

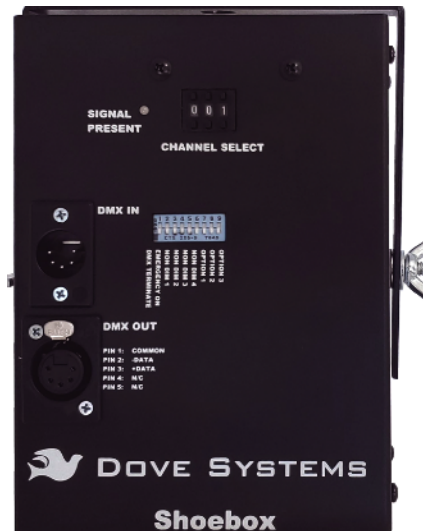


DOVE SYSTEMS

DimmerMaster Shoeboxes

Truss Mount Dimmer Packs

User Manual



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Receiving Your Unit

As soon as you have received your equipment, open the boxes and examine the contents. If the equipment in the carton does not match with your order or the packing slip, contact the factory immediately and we will be happy to help you. If any damage is noted, contact the carrier immediately to file a claim for damages. You can be sure that when the equipment left the factory it was in capable condition, thoroughly tested, and properly packed.

Features

This manual covers Dove Lighting Systems, Inc.'s line of truss-mount DimmerMasters: DM124-DUG, DM406-SUG, DM408-SUG, and DM410-SUG.

The DimmerMaster "Shoebox" Dimmer is a compact unit (approximately 5 pounds and 7 x 5 x 4 inches, not including the rubber feet, U-Bracket and mounting studs) with four 1kW dimmers. (The DM124-DUG has a single 2.4kW dimmer.) It may be pipe or tree mounted and is perfect for tight spaces where conventional rack mount dimmer packs are too bulky. The Shoebox may be powered from an appropriate single outlet.



The unit is controlled by a DMX-512 control signal (0 to +10VDC control is available as a configuration option). The starting DMX channel is set on the thumbwheel switch, which also provides load testing and local control. A status LED indicates the presence of a DMX signal. With both male and female XLR connectors, the control signal may be daisy-chained from pack to pack. The DMX signal may be terminated at the last pack by means of a DIP switch. Other switches set individual outputs for non-dim operation or force all outputs to full-on.

Installation

Mechanical Installation

For pipe mount use, a C-clamp and safety cable may be added to the mounting bracket. It may be top or bottom hung by reversing the yoke. For portable use, set the DimmerMaster “Shoebox” on a smooth cool surface, preferably in an area that remains fairly cool. Maximum air temperature must not exceed 50°C (122°F). Make certain that the vent holes all have at least 6 inches of free air around them. Do not block any vent holes. It is essential that this unit have adequate cooling for safe, reliable performance.

Electrical Installation

The pack consists of four 1kW dimming channels. (The DM124 has one 2.4kW dimming channel.) It requires a source of 120 Volts AC 50/60Hz with current capacity as listed in the following table for full-power operation.

| Model | Required Source Capacity (Amps) | Required Source Connector |
|-----------|---------------------------------|---------------------------|
| DM406-SUG | 15 | NEMA 5-15R or 5-20R |
| DM408-SUG | 20 | NEMA L5-20R |
| DM410-SUG | 30 | NEMA L5-30R |
| DM124-DUG | 20 | NEMA L5-20R |

The actual amount of power consumed is determined by the total wattage of the connected loads used; the dimmer itself consumes negligible power. It is recommended that no other equipment be connected to the circuit which is used for the pack, including other outlets on same fuse or circuit breaker. If the building circuit breaker trips, it may be necessary to reduce one of the loads.

Power input to the pack is via a flush-mount male connector either u-ground inlet (DM406) for regular extension cords, 20A 120V twist lock NEMA L5-20 (DM408 and DM124), or a 30A

120V twist lock NEMA L5-30 (DM410) mounted on the back panel. Always use 3-wire, grounded cables. 12AWG or larger cable is recommended.

When power is connected, the status LED will light up red (60Hz line) or yellow (50Hz line), and turn green when a DMX signal is present.

Grounding

The term “grounding” refers to a separate wire, usually with green insulation, which is connected from the equipment case to earth ground. This is not the same as the neutral or common and must not be confused with them. The neutral is a separate, load-carrying conductor, and common refers to the control signal’s common or reference voltage which should only be allowed to reach ground at a single point in the entire system (typically at the control console) to avoid ground loops.

When the pack is connected to the power source by a flexible cable, this ground connection is made through a third wire in the cable and to the ground prong on the plug. For maximum safety, and to comply with electrical codes, this connection must be made. Do not use an adapter (or “cheater”) plug.

Load Connections

The pack will dim any load up to 1kW per channel. The load may be incandescent, inductive or resistive. This includes conventional incandescent, quartz incandescent, “rain lights”, pin-beams, and similar “low-voltage” lighting loads containing transformers. Fluorescent and neon loads can be controlled by the Shoebox with no damage to the dimmer, but the nature of these loads requires specialized circuitry to get full range dimming. Consult the factory if you need to dim such loads.

Many “dimnable” LED bulbs work fine with the Shoeboxes (though it’s common for them to only dim to about 10% before turning completely off which can be disappointing), and the percentage of those in the market continues to increase with time as bulb manufactures improve their circuitry’s compatibility. Still, some LED bulbs will flicker at low power levels. There are a few approaches to dealing with these bulbs: The easiest is to test several different bulb models, and just avoid the trouble makers. Some control consoles can be programmed to avoid the problematic low power levels. In some cases, the flickering can be mitigated by adding parallel loads in the form of a low power incandescent bulb or resistors. Dove Systems offers factory installed 4.7k Ω output resistors by special order or retrofit.

Plug the load or an extension cord to the load into the outlet which corresponds to the circuit you wish to use. Always use grounded cords. Loads may be single fixtures or combinations of lights not exceeding a total of 1kW per channel (2.4kW on the DM124).

Each output channel is protected by a 10 Amp circuit breaker (20A on the DM124). If a breaker trips, it is generally due to an overload or short in the output load. However, elevated ambient temperatures or lack of ventilation can also result in breakers tripping just shy of their rated current.

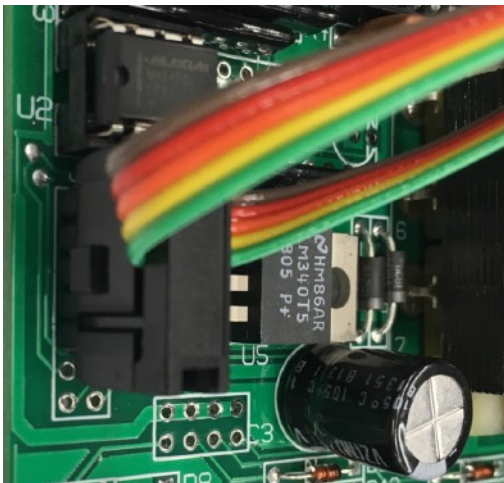
Control Connections

The pack accepts either DMX-512 or analog 0 to +10VDC control signals. **DMX control** signals are input through the male five pin XLR connector on the case and pass out on the female. Pin 1 is common; 2 & 3 are Data- and Data+ respectively. Pins 4 and 5 are usually not used but are passed through to other equipment.

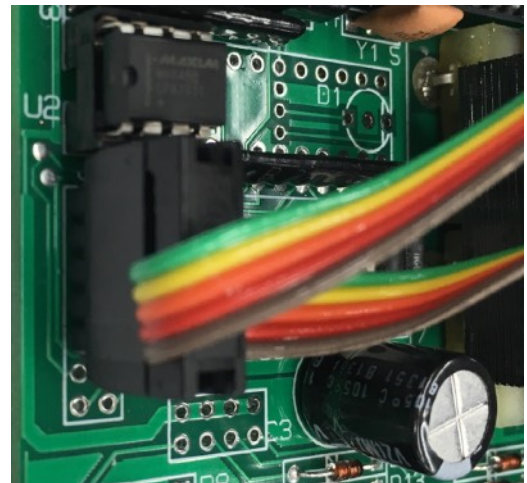
However when **DIP switch 9** (Option 3) is in the on position, it will supply +15VDC to the DMX connectors' Pin 5 for an external load referenced to Common, Pin 1. This is an unregulated power source and will typically vary between 12 and 18 Volts. Under no-load conditions it can reach 25V. It can support loads up to 100mA. An example application of this feature would be to power a Dove DMX-Y.

The dimmer packs are wired in series along the control cable: the cable is daisy-chained from pack to pack. Do not split the cable. Use one of the specialty interface boxes for this purpose (for example, the Dove DMX-Y).

To reconfigure a Shoebox to accept **analog control** signals, the unit must be removed from power and opened up. This requires removing 10 screws: 4 on both right and left sides and the top two on the front panel above the channel select. Inside, the XLR connectors are connected to the control card with a ribbon cable by a 2x5 header. To switch from DMX to analog, just reverse the header. This changes both XLR connectors from the DMX standard to 0-10V on pins 1-4 (outputs 1-4 respectively) and pin 5 becomes common.



DMX Control Configuration



Analog Control Configuration

Control

Starting Channel

The starting channel is set on a thumbwheel switch. When the switch reads 001, the dimmer pack runs on DMX channels 1 - 4. Setting 005 runs on channels 5 - 8, setting 009 runs on channels 9 – 12, and so on. Valid addresses range from 001 to 509 (512 for the DM124). The starting dimmer may be any channel, and dimmers on different packs can overlap some channels, though it is usually preferred to run them one dimmer per channel. Dimmer channels should not overlap channels for other DMX equipment, including strobe lights, & fog machines. It is not *necessary* to set the starting channels in sequence (ie. 1-4, 5-8, 9-12).

Load Test & Local Control

The thumbwheel switch enables the load testing / local control functions. The load test is useful for determining which load is plugged in. Set the first digit to 6 and the second digit to the dimming channel (from 1 to 4, but only 1 on the DM124). Set the third digit to the dimming level, from 0 (off) to 9 (full on). Levels thus set remain in effect until the power is disconnected or control is returned to DMX.

Here is an example:

- Set the thumbwheel switch to 600 for local control.
- Set the second digit to 1 to control the lamp on channel one. Set the third digit to 5 to put lamp one at half power. (The first load will now stay at half power)
- Next, set the second load to half power by setting the thumbwheel to 625. (The first and second load are now both at half power)
- Finally, set the thumbwheel to 639. This will set the third load to full on while leaving the first two loads at half power.

A **Crossfade Chase** function is also available for stand alone operation without a DMX source. Set the thumbwheel switch to 701 through 799 and the unit will perform a crossfading chase with 1 (701) to 99 second (799) steps between each of the four channels. On the single channel DM124, the chase function only fades the channel up and down with a 50% duty cycle.

Example:

Thumbwheel switch is set to 710. The unit will then crossfade from channel #1 to channel #2 in 10 seconds. Then the unit will crossfade from channel #2 to channel #3 in ten seconds, from channel #3 to channel #4 in ten seconds, and then back to channel #1. This will repeat until you change the thumbwheel setting or power down the unit.

To return to DMX operation, set the thumbwheel switch to the DMX start channel of your choice (1-512).

DMX Termination

DMX termination may be made on **DIP switch 1** on the front. Signal reflections can cause corruption of the DMX-512 data, typically causing flickering or flashing of lights in systems with long (>100 ft total) cable runs. Only the last pack in the chain should have termination enabled.

Non-Dim & Emergency On Functions

In addition to DMX termination (DIP1), the **DIP switches 3 through 6** set individual channels (1-4 receptively) for non-dim (full on or off) operation. The DM124 ignores DIP4-6. In non-dim mode, the dimmer forces that channel to full when it receives a DMX value of 50% or more and turns the channel off when it receives a DMX value less than 50%.

The Emergency On function, **DIP2**, forces all outputs to full on regardless of the control level — an easy first step when troubleshooting.

In Case of Trouble

Troubleshooting

A review of the following paragraphs may save you the cost of a service visit or of shipping and repair. Even if something is still wrong, this process will help you explain the malfunction to the service technician.

First, read the operating instructions carefully. Be sure you know how to operate the equipment. Do not expect this equipment to operate exactly like others. Many apparent failures result from not being familiar with the unit's operating characteristics.

Check all lamps and wiring for shorts that can cause damage to the dimmers.

There are three forms of malfunctions common to solid state dimmers:

- “Failed Off” (in which the lights do not come on)
- “Failed On” (in which the lights are on only)
- “Flickering” (where the levels will not maintain)

If a load has "failed off," check that the instrument is plugged in and that the lamp has not burned out. Verify that the dimmer pack is on (the LED will glow). Use the load test feature (see above) to see if the load can be controlled at the pack. Check if the circuit breaker on the unit needs to be reset — the button with the current rating on it will pop out, just push it back in to reset. Check that the control cable runs all the way back to the controller without

damage and that the signal has not been terminated at a pack somewhere up the chain. Check the controller, paying particular attention to the softpatch feature if so equipped.

If a load has "failed on," especially after resetting a breaker, it is probably due to a shorted triac. Triacs can fail when a short in the output overloads it faster than a circuit breaker can protect it. The short can be in the cable, in the connectors, in the light fixture, or in most often the lamp itself. Please check the load by plugging it into a known good *wall* outlet **before** plugging it into other dimming channels.

Flickering can be the result of a failing control console. Try an alternate control source or console power supply.

Channels which flicker or cut in and out can be victims of an intermittent connection somewhere, including broken slide controls. This can occur if dirt, coffee, or some other liquid is spilled into the slide control slot. Curing this problem usually requires the replacement of the control. Cleaning with WD-40 or TRI-FLOW may fix it temporarily.

Sometimes flickering is caused by a problem with the control cable. If DMX termination has not already been set at the last pack, set it. Crushed or pinched cables can cause intermittent failures. Try an opto isolator to eliminate any potential control cable ground loop problems. Swap control cables. Route them away from motors or other sources of noise. Do not use passive splitters.

In some installations, a Shoebox's breaker may trip after a long time in use. This is most likely to occur when a channel is loaded at or near its maximum rating and there are high ambient temperatures or limited ventilation. The solution will be to either decrease the load or improve cooling. Cooling can be improved by increasing the free space around the unit. They should never be installed in an enclosed space without plentiful free flowing air.

Obtaining Service

We are always happy to help you troubleshoot. Emailing photos of the situation to Dove@DoveSystems.com will provide a helpful point of reference for a phone call, 805-541-8292.

Service technicians are generally available between the hours of 8am to 3pm (Pacific Time) Monday through Friday. It is helpful to have a complete description of the problem and to be in the theatre or otherwise have access to the equipment when placing the call.

It is recommended that all equipment be repaired at the factory. If the unit is under warranty, it **MUST** be repaired at the factory. Replacement parts are available, but because the DimmerMaster packs are microcontroller based product running proprietary software, schematics **CAN NOT** be released.

To obtain service, please visit the Repairs page of our website, <http://www.DoveSystems.com/repairs>, download the Repair Form, and follow the instructions. We will get your Shoebox operating like new and return it quickly.

WARRANTY INFORMATION

The manufacturer agrees that the DimmerMaster shall be free from defects in material or workmanship from date of shipment over a period of one year. Said warranty will not apply if equipment is used under conditions of service for which it is not specifically intended. The manufacturer is not responsible for damage to its apparatus through improper installation, physical damage, or poor operating practice. If any device is found unsatisfactory under the warranty, the buyer should notify the manufacturer, and after receipt of shipping advice, buyer may return it directly to Dove Systems, San Luis Obispo, CA, shipping prepaid. Such equipment will be replaced or put in proper operating condition, free of all charges except transportation. The correction of any defects by repair or replacement by the manufacturer shall constitute fulfillment of all obligations to the purchaser. Manufacturer does not assume responsibility for unauthorized repairs to its apparatus, even though defective.

Manufacturer shall not be liable for any consequential damage in case of any failure to meet the conditions of any warranty of shipping schedule, nor will claims for labor, loss of profits, repairs, or other expenses incidental to replacement be allowed. No other representations, guarantees or warranties, expressed or implied, are made by the manufacturer in connection with the manufacture and sale of its equipment. This warranty is non-transferable and applies to the original buyer only.

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