

MOVING iMAGE TECHNOLOGIES

INSTRUCTIONS

FOR

INSTALLATION, OPERATION, AND MAINTENANCE

OF

M Series Dimmer

Manual Version 1.1

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M Series Dimmer

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1. INTRODUCTION

1.1 SPECIAL NOTICES

Three kinds of specific notices are used within this manual to emphasize information.

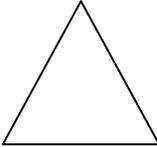
1.1.1. WARNING

 WARNING	WARNING: Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.
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1.1.2. CAUTION

 CAUTION	CAUTION: Indicates the presence of a hazard that can cause damage to equipment.
--	--

1.1.3. NOTE

 NOTE	NOTE: Provides additional information.
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2. GENERAL DESCRIPTION

The M Series Cinema Lighting Dimmer is specifically optimized for cinema theater applications. It's available with either two or four 2400 Watt lighting circuits (channels) and is remotely controlled by cinema automation equipment. Output settings for each circuit are saved in the dimmer memory and then selected by activating the appropriate scene preset input. Scene presets are activated by external switch or relay closures. Regardless of whether the dimmer has 2 or 4 circuits, all the dimmers in the series have 4 scene presets available for each circuit.

Standard models are available in 120V and 230V versions. A model that incorporates an optional fast acting 20Amp magnetic circuit breaker for each circuit is available by special order. A table in Sec. 6 of this manual gives a description of the different models available.

The unit is intended for wall mounting. M Series dimmers are for INDOOR USE ONLY.

2.1. POWER REQUIREMENTS

The M Series dimmer requires a hot power feed line for each lighting circuit (channel), a common neutral, and an earth ground. Each of these feeds must be supplied by a circuit providing 20 Amps and be dedicated solely to that dimmer circuit. The power feed for circuit/channel 1 also powers the unit's internal control circuitry. The internal circuitry is protected by a replaceable 1/2 Amp, 250 Volt, fast acting fuse. The M Series dimmer may be operated on either a single AC pole (120V in the U.S.); Split-phase AC (240V phase to phase in the U.S.); or three-phase power and may be switched between these power types by the user.

Important: The dimmer must be configured differently depending on the source of the AC power for each circuit or channel. The unit will not operate properly if not set for the appropriate AC connection per Sec 3.5.

3

3. INSTALLATION

3.1 Location and mounting

The unit is to be wall or bulkhead mounted using the mounting holes provided in the chassis. Orient the unit such that the circuit board is in the lower left area of the chassis. The unit may (but is not required to be) spaced out from the wall approx. 1 inch. This may be desirable if the unit must be used in a location with a high ambient temperature. Standard sized knockout holes are provided in the edges of the chassis for wiring. Be sure that the vent holes in the chassis and cover are not obstructed since they are needed for proper cooling. See Figure 3-1 for the general internal layout.

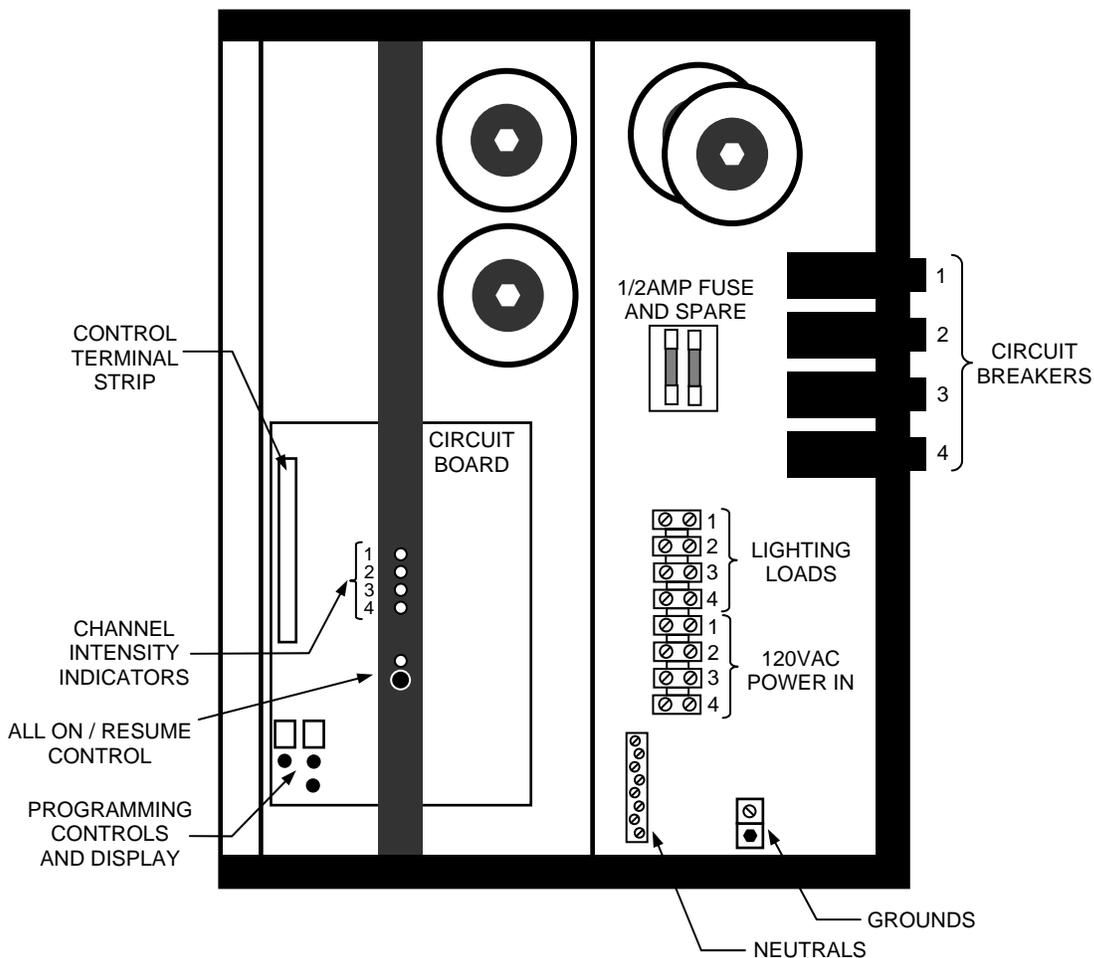
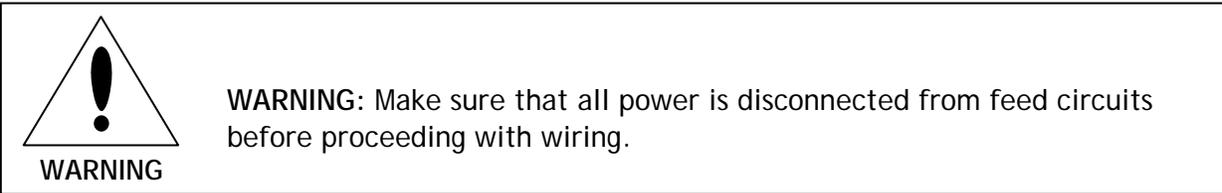


Figure 3-1: Interior layout

3.2 Input Power Connections



Connect power input leads to the lower terminal strip positions as indicated on the terminal strip labels. A hot feed line is needed for each circuit. Associated NEUTRALS are to be connected to the NEUTRAL bar provided. An earth ground is also required, a ground lug is provided. The terminal strip connection torque specification is 16 lb.-in. max. The minimum wire size is AWG#12. Consult the applicable electrical codes for your location for exact wire specifications. The power terminal connections are intended for copper wire only.

This unit will work on single phase, split phase, or three phase power. Any dimmer circuit may get power from any AC phase.

Important: The dimmer must be configured differently depending on the source of the AC power for each circuit or channel. The unit will not operate properly if not set for the appropriate AC connection per Sec 3.5.

3.3 Load connections

Up to 2400 Watts of lighting load may be connected to each output circuit/channel. Connect lighting loads to the upper terminal strip positions as indicated by the label. Note that the channels are assigned differently on different models - on 2-channel units, circuit 1 is normally assigned to "House" lights and circuit 2 is assigned to "Stage" (or curtain, screen, or sconce) lights. On 4-channel units, circuits 1 and 2 are assigned to House lights and 3 and 4 to Stage lights (see Table 4-1 on page 9 for how these functions differ).

The neutral bar and ground lug may be used for lighting loads. The terminal strip connection torque specification is 16 lb.-in. max.

3.4 Remote switch connections

A control terminal strip located on the left side of the low voltage section of the printed circuit board is provided for connecting external switch control signals. See Figure 3-2 for connections. Typically a scene preset or cue input is connected to the common through a remote momentary switch or relay contact to activate that scene preset.

Control inputs are usually jumpered together for controlling multiple circuits with the same signal input (see figure 3-2).

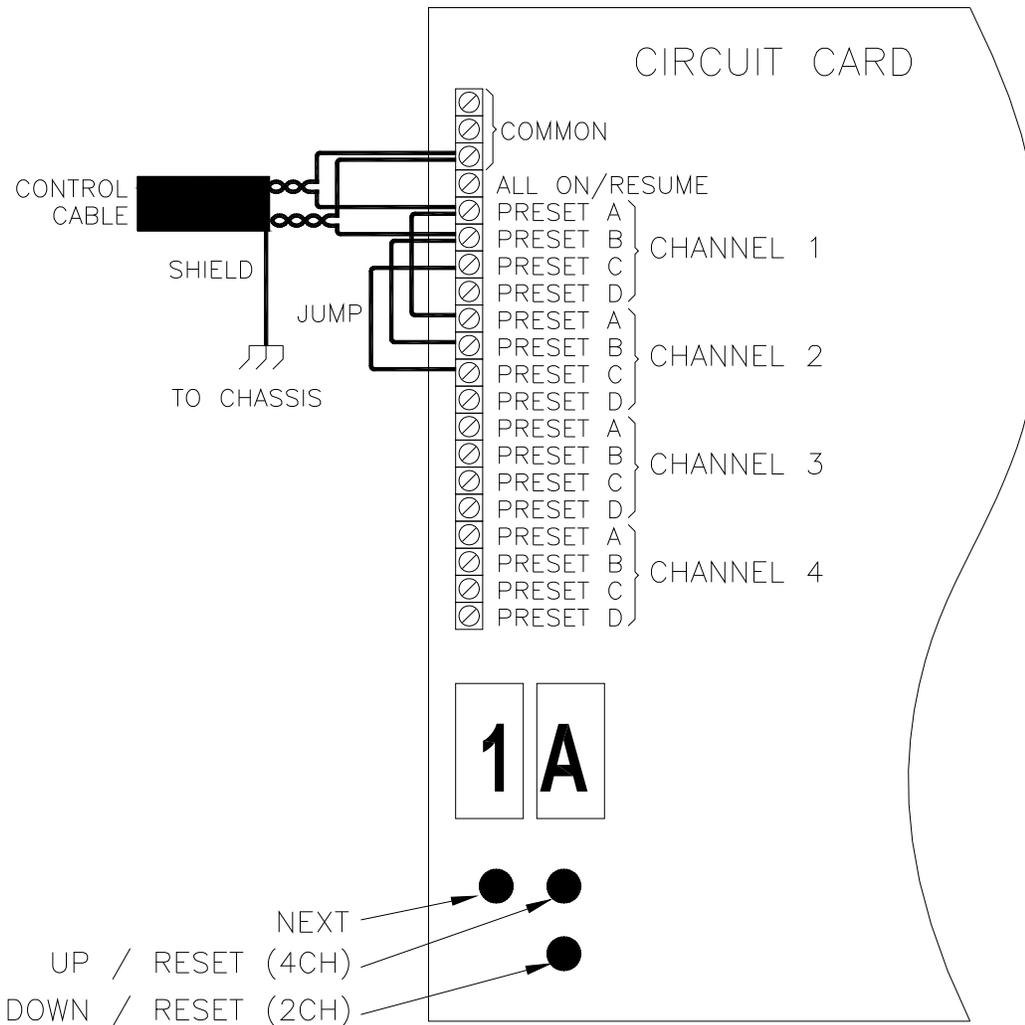
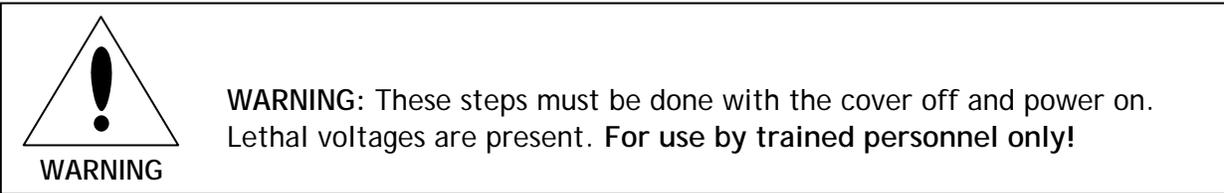


Figure 3-2: TYPICAL CONNECTIONS: 2 CH, 3 SCENES / CUES

NOTE: A shielded control cable is required as a minimum. However for the best immunity from noise and to obtain the most reliable operation, MiT recommends the use of shielded, twisted-pair cable for control lines, with one twisted pair used for each scene preset input. Each twisted pair goes to one set of switch or relay contacts. One wire in each twisted pair is connected to the common.

3.5 Initial setup



Programming of the M Series dimmer is done using the 2 LED indicators and the 3 push buttons located at the bottom of the circuit board inside of the unit. These controls allow setting the intensity and fade times of each of the lighting circuits/channels for each of the four available scene presets. The unit comes from the factory configured with a program that should work fine for most cinema applications. Changing the lamp intensity settings is covered in the next chapter. For initial setup the most important settings are configuring the unit for the type of AC power being used.

The value for settings P2, P3, and P4 tells the unit which phase those channels/circuits are getting their power from. P2 stands for the phase of Channel 2, and so on. The default value for P2 through P4 is 'A', meaning those channels all use the same phase as channel 1 (or 180° from channel 1 as with split-phase power). You should only need to change this setting from the default if the unit is being supplied by more than one phase of 3-phase power.

Note: if you change from the default factory setting as described below, those settings will be lost if you do a 'reset' procedure. Make note of any custom settings using the form in the Appendix and keep it on file for future reference.

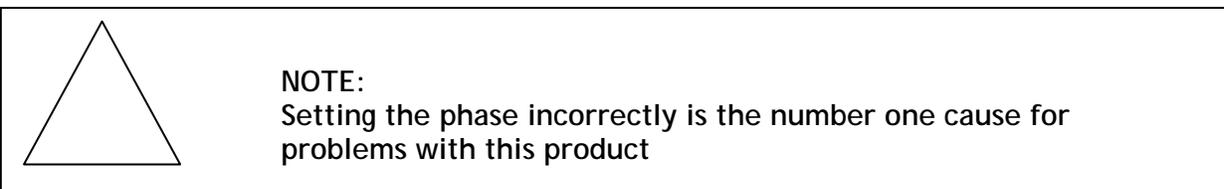
3.5.1 Setup for a single phase or split phase power installation

Use the NEXT button to get to P2 on the LED display. Verify the right display says 'A'. If not, use the UP/DOWN buttons to set the display to "A". Do the same for P3 and P4. Note: on 2-channel units the settings for P3 and P4 have no effect.

3.5.2 Setup for a three phase power installation

Press the NEXT button until P2 appears on the LED display. Use the UP/DOWN buttons to set the right hand indicator to "B". Check for proper dimming on Channel 2. If channel 2 doesn't fade smoothly between preset levels or it seems to operate in an OFF/ON only fashion then you should change this setting to the other three phase choice ('C'). If it's a 4-channel unit, repeat this process for Channel 3 and 4, settings P3 and P4.

Note: On a 4-channel unit supplied by 3 phases, at least one of the phases must connect to more than one channel, so more than one of the channels may need to be set to A, B, or C to make all the channels work properly (i.e. you may have 2 channels set to 'A', 2 channels on 'B', or 2 channels on 'C', depending on the method of wiring).



4. OPERATION

4.1 Circuit Breakers

The standard M Series dimmers use external breakers for AC power feeds. On models with optional internal breakers, each hot line going to the dimmer has its own breaker. Channel numbers for the circuit breakers are labeled on the unit. For any given channel, its associated circuit breaker must be on in order to operate. Channel 1 supplies the power to the microprocessor and other logic and must have power or the dimmer won't function at all. If any circuit breaker won't remain closed there is an overload at the lamps for that channel which MUST be corrected before operation can continue.

4.2 Manual All On / Resume button

The "All On / Resume" function may be activated by its push button on the front panel. (see Figure 3-1 for location). This function overrides all other channel controls. It sets all channels to maximum intensity, and remains in effect until the button is pushed again. At that time the unit will "Resume" normal operation (return to the intensity settings provided by the normal control signals). The LED located above the button is ON when "All On" operation is in effect.

4.3 Indicators

There is an LED indicator on the front panel for each channel. They provide an indication of the current lighting intensity for the associated channel. There's also an indicator that shows when in the 'All On' override mode. With the outer cover removed there is also a two-digit LED display visible for use during programming. When power is first applied the display will indicate the current firmware version installed for a few seconds. For example the display will show 1 4 for firmware version 1.4.

4.4 Standard theater operation

During theater operation, the lighting is usually controlled by automation cues from the projection equipment. The M Series dimmer is designed to activate scene presets lighting conditions in response to these controls, or 'cues'.

Dimmers come programmed from the factory for a typical cinema application, summarized in Table 4-1 and 4-2. Table 4-1 is for a 2-channel dimmer and Table 4-2 is for a 4-channel unit. For more specific settings see the Appendix.

The 1% intensity level shown for some of the settings in the table results in essentially no light from the lamps but keeps the lamp filaments warm which extends the lamp life.

Table 4-1: Default programming, 2-Channel Dimmer

SCENE PRESET / CUE	HOUSE LIGHTING Channel 1	STAGE LIGHTING Channel 2		
A. Opening and Seating	90% (5 sec. Fade)	90% (5 sec. Fade)		
B. Trailers, Previews, and Commercials	50% (15 sec. Fade)	1% (15 sec. Fade)		
C. Main Feature	1% (5 sec. Fade)	1% (5 sec. Fade)		
D. Credits and Closing	60% (10 sec. Fade)	60% (10 sec. Fade)		

Table 4-2: Default programming, 4-Channel Dimmer

SCENE PRESET / CUE	HOUSE LIGHTING Channel 1	HOUSE LIGHTING Channel 2	STAGE LIGHTING Channel 3	STAGE LIGHTING Channel 4
A. Opening and Seating	90% (5 sec. Fade)			
B. Trailers, Previews, and Commercials	50% (15 sec. Fade)	50% (15 sec. Fade)	1% (15 sec. Fade)	1% (15 sec. Fade)
C. Main Feature	1% (5 sec. Fade)	1% (5 sec. Fade)	1% (3 sec. Fade)	1% (3 sec. Fade)
D. Credits and Closing	60% (10 sec. Fade)	60% (10 sec. Fade)	1% (3 sec. Fade)	1% (3 sec. Fade)

4.5 Programming the unit

The M Series dimmer comes from the factory with a standard cinema program loaded in memory. The default factory values of the dimmer are shown in the Appendix. This section describes how to change the values if required.



WARNING: These steps must be done with the cover off and power on. Lethal voltages are present. **For use by trained personnel only!**

WARNING

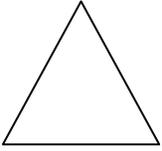
To change a setting the outer cover must be removed. While the cover is removed, stay clear of the right side of the unit where AC voltages are present.

4.5.1 Lamp Intensity and fade time values.

Use the two digits and pushbuttons at the lower left corner of the circuit card. The LED displays alternate between the FUNCTION (channel/scene and preset fade) and its VALUE (intensity or fade time). There are 2 digits and 3 buttons to control these functions. Press the NEXT button to advance through each FUNCTION. Press the UP and DOWN buttons to change the VALUE for the alternately displayed FUNCTION.

4.5.2 Power phase assignment

The Input Power Phase must be set correctly for each dimmer channel, or dimmers will behave erratically during operation. This setting is covered in Sec. 3.5 "Initial Setup".

	<p>NOTE: Setting the phase incorrectly is the number one cause for problems with this product</p>
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4.6 Configuring for Lamp type

Beginning with firmware version 1.3, provision has been added for driving certain LED drivers, specifically the "Hi Lume" series from Lutron. These drivers are used in some newer LED fixtures, particularly wall sconces. A new dimming curve was created specifically for use with these Lutron LED drivers, to avoid damaging the driver. Four parameters have been added to the memory settings to configure each channel according to the load connected to it. The two selections for each channel are "in" and "LL." Here is the setting you should use:

In: For incandescent, CFL, and all LED lamps and fixtures except those using the Lutron Hi-Lume LED driver. (factory default / reset setting)

LL: For LED fixtures using the Lutron Hi-Lume series LED driver ONLY.

The location of this setting in memory is shown in the Appendix A.3 on page 20.

5. MAINTENANCE & TROUBLESHOOTING



WARNING: RISK OF ELECTRICAL SHOCK!
 There are lethal voltages present in this product when power is applied to its feed circuits. The cabinet should be opened only by a qualified electrician

WARNING

The only user servicable part in the M Series dimmer is the Type ABC, ½ Amp, 250 Volt, fast acting fuse. A spare fuse is provided with the unit. The fuse may be replaced **ONLY** with an identical fuse.



WARNING: Make sure that all power is disconnected from feed circuits before changing the fuse.

WARNING

Service by other than the manufacturers authorized agents may void your warranty.

The best way to prolong the life of your unit is to keep it cool, clean, and dry. It is important that the cooling intake and exit vent holes are clean and unobstructed.

5.1 Troubleshooting Matrix

5.1.1 Dimmer not functional [No auditorium lights or Indicator lights on the dimmer]

	Probable Cause	Action
A	Breakers tripped or not on	Verify supply breakers at the building load center are activated, as well as at the projector console (if applicable). Check voltage at the input of the dimmer with a meter.
B	Blown fuse	Check the fuse mounted to the chassis of the dimmer.
C	Defective or incorrect wiring	Check wiring between the power source and the dimmer, and from the dimmer to the loads. Swapped Line and Load wires will cause the breaker to trip, and also usually damage the control PCB, causing symptom 5.1.2 after the wire error is corrected.

5.1.2 Auditorium lights on always, no dimming [or missing cues]

	Probable Cause	Action
A	'All On' button is pressed	Check All On indicator lamp on panel. If lit, the unit is in the 'All On' mode. Press the button to Resume normal operation.
B	'All On' button is stuck	If the indicator stays lit after pressing the button, it may be binding against the cover. Loosen the screws holding the cover and reposition it. If that doesn't work, remove the cover completely and enlarge the button hole with a file.
C	Faulty automation setup or control wiring	Using a test lead, short stiff wire, or unbent paper clip, short between the terminal 'C' and '1A', '1B', '1C', and '1D' terminals allowing several seconds between each for the dimmer to respond (see Figure 3-2 on page 6). Verify that the dimmer correctly responds to each scene preset. If it works properly, repeat the procedure at the Automation terminals to check the wiring.
D	Another scene input held active	Check with a meter to make sure one of the other cue inputs isn't shorted or being held on.
E	Incorrect voltage dimmer installed	You may be using a 230V dimmer on 120V AC. Verify your control board is the correct model for the voltage being used (See Sec. 5.2 to verify the model).
F	Processor memory corrupted	Perform system Reset (see Sec 5.3). If that doesn't fix the problem, replace the Control board.
G	Control board defective	Replace Control Board.

5.1.3 House lights missing "Mid" cue, lights either 'full' or off [trailers & end credits]

	Probable Cause	Action
A	Incorrect programming of automation or server that's controlling lighting cues	See 5.1.2, 'C' to test proper operation.
B	'House' lights connected to 'Stage' lights output	Verify that 'house' lights aren't connected to the Stage light dimmer outputs, which are programmed to be OFF for the 'Mid' cue, by factory default.

5.1.4 Dimmer functional but receiving unwanted cues [changing without cue input].

	Probable Cause	Action
A	Control cable wrong type, not shielded.	Change control cable to shielded type, or preferably shielded twisted pairs (see Sec. 3.4).
B	Control cable shield (drain) wire broken or not connected	Check continuity of drain wire to the chassis of the dimmer.
C	Control cable run alongside AC power lines (i.e. in the same conduit or wiring trough)	Re-route the control cable so it's not adjacent to wires or cables carrying AC.
D	Control board is an older type without suppression on the inputs	Control boards manufactured after about 2007 have suppression devices added to the inputs to help prevent spurious activation. If you have an older board without these components you may need to upgrade it.

5.1.5 Dimmer functional but intermittent or erratic dimming

	Probable Cause	Action
A	One or more channels set to incorrect phase of 3-phase AC	Set the channels for correct phase. See Sec. 3.5
B	Incorrect voltage dimmer installed	You may be using a 230V dimmer on 120V AC. Verify your control board is the correct model for the voltage being used (See Sec. 5.2 to verify the model).

5.1.6 LED Display showing garbage characters

	Probable Cause	Action
A	Program memory damaged	If the unit is operating OK you don't need to do anything. If not, reset the memory to factory defaults per Sec. 5.3. If that fails replace the control board.

5.2 Identifying the Dimmer Voltage

If a 230V model dimmer is used on 120V the unit may not operate at all, or operate erratically. There's a sticker on the dimmer cover that identifies the model and voltage, but covers can get switched around. The most reliable way to verify your dimmer voltage is by inspecting transformer T1 on the control board. See Figure 5-1.



Figure 5-1: Transformer ID

There are two things on the transformer that indicate the voltage of the unit.

1. The model number. On units intended for 120V operation the transformer model begins with PST3. On units for ~230V operation the transformer model begins with PDST3.
2. The number of leads/pins. On 120V units two leads on the right side of the transformer are absent, as seen in the photo (6 pins total). On 230V units there will be two more leads in that center area (8 pins total).

5.3 Resetting the Dimmer memory & defaults

If testing according to the troubleshooting section shows the dimmer is non-responsive or not working correctly, try resetting the control board to the factory defaults prior to replacing it. After a reset the settings will be as shown in the Appendix. Prior to resetting the memory you may want to scan through the settings and check for any custom settings and note the values, particularly the power phase assignments P2-P4.

To reset the control board, turn power to the dimmer off for 1 minute, then:

- 2-channel unit: Turn on the dimmer breaker while pressing the DOWN button.
- 4-channel unit: Turn on the dimmer breaker while pressing the NEXT button.

Refer to Figure 3-2 for button locations.

6. MODEL NUMBERS AND CONFIGURATION

The table below shows the number of channels and circuit breaker information for each model number.

MODEL NUMBER	DESCRIPTION
M4800-120	2 Channels x 2400W, 100-132V, 50/60Hz
M4800-230	2 Channels x 2400W, 200-240V, 50/60Hz
M9600-120	4 Channels x 2400W, 100-132V, 50/60Hz
M9600-230	4 Channels x 2400W, 200-240V, 50/60Hz

Note: Units may be labeled on the cover with just the first digit of the suffix dash number, i.e. M4800-1 or M4800-2.

All dimmers are compatible with 50 or 60Hz power. When power is first applied the microprocessor measures the timing of the AC line and configures itself accordingly. The line voltage is the only parameter that's specific to different models.

For two channel versions, only the components, indicators, and connection points for the applicable channels will be present in the unit.

Standard Product Warranty

WARRANTY, DISCLAIMERS AND LIMITATION OF LIABILITY

Unless otherwise noted, all MOVING IMAGE TECHNOLOGIES products are covered by the warranty set forth in the following paragraphs.

The warranty is extended only to the purchaser of the Products directly from MOVING IMAGE TECHNOLOGIES, or an authorized dealer of MOVING IMAGE TECHNOLOGIES, as new merchandise. For a period of twelve (12) months from the date of original delivery to Buyer, the Products are warranted to be free from functional defects in materials and workmanship, provided they are operated under condition of normal use, and that repairs and replacements are made in accordance herewith. MOVING IMAGE TECHNOLOGIES does not warrant consumable components. The foregoing warranty shall not apply to Products that have been disassembled, altered or repaired other than by MOVING IMAGE TECHNOLOGIES (or by a MOVING IMAGE TECHNOLOGIES certified technician) or if the Product has been subject to abuse, misuse, negligence or accident.

MOVING IMAGE TECHNOLOGIES sole and exclusive warranty obligation and Buyer's sole and exclusive warranty consists of MOVING IMAGE TECHNOLOGIES, at its option, repairing or replacing free of charge Products: (a) which contain a defect covered by the above warranty; (b) which are reported in writing to Moving Image Technologies not later than seven (7) days after the expiration of the twelve month warranty period; (c) which are returned to MOVING IMAGE TECHNOLOGIES promptly after discovery of the defects; and (d) which are found to be defective by MOVING IMAGE TECHNOLOGIES upon examination. Buyer shall pay all transportation charges.

Moving Image Technologies shall not be otherwise liable for any damages, including, without limitation, loss of profits or overhead, reimbursement, personal injury or property damage. The aforesaid warranty obligation of MOVING IMAGE TECHNOLOGIES constitutes its sole liability, and under no circumstances, shall the maximum liability of MOVING IMAGE TECHNOLOGIES under any legal theory (e.g. Contract, warranty, negligence, promissory, estoppels, strict liability, misrepresentation, tort) and for any reason whatsoever (e.g. Defect, delay or otherwise) exceed the purchase price of the defective part, regardless whether the claim is asserted by buyer or any other person or entity. The liabilities of MOVING IMAGE TECHNOLOGIES, as above set forth, shall not be extended because of advice given by it in connection with the design, installation or use of the products or parts thereof.

There are no express or implied warranties which extend beyond the warranties set forth above. MOVING IMAGE TECHNOLOGIES makes no warranty of merchantability or fitness for a particular purpose with respect to the products or any parts thereof.

This warranty is subject to change at any time without notice.

CONTACTING MiT

To order parts or request information from MiT, use the address, telephone number, or fax number given on the inside front page of this document. When contacting MiT be prepared to provide:

- M-Series dimmer name and serial number.
- Part name and part number, as shown in this manual.
- Purchase order number.

The purchase order number is essential for replacement parts requested under warranty. MiT issues credit for defective parts received. Please request a Return Authorization number from MiT for any defective parts.

Appendix

Lamp Intensity and Fade values and defaults

A.1 Intensity of Scene /Cue Presets

DISP	DESC / FUNCTION	VALUE RANGE	Default, 2-ch	Default, 4-ch	Custom
1A	Channel 1 Scene A intensity	0-100%	90	90	
1b	Channel 1 Scene B intensity	0-100%	50	50	
1C	Channel 1 Scene C intensity	0-100%	1	1	
1d	Channel 1 Scene D intensity	0-100%	60	60	
2A	Channel 2 Scene A intensity	0-100%	90	90	
2b	Channel 2 Scene B intensity	0-100%	1	50	
2C	Channel 2 Scene C intensity	0-100%	1	1	
2d	Channel 2 Scene D intensity	0-100%	1	60	
3A	Channel 3 Scene A intensity	0-100%	0	90	
3b	Channel 3 Scene B intensity	0-100%	0	1	
3C	Channel 3 Scene C intensity	0-100%	0	1	
3d	Channel 3 Scene D intensity	0-100%	0	1	
4A	Channel 4 Scene A intensity	0-100%	0	90	
4b	Channel 4 Scene B intensity	0-100%	0	1	
4C	Channel 4 Scene C intensity	0-100%	0	1	
4d	Channel 4 Scene D intensity	0-100%	0	1	
1 ^r	Channel 1 Up fade time (applied to all scenes)	1-99 sec	No default, affects .A1, .b1, .C1, .d1		
1 _r	Channel 1 Down fade time (applied to all scenes)	1-99 sec	No default, affects A1, b1, C1, d1		
2 ^r	Channel 2 Up fade time (applied to all scenes)	1-99 sec	No default, affects .A2, .b2, .C2, .d2		
2 _r	Channel 2 Down fade time (applied to all scenes)	1-99 sec	No default, affects A2, b2, C2, d2		
3 ^r	Channel 3 Up fade time (applied to all scenes)	1-99 sec	No default, affects .A3, .b3, .C3, .d3		
3 _r	Channel 3 Down fade time (applied to all scenes)	1-99 sec	No default, affects A3, b3, C3, d3		
4 ^r	Channel 4 Up fade time (applied to all scenes)	1-99 sec	No default, affects .A4, .b4, .C4, .d4		
4 _r	Channel 4 Down fade time (applied to all scenes)	1-99 sec	No default, affects A4, b4, C4, d4		

Note that the 100% intensity value on the LED display is indicated by "FL" (full).

You can STOP HERE, or continue to setting the individual up/down fade times if necessary.

A.2 Fade Times

These settings will override the fade up/down settings in the previous section (this step is optional and may be skipped if not needed).

DISP	DESC / FUNCTION	VALUE RANGE	Default, 2-ch	Default, 4-ch	Custom
.A1	Channel 1, Scene A - up fade time	1-99 sec	5	5	
A1	Channel 1, Scene A - down fade time	1-99 sec	5	5	
.b1	Channel 1, Scene B - up fade time	1-99 sec	15	15	
b1	Channel 1, Scene B - down fade time	1-99 sec	15	15	
.C1	Channel 1, Scene C - up fade time	1-99 sec	5	5	
C1	Channel 1, Scene C - down fade time	1-99 sec	5	5	
.d1	Channel 1, Scene D - up fade time	1-99 sec	10	10	
d1	Channel 1, Scene D - down fade time	1-99 sec	10	10	
.A2	Channel 2, Scene A - up fade time	1-99 sec	5	5	
A2	Channel 2, Scene A - down fade time	1-99 sec	5	5	
.b2	Channel 2, Scene B - up fade time	1-99 sec	15	15	
b2	Channel 2, Scene B - down fade time	1-99 sec	15	15	
.C2	Channel 2, Scene C - up fade time	1-99 sec	5	5	
C2	Channel 2, Scene C - down fade time	1-99 sec	5	5	
.d2	Channel 2, Scene D - up fade time	1-99 sec	10	10	
d2	Channel 2, Scene D - down fade time	1-99 sec	10	10	
.A3	Channel 3, Scene A - up fade time	1-99 sec	1	5	
A3	Channel 3, Scene A - down fade time	1-99 sec	1	5	
.b3	Channel 3, Scene B - up fade time	1-99 sec	1	15	
b3	Channel 3, Scene B - down fade time	1-99 sec	1	15	
.C3	Channel 3, Scene C - up fade time	1-99 sec	1	3	
C3	Channel 3, Scene C - down fade time	1-99 sec	1	3	
.d3	Channel 3, Scene D - up fade time	1-99 sec	1	3	
d3	Channel 3, Scene D - down fade time	1-99 sec	1	3	
.A4	Channel 4, Scene A - up fade time	1-99 sec	1	5	
A4	Channel 4, Scene A - down fade time	1-99 sec	1	5	
.b4	Channel 4, Scene B - up fade time	1-99 sec	1	15	
b4	Channel 4, Scene B - down fade time	1-99 sec	1	15	
.C4	Channel 4, Scene C - up fade time	1-99 sec	1	3	
C4	Channel 4, Scene C - down fade time	1-99 sec	1	3	
.d4	Channel 4, Scene D - up fade time	1-99 sec	1	3	
d4	Channel 4, Scene D - down fade time	1-99 sec	1	3	
P2	Channel 2 AC power phase (see Sec. 3.5)	A, B, C	A	A	
P3	Channel 3 AC power phase (see Sec. 3.5)	A, B, C	A	A	
P4	Channel 4 AC power phase (see Sec. 3.5)	A, B, C	A	A	

A.3 Lamp/ballast type

The following settings allow customization of the dimming curve for use with certain LED lamps using the Lutron Hi-Lume series driver (see Sec 4.6)

DISP	DESC / FUNCTION	VALUE RANGE	Default, 2-ch	Default, 4-ch	Custom
c1	Channel 1, dimming curve selection	In,LL	in	in	
c2	Channel 2, dimming curve selection	In,LL	in	in	
c3	Channel 3, dimming curve selection	In,LL	in	in	
c4	Channel 4, dimming curve selection	In,LL	in	in	
dH	Reserved for Future use	00-05	00	00	
dL	Reserved for Future use	00-99	01	01	