Rackmaster 490

The Zero 88 Rackmaster 490 dimmer pack is a 4U high, fan cooled, professional six channel power controller. It is capable of driving up to 16 Amps of lighting loads per channel, subject to a maximum total load of 84Amps. These loads may be resistive or inductive and include tungsten, transformer driven low voltage (eg. pinspots), and quartz halogen. Some highly inductive loads such as neon will require a ballast load of 100 watts.

Technical Specifications

Electrical

Power supply:	50 or 60Hz;
(a) 84 Amps	1 phase 2 wire 230 or 115v
(b) 28 Amps	3 phase 4 wire 250/440v
(c) 40 Amps	3 phase 3 wire (Delta) 230 or 115v
(d) 3 x 28Amps	1 phase 230 or 115v
Max total load:	20kW @ 240v 10kW @ 120v
Load per channel:	0.1A Min; 16A Max
No load consumption:	10w
Interference:	Suppression meets BS800 & VDE 0875
Input Signals:	0 to +10v
Connections:	8 way Ring Locking DIN on the front Panel. An internal terminal block is also fitted.
Low Voltage Supply:	+20v nominal, The 250mA fuse is mounted on the Front Panel.

Physical

Max Operating Temp:	45 °C Ambient.
Size	483 x 176 x 305 mm (19" x 7" x 12").
Net Weight:	12 kg (25lbs)

Zero 88 Lighting Ltd reserves the right to make changes to the equipment described in this handbook without prior notice.

This equipment is designed for controlling lighting and is unsuitable for any other purpose.

Issue 2

WARNING

DO NOT REMOVE ANY COVER WITHOUT FIRST COMPLETELY DISCONNECTING THE RACKMASTER 490 FROM THE MAINS SUPPLY

Wiring and Internal Links

To remove the bottom cover:

1 Disconnect the Rackmaster 490 at the supply.
2 Remove from the 19 inch rack (if appropriate).
3 Turn the unit over and remove the six screws in the side of the machine which secure the bottom plate.
4 Lift off the bottom plate.

Connections to the Rackmaster 490 can be made via the cut outs provided for 30, 25 and 20mm glands on the connection panel. ***The packs are supplied set for 240 v, 50Hz, three phase operation.*** *Changing a fuse and the position of a link is all that is required to change the voltage and frequency.*

To set the Frequency:

Locate the frequency setting links and reposition for the frequency required on **each** pcb.

To set the Voltage:

Locate the fuse and reposition for the voltage required on **each** pcb.

To set Channel Buttons for 50% Output:

Fit the links supplied with the spares kit in the positions shown on the diagram opposite.
Remember to mark the outside of the pack in some way to show the channels affected.

Please Note that the output connectors can be moved to the rear of the machine by swapping the connector panel and rear panels over.

Reassemble the Rackmaster 490 in the reverse order.

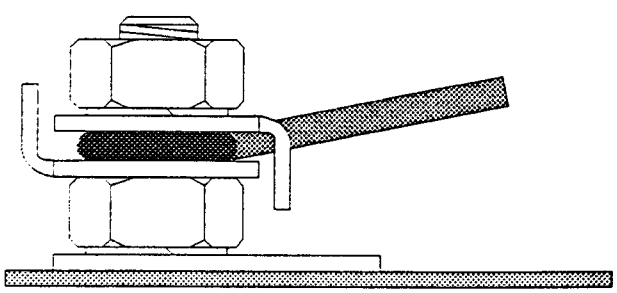
Fusing of Inductive Loads

All inductive loads (eg. pinspots, any transformer driven lamp) **must** be fitted with the correct value fuse. Failure to fit the correct fuse may mean that any supply disturbances could destroy the lamp transformer. For a single pinspot, a 500mA Quick Blow or 250mA AntiSurge fuse should be used.

Breaker Recommendations

It is advisable to set the preheat for a large lamp to avoid accidentally tripping the breakers when turning on from cold.

A minimum cable length of 10m is recommended between the dimmer and the lamp to give the triacs extra protection.



Always wire the supply as shown above.

Supply Wiring

A separate isolator and secure mains earth are required.
Phase to Neutral voltage must not exceed 250v

Rackmaster 490s are supplied wired for three phase star connected operation.

Single Phase

Remove the single phase busbar from the spares kit supplied and fit across the three phase input bolts.

Three Phase 'Star'

Remove the single phase busbar (if fitted) from across the three phase input bolts. Ensure that the neutral busbar is in place.

Three Phase 'Delta'

To make rewiring for delta connection easier to describe, the pcb which controls channels 1 and 2 (connected to phase 1) is referred to below as the **phase 1 pcb**. The **phase 2 pcb** controls channels 3 and 4; the **phase 3 pcb** controls channels 5 and 6.

Remove the blue neutral wires from the neutral busbar. Connect the neutral wires from the phase 1 pcb to the phase 2 supply input; connect the neutral wires from the phase 2 pcb to the phase 3 supply input and then connect the neutral wires from the phase 3 pcb to the phase 1 supply input.
Remove the neutral and single phase busbars (if fitted). Connect the neutral outputs 1 and 2 to the phase 2 supply input; connect the neutral outputs 3 and 4 to the phase 3 supply input and lastly connect the neutral outputs 5 and 6 to the phase 1 supply input.
Remember, **the voltage between phases must not exceed 250v when delta connected.**

Front Panel Controls

Channel Test Buttons

Each channel has a test button. Pressing this switches the channel full for rigging or test purposes. By changing internal links, these buttons may be set to switch the channels half on so that 115v lamps may be safely tested.

Lamp Preheat

Each Rackmaster 490 control input has a defined **'off'** state in addition to its normal control range. If the input signal is disconnected, the output is **'off'**, so the lamp is without preheat.

Each pair of channels has a preheat adjustment on the front panel. These may be used to set the preheat level of the channels **provided** that a controller is connected and set to minimum level on **both** the channels that are being adjusted.

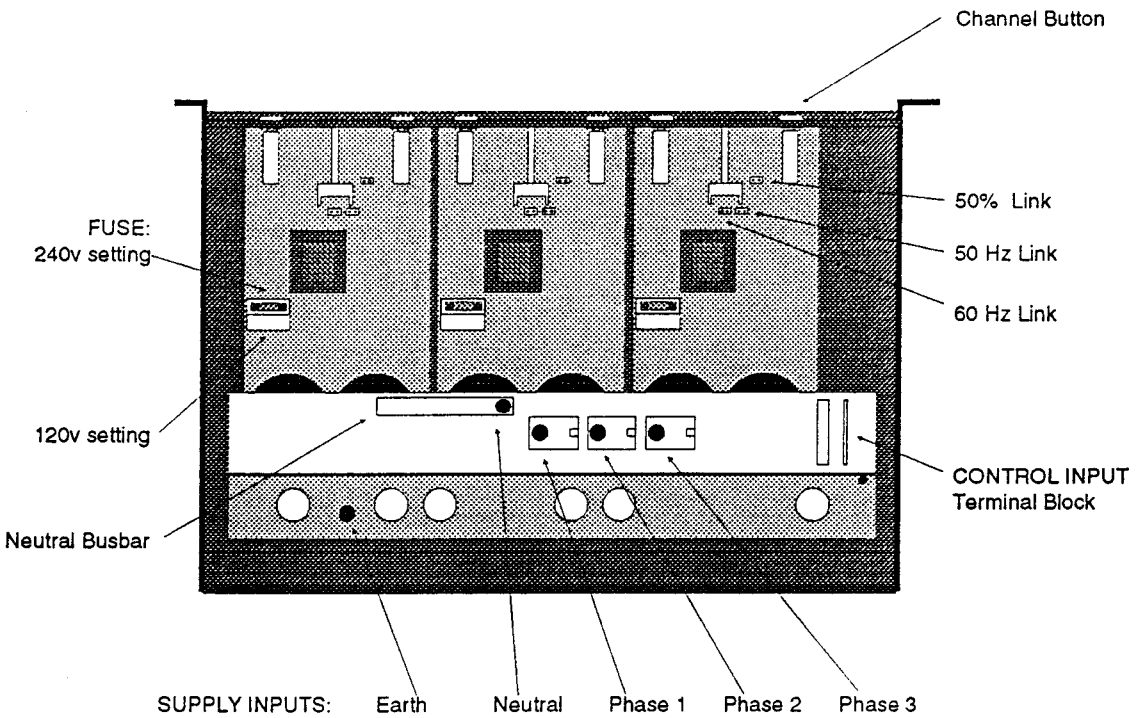
Diagnostic Lights

The green lights on each control board have the following functions:

Ref OK : When lit the reference circuit is OK

Channel : Will be on slightly **whenever** a controller is connected. This shows that the electronics driving the opto isolator is OK. If any light is completely out, check that the signal cable is OK

View of the underside with the bottom cover removed



Simple Fault Finding

REGULARLY check that all connectors are pushed fully on, all the screw terminals are tight and that the fan and air inlet are clean.

Sympton	Action	Result	Fault
One channel dead	Check bulb & cable		
	Check circuit breaker		Circuit Breaker tripped, check circuit and reset Breaker
	Press channel button	1: Ref OK on, Channel led off	Channel drive circuit dead; change board.
		2: Ref OK on, channel led on	Main triac or opto isolator dead; replace each in turn to find faulty item.
One pair of channels dead (common ref)	Press both channel buttons	1: Ref OK off, both channels leds off	a: Phase dead, check wiring and supply b: Reference circuit dead, change board
			c: Thermal cutout has operated. Check fan is working OK and air intake is clear. If this happens repeatedly and fan is OK, change cutout
		2:Ref OK on, both channel led's off	Both channels have circuits dead; change board.
		3:Ref OK on, both channel led's on	Both channels have one main triac and / or opto isolator dead. replace each inturn to find faulty item.
All channels dead	Check ref OK lights	1:All off	Mains supply faulty or disconnected.
		2: All on	Press all channel buttons, if lights come on, signal lead or connector are dead.

Servicing

To change a Main Triac: Remove the three wires, unscrew and replace with a new one, reconnect the wires and compare with the other triacs for correct wiring.

To change an opto isolator: Unplug from its socket and replace with a new one.

To change a control board: Unplug the wires and signal connector, remove the six securing screws. When the replacement board has been fitted, check the wiring and voltage/frequency settings with the other boards.

Rackmaster 490 DMX 512 Input Kit Instructions

Introduction

A DMX cable from a lighting desk carries control signals for 512 dimmer channels. The Rackmaster 490 DMX Input card will decode any sequential group of six channels out of the 512. The DMX OK LED indicates when error free DMX data is being received.

To Fit the DMX Input Kit

Warning
Remove mains before removing covers

1. Read all instructions before proceeding.
2. Disconnect the RM 490 from its mains supply.
3. Lay the module on its top panel, leaving the bottom panel face up.
4. Remove the 6 screws (3 either side) securing the bottom panel to the side panels and lift it off.
5. Remove the 3 screws securing the longer rear panel and lift it away from the module.
6. Fit the two XLR connectors to the rear of the top panel with the four screws provided.
7. Connect the flying leads from the XLR connectors to the DMX in Terminal block as shown in fig 1.
8. Secure the new DMX rear panel to the module with the 3 screws previously removed.
9. Connect the wires from the DMX card to the Auxiliary control in / out terminal block also shown in fig 1.
10. **Note:** If using DMX and an analogue input that has no in-line diode, then unplug the analogue connector from the standard input connector and connect to the Auxiliary input connector on the DMX card.
11. Tyrap the harness with the tyraps provided.
12. Reassemble the bottom cover.

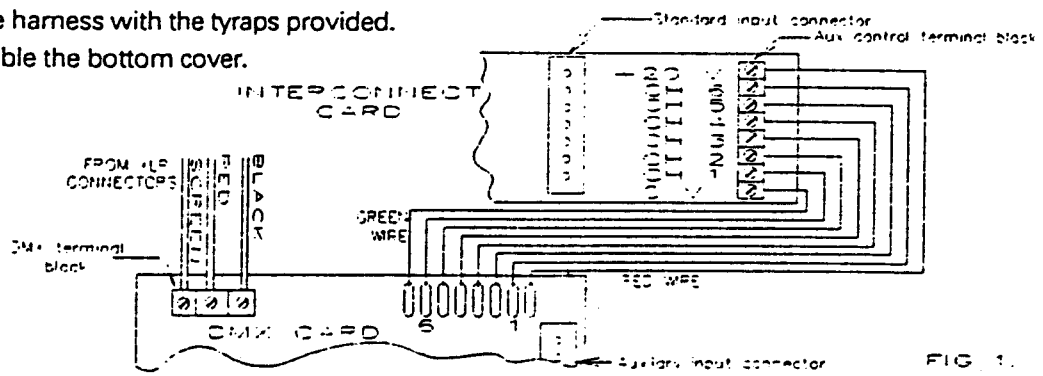


FIG 1.

Setting the Start Channel

The start channel address determines which group of six channels the card will decode. For example; if the start address is 105, channels 105, 106, 107, 108, 109, and 110 will control the six Rackmaster 490 channels. The start address may be set between 001 and 507.

Note: If the 100's switch is set to 6 or 7, the other two switches set the pack number (between 01 and 84).

Cables for DMX Transmission

The maximum cable length between a desk and the DMX receiver will depend on several factors including:

Type of cable used, number of DMX receivers connected in the line and electrical environment.

Zero 88 recommend that shielded twisted pair approved for RS422/485 (e.g. Belden 9841, Belden 9501 or Alpha 5271) is used. Communication over a hundred metres should normally be possible without problem, however for longer cable runs, it may be necessary to fit a DMX Termination Plug (Stock No 00-269-00) to the last Rackmaster 490 in order to ensure completely error free data transmission.

Substitution of microphone, or other types of cable may be possible, but data transmission errors are more likely, particularly over long distances.

Technical Specification

Data reception conforms to USITT DMX512 1990 standard and earlier.

Power Supply +16V to +28V @ 85mA (supplied from Rackmaster 490)

XLR Connections

Pin 1: 0V (Signal common)

Pin 2: 1- (Dimmer Drive Compliment)

Pin 3: 1+ (Dimmer Drive True)

Pin 4: Spare

Pin 5: Spare

Fitting must be carried out by a suitably qualified or experienced person

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This equipment is designed for use with a Rackmaster 490 dimmer unit only and is unsuitable for any other purpose.

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