



## Features

- Saf-T-Qube equipped
- 100% Dead front design
- Overheat and overcurrent protected
- Forced-air cooled with thermal sensor
- Utilizes a dedicated, oversized heatsink
- May operate as a Non-Dim for inductive loads
- U.L. listed in Mark VII rack or portable configuration
- Rise time is an actual 500+ microseconds measured at 10%-90%
- Fully magnetic circuit breakers, 10,000 AIC rating, designed for continuous duty

## 2x2 High Performance 2.4kw



## Description

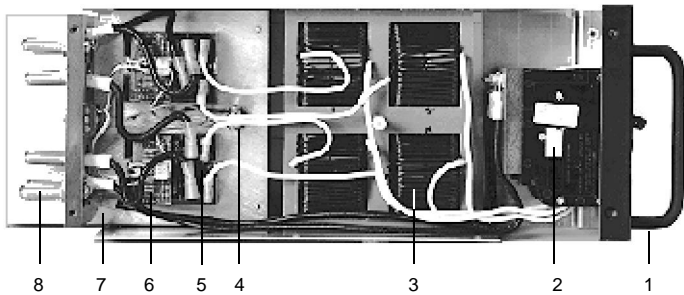
Designed for extended service life and simplicity, the **2x2** High Performance dimmer provides exceptional noise suppression at all levels. Minimum rise time is 500 microseconds measured at 10% to 90% at 2.4kw load. Each SCR power cube is equipped with an EDI Saf-T-Qube, which protects low-voltage DMX data cables and associated console and dimmer bank electronics from any potential contact with high-voltage power in the event of a power cube failure. The **2x2** SPI Dimmer is used in Mark VII dimmer banks and SCRimmer II portable dimmer packs.

The **2x2** dimmer will control incandescent, quartz and low-voltage incandescent loads as well as non-dim loads. Fully enclosed plug-in module offers a high level of safety. Chassis design includes a 300 sq. in. heatsink with forced-air cooling. Designed for user convenience, the plug-in design allows the module to be easily removed without tools.

The **2x2** plug-in module is made to the same rugged construction and quality standards used throughout EDI product lines.

## Component Information

2x2 Module side view with coverplate removed



**1. Plug-in / Pull-out handle:**

Provides easy dimmer installation and removal.

**2. Primary circuit breakers:**

20 Amp fully magnetic, 10,000 AIC full load rated circuit breakers provide short circuit and overload protection, as well as on/off switch for the dimmer.

**3. Toroidal chokes:**

Heavy-duty, iron-core, copper-wound toroidal chokes assure quiet operation with minimum lamp filament vibration and no interference in professional quality audio, radio, or television systems.

**4. Thermal Sensors:**

Monitors heatsink temperature. Dimmer output turns off when a heatsink temperature exceeds 185° F. (85° C). Normal operation automatically resumes when the temperature returns to the safe region.

**5. Solid-State Relay:**

The solid-state relay devices include two (2) silicon-controlled rectifiers each, in an inverse parallel configuration, snubber network and all required gating circuitry on the high voltage side. Complete isolation is integral to the device by means of an opto-coupled control voltage isolator, and an external electrical fault interrupt circuit (Saf-T-Qube). The rectifiers provide symmetrical alternating current output to loads at any output level from off to full intensity.

**6. Saf-T-Qube:**

Protects low-voltage DMX data cables and associated console and dimmer bank electronics from contact with high-voltage power in the event of a power cube failure.

**7. Heatsink:**

An integral component of the dimmer module, the heatsink dissipates heat produced by the solid-state relay. The solid-state relays are mounted to an extruded aluminum heatsink with a minimum of 300 square inches of radiating surface.

**8. Line Input/Load Output Pins:**

150 Amp, high quality brass pins, floating for true alignment and positive connection.

JOB NUMBER:

APPROVAL STAMP

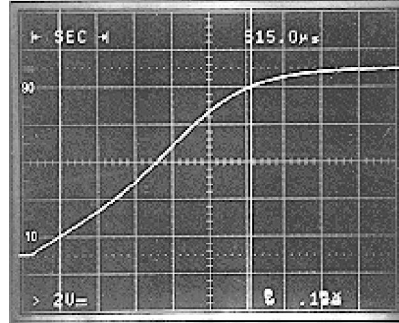
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CUSTOMER:

P. O. #

## Electrical Characteristics

- Over-current:** Withstands cold in-rush currents, over-currents, hot patches, and dead shorts. May be inserted or removed under full load without damage.
- Overheat:** Dimmer output turns off when heatsink temperature exceeds 185° F (85° C). Normal operation automatically resumes when the temperature returns to a safe level.
- Operating Environment:** Temperature range: 32° F. (0° C) to 104° F. (40° C). Humidity range: 0% - 90% non-condensing.
- Dimming Curve:** Square Law.
- Interaction:** No interaction between dimmers.
- No Load Loss:** Less than 1 watt.
- Load Ranges:** 25 watts to rated capacity, black-out to full intensity.
- Load Regulation:** 2% from 100-130VAC over the entire load range.
- SCR Rating:** Heavy duty 40A rms, 600V, Tungsten rated.



### Oscilloscope Data:\*

515 Microseconds @  
2400W.

\*Measurement taken on  
Tektronix Model 2246 100 MHz  
Oscilloscope, 10% to 90%.  
Incoming voltage: 120VAC 60Hz

## Mechanical Characteristics

- Chassis:** Heavy-gauge aluminum.
- Front Panel:** Heavy-gauge aluminum, finished with black epoxy paint and silk-screened printed nomenclature.
- Dimensions:** 5.75" H x 16.5" D x 3.75" W (14.6cm x 41.9cm x 9.52cm)
- Net Weight:** 12 lbs. (5.44 kg)

## Specifications

- The dimmer module shall be constructed of aluminum and aluminum extrusion and shall have a pull-handle on the front panel. The module shall be painted in black epoxy, with permanent, white screened markings.
- The front panel of each module shall be marked with the manufacturer's name, model number, quantity and capacity of dimmers, power line voltage and frequency.
- The solid-state switch devices shall be mounted in a substrate material for maximum heat dissipation. The substrate shall be encapsulated in an epoxy filled high-impact plastic case along with an optical isolator, a snubbing network and all required gating circuitry on the high voltage side of an integral opto-coupled control voltage isolator providing a minimum of 2500V RMS isolation between line and control in the switch device. A 2.4kw module shall have a minimum capacity of 40 amps, with a rating of 500 Amp peak single cycle surge current and 600V transient capacity.
- In addition to the optical isolation provided internally in the power cube device, additional protection shall employ a combination of Metal Oxide Varistors (MOV's), Pico fuses and/or transzorb to provide the highest level of protection to control inputs. Dimmers using Triacs or power cube isolation systems external to the dimmer module shall not be acceptable.
- The module shall contain fully magnetic circuit breakers, filter chokes, heatsink with thermal sensor, and silicon controlled rectifiers. Except for circuit breakers, the module shall contain no moving parts.
- All load connections to the module shall be by oversized pin connectors, which allows the capability of "hot patching" cold, incandescent loads up to its rated capacity without malfunction with the control signal at full on.
- All internal load circuit wiring shall be constructed of tin-coated stranded copper wire with extruded fluorinated propylene insulation, rated at 392° F. (200° C), and sized in accordance with the National Electric Code.
- The dimmer shall be protected against overcurrents and shall withstand in-rush currents, hot patches and short circuits of 0.02 ohms or more without damage. The module shall have a fully magnetic primary circuit breaker rated at 100% capacity, listed at 10,000 AIC, with a "must trip" capacity of 125%.
- The dimmer module shall include a circuit which shall shut down the module when the heatsink temperature exceeds 185° F. (85° C). When temperatures return to safe levels, the module shall restart automatically. If a dimmer module overheats, provisions shall be made in the system to signal the console operator that a dimmer module has shut down. Dimmer modules without individual thermal sensors shall not be acceptable.
- The solid-state relays shall be mounted to an extruded aluminum heatsink with a minimum of 300 square inches of radiating surface. A dedicated heatsink shall contain the maximum SCR heat generation extrusions to less than 75° C. Dimmers utilizing the chassis as a heatsink shall not be acceptable.
- Dimmer module control connectors shall be designed so that modules of a greater capacity cannot be operated within the rated capacity of the wired position.
- The dimmer shall operate over an input voltage range of 90 to 140 VAC, 50/60 Hz. Nominal input voltage shall be 120 VAC, 50/60 Hz, unless otherwise specified. Available in 220-240 VAC, 50Hz configurations.
- The maximum heat loss for each 2.4 kw dimmer shall be no greater than 59 watts per dimmer or 100 BTU's per hour per connected kw of load.
- The dimmer shall function properly with any incandescent load from 25W to the full rated capacity.
- The dimming curve shall conform to the Square Law.
- Any given control setting shall result in the same dimmer output regardless of the direction of control movement.
- Each dimmer shall have a toroidal, copper-wound, iron-core high performance choke. Rise time ratings shall be as noted in the manufacturer's oscilloscope data, but in no case shall be less than the following:

Watts	Rise Time
1000	400 microseconds
1500	450 microseconds
2400	500 microseconds
- All measurements are 10% to 90%. The alternative manufacturer must provide either high performance chokes or supply certified test data assuring compliance with the above.
- Each 120V dimmer module shall be a recognized component of Underwriters Laboratories, and shall be listed for continuous duty at 100% of its ratings.
- When used with EDI memory controllers, this dimmer may function as a non-dim. When functioning as a non-dim, this module shall function with both incandescent and inductive loads.
- The dimmer module is the SPI 2x2 2.4Kw series as manufactured by Electronics Diversified, Inc., Hillsboro, Oregon 97124.

Specifications subject to change without notice. Specification applicable to standard products only.  
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