AE-1200
Digital Dimmer

Operational Manual

Applied Electronics
TRUSSING • LIFTS • ROOFING
DIMMING • CONTROL • DISTRIBUTION
STAGING

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INTRODUCTION

Congratulations, you have purchased a state of the art digital lighting dimmer. The AE-1200 has four 1200 watt dimmer channels and uses the USITT DMX512 control protocol. DMX512 addressing is via the address switches on the side of the unit. A Green LED shows reception of valid DMX512 signal on the selected address.

AC POWER CONNECTION 2 LINES

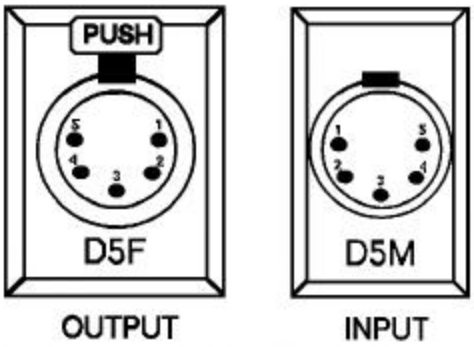
The AE-1200 Dimmer is powered from 120 vac 60 hz single phase power. AC line #1 powers channels 1 & 2, AC line #2 powers channels 3 & 4. The incoming power does not have to be from the same phase, and connecting power to either line will power the corresponding channels. However, both AC lines must be present for all four channels to operate.

DMX ADDRESSING AND OPERATION

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-1200 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-1200.

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



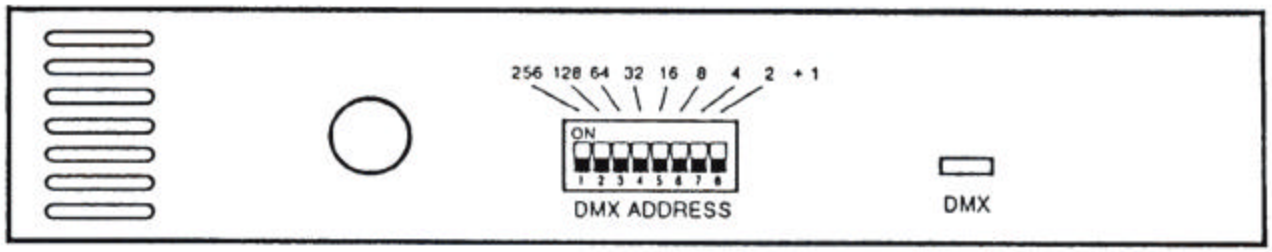
PIN 1 Signal Common
PIN 2 Signal (-)
PIN 3 Signal (+)
PIN 4 Not Specified
PIN 5 Not Specified

Valid DMX512 Indicator: This Green 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 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.

DMX512 Termination: For proper DMX512 operation it is important that a 100 ohm termination resistor be placed at the end of the DMX512 signal path to insure proper signal reception and dimmer operation. This resistor should be placed between pins 2 & 3 in the 5 pin connector. If a termination resistor is not used, the dimmer packs furthest from the console may flicker or not work at all.

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

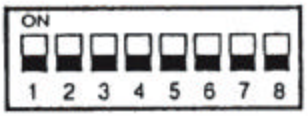


AE-1200 Side View

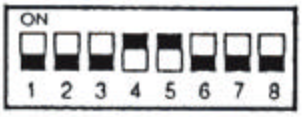
Dimmer Channel Address	EXAMPLE SWITCH SETTINGS							
	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Switch Value	256	128	64	32	16	8	4	2
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
49	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
507	ON	ON	ON	ON	ON	ON	OFF	ON

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

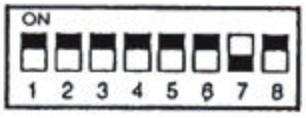
SWITCH 1 ON = 256
SWITCH 2 ON = 128
SWITCH 3 ON = 64
SWITCH 4 ON = 32
SWITCH 5 ON = 16
SWITCH 6 ON = 8
SWITCH 7 ON = 4
SWITCH 8 ON = 2
OFF = 0



DMX Address = 0+1=1



DMX Address =
32+16+1 = 49



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

Engineers and Architects Specifications:

AE-1200 Digital Dimmer

The dimmer shall be designed to hang from an iron pipe clamp. (1.8" high x 14.75" wide x 9.5" deep.) Weight for the dimmer pack shall not exceed 14 pounds.

Each dimmer pack shall be housed in an aluminum enclosure. The finish shall be industrial grade mar and scratch resistant textured polyurethane enamel. All graphics shall be silk-screened to the front and rear panels.

The dimmer pack shall operate on (2) 120 vac single phase, three wire 15 amp Edison plugs. The side panel shall be available with two power output options, either 20 amp Stage Pin or 15 amp Edison outlets.

Load connections shall be rear accessible. The back panel shall be replaceable to allow selection of various power output options including 20 amp Stage Pin, Terminal Block and 20 amp Edison outlet.

The dimmer pack shall be designed to operate safely with all channels fully loaded.

Each dimmer pack shall consist of four 1200 watt solid state dimmer channels. Output power shall be handled by two Silicon Controlled Rectifiers (SCR's) for each channel. Power device on state current shall be rated at five or more times the RMS current carried by the device at full rated load.

Use of TRIAC's as output power devices will not be acceptable.

Each dimmer shall be capable of hot patching cold incandescent loads at full capacity without malfunction.

Toroidal filtering with a rise time of not less than 400 microseconds shall be utilized on each dimmer channel to limit objectionable audible load noise (lamp filament sing), transmitted radio frequency interference (RFI), and RFI conducted onto the AC power lines.

The dimmer shall accept USITT DMX512/1986, and DMX512/1990 control protocols directly without external hardware. When DMX512 control data is being received, a front panel LED shall indicate reception of valid DMX512 information addressed to the dimmer pack.

Isolation between control signal and the AC power line shall be a minimum of 2500 volts.

Internally, the dimmer shall be a fully digital design. Digital techniques shall be used to calculate power device turn on times. DMX512 digital information shall not be converted to analog values and fed to an analog dimmer. All 255 dimming levels supported by the DMX512 protocol shall be implemented.

Dimmer output RMS voltage as determined by the control protocol shall follow the Square Law dimming curve. Curve stability shall be maintained without the need for adjustment. Output RMS voltage shall remain within $\pm$ 2% with changes in the load from 10 watts to full rated load. Channel to channel variation shall be less than 2%.

Dimmer output shall operate from full off to full on and vice versa within one half cycle of the AC line following reception of control information. Response time shall be independent of load.

Power efficiency shall be greater than 96% at full rated load. Output voltage under full load shall be within 4 volts RMS of the incoming AC line voltage.

The dimmer shall be covered by a 12 month factory warranty.

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Warranty on all electronic dimmers and controllers is one year on parts and service

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