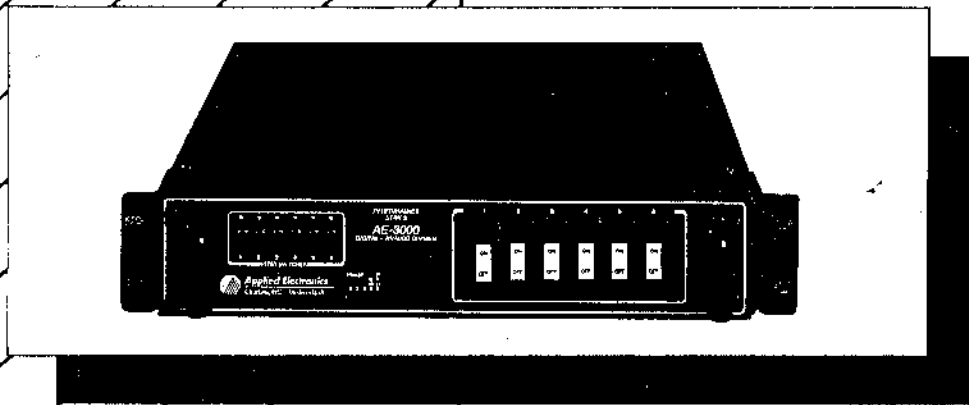


AE-3000-2
Digital
Dimmer



Operational
Manual



Applied Electronics

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INTRODUCTION

Congratulations, you are the owner of a state of the art digital lighting dimmer. The AE-3000-2 has six 3000 watt dimmer channels and uses either DMX512 or analog 0-10 vdc. control protocols. This unit is 2 EIA rack spaces and has been designed to operate continuously under full load.

MECHANICAL INSTALLATION

For temporary or portable operation, the AE-3000-2 may be placed on a flat surface with clearance of at least three inches on each side. Side clearances are required for proper integral fan forced air cooling. Ambient air temperature should not exceed 105 degrees fahrenheit (40 degrees Celsius). Areas exposed to rain or heavy dust should be avoided.

RACK MOUNTING

AE-3000-2 dimmers are designed to be rack mounted in EIA 19" equipment rails and can be supplied premounted as a rack system. If the user wishes to construct his own rack system, the following conditions should be observed:

1. Each unit must be supported in addition to the front rack ears. Side support rails or rear rack ears attached to rear rails are required to securely support the dimmer.
2. Sufficient ventilation openings must be provided on each side of the dimmer rack as air flow is from side to side. With proper side ventilation, fans within each dimmer provide adequate cooling requiring no additional rack fans.
3. Preferably, incoming power and load wiring would use properly rated quick disconnect type connectors for easy dimmer installation and removal. Alternately, enough slack should be left in the wiring to allow servicing.

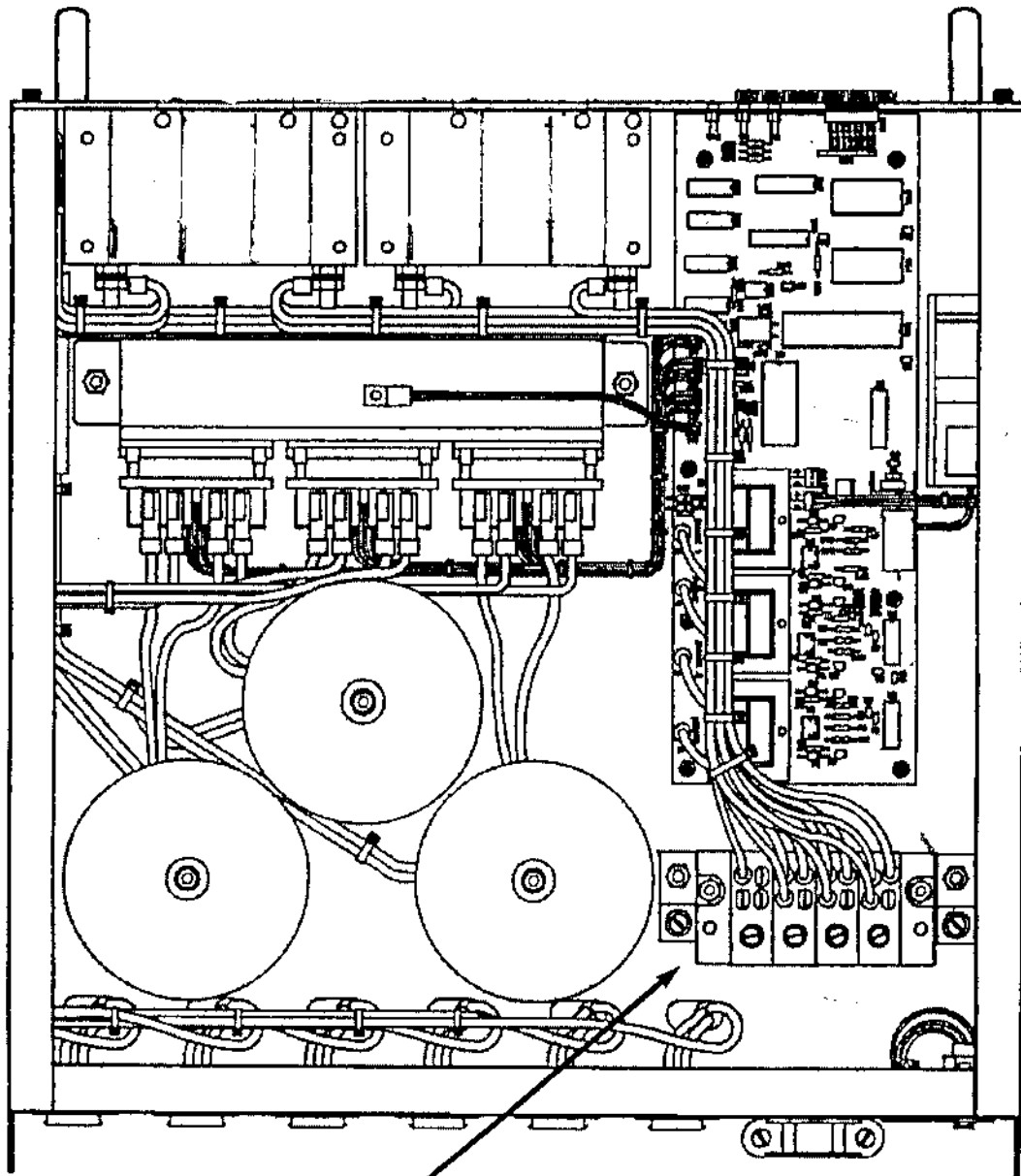
ELECTRICAL INSTALLATION

POWER HOOK-UP

The top cover must be removed to install AC power wiring. Wiring is then fed through the power clamp on the back of the dimmer and secured to the incoming power connection pressure lug terminals. Copper wiring is recommended. Always meter line side supply voltages and check the integrity of both neutral and ground lines before connecting power to the dimmer. Within the dimmer, all Phase 1 wiring is Black, Phase 2 wiring is Red, and Phase 3 wiring is Blue. Neutral, the return path for all loads is White. Safety ground wiring is Green.

NOTE: INSTALLATION WIRE SIZE, TYPE, AND ROUTING USED IN A PARTICULAR LOCATION SHOULD BE BASED ON THE CURRENT NATIONAL ELECTRICAL CODE AND APPLICABLE STATE AND LOCAL CODES. BECAUSE OF THE COMPLEXITY AND CONTINUAL REVISION OF THESE CODES, IT IS RECOMMENDED THAT INPUT POWER BE INSTALLED BY A LICENSED ELECTRICAL CONTRACTOR. APPLIED ELECTRONICS ASSUMES NO RESPONSIBILITY FOR THE SAFETY OR APPROPRIATENESS OF CUSTOMER INSTALLED WIRING.

ELECTRICAL INSTALLATION

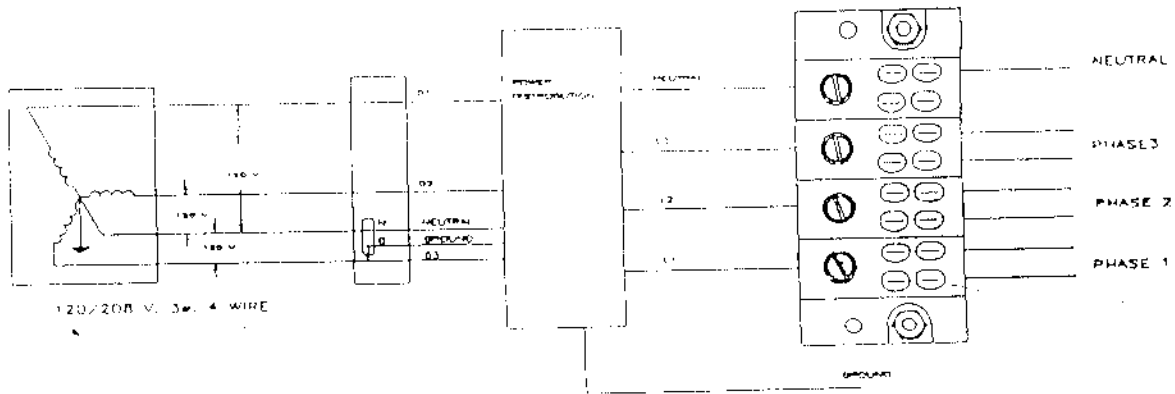


- | | |
|--|---------|
| | Ground |
| | Phase 3 |
| | Phase 2 |
| | Phase 1 |
| | Neutral |

Incoming Power
Cable Clamp

Figure 1

120/208 VAC, 3 phase, 4 wire (plus ground) is the preferred power input for each dimmer. Phase 1, Phase 2, and Phase 3 are the "hot" supply leads and are 120 VAC referenced to neutral. Each phase will draw 50 amps when the dimmer is fully loaded. With this type power input, Neutral is a current carrying conductor. Five wires must be installed to the dimmer power terminals; Phase 1, Phase 2, Phase 3, Neutral, and Ground. Terminals are marked for easy identification. **See Figure 1**



120/240 VAC, single phase, 3 wire (plus ground) may also be used. When more than 1 dimmer is to be installed, alternate wiring between **Figure 2a** and **Figure 2b** for optimal line loading. Neutral is a current carrying conductor. Each dimmer phase terminal will draw 50 amps when fully loaded.

Figure 2a

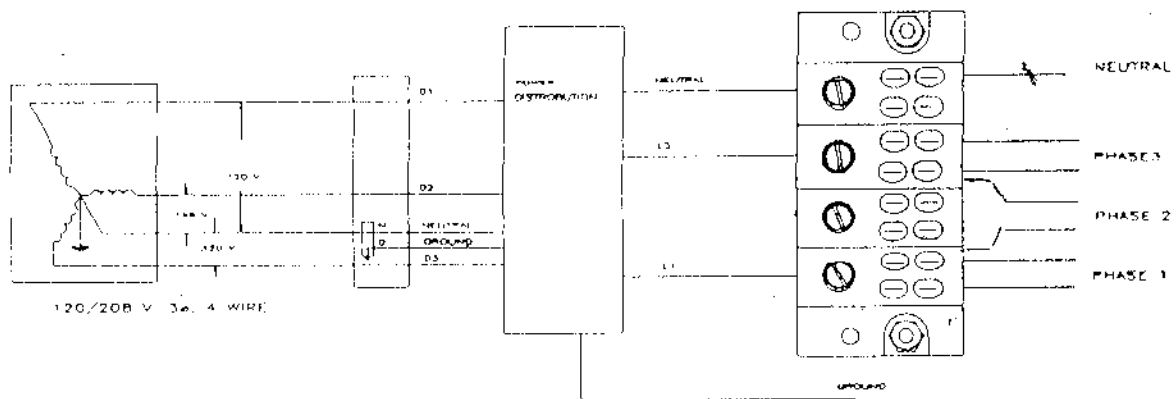


Figure 2b

DIMMER OPERATION OVERVIEW

Some DMX512 dimmers utilize a DMX decoder inside the unit to produce analog signals to control ramp comparison circuits (basically an analog dimmer with a DMX decoder inside). Other DMX dimmers may output only 64 different lighting levels. Analog dimmers may fluctuate from dimmer to dimmer in response time, trim, and output voltage curve, especially with change in ambient temperature.

The AE-3000-2 is a true digital microprocessor controlled dimmer. Digital operation insures matched dimmer to dimmer and channel performance. All 255 levels in the DMX512 protocol are supported in the AE-3000-2.

Analog 0-10 vdc signals are received via a 10 pin Cinch Jones connector and DMX512 data is received from a 5 pin XLR connector. The microprocessor then selects the higher light level setting and uses this data to calculate SCR firing times for each channel. This allows use of either a DMX512 controller or a 0-10 vdc analog controller which provides a useful back-up function. If DMX512 reception is lost, and a 0-10 vdc analog control signal is not present, the last received levels will be held indefinitely. If this occurs and a 0-10 vdc analog control voltage is received, stored DMX levels will be set to zero giving the analog controller total control.

OPERATION:

1. **DMX Input Connector:** Male and female 5 pin XLR type connectors are provided as per the DMX512 specification. **See Figure 3.**

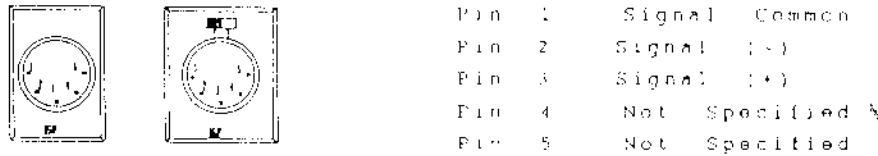


Figure 3

2. **Analog Input Connector:** Analog input is via a rear panel 10 pin Cinch-Jones type connector. **See Figure 4.**

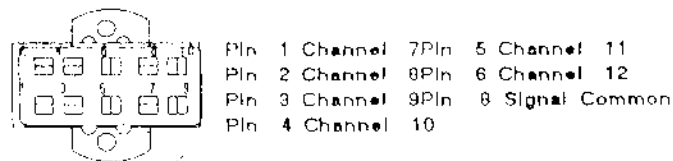


Figure 4

3. **Phase Indicators:** The presence of incoming voltage on each of the three phases is indicated by PHASE 1, PHASE 2, PHASE 3 green LED's. These are after the technical power fuses and show voltage present from the three respective internal dimmer power supplies. If power is lost on one or two phases, lighting on the remaining powered phases will continue to operate.

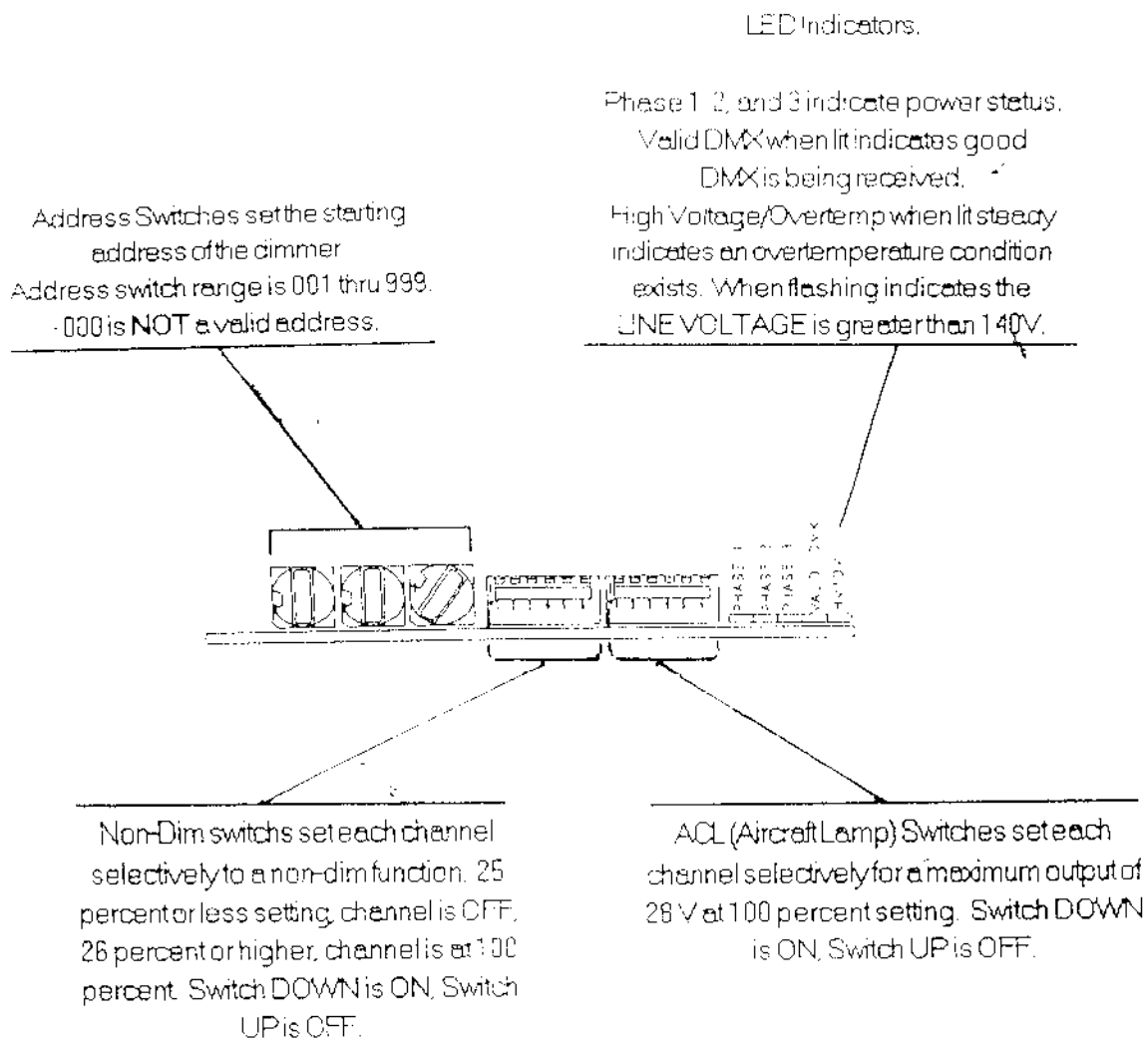
OPERATION CONTINUED:

4. **Analog Hi & Low Trim Adjustments:** Trim adjustments are located on the microprocessor board. When rotated clockwise, increases the preheat voltage from 0-35 vac rms. Low trim is used to preheat the filaments and extend bulb life. Factory settings are zero preheat voltage and a 10 vdc control signal sets the dimmer to maximum output.

5. **Test Switches:** A test switch is provided for each dimmer channel and may be used to aim lighting instruments without a controller. Pressing the test switch causes a microprocessor controlled soft change from the present controller level to full up. Pressing again turns the test switch off and causes a soft change back to the controller setting. This soft change feature is intended to reduce lamp failure from cold filament thermal shock. When in the test position an LED in the switch is lit.

6. **DMX512 Address Switches:** The DMX512 address switch which is found behind the front panel access door is used to set the channel starting address number. Channel assignments for this dimmer are in groups of six. **See Figure 6.**

Figure 5



OPERATION CONTINUED:

7. **Valid DMX512 Indicator:** This indicator illuminates only if valid data for the address selected is being received. Example: if the switch address is 258 and the console only outputs channels up to 256, the indicator will not illuminate, data is not being received for that address. If DMX512 data is lost the indicator will flash for ten seconds. If this indicator is on but flickering, you may be receiving bad data or the console update rate is too slow for clean step-less operation.

When incoming DMX512 data is lost, the last received data will be held (the lights will stay at the same brightness) until DMX data reception is restored or an analog control signal is received.

8. **Overvoltage Indicator:** This red LED indicator is illuminated if the incoming ac voltage exceeds 140 vac. If this condition occurs the microprocessor will cut off drive to the SCR's thus protecting loads. Drive will return as soon as incoming voltage returns to a normal level.

9. **Load Indicators:** Presence or a load connected to a channel is indicated by a yellow LED.

10. **Drive Indicator:** A green LED on each channel lights in proportion to the drive signal being sent to the SCR's for that channel.

11. **Channel Breakers:** Fully magnetic 25 amp circuit breakers protect against overloads and also serve as channel disconnect switches. This type of breaker is not affected by ambient temperature or cabling temperature rise.

DMX512 LINE TERMINATION:

Proper termination of the DMX512 data line is important to prevent data errors. The technical explanation for proper line termination is beyond the scope of the document. Fortunately, the hands on implementation is fairly simple. A DMX connector with a internal termination resistor should be plugged into the most distant dimmer from the console. Generally, the termination resistor is 120 ohms and is connected across the two data lines. If the DMX512 lighting console is not connected to a dimmer or system, the termination resistor shorts the inputs to the DMX receivers in each dimmer. Since the receivers are differential comparators, their outputs will not be specifically defined. To force receivers to have proper and known outputs in this situation, one dimmer in each rack should be jumpered to provide a bias voltage to the receivers.

Figure 7

