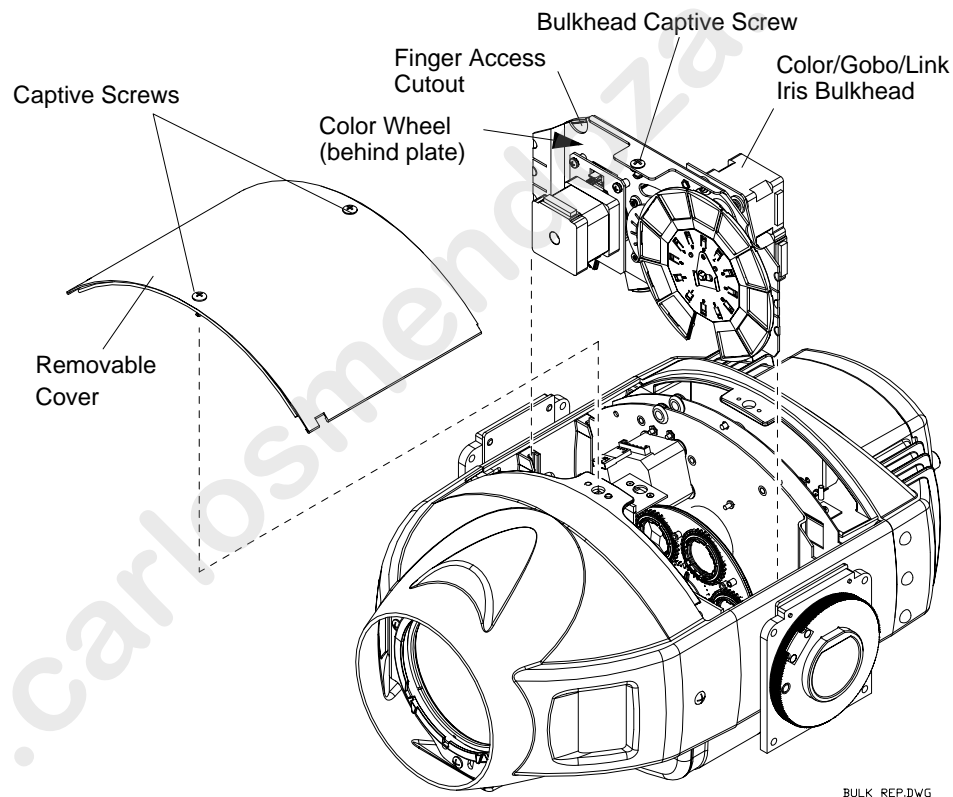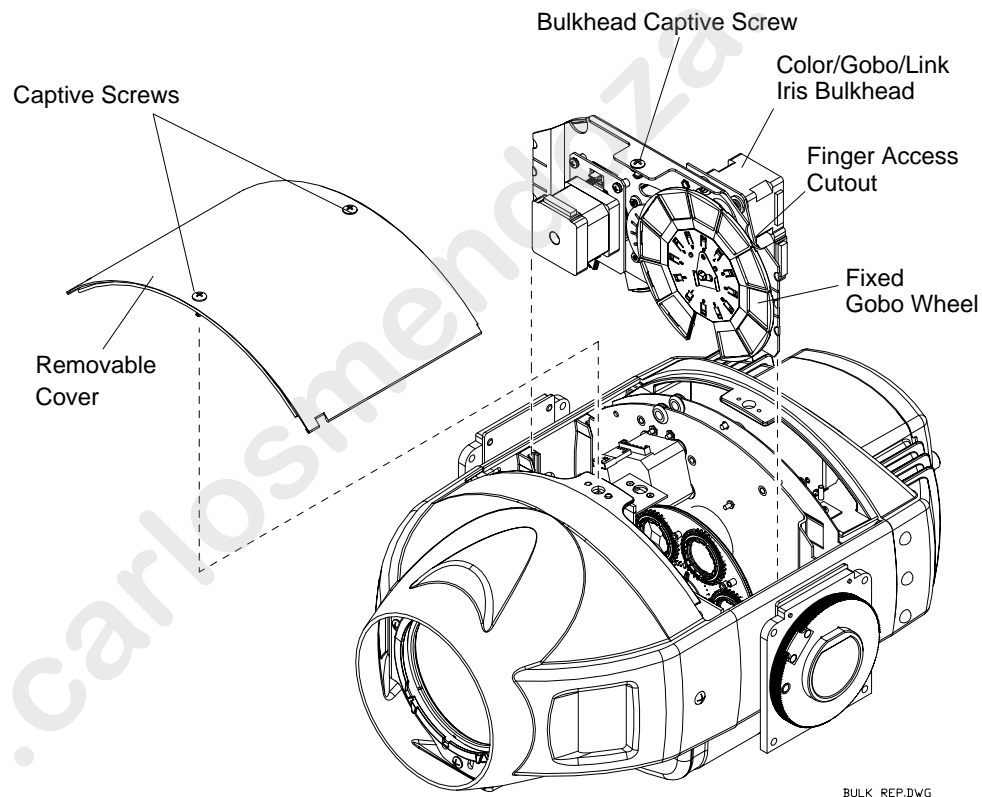

Figure A-2: Replacing a Color Filter

CAUTION: Do not touch color filters with bare fingers. Wear cotton gloves or other covering while replacing. Clean with glass cleaner and soft cloth if required.

Note: In some cases it is easier to slide bulkhead partially out of head assembly to access color filters. To do this, use #2 Phillips screwdriver to turn captive screw one-quarter turn and slide bulkhead upward. Disconnect motor connections as necessary.

Step 3. Rotate wheel until required color filter is accessible at finger access cutout.

Finger Access
Cutout
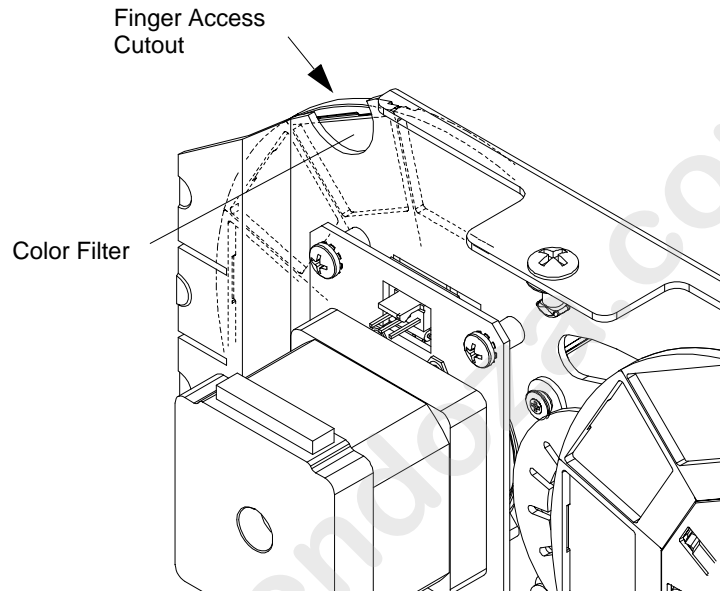
Color Filter

Figure A-3: Filter Access

⚠ **CAUTION:** Do not touch color filters with bare fingers. Wear cotton gloves or other covering while replacing. Clean with glass cleaner and soft cloth if touched.

Step 4. Using fingers, pull color filter out of wheel.

Step 5. Noting proper orientation of carrier slot, insert new color filter into position and push fully into place.

Step 6. Re-install bulkhead (if applicable) and re-install removable cover.

Color Filter

Carrier Slot

Color
Filter Wheel

Figure A-4: Color Filter Removal

Fixed Gobo Replacement

⚠️ **WARNING:** Remove power from luminaire before performing maintenance.

Tools:
Screwdriver, Phillips #2
Cotton gloves

To remove and replace a fixed wheel gobo:

Step 1. Remove power from luminaire.

Step 2. At removable cover, using #2 Phillips screwdriver, turn two captive screws one-quarter turn and remove cover. (It will remain attached by tether and lamp wires.)

Figure A-5: Replacing a Fixed Gobo

⚠ **CAUTION:** Do not touch gobos with bare fingers. Wear cotton gloves or other covering while replacing. Clean with glass cleaner and soft cloth if required.

Note: In some cases it is easier to slide bulkhead partially out of head assembly to access gobos. To do this, use #2 Phillips screwdriver to turn captive screw one-quarter turn and slide bulkhead upward. Disconnect motor connections as necessary.

Step 3. Rotate wheel until required gobo is accessible at finger access cutout.
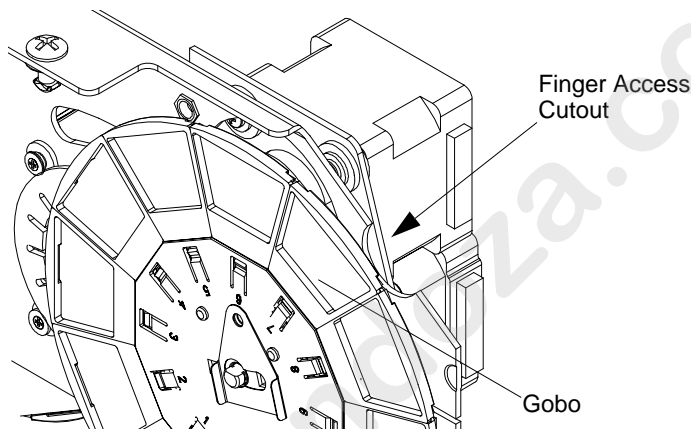
Figure A-6: Gobo Access

⚠ **CAUTION:** Do not touch gobos with bare fingers. Wear cotton gloves or other covering while replacing. Clean with glass cleaner and soft cloth if required.

Step 4. Using fingers, pull gobo out of wheel.

Step 5. Noting proper orientation of carrier slot and orienting "black" side of gobo toward front lens, insert new gobo into position and push fully into place.

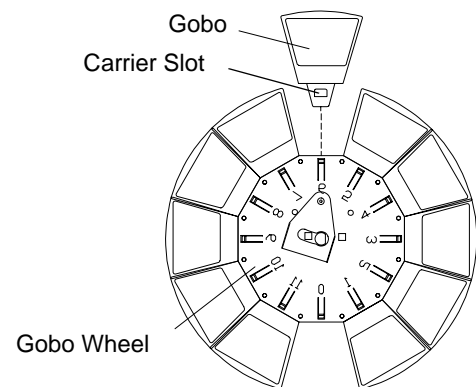Step 6. Re-install bulkhead (if applicable) and re-install removable cover.

Figure A-7: Fixed Gobo Removal

Rotating Gobo Replacement

⚠ **WARNING:** Remove power from luminaire before performing maintenance.

Tools:

Screwdriver, Phillips #2
Hook and Pick tool (or small slotted screwdriver)
Cotton gloves

To remove and replace a rotating gobo:

Step 1. Remove power from luminaire.

Step 2. At removable cover, using #2 Phillips screwdriver, turn two captive screws one-quarter turn and remove cover. (It will remain attached by tether and lamp wires.)

Captive Screws

Rotating
Gobo Wheel

Removable
Cover

BULKREP2.DWG
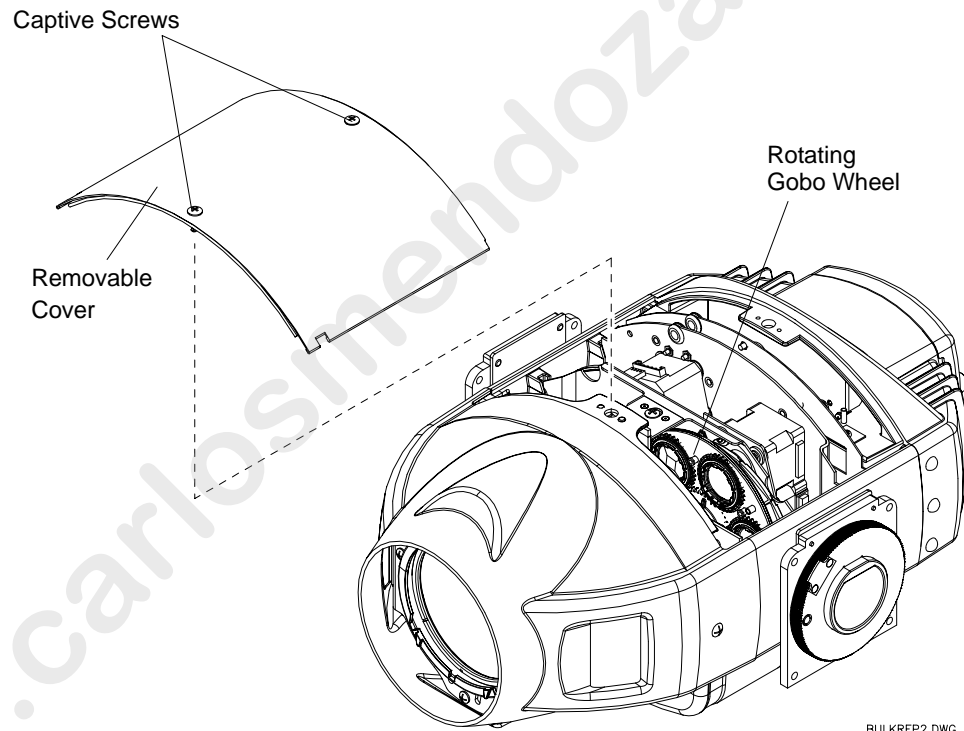
Figure A-8: Replacing a Rotating Gobo

⚠ **CAUTION:** Do not touch gobos with bare fingers. Wear cotton gloves or other covering while replacing. Clean with glass cleaner and soft cloth if required.

Step 3. At rotating gobo wheel, rotate until required gobo/filter is accessible.

Step 4. Locate end of coiled spring which is fitted under carrier tab. Using hook and pick tool or small slotted screwdriver, push end of spring from under tab until it is free. Once free, remove entire coiled spring.
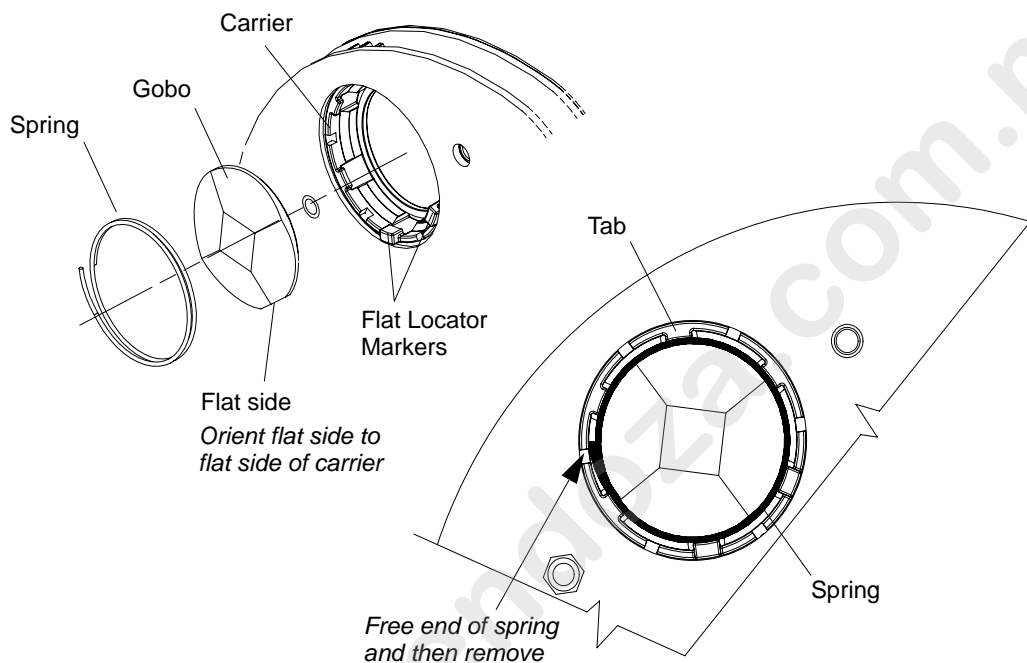

Figure A-9: Rotating Gobo Removal

⚠ **CAUTION:** Do not touch gobos with bare fingers. Wear cotton gloves or other covering while replacing. Clean with glass cleaner and soft cloth if required.

Step 5. Remove gobo.

Step 6. Aligning flat side correctly and orienting "black" side of gobo toward front lens, install new gobo.

Step 7. Re-install spring, ensuring it is fully secured under carrier tabs.

Step 8. Re-install removable cover.

Cleaning Optical Lenses and Filters

WARNING: Remove power from luminaire before performing maintenance.

The front lens, color filters, and gobos may require cleaning after extended use. A common glass cleaner can be used along with a soft, lint-free cloth to clean these components.

CAUTION: Do not continuously rub filters or it may damage or remove the optical coating.