



**NR 3000**

PROGRAMMABLE RELAY PACK

**OPERATION MANUAL**

## INTRODUCTION

Dimmer and relay packs are the heart of any stage lighting system. They translate coded signals generated by controllers into power levels required to drive high power lamps to desired intensities.

The NSI NR 3000 satellite relay pack is fully user programmable allowing assignment of four of a possible sixty-four control channels. Micro-plex, a new technology developed by NSI for the stage lighting market, is the electrical marriage of micro-processor technology with digitally controlled multiplexing. This technology allows all NSI lighting components to be connected with standard 3-pin microphone cables or even audio snakes. System expansion is further simplified through the ability to daisy chain additional relay packs to an existing system. This application of Micro-plex technology makes system set up and operation easy and convenient.

Our philosophy at NSI is to utilize only the highest quality components. Problems that often plague relays such as flickering lights, buzzing in audio equipment and triac failure are eliminated in NSI products. In place of unreliable triacs, NSI only uses professional grade dual SCR's.

You can be confident your NSI relay packs feature the best performance and reliability standards available.

## SPECIFICATIONS

|  |                      |
|--|----------------------|
|  | NR 3000              |
| No. of Channels:                       | Four                 |
| Power Output per Channel               | 1200 Watts           |
| Total Maximum Power Output:            | 2400 Watts           |
| Type of switching:                     | "zero-crossing"      |
| Serial Control System:                 | NSI "Micro-Plex"     |
| Switching threshold:                   | 1 volt (10% control) |
| Input Voltage to Output Response Time: | 50 MSEC.             |
| Control Isolation:                     | 1200 Volt HV         |
| +15 V DC available to Controller:      | 400 MA               |
| Dimensions (HxWxD):                    | 8"x9.5"x3.5"         |
| Weight:                                | 7.5 lbs              |
| Mounting Spec. (from hole centers)     | 8.25"                |

## AC OUTPUT RECEPTACLES

Dual standard AC outlet receptacles are provided for each channel of the NR 3000. These receptacles provide power to the lamps in your lighting system. Digitally coded signals received from your NSI controller are translated into power. Each dual receptacle corresponds to a single channel with the maximum power capabilities described in the specifications section of this manual. Under no circumstances should maximum recommended power capabilities be exceeded. To do so may be hazardous and will void your warranty. Most lamps, fixtures, effects motors and also rain lights may be connected to these outlets. Do not connect any other electrical appliances or equipment to the relay packs.

## MICRO-PLEX INPUTS

Both the male and female Micro-Plex connectors may be used for input signals. Micro-Plex technology allows your system to be connected using standard microphone cables or even audio snakes. Digitally coded signals may be received from your NSI controller or another relay pack. The Micro-Plex system also provides D.C. phantom power to your control unit eliminating the need for AC power cords on any NSI controller. Up to sixty-four individual control channels plus phantom power to your controller may be transmitted through a single microphone cable.

## MICRO-PLEX EXPANSION

The male and female Micro-Plex connectors are wired in parallel allowing either one to be used for input or output of control signals. When used as an output, the Micro-Plex connectors will provide control signals to another relay pack. This is called daisy chaining and makes expansion of your system easy. Up to sixty-four individual control signals may be sent through NSI relay packs via a standard microphone cable.

## PROGRAMMING

Each NSI relay pack is fully user programmable to receive any of sixty-four possible control signals. Control signals may be assigned in increments of four by programming the relay packs to receive them. To accomplish this simply position the program select switches as described in the following chart:

| CHANNELS | SWITCH POSITIONS |     |     |     |
|----------|------------------|-----|-----|-----|
|          | 1                | 2   | 3   | 4   |
| 1 - 4    | OFF              | OFF | OFF | OFF |
| 5 - 8    | ON               | OFF | OFF | OFF |
| 9 - 12   | OFF              | ON  | OFF | OFF |
| 13 - 16  | ON               | ON  | OFF | OFF |
| 17 - 20  | OFF              | OFF | ON  | OFF |
| 21 - 24  | ON               | OFF | ON  | OFF |
| 25 - 28  | OFF              | ON  | ON  | OFF |
| 29 - 32  | ON               | ON  | ON  | OFF |
| 33 - 36  | OFF              | OFF | OFF | ON  |
| 37 - 40  | ON               | OFF | OFF | ON  |
| 41 - 44  | OFF              | ON  | OFF | ON  |
| 45 - 48  | ON               | ON  | OFF | ON  |
| 49 - 52  | OFF              | OFF | ON  | ON  |
| 53 - 56  | ON               | OFF | ON  | ON  |
| 57 - 60  | OFF              | ON  | ON  | ON  |
| 61 - 64  | ON               | ON  | ON  | ON  |

Individual yellow LED's (Light Emitting Diodes) for each channel indicate when relay is receiving control signals. This feature is an excellent trouble shooting tool in identifying possible problems with signal transmissions or defective lamps and fixtures.

**IMPORTANT:** All NSI relay packs are shipped from the factory programmed for channels 1-4. Units must be reprogrammed (see chart above) before being capable of receiving any other channels.

## AC POWER CABLE

This is the main power cord for your relay pack which ultimately carries all of the AC power consumed by lights connected to the relay. It must be connected to a power source capable of supplying the total power drawn by the lights (see specification section of this manual for details on maximum power capability).

**WARNING:** Do not remove grounding prong of AC plug. To do so may cause exposure to potentially lethal voltage levels and will void the warranty on this product.

## POWER ON INDICATOR

This green LED (Light Emitting Diode) will light whenever the dimer pack is receiving AC power and functioning properly.

## CIRCUIT PROTECTION

The NR 3000 is equipped with safety circuit interruption devices to protect the units from becoming overloaded. The NR 3000 utilizes a resettable external circuit breaker as well as internal fusing.

## MOUNTING

NSI NR 3000 relay packs are designed to be mounted vertically. Each relay pack is provided with two mounting flanges or ears designed for securing to the center of truss bars. Most truss bars are already properly drilled to accept mounting of relays, however in some cases you may need to drill holes in your truss bar to accommodate your relay pack. When doing this insure hole spacing is accurate before attempting to drill.

## OPERATIONAL HINTS

- 1) Always place your relay packs as close as possible to the lights they power. This will reduce the number of extension cords required to hook up your system.
- 2) Use a power outlet located as close as possible to an electrical service panel (fusebox). It is best if the power outlet is on a separate circuit breaker or fuse from your audio system.
- 3) Insure that the rating of the breaker or fuse for the chosen outlet is adequate. The required rating (in amps) of the breaker or fuse may be calculated with the following formula:

$$I = \frac{P}{E}$$

Where I = the current (in amps)  
P = the power (in watts)  
and E = the voltage (in volts)

With a standard 120 VAC electrical system 100 watts = 5/6 of an amp. A safe and easy assumption is to say 100 watts = 1 amp. For example; if you are using four 500 watt lamps (2000 watts total), you should have at least a 20 amp electrical service.

- 4) Always use quality 14 gauge (or heavier) grounded extension cords.
- 5) Do not place AC power cables or extension cords for lighting near sensitive audio cables (guitar cords, mic cables, audio snakes, etc.).
- 6) Avoid blocking the ventilation holes on the sides of your relay pack. It is very important your unit has this ventilation to avoid possible damage which may void the warranty.

## NSI, INC. LIMITED WARRANTY

NSI, Inc. warrants new electronic products to be free from defective materials and workmanship for a period of one year from the date of purchase to the original owner when purchased from an authorized NSI Systems dealer.

Lamps and gel material are not covered under this warranty.

The purchaser is responsible for completing and mailing to NSI, within 15 days of purchase, the warranty registration card enclosed with each product. NSI products that have been subject to accident, alteration, abuse or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks and switches are not covered under this warranty.

If your NSI product requires service during the warranty period, NSI will repair or replace, at its option, defective materials provided you have identified yourself as the original owner of the product to NSI or any authorized NSI dealer. Transportation charges to and from an authorized dealer or the NSI factory for repair shall be the responsibility of the owner. All products returned to NSI must have factory authorization for return prior to shipping.

NSI, Inc. is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.