

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<sup>TM</sup> Wash 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™ Wash Luminaire	20.9671.0001	Arc

### **Additional Documentation**

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

- VL2000 Wash Luminaire Service Manual (02.9671.0010)
  - 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.)

USITT Inc. 10 West 19th St. / Suite 5A New York, NY 10011-4206 USA Tel: (212) 924 - 9088 Fax: (212) 924 - 9343 / www.usitt.org

### **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 wash luminaire features zoomable beam spreader optics, color mixing, a separate fixed color wheel and a high performance dimmer/strobe mechanism.

The luminaire contains the following standard features:

- Zoomable beam spreader.
- Crossfading color mixer mechanism. The mechanism allows independent blue, amber and magenta color control.
- Fixed Color wheel has 12 positions (1 open) for dichroic color.
- An internal mechanical douser which provides intensity control and strobing.
- An upper enclosure that houses the control electronics as well as a power factor corrected arc power supply.
- Control by DMX512 protocol.
- Two truss hook brackets for versatile hanging configurations.
- 700W arc source.

# Components

### **Included Items**

The following illustration shows all items included with the luminaire:



Figure 1-1: VL2000 Wash 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	Road Case, Plastic (Two hole)	
22.9620.0194	Safety Cable Assembly	
23.9623.0177	DMX Termination Connector Assembly	
25.9661.0056	Loopback Connector Assembly	
25.9661.0057	DMX Termination Male Connector Assembly	
55.6840.0001	Truss Hook, Mega-Clamp, Round and Square	
55.6841.0001	Truss Hook, Mega-Claw for 2" Round Tube	
71.2528.0700	700 Watt Short Arc Lamp	

### VL2000 Wash Luminaire

The following illustration shows the major luminaire components and controls.



Figure 1-2: External Components and Controls

### **LED** Indicators

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



Figure 1-3: LED Indicator Overview



# 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 90-264 VAC, 50/60 Hz. Four 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	Х
AC Line	Y
Ground (Earth)	G



For three-phase power at 208 volts RMS:

Pin
Х
Y
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.

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

Table 2.1.	Current	vs	Voltage
1able 2-1.	Current	<b>v 5.</b>	vullage

### **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 Co	ode to XLR (	Connectors		
Data Thru Cable Pinout	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Data In Cable Pinout
	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	
Male Conn		Data (-)	Data (+)	Data (-)	Data (+)	3 Female Conn

### **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.

Туре	Pairs	$\mathbf{Z}\Omega^*$	Jacket	AWG	Use	Temp (F
			Belden C	ables		
1215A	2	150	PVC	26	IBM Type 6 Office cable	75
1269A	2	100	PTFE	22 (Solid)	High Temp, Ple- num 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, Ple- num cable	200
88102	2	100	PTFE	24	High Temp, Ple- num cable	200
89696	2	100	PTFE	22	High Temp, Ple- num cable	200
89729	2	100	PTFE	24	High Temp, Ple- num cable	200
89855	2	100	PTFE	22	High Temp, Ple- num 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 C	ables		
PC224P	2	110	Polyure- thane	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:

- 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:

- 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.



Solder resistors across pins 2 & 3, and 4 & 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).



- 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 "Powering Up" on page 20.

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### **Hanging the Luminaire**

The VL2000 wash 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.



Figure 2-4: 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.



Figure 2-5: 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.



#### **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.



**Figure 2-7: 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.)



#### Figure 2-8: 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 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 57), 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 Wash wash 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. 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:

- Using internal menus select Lamp test to set beam. See "Controls Operation" on page 52 for more information. (If using console, set intensity to 100% and adjust diffusion to produce a tight beam.)
- 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 flattest field.



Figure 2-9: Aligning Lamp

### Set DMX Mode

The Series 2000 luminaires provide four modes for DMX operation. The mode is set using the luminaire's 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.

Note: See "DMX Modes" on page 28 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 "Luminaire Timing Channel Information" on page 37.

# 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 51 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 protocol). 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.



# CHAPTER 3.

# **Operation**

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

- Color Control
- DMX Modes
- DMX Mapping
- Luminaire Timing
- Updating Software

# **Color Control**

## **Color Mixing**

The color mixing mechanism is made up of three graduated color disks: blue, amber and magenta. These disks provide full-spectrum color crossfades from pastel to saturated color.



Figure 3-1: Color Mixing Mechanism

### **Snap Colors**

Snap is a feature that enables each of the color mixing disks to use the shortest path when changing colors. This transition may in some cases produce a white flash, as the disk passes through white. Snap is not applied to a timed color change, even if it is set. These timed transitions always use the default disabled setting that allows the color fade to occur. Snap is a menu based setting that can be enabled or disabled. Disable is the default setting.

Snap can also be enabled or disabled using the DMX control channel. When utilizing the control channel functionality for the snap function, the snap setting will change immediately following the input of 20-25 (Snap ON) and 30-35 (Snap OFF). No other values or actions within the control channel will change the Snap setting. The action of the Snap is based on the last command executed. Snap will not change until another value of 20-25 or 30-35 is entered into the control channel. Resetting the luminaire or cycling the power will not affect the Snap setting.

**Note:** The control channel value will remain visible on all the cues unless another value is input. We recommend that the control channel number not be changed, so that the current Snap setting can be viewed in the cue data without having to know the last change that was made. Even if the Snap feature is not changed in the show data, it will be beneficial to set Snap in the first cue. This will prevent inconsistencies when changing or substituting other luminaires that may have a different Snap setting.

Snap is applied only to the Blue, Amber, and Magenta color mixing disks and not the fixed color wheel. The diagnostic tests for the color mixing mechanism will behave differently depending on the snap setting. This has been done so that differences in the snap setting will be evident when checking a group of luminaires. These differences can be seen is tests BI 3, Amb3, MAG3 and MiX3. See "Diagnostic Tests" on page 71 for more information.

## **Color Wheel**

The color wheel is capable of rapid and timed changes, as well as half and full frame positions. The color wheel has 12 positions, one being open. It offers partial frame control and various spin rates in either direction.

The following illustration shows the standard color configuration:



Figure 3-2: Standard Color Configuration

# **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
Dimmer	1
Pan	2
Tilt	3
Blue	4
Amber	5
Magenta	6
Color Wheel	7
Diffusion	8
Strobe	9
Control	10

#### Enhanced 8-Bit (E 8)

Function	DMX Channe
Dimmer	1
Pan	2
Tilt	3
Blue	4
Amber	5
Magenta	6
Color Whee	il 7
Diffusion	8
Strobe	9
Focus Timin	g 10
Color Timin	g 11
Beam Timin	g 12
Control	13

### Standard 16-Bit (16)

Function	DMX Channel
Dimmer	1
Pan	2 - 3
Tilt	4 - 5
Blue	6
Amber	7
Magenta	8
Color Wheel	9
Diffusion	10
Strobe	11
Control	12

#### Enhanced 16-Bit (E 16)-Default

Function	DMX Channel
Dimmer	1
Pan	2 - 3
Tilt	4 - 5
Blue	6
Amber	7
Magenta	8
Color Wheel	9
Diffusion	10
Strobe	11
Focus Timing	12
Color Timing	13
Beam Timing	14
Control	15

# **DMX** Mapping

## **Color Wheel**

% 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	
	34	
	35	

#### Table 3-1: DMX Map For Color Wheel

% Value	DMX (0-255)	Wheel Position
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	
30	76	
	77	

 Table 3-1: DMX Map For Color Wheel (Continued)

% Value	DMX (0-255)	Wheel Position	
	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		
-72	108	Full Frame 7	
	109		
43	110		
+5	111		
AA	112		
44	112		
	113		
AE	114		
40	115		
	116	Half Frame	
46	117		
	118		
	119		
47	120		

#### Table 3-1: DMX Map For Color Wheel (Continued)
% Value	DMX (0-255)	Wheel Position	
	121		
48	122		
	123		
	124		
49	125		
	126	Full Frame 8	
	127		
50	128		
	129		
51	130		
	131		
	132		
52	133		1
	134	Half Frame	
53	135		1
	136		
	137		-
54	138		-
	139		-
55	140		-
	141		
	142		
56	143		-
6	144	Full Frame 9	-
57	145		-
	146		-
	147		-
58	148		-
	149		-
59	150		-
	151		-
	152	Half Frame	-
60	153		-
	154		
	155		1
61	156		1
	157		1
62	158		1
	159		1
	160		4
63	161		4
	162	Full Frame 10	1

 Table 3-1: DMX Map For Color Wheel (Continued)

% Value	DMX (0-255)	Wheel Position
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	
70	200	
13	201	
	202	
00	203	
00	204	

### Table 3-1: DMX Map For Color Wheel (Continued)

% Value	DMX (0-255)	Wheel Position
n	205	
	206	Half Frame
81	207	
	208	
82	209	
	210	
	211	
83	212	
	213	
84	214	
	215	
	216	Spin F CCW
85	210	
	217	
96	210	
00	218	
	220	
07	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	
96	245	
	246	Spin M CW

 Table 3-1: DMX Map For Color Wheel (Continued)

_
2

	97 98	247 248 249 250		A
	98	248 249 250		4
	98	249 250		
	98	250		
		054		
_	~~~	251		
	99	252		
1		253		
	100	255	Spin F CW	
L			C	

# **Beam Control**

# 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

### Table 3-2: DMX Map For Strobe

# **Color Control**

Blue

### Table 3-3: DMX Map For Blue

% Value	DMX Value	Action
0	0	Open
100	255	Closed or Full

Amber

### Table 3-4: DMX Map For Amber

% Value	DMX Value	Action
0	0	Open
100	255	Closed or Full

Magenta

### Table 3-5: DMX Map For Magenta

% Value	DMX Value	Action
0	0	Open
100	255	Closed or Full

# **Luminaire Timing**

# **Luminaire Timing Channel Information**

Timing channel control has been developed to improve 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.

Channel Function	Timing Channel				
	Focus Time	Color Time	Beam Time		
Pan (Hi Byte/Lo Byte)	•				
Tilt (Hi Byte/Lo Byte)	•				
Blue					
Amber		•			
Magenta		•			
Color Wheel		•			
Diffusion			•		

Table 3-6: Channel Function / Timing Channel Relationship

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.

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:

- Step 1. Create the cue, including color, gobo, edge, diffusion, etc.
- Step 2. Decide which fixtures and which parameter groups will use timing channels. (Timing channels work only if all channels affected by the timing channel are in the same part of the cue.)
- 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. Create a part cue containing only the attributes chosen and their associated timing channels. Store this part cue with a fade time of zero seconds.
- Step 5. Store the rest of the cue using console timing.

**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. See chart on the next page.

**Note:** We recommend profiles set timing channels in extended modes to a default value of 255 (full speed).

% 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

### Table 3-7: Timing Channels Map

% Value	DMX	= Seconds
	26	5.2
	27	5.4
11	28	5.6
	29	5.8
	30	6
12	31	6.2
	32	6.4
13	33	6.6
	34	6.8
	35	7.0
14	36	7.2
	37	7.4
15	38	7.6
	39	7.8
	40	8
16	41	8.2
	42	8.4
17	43	8.6
	44	8.8
	45	9
18	46	9.2
	47	9.4
19	48	9.6
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

% Value	DMX	= Seconds	
	68	17	
27	69	17	
	70	18	
28	71	18	
	72	18	
	73	19	
29	74	19	
	75	20	
30	76	20	
	77	20	
	78	21	
31	79	21	
	80	21	
	81	22	
32	82	22	
	83	23	
33	84	23	
	85	23	
	86	24	
34	87	24	
	88	25	
35	89	25	
	90	25	
	91	26	
36	92	26	
	93	27	
37	94	27	
	95	27	
	96	28	
38	97	28	
	98	29	
39	99	29	
	100	29	
	101	30	
40	102	30	
	103	30	
	104	31	
41	105	31	
	106	32	
42	107	32	
	108	32	
	109	33	

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

% Value	DMX	= Seconds
	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
65	166	55
	167	56
66	168	56
	169	56
	170	57
67	171	57
	172	58
68	173	58
	174	58
6	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
<u> </u>	188	80
74	189	80
<u></u>	190	85
75	191	85
	192	85
<u></u>	193	90

% Value	DMX	= Seconds
76	194	90
	195	95
77	196	95
	197	95
	198	100
78	199	100
	200	110
79	201	110
	202	110
	203	120
80	204	120
	205	120
81	206	130
	207	130
	208	140
82	209	140
	210	140
	211	150
83	212	150
	213	160
84	214	160
	215	160
	216	170
85	217	170
	218	180
86	219	180
	220	180
	220	190
87	222	190
	223	200
88	224	200
	225	200
	226	210
89	220	210
	227	210
	220	210
<u>م</u>	230	220
	230	220
01	231	230
J I	202	230
	200	230
02	204	240
92	230	∠40

# **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.

Control	Control Channel Value			
Channel Function	% Value	For 3 Secs or Greater	After 3 Secs	
Display On	1	1-4	0	
Snap On	9	20-25	N/A	
Snap Off	13	30-35	N/A	
Luminaire Reset	33	81 - 87	0	
Lamp Off	66	165 - 171	0	
Lamp On	99	249 - 255	0	

**Table 3-8: Control Channel Functions** 

#### 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 quick 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.)

Note: The Snap control channel function takes place immediately, and does not require the control value be set to zero after three seconds. For more information on Snap functionality see "Snap Colors" on page 26.

# **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.





- 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 3-4 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:

VL2000Wash button downloads the software to all VL2000 wash 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.

Figure 3-4: 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 reopened).

#### 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.



Loopback Connector

**Termination Connector** 

Figure 3-5: 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



# CHAPTER 4.

# **Menu System**

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

- Operation
- Mapping
- 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.



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.\*



\* 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 53.

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.



# **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 î↑↑ 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].
- 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:

- ٠ Pressing [Enter] and [Up] at the same time = Lamp On
- Pressing [Enter] and [Down] at the same time = Lamp Off ٠
- Pressing [Menu] and [Up] at the same time = Recalibrate ٠
- Pressing [Menu] at Power up interrupts calibration. See "Program Starting Address Without ٠ Calibrating the Luminaire" on page 23 for more information.

ation. Let on the L Keep in mind that [Up] and [Down] arrows are dependent on the Display Orientation. Refer to

# Mapping

# **Menu System Overview**

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



4

# **Menu System Functions**

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Addr	DMX DMX Address	XXX Address value		
Address	VIRT Virtuoso Address	XXXX. Address value		
CFG	LAMP Lamp Options	POWR Lamp Power	ON (default)	
System Configuration			OFF	
Comgulation		P UP Lamp Power-up State	L ON Lamp On (default)	
			LOFF Lamp Off	
			<b>C ON</b> 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 Pan/Tilt Control	Move Pan/Tilt Control	Enab Enable	
			Dis Disable	
	SNAP Snap/Fade Color	Dis Disable		
		Enab Enable		
	DDir Display Orientation	Auto (default)		
		ΨΨ		
		飰飰		
	DisP Display Illumination	30s OFF in 30 seconds		
		<b>5M</b> OFF in 5 minutes (default)		
		10M OFF in 10 minutes		
		ON ON indefinitely		
	RDef Reset Default Values	OK?		

## Table 4-1: Menu System Functions

1st Level	2nd Level	3rd Level	4th Level	5thLevel
DMX	MODE	8 Standard 8 bit		
DMX Mode		16 Standard 16 bit		
and Data		E 8 Enhanced 8 bit		
		E16 Enhanced 16 bit (default)		
	DATA	cXXX DMX Channel	XXXX Data	
	P/T Pan and Tilt Options	SWAP Swap Pan & Tilt	ON	
			OFF	
		InvP Invert Pan	ON	
			OFF	
		InvT Invert Tilt	ON	
			OFF	
Fixt	STAT Status/Error Display	Scrolls error messages * or displays <b>OK</b>	10	
	Cal Recalibrate	OK?		
	ModI Luminaire Model Type	XXXX Model Type		
	Lld 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		
	<b>Dnld</b> Download Program to Luminaires	OK?	XXXX - # of Blocks received	
Man	Pan Pan Motor	XXXX Data		
Manual Commands	Tilt Tilt Motor	XXXX Data		
Commando	Dimm Dimmer	XXX Data		
	Strb Strobe	XXX Data		
	CWhI Color Wheel	XXX Data		
	Blue Blue	XXX Data		
	Ambr Amber	XXX Data		
	MAG Magenta	XXX Data		
	DIFF Diffusion	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 Functions (Continued)

4

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Cue	FLTM Follow Time	XXX.X Data		
Cue Processing	Stor Store Cue	<b>cXX</b> <i>Cue # to Store</i> (Not editable – given next cue ID in list)		
	Mod Modify Cue	cXX List of Cues		
	Del Delete Cue	<b>cXX</b> <i>Cue # to Delete</i> (Not editable – given last cue ID in list)		
	PCue Play Cue	cXX List of Cues		
	PSEQ Play Sequence	Press [Enter] to start Press [Menu] to stop	ScXX - Sequence, Cue # currently playing	
	DSEQ Delete Sequence	OK?		
	SEQ Sequence Playback Mode	ISEQ Individual Sequence (default)	10	
		MSEQ Master Sequence		
	Auto Autoplay at Power-Up	OFF		
		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		
	Р/Т Pan/Tilt	PT 1 Min/Max Fast Pan/Tllt test		
		PT 2 Min/Max SlowPan/Tilt test		
		P 1 Min/Max Fast Pan Test		
		P 2 Min/Max Slow Pan Test		
		P 3 Pan Test		
		T 1 Min/Max Fast Tilt Test		
		T 2 Min/Max Slow Tilt Test		
		T 3 Tilt Test		
	Dimm Dimmer/Strobe	Dim1 Min/Max Dimmer Test		
		Dim2 Min/Max Dimmer Test		
		Dim3 Dimmer Test		
		Strb Strobe Test		
	CWhI Color Wheel	CW1 Color Wheel Test		
		CW2 Color Wheel Test		
		CW3 Color Wheel Test		
	Blue Blue	BI 1 Min/Max Blue Test		
		BI 2 Min/Max Blue Test		
		BI 3 Blue Test		

## Table 4-1: Menu System Functions (Continued)

1st Level	2nd Level	3rd Level	4th Level	5thLevel
Test (cont.)*	Ambr Ambr	Amb1 Min/Max Amber Test		
		Amb2 Min/Max Amber Test		
		Amb3 Amber Test		
	MAG Magenta	MAG1 Min/Max Magenta Test		
		MAG2 Min/Max Magenta Test		
		MAG3 Magenta Test		
	CMiX Color Mixer	MiX1 Color Mixer Test		
		MiX2 Color Mixer Test		
		MiX3 Color Mixer Test		
	DIFF Diffusion	DiF1 Min/Max Diffusion Test		
		DiF2 Min/Max Diffusion Test		
		DiF3 Diffusion Test		
	LAMP Lamp	LAMP Lamp Test		
	Encr Encoders	Pan Pan Encoder	XXXX Data	
		Tilt Tilt Encoder	XXXX Data	
	Sens Sensors	Pan EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
		Tilt EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
	6	Dimm Dimmer/Strobe EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
		CWhI Color Wheel EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
		Blue Blue EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
	•	Ambr Amber EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
		MAG Magenta EOT Sensor	STST Sensor Test in Progress	PASS
				FAIL
	DISP Display	X.X.X.X. Ingites all 14 segments of each of the 4 characters and all 4 decimal		
		points.		

\*Refer to "Diagnostic Tests" on page 71 for more information.

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# **Function Definitions**

Each menu item is listed in the first column by its display abbreviation. The abbreviations appear in alphabetical order.

	Display	Definition	Purpose
	$\Downarrow \Downarrow$	Display Orientation	Shows upside-down orientation (for hanging luminaires)
	氜	Display Orientation	Shows upright orientation.
	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.
	10 <b>M</b>	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 ( <b>VIRT</b> ) or DMX ( <b>DMX</b> ) controlled systems.
	ALL	All Motors	Tests all internal motors.
	Ambr	Amber	Specifies Amber for manual control (Man) or test Amber functions (Test).
Auto		Auto Detect <i>or</i> Auto Playback	Automatically detects required Menu Display orientation when selected ( <b>DDir</b> ) or initiates automatic playback of a cue sequence at power-up ( <b>CUE</b> ).
	Blue	Blue	Specifies Blue for manual control (Man) or tests Blue functions (Test).
	BTim	Beam Time	Accepts timing value for beam time.
	C ON	On after Calibra- tion	Configures arc luminaire so that lamp will strike after calibration procedure is complete.
	Cal	Re calibrate	Re calibrates luminaire.
.5	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.
	CWhl	Color Wheel	Specifies Color Wheel for manual control and test.
	CMiX	Color Mixer	Tests color mixing mechanism.
5	CTim	Color Time	Sets color time. This applies to Blue, Amber, Magenta and Color Wheel.
	Cue	Cue Processing	Accesses cue store, modify, delete, and playback commands.
	cXX	Cue Data	Specifies cue number for display of current data value.
	cXXX	DMX Channel	Specifies DMX channel for display of current data value.
	DATA	DMX Data	Accesses function for displaying DMX data by channel number.

### **Table 4-2: Menu Function Definitions**

	Display	Definition	Purpose		
	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.		
DIFF		Diffusion	Specifies manual control of Diffusion (Man) or tests Diffusion func- tions (Test).		
	Dimm	Dimmer Specifies dimmer mechanism for manual control (Man) or dimmer/strobe functions (Test).			
	Dis	Disable	Disables a function.		
	DisP	Display Illumina- tion	Accesses options for Menu Display on and off times.		
	DISP	Display Test	Tests all 14 segments in the Display.		
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.		
Enab Encr FAIL		Enable Enables a function.			
		Encoders	Accesses encoder choices for diagnostic testing.		
		Test Fail Indicates that sensor test has failed.			
	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.		
	InvP	Invert Pan	Reverses pan action for special focus requirements.		
	InvT	Invert Tilt	Reverses tilt action for special focus requirements.		
	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 dif- ferent, 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 ( <b>CFG</b> ) and sets beam for lamp alignment adjustment ( <b>TEST</b> ).		
	LHrs	Lamp Hours	Displays total number of lamp operating hours.		
	Lld	Luminaire ID	Displays unique ID number for the luminaire which is used by Vir- tuoso consoles to identify the unit (in two pages).		

Table 4-2: Menu	Function	Definitions	(Continued)
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	Display	Definition	Purpose		
	LOFF	Lamp is Off	Configures arc luminaire so that lamp will await manual command before striking.		
	MAG	Magenta	Specifies manual control of Magenta (Man) or test Magenta func- tions (Test).		
	Man	Manual Com- mands	Accesses functions for controlling luminaire mechanisms and tim- ing by entry of an absolute data value.		
	Mod	Modify Cue	Accepts cue number of cue to modify from cue list.		
	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.		
	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	Calibration has completed and no errors have occurred.		
	OK?	Okay?	Prompt for pressing [Enter] before an action is executed.		
	ON	On Indefinitely	Sets Menu Display to stay on until programmed otherwise ( <b>DisP</b> ) or turns on a function.		
	P UP	Lamp Power Up	Accesses options for lamp power up: on, off, or on after calibra- tion.		
	P/T	Pan/Tilt	Accesses pan and tilt options for DMX function, system configura- tion, and testing.		
	Pan	Pan	Specifies pan function for manual control ( <b>Man</b> ) or pan encoder for testing ( <b>Test</b> ).		
	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.		
	PROG	Programming	Currently programming the new version of software.		
	PSEQ	Play Sequence	Plays back cue sequence. Press [Enter] to start and [Menu] to stop.		
	RCAL	Recalibrate	Currently executing Calibration.		
50	RDef	Reset Default	Resets default system configuration values.		
	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.		
-	SAVE	Save	Saving cue data.		
	ScXX	Sequence Data	Sequence playing cue number, where XX defines cue number.		
	Sens	Sensors	Accesses sensor choices for diagnostic testing.		

Table 4-2: Menu Function Definiti	ions (Continued)
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Di	isplay	Definition	Purpose
5	SEQ	Sequence Play- back	Sets sequence playback mode to Individual (plays cues from each luminaire) or Master (all luminaires play same cue).
S	SNAP	Snap	Enables, disables the colors (Blue, Amber, or Magenta) taking the shortest distance from one color to the next.
s	STAT	Status/Error Dis- play	Allows scrolling through error list or displays <b>OK</b> if no errors.
5	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.
5	Strb	Strobe	Specifies strobe function for manual control.
	Strk	Strike	Displays total number of lamp strikes.
S	STST	Sensor Test	Indicates that a system sensor test is in progress.
S	WAP	Swap	Swaps pan and tilt functions for special focus requirements such as moving mirror mechanisms.
	Test	System Tests	Accesses diagnostic tests for internal mechanisms.
	Tilt	Tilt	Specifies tilt function for manual control ( <b>Man</b> ) or tilt encoder for testing ( <b>Test</b> ).
Т	Гime	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.

Table 4-2: Menu	<b>Function</b>	Definitions	(Continued)
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# **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 57 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 "C--" or "Sc--" 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].
- 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 66).

#### 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 71.

**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.)





#### 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 57 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 (In alphabetical order)

ALL1	Tests low voltage power supplies by moving all motors at once.
ALL2	Tests all functions and provides a burn in or soak test.
BI 1/Amb1/MAG1	Fast color mixer tests, Goes from full color to open.
BI 2/Amb2/MAG2	Slow color mixer tests, Goes from full color to open.
BI 3/Amb2/MAG3	Tests different color mixer positions.
Cw 1	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.
Cw 2	Tests color wheel stabilizers. Performs Max reverse spin, stops on a color, and then stops on the sensor.
Cw 3	Test color wheel stabilizers. Steps through selected colors.
DiF1	Fast diffusion test from stop to stop.
DiF2	Slow diffusion test from stop to stop.
DiF3	Tests different diffusion positions.
Dim1	Fast dimmer test from full to closed.
Dim2	Slow dimmer test from full to closed.
Dim3	Tests different dimmer moves.
MiX1	Fast color mixer test where all colors are operating.
MiX2	Slow color mixer test where all colors are operating.
MiX3	Tests different positions with all colors operating. Verifies the color match for VL2416.
PT1	Fast pan and tilt from stop to stop.
PT2	Slow pan and tilt from stop to stop.
P 1	Fast pan only test from stop to stop.
P 2	Slow pan only test from stop to stop.
Р 3	Tests different pan movements.
Τ1	Fast tilt only test from stop to stop.
Т 2	Slow tilt only test from stop to stop.
Т 3	Tests different tilt movements.
Strb	Strobe test that tests 0-Open, 4-Closed, 11-Fast Random, 255-Max Strobe actions.

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

Test					Pa	rameters				4
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time
ALL1	0	0	0	0	0	0	0	0	0	0/4
	65535	65535	255	255	255	255	255	255	255	0/4
ALL2	0	0	0	255	0	0	0	0	0	0/4
	65535	65535	0	255	0	0	0	0	0	0/4
	0	0	0	0	0	0	0	0	0	0/4
	65535	65535	0	0	0	0	0	0	0	0/4
	0	0	0	255	0	0	0	0	0	7/7 (P/T only)
	65535	65535	0	255	0	0	0	0	0	7/7 (P/T only)
	0	0	0	0	0	0	0	0	0	7/7 (P/T only)
	65535	65535	0	0	0	0	0	0	0	7/7 (P/T only)
	45167	27000	255	0	35	0	0	0	0	0/3
	45167	27000	255	0	143	0	0	0	11	0/2
	45167	27000	255	0	53	0	0	0	0	0/2
	45167	27000	255	0	179	0	0	0	255	0/3
	45167	27000	255	128	71	0	0	0	0	0/1
	45167	27000	255	128	161	0	0	0	0	0/1
	45167	27000	255	255	179	0	0	0	0	0/1
	45167	27000	255	255	53	0	0	0	0	0/1
	45167	27000	255	128	143	0	0	0	0	0/1
	45167	27000	255	128	0	0	0	0	0	0/1
	45167	27000	255	0	0	255	0	0	0	0/1
	45167	27000	255	0	0	100	0	0	0	0/1
	45167	27000	255	0	0	255	0	0	0	0/1

Table 4-3: Diagnotic DMX Values

Name						_				
	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total tim
ALL2	45167	27000	255	0	0	0	255	0	0	0/1
(cont.)	45167	27000	255	0	0	0	100	0	0	0/1
	45167	27000	255	0	0	0	255	0	0	0/1
	45167	27000	255	0	0	0	0	255	0	0/1
	45167	27000	255	0	0	0	0	100	0	0/1
	45167	27000	255	0	0	0	0	255	0	0/1
	45167	27000	255	200	0	255	0	0	0	4/4 (Col only)
	45167	27000	255	0	0	0	255	0	0	4/4 (Col only)
	45167	27000	255	150	0	0	0	255	0	4/4 (Col only)
-	45167	27000	35	0	255	0	0	0	0	0/1.65
	45167	27000	255	0	161	0	0	0	0	0/1
	45167	27000	35	0	216	0	0	0	0	0/1.89
	45167	27000	255	0	71	0	255	0	0	0/1
PT1	0	0	0	0	0	0	0	0	0	0/4.5
	65535	65535	0	0	0	0	0	0	0	0/4.5
PT2	0	0	0	0	0	0	0	0	0	11/11
	65535	65535	0	0	0	0	0	0	0	11/11
Р1	0	54957	0	0	0	0	0	0	0	0/4.5
	65535	54957	0	0	0	0	0	0	0	0/4.5
P 2	0	54957	0	0	0	0	0	0	0	11/11
	65535	54957	0	0	0	0	0	0	0	11/11

Table 4-3: Diagnotic DMX Values (Continued)

Test					Pa	rameters				
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time
Р3	33511	54957	0	0	0	0	0	0	0	0/2
	22227	54957	0	0	0	0	0	0	0	0/2
	35511	54957	0	0	0	0	0	0	0	0/2
	22227	54957	0	0	0	0	0	0	0	0/2
	44423	54957	0	0	0	0	0	0	0	0/4
	39401	54957	0	0	0	0	0	0	0	0/2
	44423	54957	0	0	0	0	0	0	0	0/2
	34901	54957	0	0	0	0	0	0	0	0/2
	65535	54957	0	0	0	0	0	0	0	0/4
	0	54957	0	0	0	0	0	0	0	0/4
T 1	45167	0	0	0	0	0	0	0	0	0/2.2
	45167	65535	0	0	0	0	0	0	0	0/2.2
T 2	45167	0	0	0	0	0	0	0	0	9/9
	45167	65535	0	0	0	0	0	0	0	9/9
Т 3	45167	32767	0	0	0	0	0	0	0	0/1.2
	45167	11207	0	0	0	0	0	0	0	0/1
	45167	4487	0	0	0	0	0	0	0	0/1
	45167	11207	0	0	0	0	0	0	0	0/1
	45167	4487	0	0	0	0	0	0	0	0/1
	45167	64555	0	0	0	0	0	0	0	0/1.5
	45167	54957	0	0	0	0	0	0	0	0/1.1
	45167	47677	0	0	0	0	0	0	0	0/1
	45167	54957	0	0	0	0	0	0	0	0/1
	45167	65535	0	0	0	0	0	0	0	0/1
Dim1	45167	27000	255	0	0	0	0	0	0	0/0.5
	45167	27000	0	0	0	0	0	0	0	0/0.5
Dim2	45167	27000	255	0	0	0	0	0	0	6.5/6.5
	45167	27000	0	0	0	0	0	0	0	6.5/6.5

 Table 4-3: Diagnotic DMX Values (Continued)

Test					Pa	rameters				
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time
Dim3	45167	27000	255	0	0	0	0	0	0	0/0.5
	45167	27000	128	0	0	0	0	0	0	0/0.5
	45167	27000	80	0	0	0	0	0	0	0/0.5
	45167	27000	100	0	0	0	0	0	0	0/0.5
	45167	27000	40	0	0	0	0	0	0	0/0.5
	45167	27000	50	0	0	0	0	0	0	0/0.5
	45167	27000	40	0	0	0	0	0	0	0/0.5
	45167	27000	60	0	0	0	0	0	0	0/0.5
	45167	27000	0	0	0	0	0	0	0	0/0.5
Strb	45167	27000	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	4	0/1
	45167	27000	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	4	0/1
	45167	27000	0	0	0	0	0	0	11	0/4
	45167	27000	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	255	0/3
	45167	27000	0	0	0	0	0	0	4	0/1
	45167	27000	0	0	0	0	0	0	255	0/3
CW1	45167	27000	0	0	0	0	0	0	0	0/1
	45167	27000	0	0	17	0	0	0	0	0/1
	45167	27000	0	0	35	0	0	0	0	0/1
	45167	27000	0	0	53	0	0	0	0	0/1
	45167	27000	0	0	71	0	0	0	0	0/1
	45167	27000	0	0	89	0	0	0	0	0/1
	45167	27000	0	0	108	0	0	0	0	0/1
	45167	27000	0	0	125	0	0	0	0	0/1
	45167	27000	0	0	143	0	0	0	0	0/1

#### Table 4-3: Diagnotic DMX Values (Continued)

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Test					Pa	rameters				
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time
CW1	45167	27000	0	0	179	0	0	0	0	0/1
(cont.)	45167	27000	0	0	197	0	0	0	0	0/1
	45167	27000	0	0	216	0	0	0	0	0/1.65
	45167	27000	0	0	179	0	0	0	0	0/1
	45167	27000	0	0	255	0	0	0	0	0/1.9
CW2	45167	27000	0	0	255	0	0	0	0	0/1.9
	45167	27000	0	0	35	0	0	0	0	0/1
	45167	27000	0	0	0	0	0	0	0	0/1
CW3	45167	27000	0	0	125	0	0	0	0	0/0.4
	45167	27000	0	0	71	0	0	0	0	0/0.4
	45167	27000	0	0	197	0	0	0	0	0/0.4
	45167	27000	0	0	107	0	0	0	0	0/0.4
	45167	27000	0	0	89	0	0	0	0	0/0.4
	45167	27000	0	0	179	0	0	0	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
BI 1	45167	27000	0	0	0	255	0	0	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
BI 2	45167	27000	0	0	0	255	0	0	0	4.5/4.5
	45167	27000	0	0	0	0	0	0	0	4.5/4.5
BI 3	45167	27000	0	0	0	255	0	0	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	0	0	200	0	0	0	0/0.4
	45167	27000	0	0	0	150	0	0	0	0/0.4
	45167	27000	0	0	0	175	0	0	0	0/0.4
	45167	27000	0	0	0	170	0	0	0	0/0.4
	45167	27000	0	0	0	190	0	0	0	0/0.4
	45167	27000	0	0	0	50	0	0	0	0/0.4
	45167	27000	0	0	0	220	0	0	0	0/0.4

 Table 4-3: Diagnotic DMX Values (Continued)

Test					Pa	rameters				
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time
BI 3	45167	27000	0	0	0	200	0	0	0	0/0.4
(cont.)	45167	27000	0	0	0	205	0	0	0	0/0.4
	45167	27000	0	0	0	100	0	0	0	0/0.4
	45167	27000	0	0	0	255	0	0	0	0/0.4
	45167	27000	0	0	0	100	0	0	0	0/0.4
Amb1	45167	27000	0	0	0	0	255	0	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
Amb2	45167	27000	0	0	0	0	255	0	0	4.5/4.5
	45167	27000	0	0	0	0	0	0	0	4.5/4.5
Amb3	45167	27000	0	0	0	0	255	0	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	0	0	0	200	0	0	0/0.4
	45167	27000	0	0	0	0	150	0	0	0/0.4
	45167	27000	0	0	0	0	175	0	0	0/0.4
	45167	27000	0	0	0	0	170	0	0	0/0.4
	45167	27000	0	0	0	0	190	0	0	0/0.4
	45167	27000	0	0	0	0	50	0	0	0/0.4
	45167	27000	0	0	0	0	220	0	0	0/0.4
	45167	27000	0	0	0	0	200	0	0	0/0.4
	45167	27000	0	0	0	0	205	0	0	0/0.4
	45167	27000	0	0	0	0	100	0	0	0/0.4
	45167	27000	0	0	0	0	255	0	0	0/0.4
	45167	27000	0	0	0	0	100	0	0	0/0.4
MAG1	45167	27000	0	0	0	0	0	255	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
MAG2	45167	27000	0	0	0	0	0	255	0	4.5/4.5
	45167	27000	0	0	0	0	0	0	0	4.5/4.5

Table 4-3: Diagnotic DMX Values (Continued)

Test					Pa	rameters				
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time
MAG3	45167	27000	0	0	0	0	0	255	0	0/0.4
	45167	27000	0	0	0	0	0	0	0	0/0.4
	45167	27000	0	0	0	0	0	200	0	0/0.4
	45167	27000	0	0	0	0	0	150	0	0/0.4
	45167	27000	0	0	0	0	0	175	0	0/0.4
	45167	27000	0	0	0	0	0	170	0	0/0.4
	45167	27000	0	0	0	0	0	190	0	0/0.4
	45167	27000	0	0	0	0	0	50	0	0/0.4
	45167	27000	0	0	0	0	0	220	0	0/0.4
	45167	27000	0	0	0	0	0	200	0	0/0.4
	45167	27000	0	0	0	0	0	205	0	0/0.4
	45167	27000	0	0	0	0	0	100	0	0/0.4
	45167	27000	0	0	0	0	0	255	0	0/0.4
	45167	27000	0	0	0	0	0	100	0	0/0.4
MiX1	45167	27000	0	0	0	0	255	0	0	0/0.4
	45167	27000	0	0	0	255	0	255	0	0/0.4
MiX2	45167	27000	0	0	0	0	255	0	0	4.5/4.5
	45167	27000	0	0	0	255	0	255	0	4.5/4.5

Table 4-3: Diagnotic DMX Values (Continued)

Test					Pa	rameters				
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total tir
MiX3	45167	27000	0	0	0	255	255	255	0	0/0.7
	45167	27000	0	0	0	0	190	200	0	0/0.7
	45167	27000	0	0	0	200	170	150	0	0/0.7
	45167	27000	0	0	0	150	175	175	0	0/0.7
	45167	27000	0	0	0	175	150	170	0	0/0.4
	45167	27000	0	0	0	170	200	190	0	0/0.4
	45167	27000	0	0	0	190	0	50	0	0/0.4
	45167	27000	0	0	0	50	205	220	0	0/0.4
	45167	27000	0	0	0	220	200	200	0	0/0.4
	45167	27000	0	0	0	200	220	205	0	0/0.4
	45167	27000	0	0	0	205	50	0	0	0/0.4
	45167	27000	0	0	0	255	100	0	0	0/0.4
	45167	27000	0	0	0	100	255	120	0	0/0.4
	45167	27000	0	0	0	120	100	255	0	0/0.4
	45167	27000	0	0	0	0	120	100	0	0/0.4
DiF1	45167	27000	0	255	0	0	0	0	0	0/2
	45167	27000	0	0	0	0	0	0	0	0/2
DiF2	45167	27000	0	255	0	0	0	0	0	6.5/6.5
	45167	27000	0	0	0	0	0	0	0	6.5/6.5

Table 4-3: Diagnotic DMX Values (Continued)

Test	Parameters											
Name	Pan*	Tilt*	Dim	Diff	CWhl	Blue**	Ambr**	MAG**	Strb	time/total time		
DiF3	45167	27000	0	245	0	0	0	0	0	0/2		
	45167	27000	0	200	0	0	0	0	0	0/2		
	45167	27000	0	245	0	0	0	0	0	0/2		
	45167	27000	0	200	0	0	0	0	0	0/2		
	45167	27000	0	50	0	0	0	0	0	0/2		
	45167	27000	0	128	0	0	0	0	0	0/2		
	45167	27000	0	5	0	0	0	0	0	0/2		
	45167	27000	0	20	0	0	0	0	0	0/2		
	45167	27000	0	5	0	0	0	0	0	0/2		
	45167	27000	0	20	0	0	0	0	0	0/2		
	45167	27000	0	0	0	0	0	0	0	0/2		
**Color 1	*Pan an ests will fur	d Tilt value nction differ	s are 16-bi ently when	the Snap	function is on page	enabled. F e 26.	or more inf	ormation or	n Snap se	e "Snap Colors		
**Color 1	*Pan an rests will fur	d Tilt value nction differ	s are 16-bi	the Snap	function is on page	enabled. F	or more inf	ormation or	n Snap se	e "Snap Colors		

#### Table 4-3: Diagnotic DMX Values (Continued)





# **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 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.)

Display	Message
OK	No Errors Found
B1M1 / MAG / NoSn	Aux Board 1, Motor 1 / Magenta / Sensor Not Found
B1M1 / MAG / SAct	Aux Board 1, Motor 1 / Magenta / 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 / CWhl / NoSn	Aux Board 1, Motor 3 / Color Wheel / Sensor Not Found
B1M3 / CWhl / SAct	Aux Board 1, Motor 3 / Color Wheel / Sensor Always Active
B2M1 / Blue / NoSn	Aux Board 2, Motor 1 / Blue / Sensor Not Found
B2M1 / Blue / SAct	Aux Board 2, Motor 1 / Blue / Sensor Always Active
B2M2 / Ambr / NoSn	Aux Board 2, Motor 2 / Amber / Sensor Not Found
B2M2 / Ambr / SAct	Aux Board 2, Motor 2 / Amber / Sensor Always Active
BRD1 / NO / COMM	Aux Board 1 Communication Failure
BRD2 / NO / COMM	Aux Board 2 Communication Failure
HEAD/ OVER/ TEMP	Head Over Temperature
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

#### Table A-1: Error Messages

### **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.

Error Display	Description	Possible Cause and Remedy
B1M1 MAG NoSn	Aux Board 1, Motor 1, Magenta, Sensor Not Found	Magenta power not connected, motor not moving - Connect Magenta motor power at motor Magenta sensor not connected - Connect Magenta sensor Magenta movement restricted or impeded - Remove obstruction
		Magenta sensor is faulty - Replace color sensor assembly Aux Board 1 is faulty - Replace aux board
B1M1 MAG SAct	Aux Board 1, Motor 1, Magenta, Sensor Always Active	Magenta power not connected and Magenta aligned with sensor - Connect Magenta power at motor
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
	·	

#### Table A-2: Troubleshooting Guide

	Error Display	Description	Possible Cause and Remedy
	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
	B1M3 CWhI NoSn	Aux Board 1, Motor 3, Color Wheel, Sensor Not Found	Color Wheel power not connected, motor not moving - Connect Color Wheel power at motor Color Wheel sensor not connected - Connect Color Wheel sensor Color Wheel movement restricted or impeded - Remove obstruction
			Color Wheel sensor is faulty - Replace Color Wheel sensor assembly Aux Board 1 is faulty - Replace aux board
	B1M3 CWhl SAct	Aux Board 1, Motor 3, Color Wheel, Sensor Always Active	Color Wheel power not connected and Color Wheel aligned with sensor - Connect Color Wheel power at motor
		0	Color Wheel not installed on motor shaft - Install Color Wheel on motor shaft
	B2M1 Blue NoSn	Aux Board 2, Motor 1, Blue, Sensor Not Found	Blue power not connected, motor not moving - Connect Blue power at motor Blue sensor not connected - Connect color sensor Blue movement restricted or impeded - Remove obstruction
	-0		Blue sensor is faulty - Replace Blue sensor assembly Aux Board 2 is faulty - Replace aux board
	B2M1 Blue SAct	Aux Board 2, Motor 1, Blue, Sensor Always Active	Blue power not connected and Blue aligned with sensor - Connect Blue power at motor
Jones Land	B2M2 Ambr NoSn	Aux Board 2, Motor 2, Amber, Sensor Not Found	Amber power not connected, motor not moving - Connect Amber power at motor Amber sensor not connected - Connect Amber sensor Amber movement restricted or impeded - Remove obstruction
			Amber sensor is faulty - Replace color sensor assembly Aux Board 2 is faulty - Replace aux board

#### Table A-2: Troubleshooting Guide (Continued)

	Error Display	Description	Possible Cause and Remedy
	B2M2 Ambr SAct	Aux Board 2, Motor 2, Amber, Sensor Always Active	Amber power not connected, and amber aligned with sensor - Connect Amber power at motors
	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
		0	Encoder faulty - Replace pan end-of-travel/encoder sensor assembly
	PAN NO SENS	Pan Sensor Not Found	<ul> <li>EOT flag attached to large pulley is not engaging the EOT sensor</li> <li>Ensure flag is attached to the large pulley</li> <li>Ensure that flag passes through the sensor at a depth sufficient to engage the sensor beam</li> <li>Pan belt disconnected, extremely loose or not installed properly</li> <li>Properly install belt between pan motor and large pulley</li> </ul>
5	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)

Table A-2: Troubleshooting Guide	(Continued)
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Error Display	Description	Possible Cause and Remedy
SRCH/FOR/ BRD1 BRD2	Searching for Board 1 or 2	Attmepting 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
TILT NO SENS	Tilt Sensor Not Found	<ul> <li>EOT flag attached to large pulley is not engaging the EOT sensor</li> <li>Ensure flag is attached to the large pulley</li> <li>Ensure that flag passes through the sensor at a depth sufficient to engage the sensor beam</li> <li>Tilt belt disconnected, extremely loose or not installed properly</li> <li>Properly install belt between tilt motor and large pulley</li> </ul>
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

#### Table A-2: Troubleshooting Guide (Continued)

## **Routine Maintenance**

### **Lamp Replacement**



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

#### **Parts:**

700 WATT SHORT-ARC LAMP (Vari-Lite part: 71.2528.0700)

#### **Tools:**

Screwdriver, slotted Cotton gloves

CAUTION:

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

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#### 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. See **Figure A-1**.
- Step 3. Slide backcap away from head assembly (it will remain attached by tether and lamp wires).



Backcap Assembly

Guide Rod

Figure A-1: Lamp Replacement

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**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 51 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.) See Figure A-2.



Figure A-2: Filter Removal



**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. See Figure A-3.



**Figure A-3: Filter Replacement** 

**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. See Figure A-4.
- Step 6. Re-install bulkhead (if applicable) and re-install removable cover.



Figure A-4: Filter Installation

### **Cleaning Optical Lenses and Filters**

WARNING: Remove power from luminaire before performing maintenance.

The front lens and color filters 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. <u>s</u>