

# MX-3000



## Control Retrofit for Electronics Diversified Inc. (EDI) and Cooper MX Series Dimmer Racks



The MX-3000 is a next generation retrofit electronics package designed specifically for upgrading the EDI/Cooper MX Series performance dimmer racks making system replacement completely unnecessary. This full-featured, state-of-the-art control module provides a direct digital interface to most of today's modern lighting communication protocols. Designed based on the successful 3000 Series control technology developed by JSI, the MX-3000 shares identical firmware and features as other popular 3000 Series products.

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The MX-3000 installs in minutes by simply "plugging" into the existing OEM backplane. This compact unit has been designed for OEM rack compatibility, longevity and reliability with the end-user in mind. Intuitive LCD user interface combined with a single modular design makes the MX-3000 extremely user-friendly and easily serviceable. Advanced next generation hardware and software designs reduce stand-by power consumption to less than 1 Watt, allowing for compliance with the International Energy Agency's "One Watt Initiative" for standby power consumption. MX-3000 is over 4x more energy efficient than the obsolete OEM electronics!



*These products are energy efficient and consume less than 1 watt. Compliance with the International Energy Agency's "One Watt Initiative".*

Full featured, hi-resolution dimming with ultra-fast response. Exclusive "lamp warming" techniques extends lamp life considerably. An environmentally and financially responsible solution that offers unsurpassed high performance in a matter of minutes!

- Compatible with OEM dimmer rack backplane and input PCB's for fast easy installation. Installs in minutes.
- 4x more energy efficient than the OEM electronics.
- Unique "lamp warming" feature lowers the dimmer to cold lamp filament by up to 70% resulting in significantly increased lamp filament life and lower cost of ownership.
- 96 Hi-resolution digital outputs with individual dimmer profile selection.
- Individual channel threshold trigger in 10% increments for non-dim control "hard-fired" loads.
- Dual opto-isolated DMX512 inputs with built-in protocol manager.
- Analog and dedicated dry contact BMS inputs for interface with HVAC, security and fire alarms.
- "Load Shed" inputs for power management, occupancy sensor or photocell interface.
- LCD user interface for ease of set up and monitoring. Site programmable via a user-friendly, intuitive and self-prompting menu structure. No laptop computer or special software is required!
- Dimmer rack thermal shutdown protection.
- Removable memory dongle permits remote/off site backup of configuration data and ease of future firmware upgrades.
- Up to 10 year product warranty available!



**JOHNSON SYSTEMS INC.**

"PROFESSIONAL LIGHT CONTROL PRODUCTS"

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# 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 if 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 "backup" of all system configuration data. All data shall be protected from power failure by EEPROM for a minimum of 100 years.
- 2.7 The MX-3000 shall contain a removable memory dongle to facilitate remote or off site backup 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:

1. **SCENESET** Enable and setup 20 different backup scenes.
2. **FADETIME** Set the fade time for each of the 20 scenes from 0 to 99 seconds.
3. **SNAPSHOT** Record DMX levels into the backup scenes.
4. **DIM TEST** Test the dimmer outputs one at a time, or all at once.
5. **MONITOR** View the control level to each dimmer output.
6. **ADDRESS** Set the DMX start address.
7. **DMX MODE** Configure the mode of the on-board DMX protocol manager.
8. **2 RM SET** Set the two room assignment for each of the dimmer outputs.
9. **DMXA TRM** Enable or disable termination on the DMX A input.
10. **DMXB TRM** Enable or disable termination on the DMX B input.
11. **DMX O/P** Configure the DMX protocol manager for offset or patch mode.
12. **DMXA PAT** Patch the 96 dimmer (PWM) outputs to any DMX A input channel.
13. **DMXB PAT** Patch the 96 dimmer (PWM) outputs to any DMX B input channel.
14. **SH TIME** Set the DMX status hold time from 0 to 99 minutes or infinite.
15. **DC PATCH** Configure the dimmer to channel patch for the dimmer rack.
16. **DIM CURV** Configure the dimmer curve for each output.
17. **ND-LEVEL** Set the non-dim trigger level threshold (10–100%) for each output.
18. **VOUT LIM** Set the maximum RMS output voltage for each dimmer.
19. **REGULATE** Enable or disable the dimmer output voltage regulation.
20. **ANA MODE** Configure the analog inputs for normal or load shed mode.
21. **ANA PAT** Patch the analog inputs to any combination of control channels.
22. **ANA TEST** View the control level for each of the analog inputs.
23. **ANA FLTR** Apply a noise filter on the analog inputs of up to 1 Volt.
24. **ANA BLOC** Enable or disable the analog inputs when DMX is being received.
25. **STANDBY** Enable or disable the power savings standby mode.
26. **TEST INC** Set the test increment units to percent or hexadecimal.
27. **OC MODE** Configure the input trigger parameters for the open collector output.
28. **AUX IN** Select which scene the auxiliary input will trigger/enable.
29. **SCENEMOD** Enable or disable scene mode and the auxiliary input.
30. **S-ALARM** Select the level and control channels triggered by the security alarm input.
31. **F-ALARM** Select the level and control channels triggered by the fire alarm input.
32. **Ø-PATCH** Set the zero-cross phase reference for each dimmer control output circuit if other than factory default.
33. **WARMING** Turn the "lamp warming" feature on or off.
34. **LINE V** View the RMS line voltage for each power phase.
35. **LINE F** View the line frequency of phase A.
36. **CTL TEMP** View the temperature of the microcontroller.
37. **RTIME** View the total run time of the microcontroller.
38. **HARD-KEY** View the microcontroller's unique six-character hard-key code.
39. **SERIAL#** View the microcontroller's unique six-character silicone serial number.
40. **VERSION** View the microcontroller's firmware version.
41. **EEPROM** View the type of EEPROM memory module plugged in.
42. **FW-LOAD** Load new firmware into the MX-3000 via the EEPROM memory module.
43. **RESTORE** Restore parameters saved in the EEPROM memory module.
44. **BACKUP** Backup parameters and save them in the EEPROM memory module.
45. **PRINTOUT** Print various system configuration settings using a hand held infrared printer.
46. **DEFAULTS** Set various system configuration settings to the factory default.
47. **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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