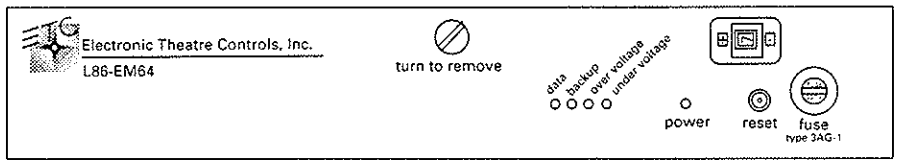
L86 EM64

electronics module

USER MANUAL

This manual describes ETC's *EM64* electronics module. The *EM64* electronics module uses either DMX512 or analog control signal to control dimmers in ETC *L86 Installation Racks* and *L86 Touring Racks*. Each column of dimmer modules in a chassis is controlled by an *EM64* near the top of the column.

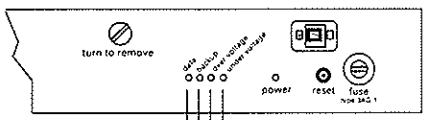
Front panel



Thumbwheel shown in this illustration is optional.

The *EM64* front panel contains four indicator LEDs and a power LED that provide you with information about your dimming system. When you first turn on your system (or press [Reset]) the *EM64* processor runs a series of self tests. The four indicator LEDs turn on, then flash in order from right to left. Once the tests finish, the LEDs stop flashing.

Indicator LEDs



Each indicator LED on the *EM64's* front panel provides specific information about the operating status of the *EM64* electronics. The information each LED provides is described below:

Under voltage

LED On ..... Input voltage is less than 100V AC.
LED Off ..... Normal.
LED Flashing ..... Problem with RAM. Contact ETC.

Over voltage

LED On ..... Input voltage exceeds 130V AC.
LED Off ..... Normal.
LED Flashing ..... Problem with EROM. Contact ETC.

Backup

LED Off ..... Digital data mode is selected. (Normal)
LED Flashing ..... Backup (analog) mode selected.

Data

LED Off ..... Backup (analog) mode is selected and the backup jumper is on.
LED On ..... System is receiving DMX512 data. (Normal)
LED Flashing ..... Digital data input mode is selected, but no DMX512 data is being received.

Note: When input is interrupted, the EM64 maintains the last valid output levels it received for four minutes, then fades all outputs to zero.

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Power

The power LED is on any time power is supplied to the system.

Reset switch

Press [Reset] to restart the *EM64*. The module will reset itself to match current settings. Press [Reset] any time the starting address is changed and any time an *EM64* is installed into a system which has already been turned on.

Fuse

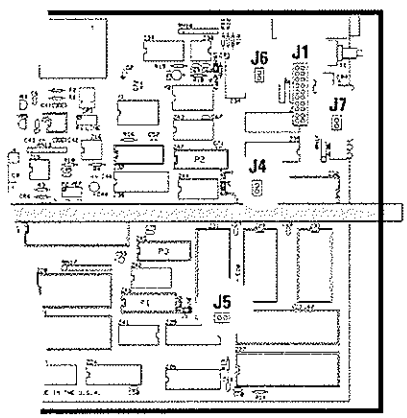
To remove the fuse, push slightly on the center of the fuse cover with a screwdriver and turn the cover counter-clockwise. Replace the fuse with type 3AG-1 only.

Thumbwheel address switch (optional)

The thumbwheel is used to set starting addresses for your dimmers during normal operation. The thumbwheel can also be used to select self tests and to set speeds and levels for self tests.

Configuring the EM64

EM64 jumper locations



Internal jumpers allow you to configure *EM64* options and run self tests.
A jumper consists of a pair of vertical pins on the circuit board. A jumper is **On** when a jumper clip (a small, rectangular piece of plastic with two sockets) is placed over both connectors, closing the circuit. It is **Off** when the clip is removed. Jumper locations are shown on the *EM64* circuit panel diagram. Each jumper location is marked with a **J**.

Note: Under normal operation, all EM64s in the racks in your system should have the same jumper settings, except for their starting addresses and module sizes.

Setting starting address

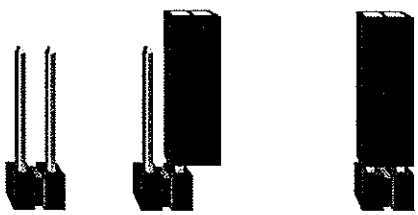
Jumpers 1 through 4 at location **J1** set the starting address for the *EM64*. Select the starting address by setting the jumpers according to the chart below. The starting address and the dimmer number (as listed on your console) do not necessarily correspond. If you need to make changes, write down your original jumper settings for future reference.

If your system has the optional front panel thumbwheel address switch, you can use it to select a starting address.

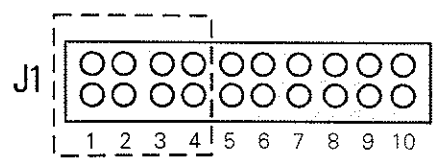
Note: All EM64s in a single chassis should have the same starting address.

Two prong jumper

Jumper clip off *Jumper clip on*



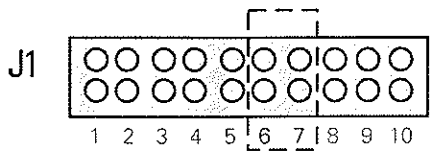
Use these jumpers to set starting address



Thumbwheel number	Starting input	Jumper 1	Jumper 2	Jumper 3	Jumper 4
1	1	—	—	—	on
2	49	—	—	on	—
3	97	—	—	on	on
4	145	—	on	—	—
5	193	—	on	—	on
6	241	—	on	on	—
7	289	—	on	on	on
8	337	on	—	—	—
9	385	on	—	—	on
0	433	on	—	on	—

Selecting dimmer module type

Use Jumpers 6 and 7 to select dimmer module type

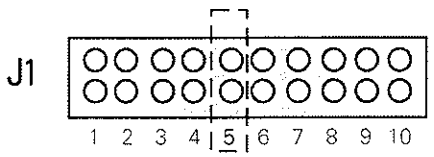


Set Jumpers 6 and 7 at location **J1** to indicate the smallest dimmer installed in your chassis. For example, if the chassis contains both 6k and 1k dimmers, set the jumpers to the 1k setting.

Jumper 6	Jumper 7	Smallest dimmers on each module
—	on	6k modules
on	—	2k modules
on	on	1k modules
—	—	used for testing only

Setting line regulation

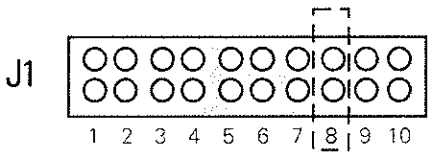
Use Jumper 5 to set line regulation



Line regulation maintains lamp intensity at a constant level, even if power line voltage fluctuates. Set Jumper 5 at location **J1** to **Off** to allow normal line regulation. Set it to **On** to disable line regulation.

Setting backup mode (analog)

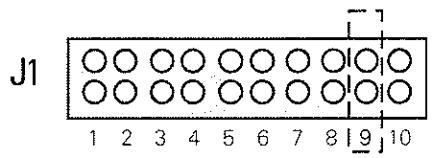
Use Jumper 8 to set backup mode



Some EM64s have the optional ability to accept analog input. If you have this option, set Jumper 8 at location **J1** to **Off** to disable digital mode and select the backup (analog) mode. For normal digital input, this option is set to **On**.

Enabling Soft start

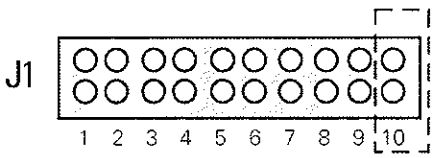
Use Jumper 9 to enable Soft start



Soft start is an option that adds a dynamic filter to reduce lamp shock, caused by turning a lamp on to full when the bulb is cold. Jumper 9 at location **J1** enables the Soft start option when set to **Off**. Set Jumper 9 to **On** for normal operation.

Enabling Self test mode

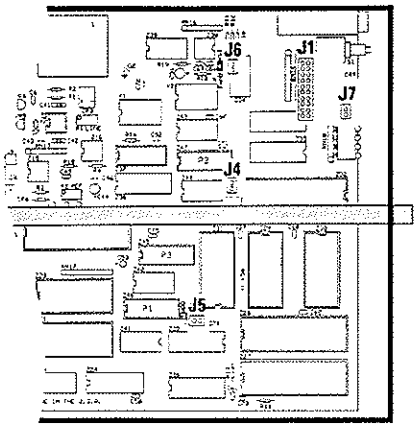
Use Jumper 10 to enable Self test



The *EM64* allows you to specify a number of built-in self tests. If you wish to run one of these self tests, set Jumper 10 at location **J1** to **On**. The next time you restart the module or turn the system on, the *EM64* will run the self test you require. See *Self test mode* on Page 4 for further information.

Enabling Preheat mode

Use jumper at J7 to enable Preheat mode



In Preheat mode, the **EM64** maintains all dimmers at a minimal level even when the dimmer is turned all the way down. This can prolong the life of your lamps by protecting the filaments. Please note that if your rack contains modules with indicators, the Preheat mode will make them glow at all times.

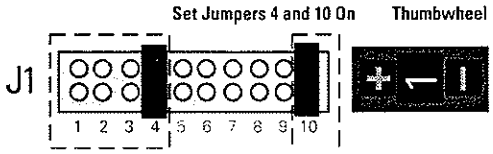
Jumper 1 at location **J7** enables Preheat when set to **On**. Set the jumper to **Off** for normal operation.

Self test mode

The *EM64's* Self test mode allows you to run a number of diagnostic self tests. To enable the Self test mode, set Jumper 10 **On,** then set Jumpers 2, 3 and 4 as shown below to select the desired test. (If your *EM64* is equipped with a thumbwheel, you may use it to select the desired test.) Then, reinstall the *EM64* and press [Reset] to start the test. When you press [Reset], all the LEDs flash, the *EM64* resets to the new jumper settings, and the self test you have selected runs.

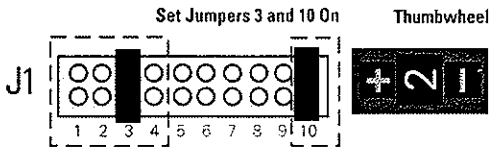
If your *EM64* is equipped with the optional thumbwheel, you can use it to select a speed for the *Chase, Fade all* and *Fade one* tests without removing the module. Once the selected test is running, set the thumbwheel to the desired speed. Set the thumbwheel to zero to freeze the test. Thumbwheel settings from one to nine set the speed from the slowest rate to the fastest rate respectively. In the *Level to all* test, the thumbwheel allows you to set output levels of zero through nine.

Chase



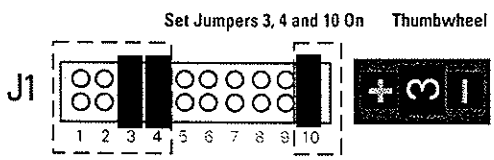
The chase test runs through all the system's outputs from 1 through 64. This test confirms that all outputs are functioning. Set Jumpers 4 and 10 to **On**. Jumpers 1, 2 and 3 must be **Off** to run the test. You can adjust the speed of the test by changing the settings on your optional thumbwheel.

Fade all



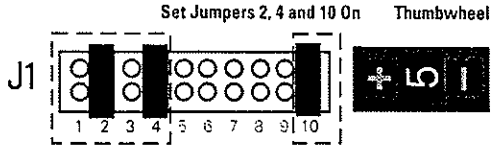
This level test fades all outputs simultaneously from off to full and back to off one at a time. Set Jumpers 3 and 10 to **On**. Jumpers 1, 2 and 4 must be **Off** to run the test. You can adjust the speed of the test by changing the settings on your optional thumbwheel.

Fade one



This level test fades each output from off to full and back to off one at a time. Set Jumpers 3, 4 and 10 to **On**. Jumpers 1 and 2 must be **Off** to run the test. You can adjust the speed of the test by changing the settings on your optional thumbwheel.

Level to all



This test raises all outputs to a specified level. Set Jumpers 2, 4 and 10 to **On**. Jumpers 1 and 3 must be off to run the test. Use the optional thumbwheel to set the desired level between 0 and 9. If you don't have the thumbwheel installed, outputs rise to a default level of 50%.