



# DE90-3000

Retrofit Kit for Strand Digital Environ DE90 Architectural Dimmer Rack



The DE90-3000 is a next generation retrofit electronics package designed specifically for Strand DE90 Architectural dimmer racks. The DE90-3000 will save significant \$\$\$ by replacing the aging control electronics of the existing DE90 dimmer rack making system replacement completely unnecessary. This full-featured, state-of-the-art unit provides a digital interface to modern lighting communication protocols.

Designed to install in minutes with only a multi-screwdriver, this kit has been designed for longevity and reliability with the end-user in mind. Intuitive LCD user interface and OEM wiring compatible backplane combined with the 3000 Series control technology and software makes the DE90-3000 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. The DE90-3000 will provide a "Green" dimmer rack!

Full featured, hi-resolution dimming with lightning fast response. Exclusive "lamp warming" techniques extends lamp life considerably by lowering lamp filament inrush current by up to 70%. An environmentally and financially responsible solution that offers unsurpassed performance and value in a matter of minutes!

- ✦ Replaces the old DE90 processor and backplane with new "next generation" control electronics. Upgrades any size standard DE90 dimmer rack in minutes.
- ✦ Compatible with O.E.M. dimmer rack wiring for fast easy installation.
- ✦ Unique power saving "stand-by" mode reduces power consumption to less than 1 Watt. Compliance with the I.E.A.'s "One Watt Initiative". A "Green" dimmer rack!
- ✦ Unique "lamp warming" feature lowers the in-rush current to the dimmer by up to 70% resulting in increased lamp filament life.
- ✦ 24 Hi-resolution digital outputs with individual dimmer profile selection.
- ✦ Isolated dual DMX inputs with protocol manager.
- ✦ Analog, load shed and dry contact inputs.
- ✦ 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.
- ✦ "Plug-in" control electronics also for fast easy servicing.
- ✦ Up to 10 year product warranty available!



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"PROFESSIONAL LIGHT CONTROL PRODUCTS"

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# DE90-3000 SPECIFICATIONS

## 1.0 DE90-3000 - GENERAL

DE90-3000 is a direct retrofit kit specifically designed for facilities with existing Strand DE90 architectural dimmer rack(s) requiring new, reliable and cost-effective control electronics.

Save time and money by retrofitting to current dimming technology with options equaling or exceeding those of most new dimming systems.

DE90-3000 has been designed with pin to pin compatibility with OEM factory wiring for ease of installation. Facilities can upgrade to this state-of-the-art technology in minutes with only a multi-screwdriver. Engineered with both the installer and end-user in mind, the DE90-3000 incorporates the following features:

- 1.1 DE90-3000 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 DE90-3000 control electronic shall not exceed 1 Watt.
- 1.2 DE90-3000 shall employ a unique "lamp warming" technique that extends lamp life by limiting the in-rush current 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 software will be required.
- 1.4 Modular design of the unit shall make any potential service requirements fast and easy. The DE90-3000 control electronics shall be contained on a single plug-in PCB. This PCB shall contain all ancillary control electronics for the dimmer rack.
- 1.5 Dimmer control outputs shall be designed for precise and reliable control of the existing DE90 dimmer modules. It shall never be necessary to adjust ramp circuits for proper dimmer output.
- 1.6 The DE90-3000 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 or merging of both DMX inputs.
- 1.7 Optional node supports all major Ethernet protocols including Net2, Strand, ArtNet, ACN (Net3) and Pathport. Automatic recognition will permit interface to most popular lighting control protocols. It shall not be necessary to assign protocol.
- 1.8 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.
- 1.9 Rack thermal protection shall be employed via a mechanical relay interface to existing rack OEM thermal sensor. An active input shall cause an immediate disconnect of all dimmer control outputs.

## 2.0 CONTROL ELECTRONICS

The DE90-3000 control electronics are based on the MADD-24 (Multiple Application Dimmer Driver) design employed in JS-ICON dimmers racks and other 3000 Series products offered by Johnson Systems. The control electronics shall be contained in one plug-in PCB (MADD-24) and shall provide the following features:

- 2.1 The DE90-3000 shall be capable of controlling up to 24 dimmers in the DE90 dimmer cabinet. Advanced state-of-the-art voltage regulation hardware and software will ensure >1% all dimmer outputs. The DE90-3000 will operate with a voltage input range of 85-264VAC at 50 or 60Hz.
- 2.2 The DE90-3000 shall be capable of memorizing and storing up to 24 presets in the form of a DMX "snapshot" or individually programmed via the keypad. Scene selection on loss of DMX input shall be selectable. Scene playback shall be seamless on loss of DMX as well as allowing high resolution fades between all 24 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 any cabinet module location.
- 2.5 The DE90-3000 shall permit non-volatile storage all system configuration data. All data shall be protected from power failure by EEPROM for a minimum of 100 years.
- 2.6 The ECU module shall accept up to 4 (four) analog inputs with the ability to be assigned to any of the 24 dimmer 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.
- 2.7 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.

- 2.8 Each individual dimmer in the dimmer cabinet shall be capable of being assigned one of four dimmer curves: incandescent square law curve, direct curve, linear curve, or non-dim (adjustable threshold with 5% hysteresis).
- 2.9 The face of the control module 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 DE90-3000.
- 2.10 The MADD-24 control electronics shall employ the "system-on-a-chip" advanced digital technology. Such electronic circuitry shall permit real time signal monitoring and status LED indication to allow easy setup and remote troubleshooting. The DE90-3000 shall permit configuration/monitoring of the following within the DE90 dimmer rack:

1. SCENESET	Enable and setup 24 different backup scenes.
2. FADETIME	Set the fade time for each of the 24 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 OP	Configure the on-board DMX protocol manager for offset or patch mode.
12. DMXA PAT	Patch the 24 dimmer (PWM) outputs to any DMX A input channel.
13. DMXB PAT	Patch the 24 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 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 PTCH	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. L-BUTTON	Set the mode of the local buttons to scene, bump or disabled.
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.
33. WARMING	Turn the "lamp warming" feature on or off.
34. POLARITY	Set the PWM output control polarity. Locked for factory use only!
35. LINE V	View the RMS line voltage for each power phase.
36. LINE F	View the line frequency of phase A.
37. REM TEMP	View the temperature of the remote temperature sensor.
38. CTL TEMP	View the temperature of the microcontroller.
39. RTIME	View the total run time of the microcontroller.
40. HARD-KEY	View the microcontroller's unique six-character hard-key code.
41. SERIAL#	View the microcontroller's unique six-character silicone serial number.
42. VERSION	View the microcontroller's firmware version.
43. EEPROM	View the type of EEPROM memory module plugged in.
44. FW-LOAD	Load new firmware into the MADD-24 via the EEPROM memory module.
45. RESTORE	Restore parameters saved in the EEPROM memory module.
46. BACKUP	Backup parameters and save them in the EEPROM memory module.
47. PRINTOUT	Print various system configuration settings using a hand held infrared printer.
48. DEFAULTS	Set various system configuration settings to the factory default.
49. LCD VIEW	Adjust the contrast of the LCD Display for optimum viewing.

- 2.11 The DE90-3000 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.
- 2.12 The DE90-3000 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.
- 2.13 A reset push-button shall be included on the face of the module. 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 without any noticeable change.
- 2.14 It shall be possible to "Lock" and "Unlock" the programming keypad of the DE90-3000 in order to protect all programmed system data.
- 2.15 The DE90-3000 shall incorporate fan control circuitry designed to allow for an additional five (5) minutes of air evacuation from the dimmer cabinet with loss of input control signal.
- 2.16 The DE90-3000 face panel will provide an auxiliary DMX B input via 5 pin XLR connector.
- 2.17 The DE90-3000 face panel will provide a panic switch for emergency lighting requirements. This switch, when activated, will drive all dimmer control outputs to full. Operation shall be independent from the MADD-24 control electronics.
- 2.18 All printed circuit boards (PCB's) shall be FR4/G10 with a UL 94V-0 Flame Class Rating.

Specifications subject to change without notice.



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