

# **DIMMEX™**

## Dimmer Pack (DX Series)



DX 6-2



DX 12-1

## User Manual

**Introduction**

This Users Manual is supplied with your system. Copies of this manual may be obtained from Electronics Diversified, Inc. for a nominal charge. It is recommended that you copy those portions of this manual applicable to your present use in the installation, maintenance or repair and preserve the original in a safe place. Copyright 1997, 1998, by Electronics Diversified, Inc. All rights reserved.


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**Specifications**

- General:** Portable or Rack mounting Dimmer pack. Features twelve 1.2Kw SCR dimmers (DX 12-1) or six 2.4Kw SCR dimmers (DX 6-2); one circuit breaker per dimmer, four indicator lights, and forced-air cooling.
- Cabinet:** Heavy duty materials finished with black polyurethane enamel paint. Nomenclature permanently silk screened.
- Environment:** Temperature range; 32°F (0°C) to 104°F (40°C). Humidity; 0% to 90% noncondensing. Dimmex may be used in any position (horizontal or vertical), providing air vents are not blocked.
- Control Input:** 0 - +10 VDC standard. Contact factory for other control volatges up to 14 VDC.
- Protection:** Primary circuit breaker for each dimmer. Two fuses provide control card protection.
- Load:** 10 Watts to rated load incandescent.
- Dimming Curve:** Square Law.
- Input Voltage:** 90 to 140 VAC.
- Power Requirements:** 120 Amps per leg for 1Ø, 2-wire 120 VAC.  
60 Amps per leg for 1Ø, 3-wire, 120/240 VAC.  
60 Amps per leg for two legs of 3Ø, 4-wire, 120/208 VAC.
- Load Connectors:** Parallel Blade: (DX-6) Two per dimmer.  
(DX-12) One per dimmer.  
Grounded Stage Pin: One per dimmer.  
Twist Lock: One per dimmer.  
Terminal Strip: One per dimmer.
- Dimensions:** 5.75" H x 15.25" D x 17.5" W  
(14.6cm x 38.7cm x 44.5cm)
- Weight:** DX6-2 32 lbs. (14.52kg)  
DX12-1 37 lbs. (16.78kg)

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**WARNING:**

Maximum ambient operation and storage environment for this equipment is 104°F (40°C), with 90% humidity, non-condensing. Extreme caution is advised when having liquids, food and cigarettes around any equipment. During severe electrical storms, equipment should be disconnected. Failure to adhere to these requirements may result in malfunction or serious damage.



## Description

The Dimmex dimmer pack is a compact lighting control system. The Dimmex Model 12-1 provides twelve solid-state dimmers of 1200 watts capacity each. The Model 6-2 provides six solid-state dimmers of 2400 watts capacity each.

Flexibility is the cornerstone of the Dimmex unit; the pack uses any EDI analog output control console and can either rack mount, wall mount, or remain portable.

The front panel contains circuit breakers for each dimmer, a removable control module, an air vent for forced air cooling, two fuses for control module protection, a Control Power Switch, and an input power error indicator.

The Control Module front panel contains a preheat adjustment, phase/power indicators, an overtemperature indicator, a control input connector, a calibration adjustment cover, and depending on the options purchased, a test indicator button per dimmer circuit.

The back panel includes output load connectors, and an air vent for forced-air cooling.

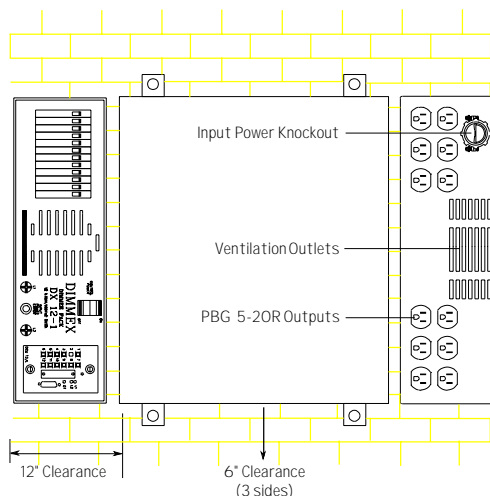
A cooling fan is mounted inside the console. The vents on front and back **MUST REMAIN CLEAR**, or overheating may occur.

## Mounting

Dimmex dimmer packs are excellent for portable or permanent lighting applications. For semi-permanent installations, the Dimmex is designed to be mountable in an E.I.A. standard 19" equipment rack with optional rack mount brackets. Contact EDI to order brackets.

**Wall Mounting:** Mount the dimmer to the wall with the front panel facing either right or left, as spacing permits.

Front view



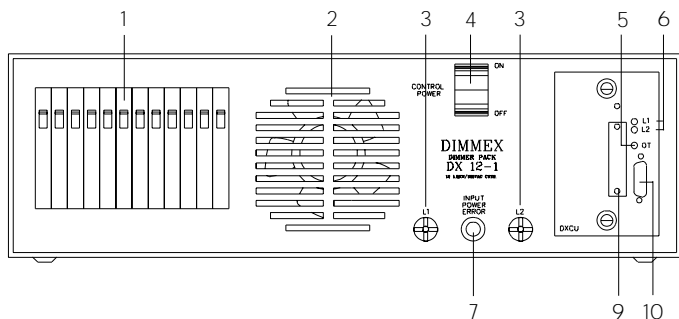
Allow 6" clearance on three sides, and 12" in front to allow the dimmer control module to be removed. Do not block any of the ventilation openings.

Do not use aluminum wire.

Do not run the control wiring and the load wiring together or in the same conduits.

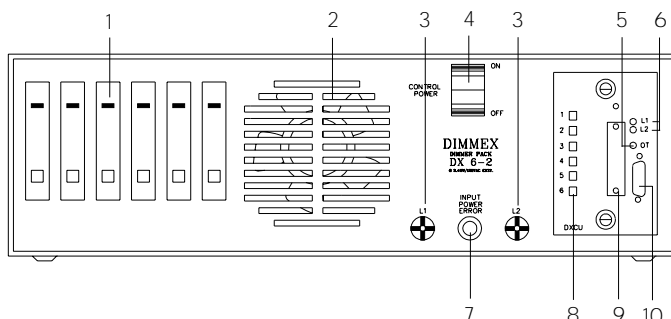
Avoid running common neutrals to the load wiring.

DX 12-1 Front View



1. Primary circuit protection:  
U.L. listed fully magnetic circuit breakers.
2. Cooling:  
Forced air ventilation with a single 55 CFM fan.
3. Fuses:  
Protection for plug-in control electronics.
4. Control Power Switch:  
Applies power to the dimmer pack control circuitry and the fan.
5. Overtemperature Indicator:  
Red LED lights when the thermal sensor shuts dimmer off.

DX 6-2 Front View



6. Phase/Power Indicator:  
Two green LEDs light when breakers or fused switches are on and power is on. DX-12 model has two per phase.
7. Input Power Error Indicator:  
Red light indicates incorrect input wiring.
8. Optional dimmer output test buttons and status indicators:  
Allows for simple verification of operation without a control console.
9. Removable Cover Plate:  
For calibration or replacement of plug-in control card.
10. 15-pin male "D" connector for analog remote control console.

### System Connection

The Dimmex dimmer pack, when powered by single phase, 2-wire 120 VAC, draws a maximum current of 120 Amps. When powered by single phase, 3-wire, 120/240 VAC or two legs of three phase, 4-wire, 120/208 VAC power, each leg draws a maximum of 60 Amps.

#### Cable

**Selection:** To avoid excessive voltage drops, proper cable sizes and lengths must be used. To choose an appropriate cable size for a given length, use the Surge Factor and Surge Current tables below. The maximum length in feet for a given size cable is found by dividing the cable's surge factor by the surge current for the power configuration used.

Copper Wire Size	Surge Factor
6	6,250
4	8,300
3	12,500
2	15,500
1	20,800
1/0	25,000

*NOTE: For aluminum wire, multiply the Surge Factor by .25. For two equal-sized wires used in parallel as one conductor, double the surge factor.*

#### Surge Current per Leg:

Power Configuration	Estimated Surge
Single Ø, 2-wire 120 VAC . . . . .	240 Amps
Single Ø, 3-wire 120/240 VAC, or	
Two legs of three Ø, 4-wire,	
120/208 VAC . . . . .	120 Amps

#### Wiring:

This information is for permanent installations only.

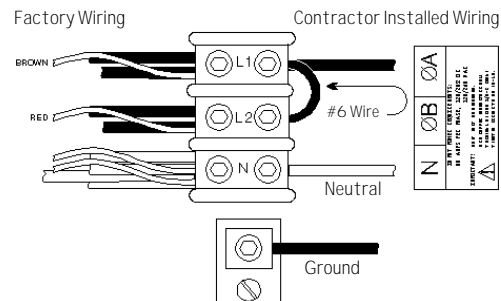
1. Do not use common neutrals. Run separate neutrals for each dimmer load circuit.
2. Ten percent spares recommended for all control lines.
3. All wiring shall conform to local codes and the National Electric Code (NEC). Conductors shall be sized in accordance with the N.E.C. ampacity tables 310, including notes 8 & 10.
4. All controls wiring is NEC Class 2.
5. Feed and branch neutrals must be counted as current carrying conductors per notes 10B & 10C to N.E.C. ampacity tables 310.
6. Power and control conductors may not share the same conduit or raceway.
7. Recommend double check continuity for all listed control lines, before initial turn-on from terminal strip to control unit (controller, wallplate, etc.).

**Input Power:** Before connecting input power, turn off the power source breaker and the Dimmex front panel breakers.

Remove the screws from the top cover and lift off the cover.

Route the feed cable through the cable clamp on the rear panel. Make the required connections. All terminal screws must be snugged down firmly. Beware of stray wire strands as they can cause problems. Tighten the feed cable clamp; this clamp provides strain relief. Replace the cover.

#### Single Phase, 2-wire, 120 VAC power:



Connect:

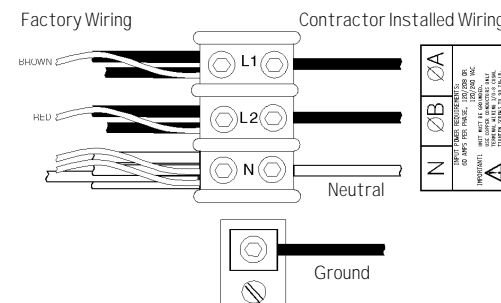
- ...Ground to the lug bolted to the case bottom, near the main input power terminals.
- ...Neutral to terminal N.
- ...Line to terminal L1(ØA).

Install a #8 jumper wire between terminal L1 (ØA) and terminal L2 (ØB).

#### Single Phase, 3-wire, 120/240 VAC power:

or:

#### Two legs of 3-Phase, 4-wire, 120/208 VAC power:



Connect:

- ...Ground to the lug bolted to the case bottom near the the main input power terminals.
- ...Neutral to terminal N.
- ...Line 1 to terminal L1 (ØA).
- ...Line 2 to terminal L 2 (ØB).

After completing the above procedure, turn on the power and check the front panel Input Power error indicator. If error light is illuminated, the dimmer pack is miswired. Turn off power and recheck the above wiring steps. If light remains on after rechecking connections, contact the factory.



## System Use

The Control Power switch applies power to the dimmer pack control circuitry and the fan. The circuit breakers control power to their respective dimmers.

Ensure that the front and back air vents are not blocked.

Place the Control Power switch in the *ON* position. The phase indicators should light. If the phase indicators do not come on, turn the Control Power switch off and recheck all wiring. Once Control Power has been applied with the phase indicators on, the dimmer breakers may be turned on by placing the lever in the upward position.

**Indicator Lights:** The Dimmex dimmer pack features four types of indicators: *GREEN LEDs* (L1 & L2) are phase/power indicators; the *RED LED* is the over-temperature indicator, the large *RED NEON* light is the input power error indicator, the (optional) small rectangular *YELLOW* buttons are the dimmer indicators.

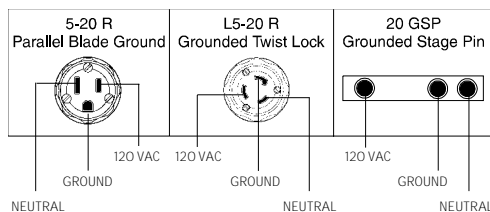
With power wired correctly and the Control Power switch in the ON position, the phase A and phase B indicators (two *GREEN LEDs*) will be on, and the Input Power Error indicator will be off.

The *RED* overtemp indicator turns on if the thermal sensor shuts off the dimmer. When the temperature returns to the safe region, the dimmer automatically resets and operation resumes.

## Lamp

**Connections:** With the exception of Terminal Strip varieties, access to the load connectors are on the rear panel, and numbered for each dimmer. Each connector provides line, neutral, and ground terminals.

### Connector Types:

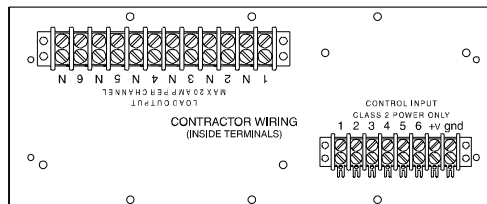


The DX6-2 dimmer pack has two connectors for each dimmer output when ordered with the parallel blade (NEMA 5-20R) and the grounded stage pin (20GSP) load connectors.

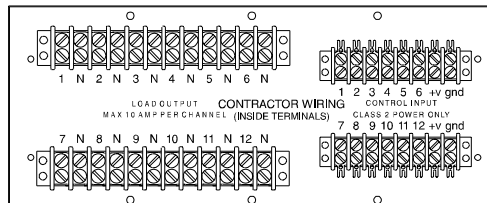
The DX12-1 dimmer pack has a single load connector for each dimmer output when ordered with the parallel blade (NEMA 5-20R) or grounded stage pin (20GSP) load connectors.

## Terminal Strips: (Class 2 Power Only)

### Dimmex 6-2



### Dimmex 12-1



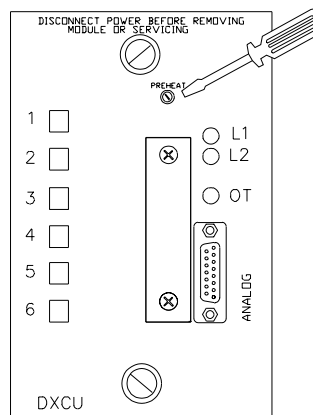
Both the DX6-2 and DX12-1 dimmer packs have a single load connector for each dimmer output when ordered with the twist lock or terminal strip connectors. For each dimmer, the load may be from 25 watts to rated capacity.

## Calibration

The Dimmex is factory calibrated for a 0 to +10 volt d.c. control signal, unless otherwise specified. The following adjustments should only be accomplished AFTER it has been ascertained that the control console is properly calibrated. Should problems still persist after accomplishing this procedure, contact the factory.

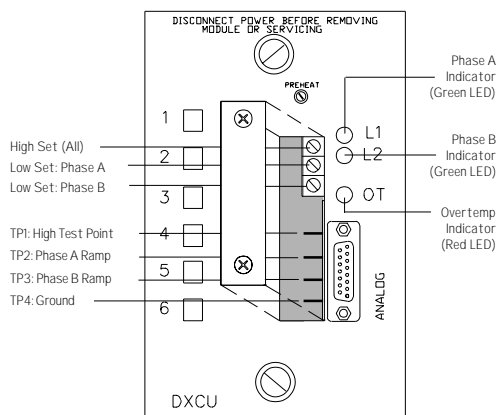
### Preliminary:

Locate the control module in the right corner of the dimmer pack front panel. Using a small flat-bladed screwdriver, set the preheat adjustment fully counter-clockwise before attempting any calibration procedure. Remove the two screws securing the small calibration cover plate, located immediately to the left of the control connector.



**Calibration:** Removing the cover plate will reveal, from the top down, three potentiometers and four test points.

The top potentiometer is the *HIGH* adjust control for all dimmers in the pack. The middle potentiometer is the *LOW* adjust for dimmers on phase L1 (A). The bottom potentiometer is the *LOW* adjust for the dimmers on phase L 2 (B).



**Calibration:** (cont'd)

*NOTE: Many voltmeters cannot accurately measure the output waveform of a solid-state dimmer. Use a true RMS voltmeter or an oscilloscope and at least a 100 Watt load connected to the dimmer output.*

*Set the control for dimmer 1 to FULL ON and measure the output. Adjust the HI adjust potentiometer just at the threshold of maximum output. DO NOT adjust the control beyond maximum output.*

*Set the control on dimmer 1 to 0 (or OFF) and measure the output of dimmer 1. Set the L1 LOW adjust for 8V RMS, or until the connected lamps just extinguish.*

Repeat above for phase L2, using dimmer 4.

**Preheat Adjust:** To set the Dimmex for preheating the lamps, move all sliders on the control console to 0. Locate and adjust the *PREHEAT* pot on the control module.

Turn the adjust clockwise until the lamps begin to glow dimly, and then back off the adjustment until the glow extinguishes. This will reduce nuisance tripping when a maximum load is instantly turned full ON.

## Trouble-Shooting Guide

Consult with EDI's Customer Service Department before performing any maintenance or repair on a unit under warranty. All work inside the console should be done only by a qualified service technician. Unauthorized service may void the warranty.

The trouble-shooting guide lists various problems, probable causes and possible solutions. For any malfunction, first check for physical damage (i.e., broken or pinched wires, or loose connections).

**Problem:**

Input Power Error Light on . . . . .

Phase A or B Indicator lamps out . . . . .

Entire pack non-functional . . . . .  
(Power LED out)

Dimmers interact when sliders are moved . . . . .

Lamps off before sliders reach zero . . . . .

**Cause:**

A voltage has been applied between the Neutral and Ground input power terminals. Check that the neutral conductor has been installed in the neutral terminal, and not exchanged with one of the 120VAC conductors.

Power has not been applied to either input power terminal Phase A or Phase B. If 2-wire power is used, the phase B lamp will not light, since the L2 terminal is not used.

Control Power Switch is in the OFF position.

Phase fuses are missing or blown.

Dimmer Pack is not connected to a power source.

Control Power Switch is in the OFF position.

Phase fuses are missing or blown.

There is excessive voltage drop in the input power cables or the lamp cables (a problem in 3-wire power systems). Refer to cable selection (5) and check that the input power cables are neither too small nor too long. The neutral conductor must be at least as large as the largest 120VAC conductor. Check that each lamp has a separate neutral conductor, equal in size to the 120VAC conductor.

Check all power connectors in the system. A dirty or loose connector can cause this problem.

Measure the voltage between neutral and ground at the console power terminals, not the power source. It should be approximately zero volts a.c.

Calibration error. Recheck high-set calibration for phase L1 (A) & L2 (B).



**Troubleshooting (cont'd)**

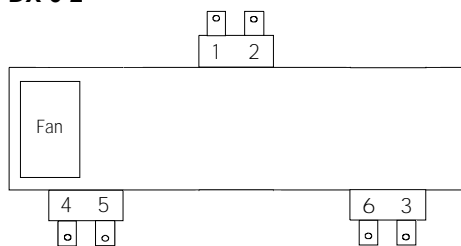
Lamps glow slightly with sliders at zero . . . . .	Preheat and/or Low set is too high. Recheck low set calibration for phase A (L1) and phase B (L 2).
Lamps on FULL before sliders reach 10 . . . . .	High setting too high. Recheck high-set calibration for phase A and B.
Lamps less than full ON with slider at 10 . . . . .	High setting too low. Recheck high-set calibration for phase A and B.
Single dimmer full ON at any control setting . . . . .	Faulty SCR module. Contact the factory for replacement part.
Single dimmer off . . . . .	Individual dimmer's circuit breaker is OFF. Recheck circuit breaker. Faulty SCR module. Contact the factory for replacement part.
Overheating, overheat LED ON . . . . .	Blocked cooling vents. Fan cord unplugged; fan not running. Overloaded dimmers. The dimmer unit will automatically shut down when overheated and reset when cooled.

**Solid-State Relay Replacement**

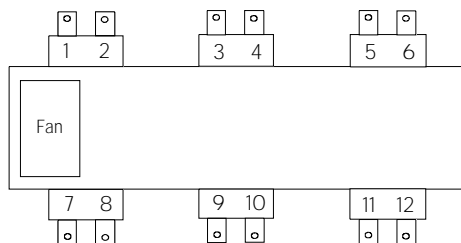
Determine which dimmer needs repairing. The solid-state relays are mounted on the heatsink.

- Replacement:**
1. Note the arrangement of the power connections (large wires) on the defective solid-state relay, then unplug the connections.
  2. Note the orientation of the control connector, then unplug the connector.
  3. Remove the relay by removing the two screws which secure it to the heatsink.
  4. Apply a thin coating of heatsink compound to the bottom of the new solid-state relay and replace by following steps 1 - 3 in reverse order.

**SSR Location: DX 6-2**



**DX 12-2**



**Replacement Parts**

Replacement parts are available from Electronics Diversified, Inc.

To obtain replacement parts, call (800) 547-2690 and ask for Customer Service.

Since these systems are customized for individual applications, it is important that you have the following information available when you call.

The equipment type or number, serial number, and original EDI system drawing number (As-Built Drawing Number). Please SPECIFY LINE VOLTAGE.

When calling, the customer service representative will help to determine the proper part you need, and any additional parts, if necessary, depending upon your requirement.

EDI Part No.	Description
<b>DX 6-2</b>	
261-2070	Circuit breaker 20A-1Ø
152-2025	SSR Dual 40 Amp
159-0004	Fuse (1 Amp)
645-0095	Dimmex Control Unit
<b>DX 12-1</b>	
261-2015	Circuit Breaker 15A-1Ø
152-2025	SSR Dual 40 Amp
159-0004	Fuse (1 Amp)
645-0095	Dimmex Control Unit



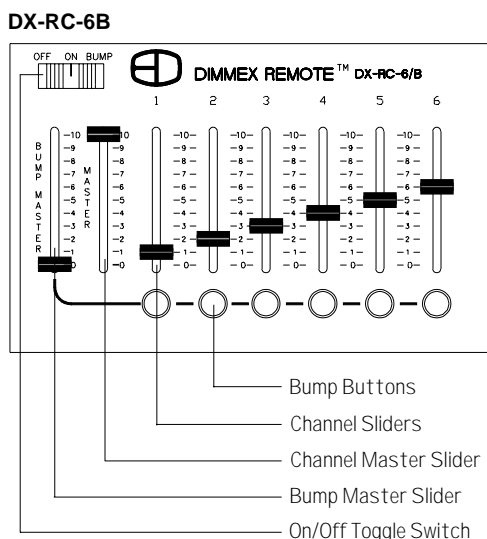
## DX-RC Remote Control

- General:** A portable single-scene control console featuring one channel control slider per dimmer (6 of 12 channels), one master control slider, one on/off toggle switch, and bump buttons.
- Cabinet:** Heavy-duty materials finished with black polyurethane enamel paint. Nomenclature permanently silk-screened.
- Environment:** Temperature: 32°F (0°C) to 104°F (40°C). Humidity: 0% to 90% non-condensing.
- Dimensions:**  
 DX-RC 12B:  
 12" L x 4¾" W x 2¾" to 1½" H.  
 (30.48cm x 12.06cm x 6.98 to 3.81cm)  
 DX-RC 6B:  
 7-3/8" L x 4¾" W x 2¾" to 1½" H.  
 (18.73cm x 12.06cm x 6.98 to 3.81cm)
- Weight:**  
 DX-RC 6B:  
 4 lbs (1.81kg)  
 DX 12-1B  
 6 lbs (2.72kg)  
 (includes 20 ft. extension cord):

## Description:

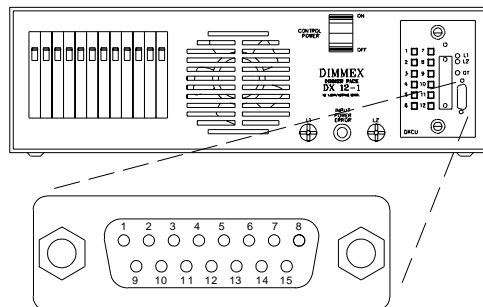
DX-RC-6B and DX-RC-12B are portable, single-scene controllers designed for use only with Electronics Diversified, Inc.'s Dimmex analog dimmer packs. Each unit contains one channel per dimmer (6 or 12 channels), slider controls, one master slider, an on/off toggle switch, and channel bump buttons with bump master.

*NOTE: Do not attempt to use the Remote control Unit (DX-RC) with any other dimmers.*



**Connection:** Plug the DX-RC cable into Dimmex's control input connector (15-pin "D" connector located on the front of the control module).

### Control In



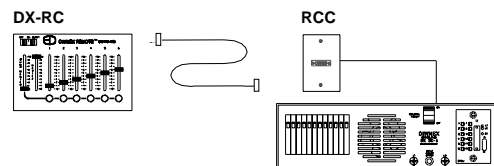
Pin Number	Description
1 thru 12	Channels 1 thru 12
14	DX-RC power
15	Control Ground

For the DX 6-2, pins 7 through 12 are not used. Pin 13 is not used on the DX 6-2 or DX 12-1.

*NOTE: Unless otherwise requested, control voltage will be calibrated for 0 to +10 volts d.c.*

## DX-RC-RCC

**Connection:** When connecting a DX-RC-6 or 12B to the Dimmex dimmer by means of an RCC (Remote Control Connector), the DX-RC plugs into the RCC with a 20' 15-D connector, and the RCC is hard-wired to the Control Input terminal strip inside the dimmer pack.

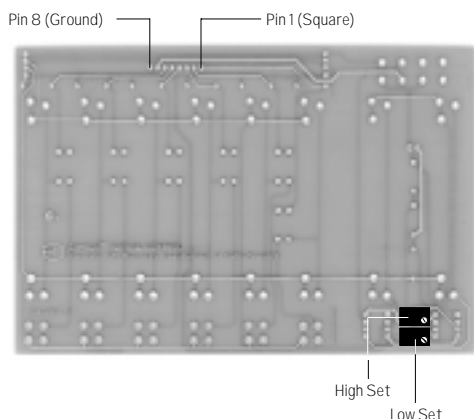


## DX-RC

**Operation:** Individual channel sliders are scaled 0 (0% OFF) to 10 (100% full intensity). With a slider set at 5, lights will be 50% intensity. The master slider proportionally controls all channels, including the Bump Master. With the master slider set at 10 (100%) and a channel slider set at 4, lights will be 40% intensity. If you move the master slider to 5 (50%) intensity, the light will now be 20% intensity (one-half a 40% setting). With the master slider at 0, all channels will be off. To operate the DX-RC, the ON/OFF switch must be in the ON position. To turn off all lights, move the switch to the OFF position. Each channel has a bump button. Press the button and the channel will go to the intensity set by the Bump Master. Release the button and the channel will return to its preset level. To have the bump function active, place the ON/OFF switch in the BUMP position.



**Calibration:** Disassemble the unit and locate the high and low set pots.  
 Make sure the DX-RC is on, the master slider is at 10, and the dimmer pack is ON.  
 Connect the voltmeter's "+" to pin 1 (square) and connect the ground to pin 8.  
 Set the control for dimmer 1 full ON and measure the output from pin 1. Adjust the high set for an output of +10 volts.  
 Set the control full OFF and measure pin 1's output. Adjust the low set for an output of +.35 volts.  
 Calibrating Channel 1 will calibrate all DX-RC control channels.



**DX-RC Trouble-Shooting**

**All channels dead:**

- Check that dimmer pack and DX-RC is on.
- Check that Off/On switch is on.
- Check that master slider is not on 0.
- Check that DX-RC is connected properly.

**One of the following:**

- A. One or more channels is dead.
- B. One or more channels on full at any control.
- C. Lamps off before sliders reach zero.
- D. Lamps glow slightly with sliders at zero.
- E. Lamps on full before slider reaches 10.
- F. Lamps less than full with slider at 10.

**Refer to Dimmex Trouble Shooting (page 6), or DX-RC Calibration**

**Service**

EDI offers a 24 hour Service / Support Network.  
 For technical questions about this product or operational assistance, ask for Customer Service at: . . . . . 1-800-547-2690  
 You may communicate by FAX: . . . . . 1-503-629-9877  
 After Hours Emergency contact: . . . . . 1-503-645-5533  
 Ask for Emergency Assistance.  
 Internet: . . . . . www.edionline.com  
 Internet E-Mail: . . . . . service@edionline.com

If your Dimmex needs repair, call 503-645-5533 for a Return Materials Authorization number, and a **shipping address** will be furnished.



Electronics Diversified, Inc.  
 1675 N.W. Cornelius Pass Road  
 Hillsboro, Oregon, 97124  
 Ph: (503) 645-5533  
 Fax: (503) 629-9877



**Attention Dimmex dimmer pack owners!**

**Please return this registration card immediately.**

Your prompt attention to this matter will ensure your receiving updated technical information for this product as it becomes available. Please complete all information. Look for acknowledgment of your registration within 6-8 weeks.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Facility and/or Company: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

Web site: \_\_\_\_\_

CUT ALONG DOTTED LINE



**Mail to:  
EDI User Manual Registration  
1675 NW Cornelius Pass Road  
Hillsboro, Oregon 97124**

**or FAX to: (503) 629-9877**

