



# Digital Lighting Systems, Inc.

## SF404

**4 Channel "Super-Fader"**

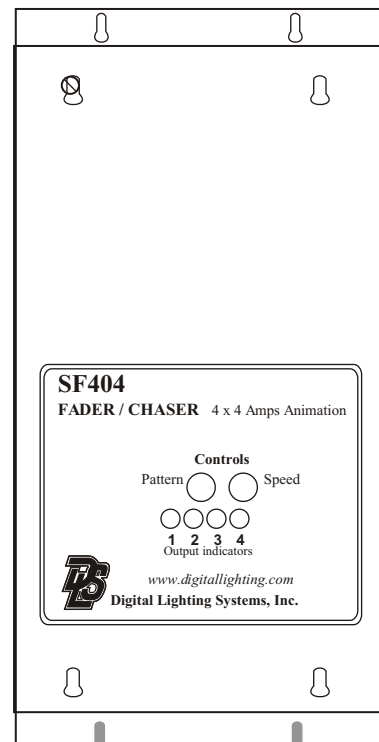
**Cross Fade/ color mixing/ Animation**

**(SF404-12/SF404-24/SF404-120/SF404-220)**

## SC404

**4 Channel "Super-Chaser"**

**(SC404-12/SC404-24/SC404-120/SC404-220)**



**Animation**

# USER'S MANUAL

## General Description

The **SF404** is a four-channel single-phase AC lighting controller (Cross-Fader/Lighting animation) capable of producing slow level changes( Color Mixing ) as well as Quick ON/ OFF ( Animation)

It consists of 2 circuit boards, the **INT04-SF** logic board and the **LDM** load driver module board. The **INT04-SF** and **LDM** circuit boards are interconnected by a 10-conductor low-voltage cable (**LVC**).

A functional block diagram of the **SF404** is shown in Figure 1. The **LDM** board contains the equivalent of four solid-state relays (**SSR**) The **LDM** is configured as 4 dimmers, with one power line feed. Each dimmer is rated at a maximum output current of 4 Amperes. The **SSR** dimmers are controlled by low-voltage DC signals from the **INT04-SF** SF logic board. These signals are optically-isolated by the **LDM** circuitry from all line voltage elements. The **INT04-SF** logic board contains a powerful microprocessor programmed to generate 16 user-selectable light sequences or patterns at an adjustable rate (the **SF404** is also available with a "SPELLER" pattern or custom patterns upon request). A rotary selector on the **INT04-SF** is used to select the pattern and a second one is used to set the rate or speed. Patterns and speed can be monitored by four LED's that represent the outputs of the **SF404**. The **INT04-SF** is mounted on the back of the front cover and derives its power from the 10 VAC step down transformer located on the LDM circuit board. All controls are accessible at the front panel.

Please contact the factory for additional information by telephone 1-877-264-8391 or email info@digitallighting.com

Figure 1 - SF404 Functional Block Diagram

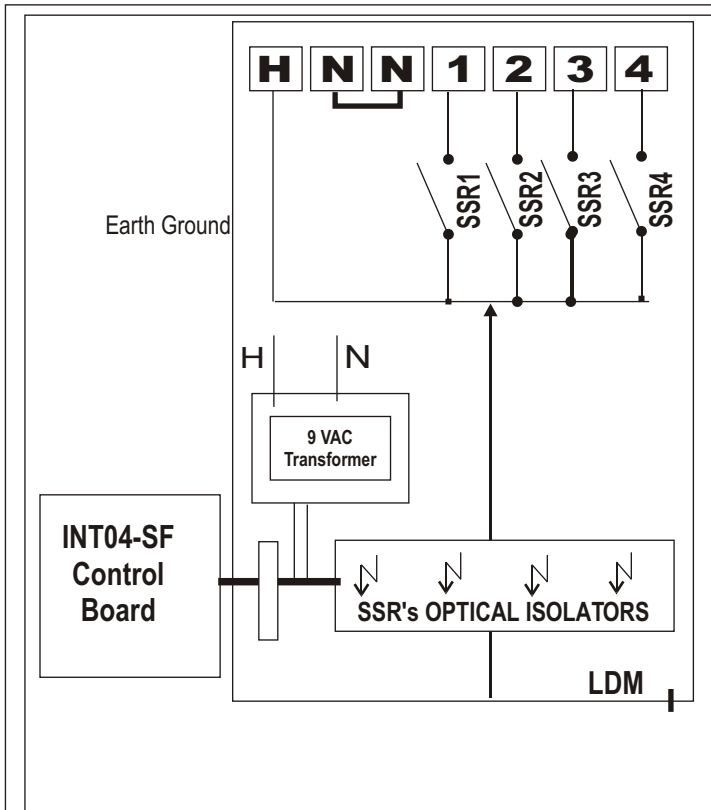


TABLE 1 - TERMINALS DEFINITION

| NAME | DESCRIPTION                             |
|------|-----------------------------------------|
| 1    | Output Of Solid-State Relay #1          |
| 2    | Output Of Solid-State Relay #2          |
| 3    | Output Of Solid-State Relay #3          |
| 4    | Output Of Solid-State Relay #4          |
| H    | Hot Line Feed For Relays 1 , 2 , 3 & 4. |
| N    | Neutral Bus Connections.                |

TABLE 2 - ABSOLUTE MAXIMUM ELECTRICAL RATINGS

| Electrical Characteristic | Terminal | Maximum  |
|---------------------------|----------|----------|
| Relay Load Current        | 1 to 4   | 4 Amps.  |
| Input Current             | H        | 20 Amps. |
| Input Voltage             | H        | 120 VAC  |

Figure 2 - SF404 Detail

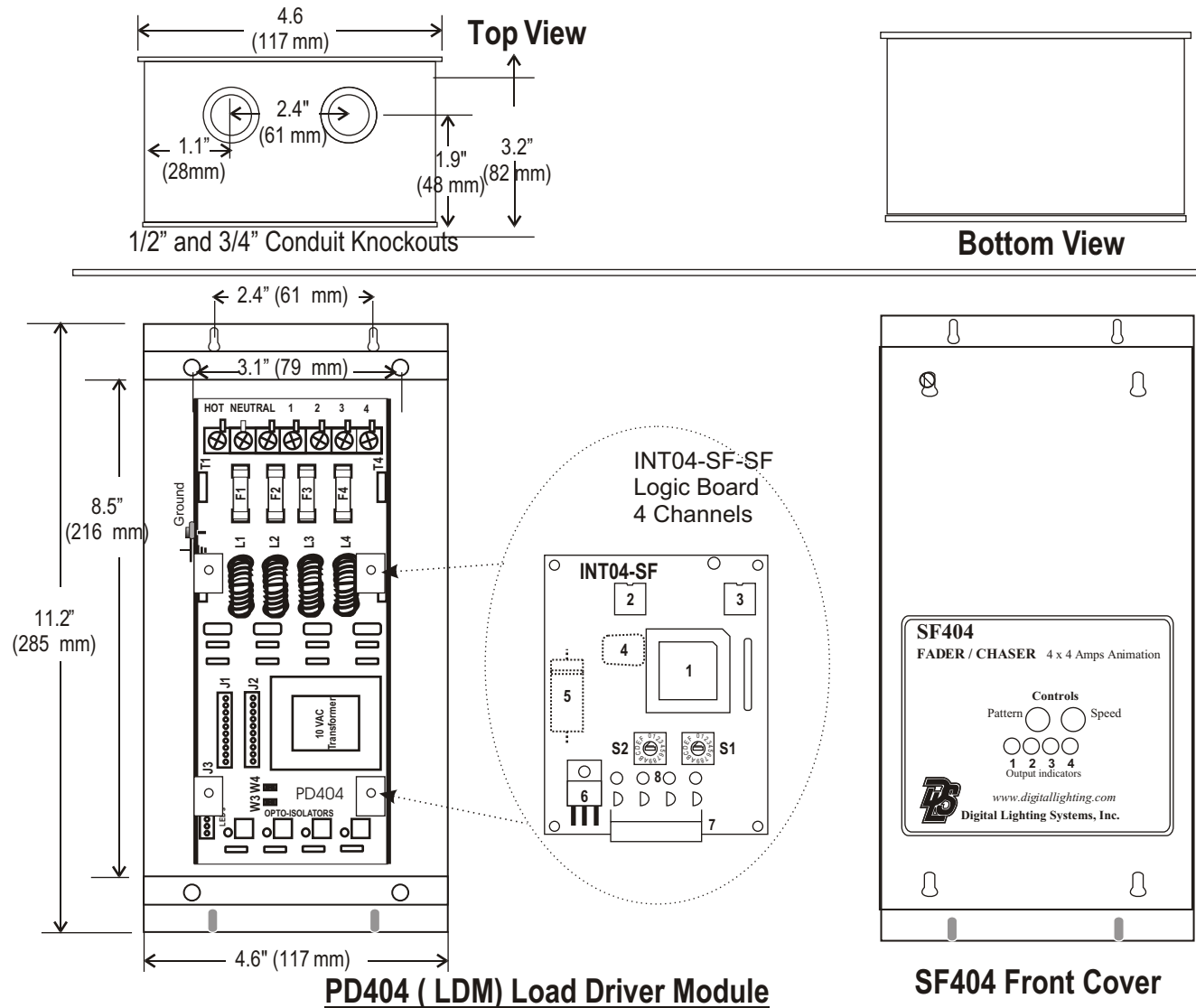


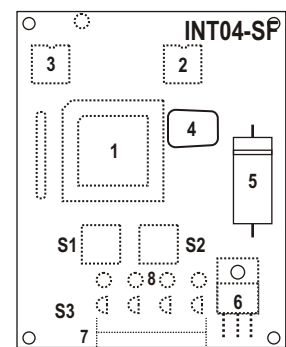
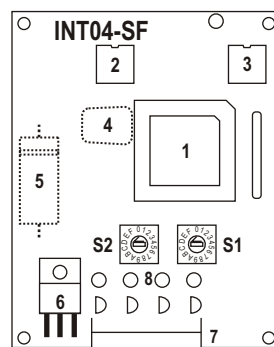
Figure 3 - SF404 INT04-SF

Table 3 - INT04-SF Circuit Legend

|      |                                 |
|------|---------------------------------|
| 1    | Microprocessor.                 |
| 2    | Nonvolatile Memory. (not used)  |
| 3    | Communications Chip. (not used) |
| 4    | Quartz Crystal.                 |
| 5    | Power Supply Capacitor.         |
| 6    | Voltage Regulator.              |
| 7    | Signal & Power Connector.       |
| 8    | Output LED Monitors.            |
| S1-2 | Speed/Pattern Selectors.        |

Components Side  
(Components with dashed outline are mounted on the rear of the board)

Solder Side



## **A- ENCLOSURE INSTALLATION**

Install the **SF404** enclosure in a well ventilated area where the ambient temperature will remain between 40°F and 104°F for full load operation. The enclosure location can be near the electric service panel or close to the loads, whichever is more convenient.

## **B- LINE VOLTAGE WIRING**

*(Please refer to Figures 5, 6 & 7)*

***All Line and Neutral wires must have adequate gauges to carry the load and the common currents.***

***All wires must have Copper Conductors with 90°C Wire Insulation.***

- One feed is needed from a 20-Amp. Breaker in the service panel.
- Connect the above breaker to terminals H . TThe total load should not exceed 16 Amps.
- Connect 1 Neutral wire from the service panel to N.
- Bring a Common wire and a Return wire, from each of the loads to the **SF404**. A single Common wire may be used provided the wire gauge is adequate for carrying the required total load current.
- Connect the Common wires from load #1 through load #4 to the Neutral Bus .
- Connect the Return wires from load #1 through load #4 to terminals 1 through 4 respectively.

## **C- MASTER-SLAVE SYSTEM WIRING**

The **SF404** can control four additional **SL408-D** slave units. The slaves contain the Load Driver Module (LDM) without the **INT04-SF** logic control board. This configuration is helpful when the load capacity of the **SF404** master is exceeded and all loads must be synchronized together. The slave is daisy-chained to the master via low-voltage 5-conductor cables (**JJ88**) provided by the factory. The **SF404** and **SL408-D** are wired identically.

## SF404-120 General Wiring Instructions for 120V version.

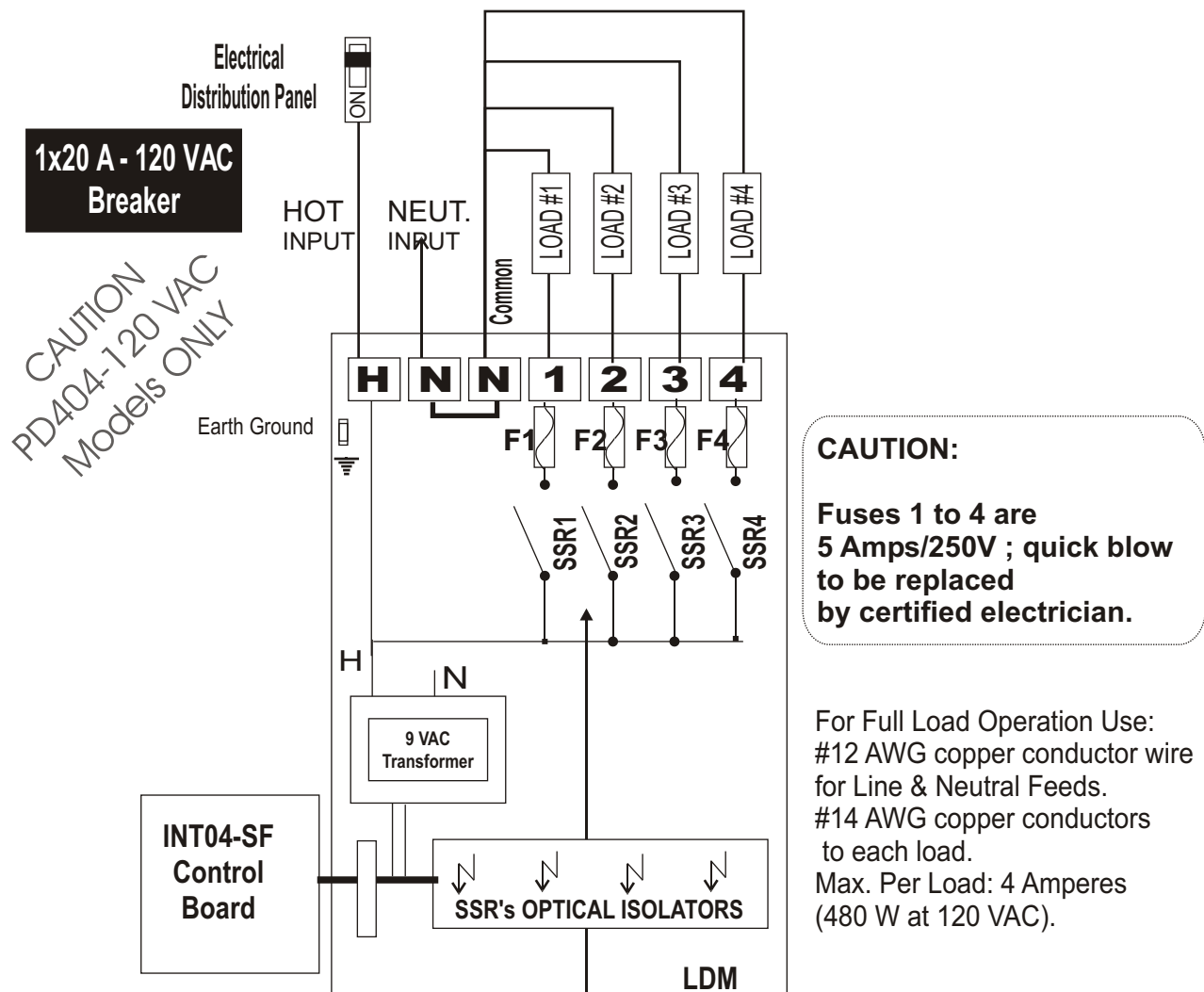
### Wiring Notes

- **DO NOT EXCEED** 480 W (4 Amps. ) per circuit output @ 120VAC.
- SF404 Fader packs may be fed by one 20 A (maximum) branch circuits and may have up to four separately dimmed loads.
- Loads connected to outputs must be dimmable.
- **CAUTION: DO NOT** attempt to parallel outputs to increase capacity.
- Installations must conform to local and/or NEC code requirements.
- Each load must have its own Neutral wire for full load operation.
- All line voltage wires must have copper conductors of adequate Gauge with 90° C wire insulation.
- **POWER EACH LOAD DIRECTLY BEFORE CONNECTING IT TO THE SF404, TO ENSURE PROPER WIRING.**

### NOTE

The **SL408-D** output wiring is identical to the **SF404**. **SL408-D** slaves do not have the **INT04-SF** control board. The **SL408-D** Load Driver Board (LDM) does not have a transformer.

Figure 5 - SF404 Typical 120 VAC Wiring.



## SF404-220 General Wiring Instructions for 220-240V version.

### Wiring Notes

- ❑ **DO NOT EXCEED** 1920 W (8 Amps. ) per circuit output @ 240VAC.
- ❑ SF404 Fader packs may be fed by one or two 20 A (maximum) branch circuits and may have up to four separately switched loads.
- ❑ Loads connected to outputs must be dimmable.
- ❑ **Both breakers must be on the same power phase.**
- ❑ **CAUTION: DO NOT** attempt to parallel outputs to increase capacity.
- ❑ Installations must conform to local and/or NEC code requirements.
- ❑ Each load must have its own Neutral wire for full load operation.
- ❑ All line voltage wires must have copper conductors of adequate Gauge with 90° C wire insulation.
- ❑ **POWER EACH LOAD DIRECTLY BEFORE CONNECTING IT TO THE SF404, TO ENSURE PROPER WIRING.**

### NOTE

The **SL408-D** output wiring is identical to the **SF404**. **SL408-D** slaves do not have the **INT04-SF** control board. The **SL408-D** Load Driver Board (LDM) does not have a transformer.

Figure 5 - SF404 Typical 220 VAC Wiring.

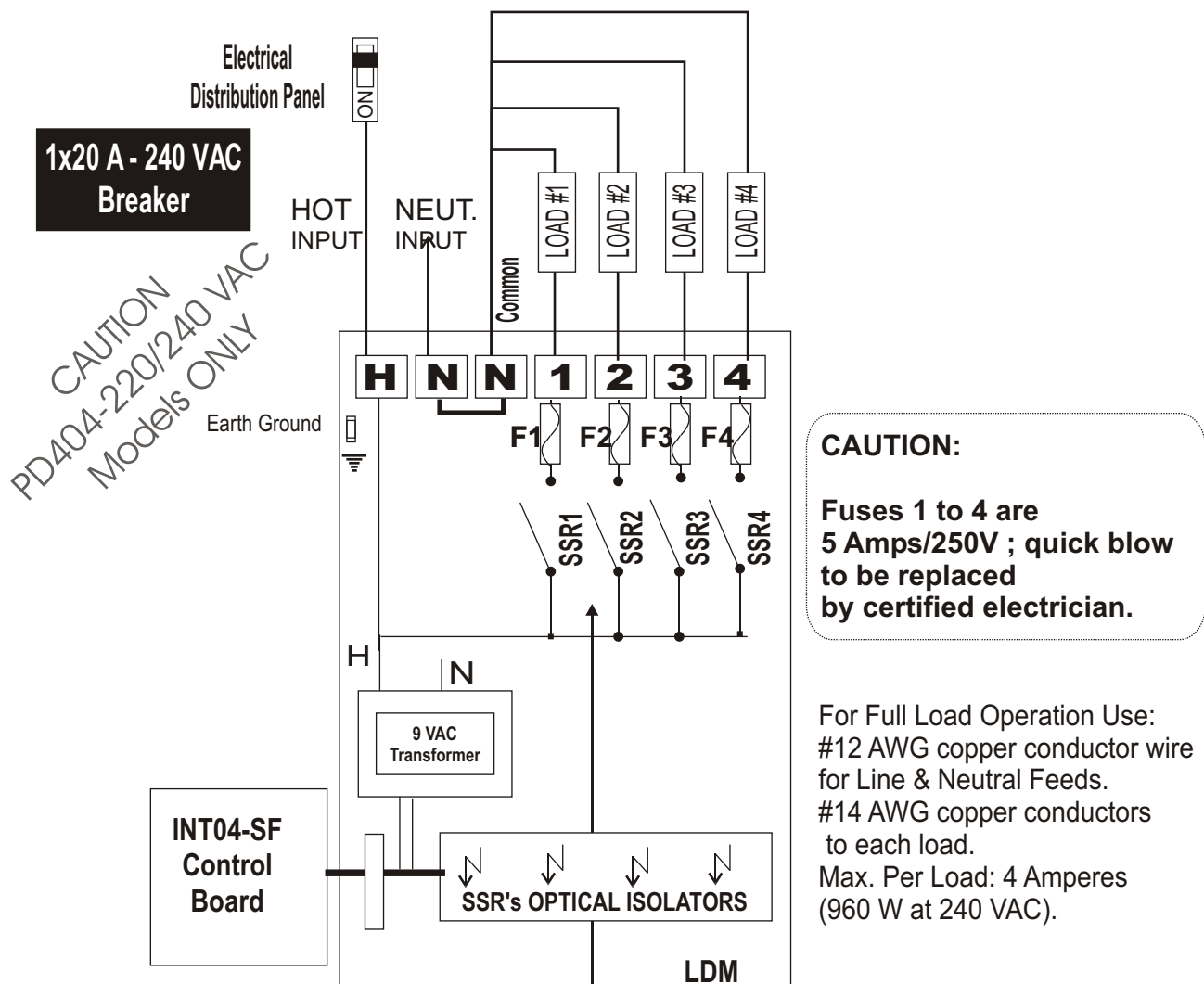
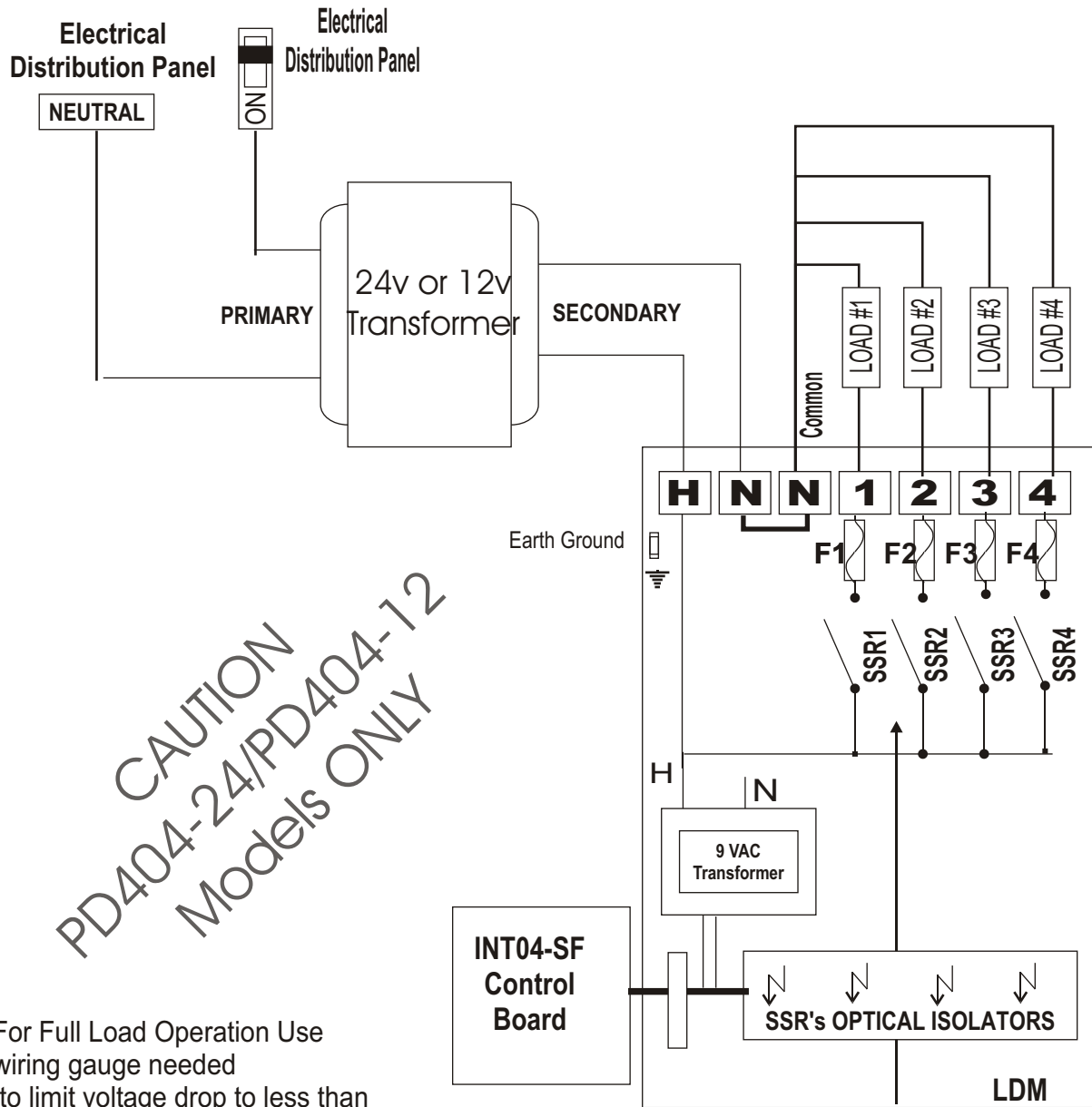


Figure 7 - SF404-24/12 Low Voltage Load and Power Wiring



**CAUTION**  
PD404-24/PD404-12  
Models ONLY

For Full Load Operation Use  
wiring gauge needed  
to limit voltage drop to less than  
3% of the Source Voltage.

**NOTES**

- 1 With PD404-24 you may use a single 24 VAC-400 VA or better transformer.
- 2 With PD404-12 you may use a single 12 VAC-200 VA or better transformer.
- 3 Follow transformer's installation & wiring instructions from manufacturer.
- 4 Maximum Load Per Output: 50 Watts at 12 VAC.
- 5 Maximum Load Per Output: 100 watts at 24 VAC.

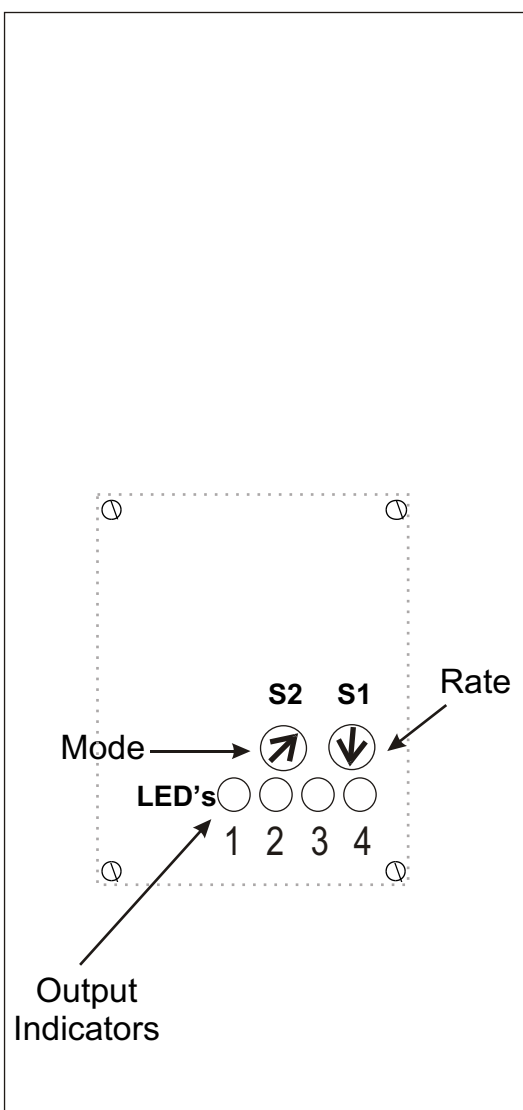
## Controls

The controls consist of two rotary 16-position (**0-9** and **A-F**) selectors. **S2 (Mode)** is used for selecting the desired Fade pattern. Positions **0** and **F** contain special patterns. The **SF404** outputs can be turned to static **ON** by selecting **F**. When **0** is selected, the **SF404** goes into an automatic pattern change mode. All other positions cause the **SF404** to play a single pattern indefinitely. **S1** is used to select one of 16 individual Fade rates (**Rate**). Minimum speed is achieved by selecting position 0. Speed doubles with each subsequent selector position.

## Indicators

LED indicators 1 to 4 indicate the status (On-Dimmed-Off) of their corresponding outputs.

Figure 9 - SF404 Front Panel Indicators and Control Selectors



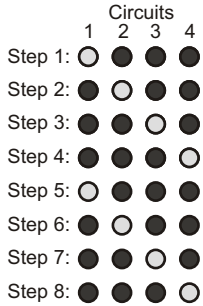
### CAUTION

Use a small Screw driver for adjusting selector positions in order to avoid damaging the Selectors slots.

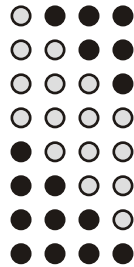


## Patterns for SF404

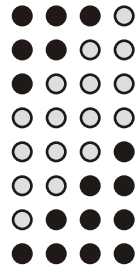
**1**  
Light Fade



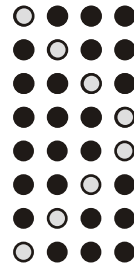
**2**  
Fill & Swipe Forward



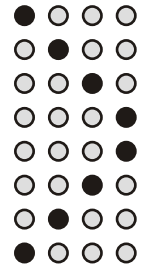
**3**  
Fill & Swipe Back



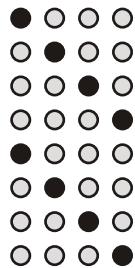
**4**  
Light Bounce



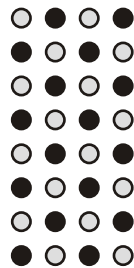
**5**  
Dark Bounce



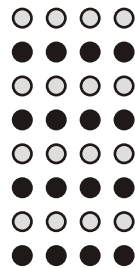
**6**  
Dark Fade



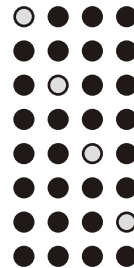
**7**  
Flip-Flop



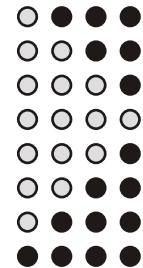
**8**  
Flash All



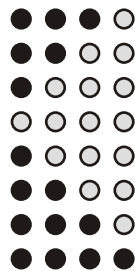
**9**  
Flash Light Fade



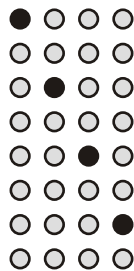
**A**  
Spring Forward



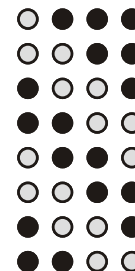
**B**  
Spring Back



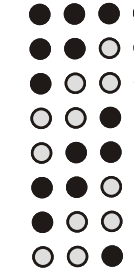
**C**  
Flash Dark Fade



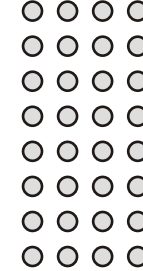
**D**  
Crawl Forward



**E**  
Crawl Back



**F**  
All On



**0**

Auto Cycle  
Patterns 1-F  
4 x each  
then repeat



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## LIMITED WARRANTY

**Digital Lighting Systems**, warrants to the purchaser that its products have been carefully manufactured and inspected and are warranted to be free from defects of workmanship and materials when used as intended. Any abuse or misuse contrary to normal operation shall void this warranty.

Digital Lighting Systems' obligation under this warranty shall be limited to replacement or repair of any units as shall within one year of date of invoice from **Digital Lighting Systems**, prove defective; and **Digital Lighting Systems** shall not be liable for any other damages, whether direct or consequential. **The implied warranties of merchantability and fitness for a particular purpose are limited to the duration of the expressed warranty.** Some states do not allow the exclusion of the limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, you may also have other legal rights which vary from state to state.

Defective merchandise may be returned to **Digital Lighting Systems**, prepaid, after prior notification has been given and approval obtained for the return. To obtain prior approval for the return of the defective items, contact your local Digital Lighting Systems distributor, representative, or:

### **Digital Lighting Systems, Inc.**

Attn: Customer Service Department  
7588 NW 8th Street  
Miami, FL 33126  
(305) 264-8391


Upon request, replacement unit(s) will be shipped as soon as available. Unless immediate shipment of replacement merchandise is requested, **Digital Lighting Systems** will not ship replacement merchandise until defective merchandise is received, inspected, and determined to be defective.

**No labor charges in connection with warranty problems will be reimbursed by Digital Lighting Systems without prior written approval from the factory.**

**Digital Lighting Systems** distributors and representatives have no authority to change this warranty without written permission.

**Digital Lighting Systems** reserves the right to determine the best method of correcting warranty problems.

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