



## INSTALLATION INSTRUCTIONS

- 1 - Ensure that relay panel power is off (no indicator LEDs glowing on the system motherboard). Remove the metal cardframe cover.
- 2 - Connect the DMX data line at the panel motherboard, with D- to the black terminal and D+ to the red terminal. Attach the shield drain wire to the SHIELD terminal.
- 3 - If the DMX line is to be passed through to another panel, attach the outgoing wires to the second set of data terminals.
- 4 - If the relay panel is the last panel on the DMX wire run, it is recommended that a 100 or 120 ohm 1/4W termination resistor be installed between one pair of black and red data line terminals.
- 5 - Connect switch wiring to the A/B master switch input terminals as required. The white terminal is switch common, the red is switch "on", and black is switch "off". Connect the pilot lamp to the yellow terminal adjacent to the first of the assigned relays.
- 6 - Plug the controller card and one to four LCRD-12 driver cards firmly into the cardframe.
- 7 - Configure the controller card according to the following DIP switch settings. Restore power.
- 8 - Check that the power LED (between the DIP switch and the three rotary switches) is glowing steadily. This indicates +5 volts present and correct microprocessor operation. A flashing LED indicates a defective controller card.
- 9 - Follow the program mode instructions to program the card for optional DMX patch assignment and panel master switch inputs.
- 10 - Apply the DMX control signal and observe that the receive data LED (at left) is glowing. The LED will not glow if the address set on the rotary switches exceeds either 512 or the number of dimmer signals present on the data line, if the data format does not conform to USITT-DMX512, or if the data wires are reversed at the motherboard.
- 11 - Verify relay operation with the DMX control system or the card's test function, then use the checklist to ensure that everything is set correctly before re-installing the cardframe cover.

## DIP Switch Settings

<b>THRESHOLD SELECT</b>		
25% THRESHOLD (Trigger on at 30%, off at 20%)	DS-1	
75% THRESHOLD (Trigger on at 80%, off at 70%)	ON	
<b>STATUS QUO</b>		
ON (INFINITE HOLD)	DS-2	
OFF (2 SECOND HOLD)	ON	
<b>RELAY SELECTION</b>		
	DS-3	DS-4
1-12 RELAYS INSTALLED	ON	ON
13-24 RELAYS INSTALLED	OFF	ON
25-36 RELAYS INSTALLED	ON	OFF
37-48 RELAYS INSTALLED	OFF	OFF
<b>CONTROL MODE</b>		
PATCH Addressing determined by programmed patch for each relay		DS-5
OFFSET Panel start address determined by the address select switches		ON
<b>SCAN RATE</b>		
FAST SCAN (50 msec., 20 relays per second)		DS-6
NORMAL SCAN (100 msec., 10 relays per second)		ON
<b>PROGRAM MODE</b>		
Program Mode Enabled		DS-7
Program Mode Disabled (RUN MODE)		ON
<b>TEST MODE</b>		
Test Mode enabled		DS-8
Normal (RUN) Mode		ON
		OFF

## NORMAL (RUN) MODE CHECKLIST

- 1- JP1 is in the "open position"
- 2- DS-1 and DS-2 set for relay operating threshold
- 3- DS-3 and DS-4 set for number of relays in panel
- 4- DS-5 set for patch or offset mode
- 5- DS-6 set for normal or fast relay scan rate
- 6- DS-7 (program mode) and DS-8 (test mode) are off

## PROGRAMMING

**DS-8 must be off and DS-7 on. The "PGM" LED will be on.**

**Program Patch:** *DS-5 ON, JP1 OPEN*

The address switches set the equivalent DMX device channel (001 to 512) and the relay switches select the relay number (01 to 48). Pressing the program store pushbutton (S1) to store the patch assignment will cause program (PGM) LED to flash once unless an incorrect address or relay value has been selected.

**NOTE:** Address 000 is used to clear the patch assignment for the selected relay. Each relay can be assigned to only one DMX channel. A new assignment for a relay overwrites the previous assignment for that relay.

**Clear Patch:** *DS-5 ON, JP1 SHORTED*

The entire patch will be cleared when the program pushbutton is pressed. The "PGM" LED will flash once to indicate a successful execution.

**Program Master Sw.A:** *DS-5 OFF, DS-6 OFF, JP1 OPEN*

The relay switches select the relay number to connect. The program pushbutton is pressed to execute. The "PGM" LED will flash once unless an incorrect relay value has been selected.

**Program Master Sw.B:** *DS-5 OFF, DS-6 ON, JP1 OPEN*

The relay switches select the relay to connect. The program pushbutton is pressed to execute. The "PGM" LED

will flash unless an incorrect relay value has been selected.

**NOTE: To program a Master Switch the DMX address switches must be set to an address other than 000.** To clear the connection between a master switch and an assigned relay, set the address select switches to 000 and press the program button. Each master switch can be connected to any combination of valid relays. Panel master switches can be tested while in the program mode.

**Clear Master Sw.A:** *DS-5 OFF, DS-6 OFF, JP1 SHORTED*

Press the program pushbutton to clear all relay connections to master switch A. The "PGM" LED will flash once.

## NOTES ON GROUNDING

Pay particular attention to the grounding of the data line shield. If the DMX controller grounds the shield, that is sufficient. If not, a jumper wire must be installed between the data line SHIELD terminal and the relay panel COM terminal. Only one such ground connection should be made in any one data cable run.

## TEST MODE

**DS-7 must be off and DS-8 on. The "TST" LED will be on.**

### DS-5 ON...PATCH TESTING MODE

The address switches select the DMX device channel. When the program pushbutton is pressed the assigned relay(s) and their status LEDs will turn on. The "TST" LED will flash once if there is an error in address range selection.

### DS-5 OFF...RELAY AND DMX TEST FUNCTION

The address switches select the relay number to test. The selected relay can then be turned on by pressing the program pushbutton. If the number is out of the correct range (000 to 048) the "TST" LED will flash to indicate an error when the button is pressed.

The DMX receive LED (RxD) will be on and steady if a valid DMX signal is received. If no DMX signal is present the LED will be off, and if the DMX signal is not valid the LED will flash continuously.

## NOTES ON DMX OPERATION

When a DMX signal is used to control relays, on or off operation occurs as signal levels pass through the set threshold. If the DMX signal fails while relays are in the on state, those relays will turn off after a two second timeout unless STATUS QUO was turned ON or they were turned on by a panel master switch (see below)

## NOTES ON CONTROL MODE

**PATCH MODE OPERATION:** Addressing is determined by the programmed DMX patch assignment for each relay. In this mode, any relay can be assigned to any DMX device in any order. Any number of relays can be assigned to the same DMX channel, but each relay can be assigned to only one DMX channel

**OFFSET MODE:** Panel start address is determined by the address select switches. These switches select the DMX address for relay #1 and all other relays in that panel follow sequentially.

## NOTES ON PANEL MASTER SWITCHES

Panel master switch inputs function in a "highest level takes precedence" (HTP) mode of operation with the DMX signal. If the DMX level for a given relay is above the set threshold, the panel master switch will not turn that relay off. Similarly, lowering the DMX signal for a relay will not turn that relay off if a master switch has previously turned it on. This function allows the user to pre-set relays to the on state prior to lowering or shutting off the DMX signal. In the absence of a DMX signal, the A and B master switches will operate in a "last action takes precedence" (LTP) mode, that is, either one will turn on or off a relay assigned to both switches.

Panel master switch inputs may be operated by either momentary or maintained action switches or contacts. If a momentary switch is used, connect as per step #3 in the installation instructions. For maintained switches, connect the RED (ON) and BLACK (OFF) terminals together, then connect those to one terminal of the switch. The other switch terminal connects to WHITE (SWITCH COMMON). When the maintained contact closes, assigned relays will be cycled ON, when the contact opens assigned relays will cycle OFF.

The ON cycle will also occur if the switch contact is in the closed



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