

AE-2400D
Digital
Dimmer



Operational
Manual



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INTRODUCTION

Congratulations, you have purchased a state of the art digital lighting dimmer. The AE-2400D has six 2400 watt dimmer channels and uses the USITT DMX512 control protocol. 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-2400D 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-2400D 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 cable clamp on the back of the dimmer and secured to the incoming power connection pressure lug terminals. **See Figure 1.** 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, (line and load) 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

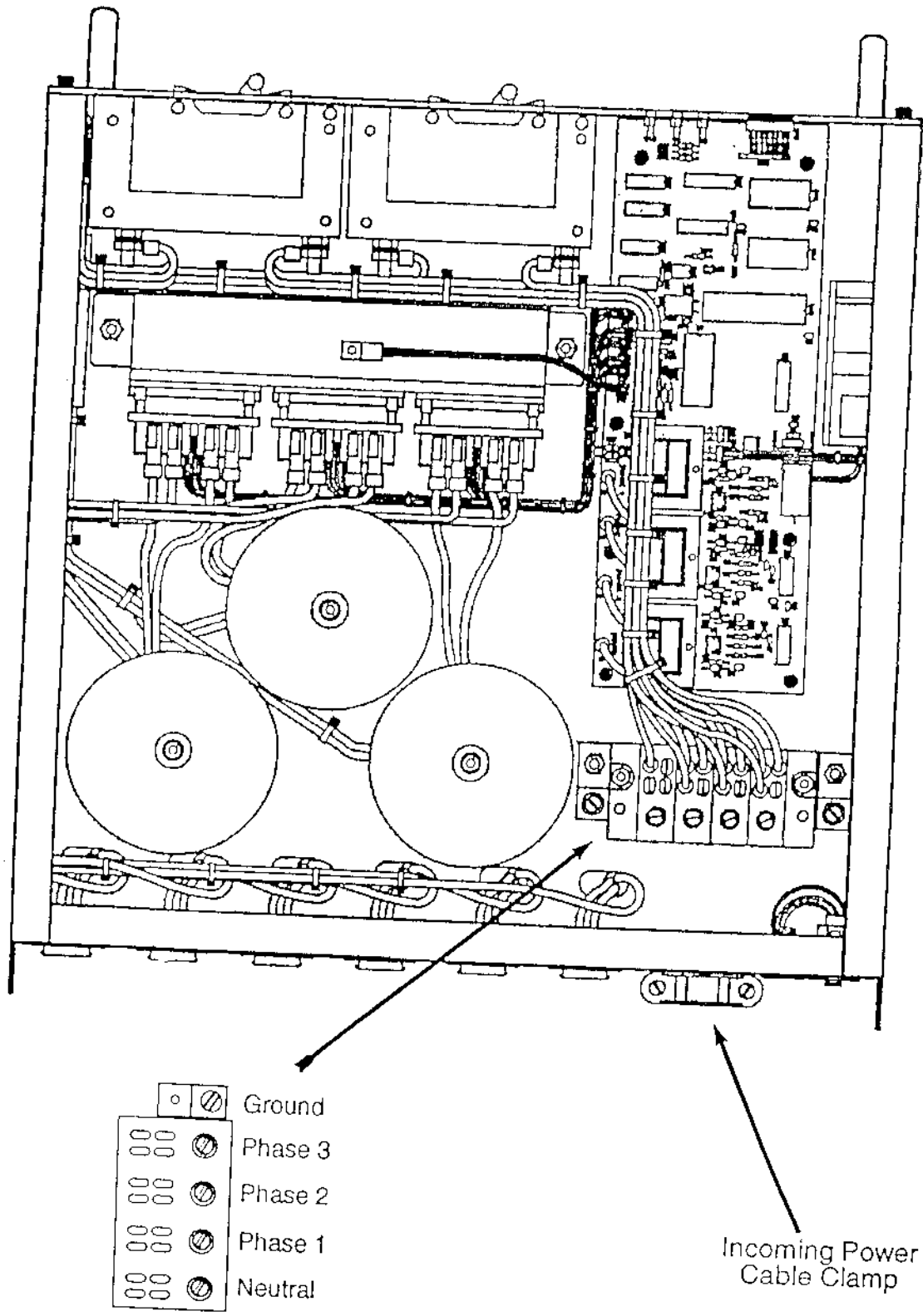
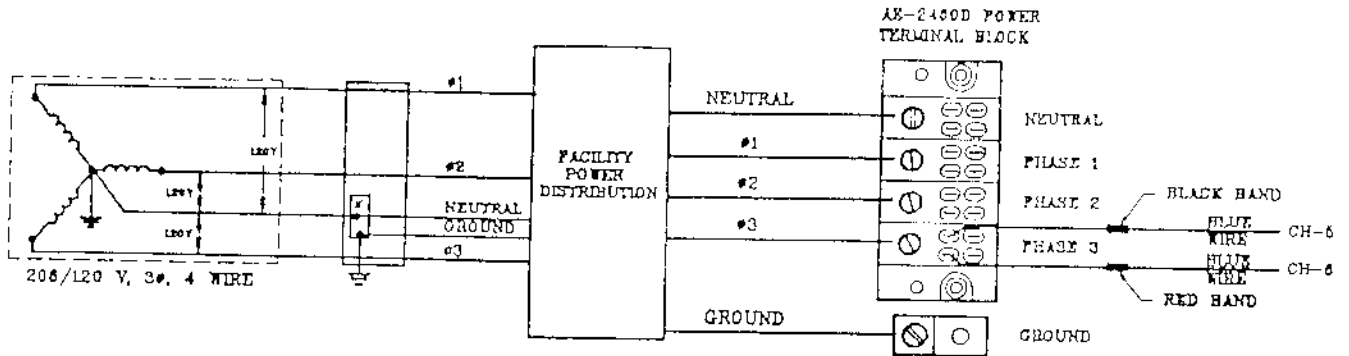


Figure 1

120/208 VAC, 3 phase, 4 wire (plus ground) may be used to power the dimmer. Phase 1, Phase 2, and Phase 3 are the "hot" supply leads and are 120 VAC referenced to neutral. Each phase will draw 40 amps when the dimmer is fully loaded. With this type of 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 2.

Figure 2



120/240 VAC, single phase, 3 wire (plus ground) may also be used. There is no need to alternate phase loading when more than 1 dimmer is to be installed, the AE-2400D offers single phase balanced load operation. This is accomplished by moving two wires from the Phase 3 terminal block to Phase 1 and Phase 2 respectively, and changing the pcb jumpers J-3, J-4 to J-5, J-6. Neutral is a current carrying conductor. Each phase terminal will draw 60 amps when fully loaded. Wiring for single phase operation is illustrated in Figure 3.

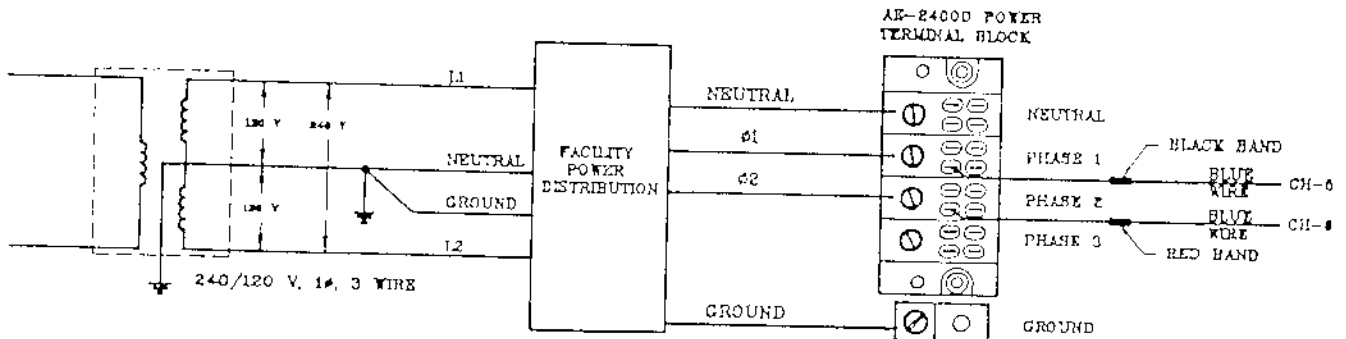


Figure 3

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-2400D is a true digital microprocessor controlled dimmer. Digital operation insures matched dimmer to dimmer and channel to channel performance. All 255 levels in the DMX512 protocol are supported in the AE-2400D.

DMX512 data is received from a 5 pin XLR connector. The microprocessor then uses this data to calculate SCR firing times for each channel.

If DMX512 reception is lost, the last received levels will be held indefinitely until data reception is restored.

OPERATION

1. **DMX Input Connector:** Male and female 5 pin XLR type connectors are provided as per the DMX512 specification. See Figure 4.

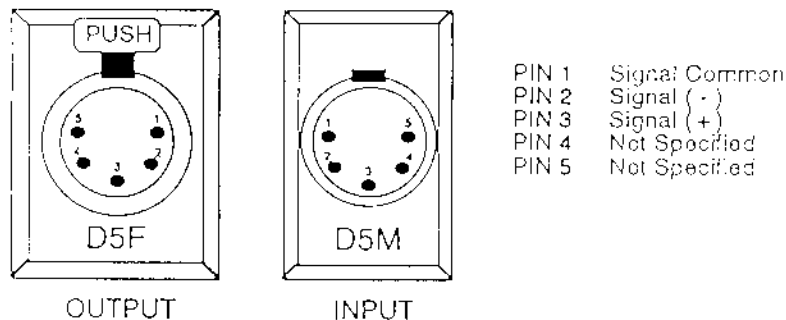


Figure 4

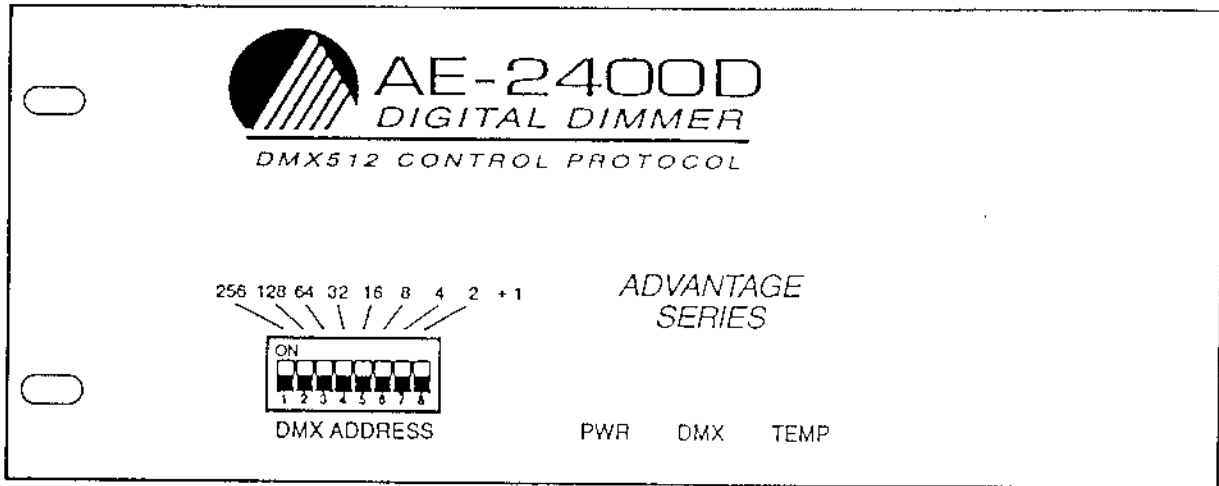
2. **Power Indicator:** A Green LED indicated the presence of AC power and operation of the dimmer low voltage supply. If power is lost on one of two phases, the dimmer will continue to operate on the remaining phase.

3. **Valid DMX512 Indicator:** This Yellow LED 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 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.

OPERATION CONTINUED

4. **DMX512 Address Switches:** The DMX512 address switch is found on the front panel and is used to set the dimmer channel starting address. Channel assignments for this dimmer are in groups of six. Add the switch values indicated above the switches, plus one, to obtain selected starting address. See Figure 5.

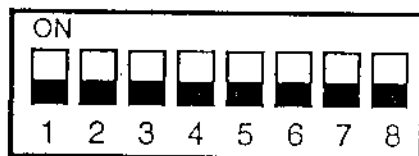


Dimmer Channel Address	EXAMPLE SWITCH SETTINGS							
	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
1	256	128	64	32	16	8	4	2
49	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
507	ON	ON	ON	ON	ON	ON	OFF	ON

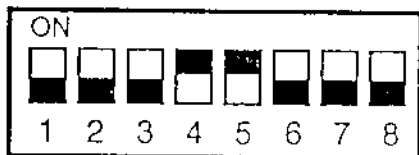
Figure 5

ADD VALUES OF SWITCH SETTINGS +1 TO OBTAIN STARTING DIMMER ADDRESS.

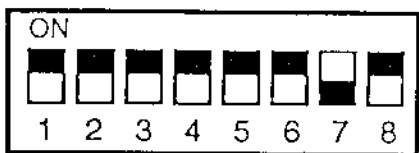
SWITCH 1 ON = 256 SWITCH 5 ON = 16 OFF = 0
 SWITCH 2 ON = 128 SWITCH 6 ON = 8
 SWITCH 3 ON = 64 SWITCH 7 ON = 4
 SWITCH 4 ON = 32 SWITCH 8 ON = 2



DMX address = 0+1=1



DMX address = 32+16+1=49



DMX address =
 256+128+64+32+16+8+2+1=507

OPERATION CONTINUED

5. **Channel Breakers:** Fully magnetic 20 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.

6. **TEMP Indicator:** A Red LED on the front panel will illuminate if the internal heatsink temperature rises above 105 degrees. This indicates that an over temperature condition exists and drive to the SCR's has been shut down. When the temperature drops below 105 degrees, drive to the SCR's will be continued. Fan and logic board operation continue during over-temp conditions.

7. **Pre-Heat Operation:** "Pre-Heat" is a small voltage that can be selected to heat the filament in the lamp to prevent thermal shock and premature lamp failure. This voltage is 3.5 volts ac (rms) when connected to a 1,000 watt load. This is enabled by placing the pcb jumper on J-21. The AE-2400D is shipped from the factory with pre-heat enabled. If pre-heat is not desired, remove jumper J-21.

DMX512 LINE TERMINATION

A DMX termination switch is provided on the rear panel for last pack data line termination. This switch should be set to the "ON" position if the dimmer is the last unit or most distant unit from the controller in the DMX data line. In the "ON" position, this switch places a 100 ohm resistor between pin 2 and pin 3 of the DMX512 connector. Only one unit should have the termination switch active, all other dimmers or DMX512 devices should have their termination switches set to "OFF".

SAMPLE DIMMER ADDRESS SETTINGS



DMX ADDRESS 1
CHANNELS 1-6



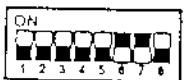
DMX ADDRESS 25
CHANNELS 25-30



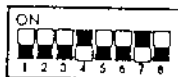
DMX ADDRESS 7
CHANNELS 7-12



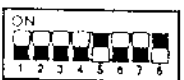
DMX ADDRESS 31
CHANNELS 31-36



DMX ADDRESS 13
CHANNELS 13-18



DMX ADDRESS 37
CHANNELS 37-42



DMX ADDRESS 19
CHANNELS 19-24



DMX ADDRESS 43
CHANNELS 43-48

**Warranty on all
electronic dimmers
and controllers is 1
year on parts and
service**

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