

MX-3000+ Control Retrofit for Electronics Diversified Inc. (EDI) Mark VII Dimmer Racks Specifications

1.0 MX-3000+ - GENERAL

1.1 **MX-3000+** is a direct retrofit kit specifically designed for facilities with existing Electronics Diversified Inc. (EDI) or Copper MX Series dimmer rack(s) requiring new, reliable and cost-effective control electronics. **MX-3000+** is designed to upgrade existing dimmer installations to current dimming technology while maintaining the existing rack, modules and wiring infrastructure. Designed for pin-to-pin compatibility with the MX Series OEM factory dimmer control wiring, installation is both fast and easy. Facilities can upgrade to this state-of-the-art technology in minutes. The **MX-3000+** is ETL compliant with UL 508 and CSA 22.2 safety approvals.

1.2 **MX-3000+** shall employ a unique "lamp warming" feature that extends lamp life substantially by limiting the in-rush current from the dimmer to cold lamp filaments by up to 70%.

1.3 An LCD user interface for ease of set up and monitoring. All programming shall be via a user-friendly, intuitive and self-prompting menu structure. No PC or special OS software by others will be required.

1.4 Modular design of the unit shall make any potential service requirements fast and easy.

1.5 Dimmer control outputs shall be designed for precise and reliable control of the existing MX Series dimmer modules. It shall never be necessary to adjust ramp circuits for proper dimmer output.

1.6 The **MX-3000+** shall accept dual independent DMX 512-A digital data protocol inputs allowing industry wide compatibility with modern control consoles. Both DMX inputs shall be independently opto-isolated from all other control circuitry, as well as from the DMX output ports. An internal protocol manager shall allow priority management, offset start addressing or merging of both DMX inputs. It shall be possible to "patch" any of the 96 dimmer (PWM) outputs to any DMX A or DMX B input channel.

1.7 An infrared LED link shall be provided on the control module face panel. This interface will permit hard copy printouts of all programmed data via an optional hand held infrared printer.

1.8 Rack thermal protection shall be employed to interface with the existing dimmer module over-temp sensors and wiring. An active over-temp input from any dimmer shall illuminate a red warning LED. An internal **MX-3000+** temperature of 65°C shall immediately disconnect of all dimmer control outputs.

2.0 CONTROL PCB

2.1 The **MX-3000+** control electronics shall be capable of controlling up to 96 dimmers in the MX Series dimmer cabinet. Advanced state-of-the-art voltage regulation hardware and software will ensure >1% all dimmer outputs. The **MX-3000+** will operate with a voltage input range of 85-264VAC at 50 or 60Hz.

2.2 The **MX-3000+** shall be capable of memorizing and storing up to 20 presets in the form of a DMX "snapshot" or individually programmed via the keypad. Scene playback shall be seamless on loss of DMX as well as allowing high resolution fades between all 20 scenes. Each scene shall have a selectable fade time from 0-99 seconds.

2.3 The DMX512 input ports shall accept two independent sources of DMX512 data protocol simultaneously from the system control console(s) or architectural control unit(s). The DMX inputs shall comply with USITT DMX512-A (ANSI E1.11 - 2008), standard protocol for digital data control.

2.4 It shall be possible to assign (patch) any dimmer control signal to any module position in the cabinet, thereby allowing dimmer modules of any rating to be used in the same cabinet.

2.5 **MX-3000+** will offer compliance with the International Energy Agency's "One Watt Initiative" on stand-by power requirements (please refer to U.S. Executive Order #13221). Standby power on the **MX-3000+** shall not exceed 1 Watt.

2.6 The **MX-3000+** shall allow "back up" of all system configuration data. All data shall be protected from power failure by EEROM for a minimum of 100 years.

2.7 The **MX-3000+** shall contain a removable memory dongle to facilitate remote or off site back up of all system configuration and ease of future firmware upgrades. **MX-3000+** swaps, if necessary, will be easy and fast with no loss of rack programming or system parameters.

2.8 The **MX-3000+** shall accept up to 4 (four) analog inputs with the ability to be assigned to any of the 96 outputs in the system. Each analog input shall be selectable as either "Normal" mode (0-10VDC input) for dimmed applications or "Load Shed" mode (5VDC trigger) for power management interface to building management systems (BMS). The analog inputs shall function in a pile-on or HTP mode with the DMX control signal.

2.9 Dedicated dry contact inputs shall be provided for BMS, HVAC, security and fire alarm. Active security input shall "flash" any programmed dimmer outputs to a selectable level at a rate of 1Hz. Active fire alarm input shall bring any programmed dimmers to a selectable level and override all incoming control data.

2.10 Each individual dimmer in the dimmer rack shall be capable of being assigned one of four dimmer curves: incandescent square law curve, direct curve, linear curve, or non-dim. Non-dim threshold shall be adjustable in 10% increment from 10% through 100% with a 5% hysteresis.

2.11 The face of the **MX-3000+** shall include an LCD display and momentary push buttons for function select, parameter setting and feature monitoring. All programming shall be via a user-friendly, intuitive and self-prompting menu structure. It shall not be necessary to use a PC or any external programming device to configure or set-up any function of the **MX-3000+**.

2.12 The **MX-3000+** shall employ the "system-on-a-chip" advanced "3000 Series" digital technology. Such electronic circuitry shall permit real time signal monitoring and status LED indication to allow easy setup and remote troubleshooting. The **MX-3000+** shall permit configuration/monitoring of the following within the MX Series dimmer rack:

SCENESET Enable and setup 20 different backup scenes.

FADETIME Set the fade time for each of the 20 scenes from 0 to 99 seconds.

SNAPSHOT Record DMX levels into the backup scenes.

DIM TEST Test the dimmer outputs one at a time, or all at once.

MONITOR View the control level to each dimmer output.

ADDRESS Set the DMX start address.

DMX MODE Configure the mode of the on-board DMX protocol manager.

2 RM SET Set the two room assignment for each of the dimmer outputs.

DMXA TRM Enable or disable termination on the DMX A input.

DMXB TRM Enable or disable termination on the DMX B input.

DMX O/P Configure the DMX protocol manager for offset or patch mode.

DMXA PAT Patch the 96 dimmer (PWM) outputs to any DMX A input channel.

DMXB PAT Patch the 96 dimmer (PWM) outputs to any DMX B input channel.

SH TIME Set the DMX status hold time from 0 to 99 minutes or infinite.

DC PATCH Configure the dimmer to channel patch for the dimmer rack.

DIM CURV Configure the dimmer curve for each output.

ND-LEVEL Set the non-dim trigger level threshold (10-100%) for each output.

VOUT LIM Set the maximum RMS output voltage for each dimmer.

REGULATE Enable or disable the dimmer output voltage regulation.

ANA MODE Configure the analog inputs for normal or load shed mode.

ANA PAT Patch the analog inputs to any combination of control channels.

ANA TEST View the control level for each of the analog inputs.

ANA FLTR Apply a noise filter on the analog inputs of up to 1 Volt.

ANA BLOC Enable or disable the analog inputs when DMX is being received.

STANDBY Enable or disable the power savings standby mode.

TEST INC Set the test increment units to percent or hexadecimal.

OC MODE Configure the input trigger parameters for the open collector output.

AUX IN Select which scene the auxiliary input will trigger/enable.

SCENEMOD Enable or disable scene mode and the auxiliary input.

S-ALARM Select the level and control channels triggered by the security alarm input.

F-ALARM Select the level and control channels triggered by the fire alarm input.

Ø-PATCH Set the zero-cross phase reference for each dimmer control output circuit if other than factory default.

WARMING Turn the "lamp warming" feature on or off.

LINE V View the RMS line voltage for each power phase.

LINE F View the line frequency of phase A.

CTL TEMP View the temperature of the microcontroller.

RTIME View the total run time of the microcontroller.

HARD-KEY View the microcontroller's unique six-character hard-key code.

SERIAL# View the microcontroller's unique six-character silicone serial number.

VERSION View the microcontroller's firmware version.

EEPROM View the type of EEPROM memory module plugged in.

FW-LOAD Load new firmware into the MX-3000+ via the EEPROM memory module.

RESTORE Restore parameters saved in the EEPROM memory module.

BACKUP Backup parameters and save them in the EEPROM memory module.

PRINTOUT Print various system configuration settings using a hand held infrared printer.

DEFAULTS Set various system configuration settings to the factory default.

LCD VIEW Adjust the contrast of the LCD Display for optimum viewing.

2.13 The **MX-3000+** face panel shall include a green LED indicator for power supply and microprocessor status. The LED, when illuminated, shall indicate normal operation, and when flashing shall indicate a hardware fault. A power supply or power failure, shall cause the LED to extinguish.

2.14 The **MX-3000+** face panel shall include three green LED's for phase detect and two yellow LED's for data receive indication. Loss of accurate phase detect signal and/or invalid DMX512 data shall cause the corresponding LED to extinguish.

2.15 The **MX-3000+** face panel shall include two red LED's for active alarm status or dimmer rack over temperature. Active inputs shall cause these cause the corresponding LED to illuminate.

2.16 A reset push-button shall be included on the face panel of the **MX-3000+**. Resetting the unit, whether by the reset button or power-up shall not affect any stored parameters or presets, and dimmer outputs shall automatically return to their former status.

2.17 It shall be possible to "Lock" and "Unlock" the programming keypad of the **MX-3000+** in order to protect all programmed system data.

2.18 The **MX-3000+** shall incorporate fan control circuitry to control the existing MX Series rack fans and is designed to allow for an additional five (5) minutes of air evacuation from the dimmer cabinet with loss of input control signal.

2.19 All printed circuit boards (PBC's) shall be FR4/G10 with a UL 94V-0 Flame Class Rating.

2.20 The entire assembly shall be ETL compliant with UL 508 and CSA 22.2 safety approvals.

Specifications subject to change without notice.

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