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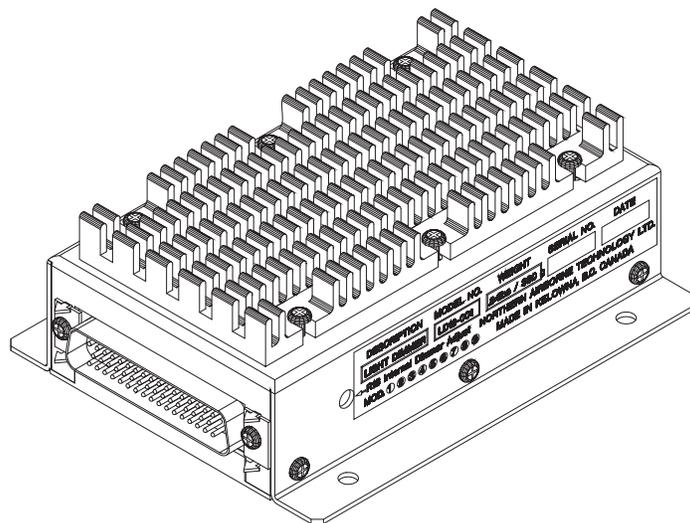
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LD12-001  
Lamp Dimmer

SM15-1



## INSTALLATION and OPERATION MANUAL

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**LD12-001 Lamp Dimmer  
SM15-1 Installation and Operation Manual**

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**LD12-001 Lamp Dimmer  
SM15-1 Installation and Operation Manual**

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## LD12-001 Lamp Dimmer SM15-1 Installation and Operation Manual

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### Section 1.0 Description

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#### 1.1 Introduction

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This manual contains information on the LD12 Lamp Dimmer. Information in this section consists of purpose of equipment, features and specifications.

#### 1.2 Purpose of Equipment

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The LD12 is a remote mounted light dimmer module, designed for complicated annunciator requirements in Loran / GPS systems. The unit is capable of controlling 12 independent lamps with full test function. In its basic mode of operation, the LD12 can be used as a bulk lamp dimmer, outputting up to 1 amp of current. The LD12 unit can be easily interfaced with all AEM RS-series remote switch products used in Loran / GPS installations.

#### 1.3 Features

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Internal logic is provided to interface to both the floating lamp connections of the PB08, and annunciators triggered by a ground output. An adjustable lamp dimmer is provided to drive twelve separate 28 Vdc / 50 mA lamp lines.

The dimmer may be operated in the preset mode (typically set in the 12-24 V range), or as an adjustable dimmer via an external control. A single switch can be used to select day, night, and lamp test functions.

The day operation mode also provides regulated 24 Vdc for all lamps, to prevent early lamp failure and internal lamp blackening from excessive voltage.

All interconnect and relay contacts are gold plated. Relays are sealed, high vibration rated (50 g shock), dry nitrogen filled units.

Circuit boards are constructed of G10-FR (flame retardant) material, with solder masks, reflowed tin plating, and environmental post-coating.



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### 1.4 Specifications

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#### 1.4.1 Electrical Specifications

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Input Power + 24.8 Vdc to +30 Vdc, +27.5 Vdc nominal  
(reverse and over voltage protection)

Input Current: 50 mA idle ( 2 A max)

##### Input Signals

Test keyline: Active low input. When grounded, this pin will cause all lamps to illuminate at full brightness, allowing the user to check for faulty filaments.  
Max. current source 10 mA.  
Input should be left floating when unused.

Dimmer Active low input. Grounding this pin will cause the internal preset dimmer voltage to be supplied to all lamps.

Dimmer gnd: Provides a convenient ground return for the dimmer controls.

Lamp pwr in: Direct connection to internal lamp bus.

Lamp keys: Active low keyline. When grounded, the selected lamp will illuminate. Current drawn will depend on type of lamp used in circuit. Pin should be left open when unused.

##### Output Signals

Lamp outputs: Provides up to 50 mA of current to 2 floating lamp circuits and 10 ground keyed circuits for system annunciators. Recommended lamps: Type 327, 387, or 388 for 28 Vdc operation @ 40 mA each.

Dimmer out: Direct connection to dimmer circuit output.  
Provides up to 1 Amp of current.



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### 1.4.2 Physical Specifications

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Height	1.75" (44.5 mm)
Length	5.00" (127.0 mm)
Width	3.95" (100.3 mm)
Weight	380 g (0.84 lbs) max
Mounting	Bulkhead attachment ( 4 x 10-32 screws)

### 1.4.3 Environmental Specifications

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Temperature:	-15° C. to +70° C (operating) -55° C. to + 85° C (storage)
Altitude	50,000 feet
Humidity	95% Non-condensing Cat. A
Vibration	DO-160C, Cat. B,M,N

End of Section 1.0

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## LD12-001 Lamp Dimmer SM15-1 Installation and Operation Manual

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### Section 2.0 Installation

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#### 2.1 Introduction

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Information in this section consists of: unpacking and inspection procedures, installation procedures, post-installation checks, and installation drawings.

#### 2.2 Unpacking and Inspection

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Unpack the equipment carefully. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Note that each unit should have the following:

- LD12-001
- Product Information Card
- Certificate of Conformity

Verify that all items are present before proceeding and report any shortage immediately to your supplier.

##### 2.2.1 Warranty

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All Anodyne Electronics Manufacturing Corp. (AEM) products are warranted for 2 years. See the website [www.aem-corp.com/warranty](http://www.aem-corp.com/warranty) for complete details.

#### 2.3 Installation Procedures

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##### 2.3.1 Warnings

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Do not bundle **any lines from this unit** with transmitter coax lines. Do not bundle any logic or DC power lines from this unit with 400 Hz synchro wiring or AC power lines. Do not position this unit next to any device with a strong alternating magnetic field such as an inverter, motor or blower.

##### 2.3.2 Cautions

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Do not install the LD12 without making a suitable amendment to the flight manual indicating how the NAV annunciation and dimming/test functions have been implemented in the aircraft.

##### 2.3.3 Notes

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In order to minimize wiring, the unit should be located close to the annunciators it will be dimming. It should not be mounted near hot air paths, as it needs to dissipate substantial heat.



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### 2.3.4 Cable and Wiring

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Use Tefzel Mil-M-27500, Mil-M-22759 or Mil-M-81044 single conductor and shielded wire with solder sleeves (for shield termination) to make the most compact and easy to terminate interconnect. Follow the wiring diagrams provided in Section 2.5 as required.

Note that the hood is a "clamshell" hood and is installed after the wiring is complete. Aircraft harnessing should permit the unit to be lowered from the panel for easy access to all adjustments. DO NOT mount the unit until all adjustments have been carried out.

All wiring should be at least 22 AWG, except input power and ground connections which should be 20 AWG. Ensure that the ground connection is clean and well secured and that it shares no path with any electrically noisy aircraft accessories such as blowers, turn and bank instruments or similar loads. To prevent system failure or inadequate equipment protection, power to this system must be supplied from a separate breaker or fuse (2 A) and not bundled to any other source.

### 2.3.5 Installation Variations

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The normal installation of the LD12-001 uses a single toggle switch for the pilot's control. This selects the following modes:

DIM	Night flying lamp levels. Can be adjusted either at the panel or inside the LD12-001.
NORM	Day flying lamp levels (full brightness).
TEST	All lamps ON (full brightness). Tests functionality of all lamps.

The switch is a SPDT center-off toggle, spring loaded in the TEST position so that it will return to the normal position when released. Alternately, the DIM function can be selected by a separate switch, or tied into another switch function, and the lamp test can be activated by a momentary pushbutton switch.

The DIM position can also have a level control connected in series with the switch, to permit local adjustment of the night flying lamp level. The switch may also be integral with the level control to conserve panel space.

### 2.3.6 Optional Dimmer Adjustment

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Inserting a 10 k $\Omega$ , 1/2 W linear taper potentiometer between the dimmer input and ground will allow external adjustment of the dimming voltage. If using an external adjustment, make sure internal trimpot is set for minimum voltage output (rotated fully counterclockwise).

### 2.3.7 Optional Emergency Bypass Switch

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This is an optional external SPST toggle switch; it can be used to route an external voltage to the lamps if the dimmer should fail.

### 2.3.8 Post-Installation Checks

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Before the unit is mounted, make all functional tests and trimpot adjustments. Be sure the harness has enough clearance to permit the unit to be pulled out for re-adjustment, if needed later.



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### **2.3.8.1 Voltage/Resistance Checks**

**Do not attach the LD12 until these conditions are met.**

- a) At the airframe connector, check P1 pin 1 for +28 VDC relative to ground and pin 34 for continuity to ground (below 0.5 ohms).
- b) Ensure that no short circuits exist on any lamp line (lamp hi to lamp lo or to ground), and that no press-to test lamp holders have been used. These can cause the lamp line(s) to be shorted to ground, which may damage the internal circuitry of the LD12.

### **2.3.8.2 System Checks**

- a) Install the LD12 and power up the ship's systems. Select the TEST position on the dimmer switch and check that all lamps are functioning.
- b) Select the BRIGHT position on the dimmer switch; lamps that are activated should be fully illuminated.
- c) Select the DIM position on the dimmer switch and adjust the dimmer pot; the active lamps should track the dimmer pot.
- d) Make sure unit is securely fastened and that the connector locks are correctly mated before any flight is attempted.

## **2.4 Continued Airworthiness**

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Maintenance of the LD12 Lamp Dimmer is 'on condition' only. Periodic maintenance of this product is not required.

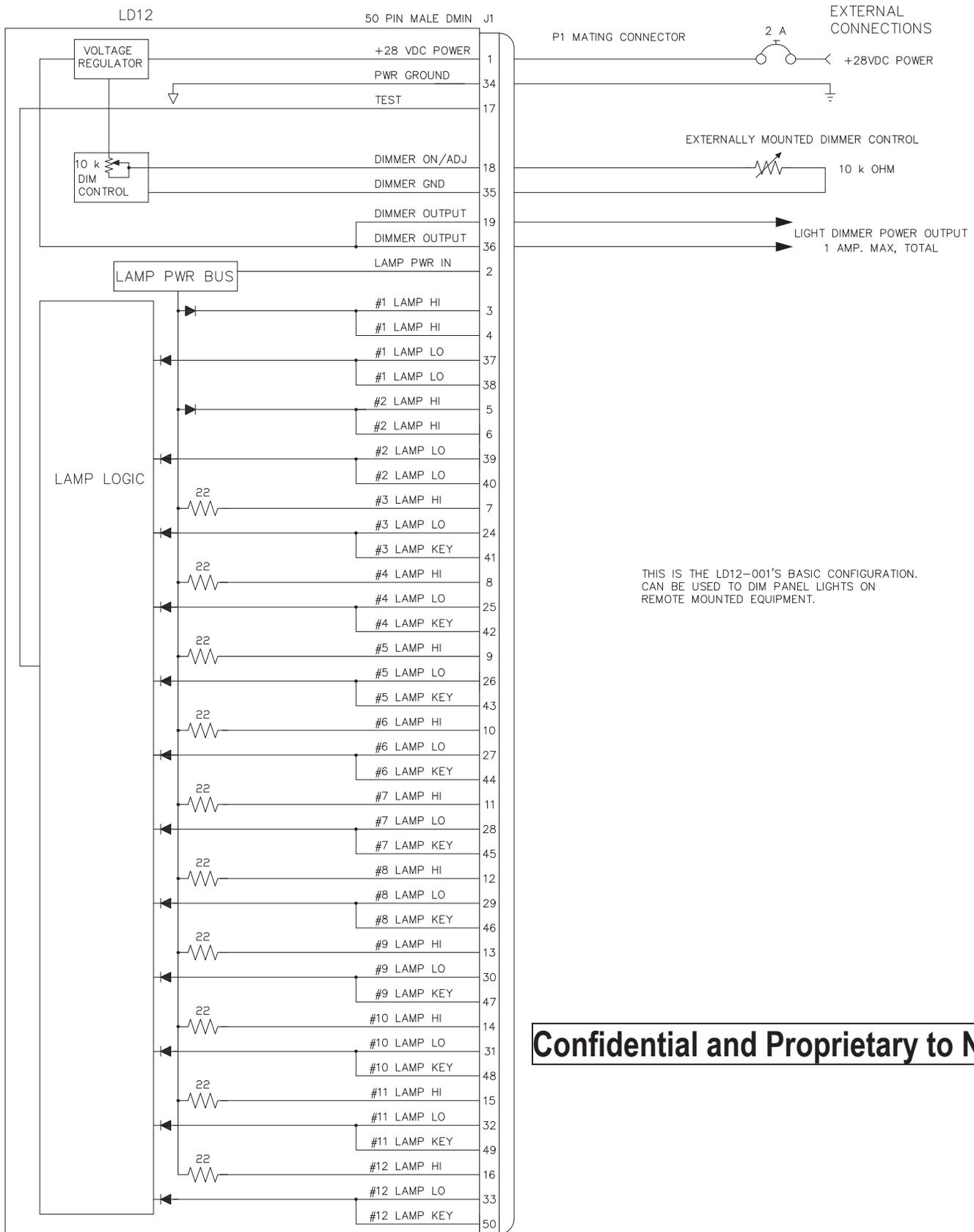
## **2.5 Installation Drawings**

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<b>DRAWING</b>	<b>REV.</b>	<b>DESCRIPTION</b>	<b>TYPE</b>
LD12\001\403-0	1.00	Lamp Dimmer - External Dimming	Interconnect
LD12\001\403-1	1.00	Lamp Dimmer with RS08 - External Dimming	Interconnect
LD12\001\405-0	1.00	Lamp Dimmer	Connector Map
LD12\001\922-0	1.20	Lamp Dimmer	Mech Installation

Section 2.0 ends following the above documents

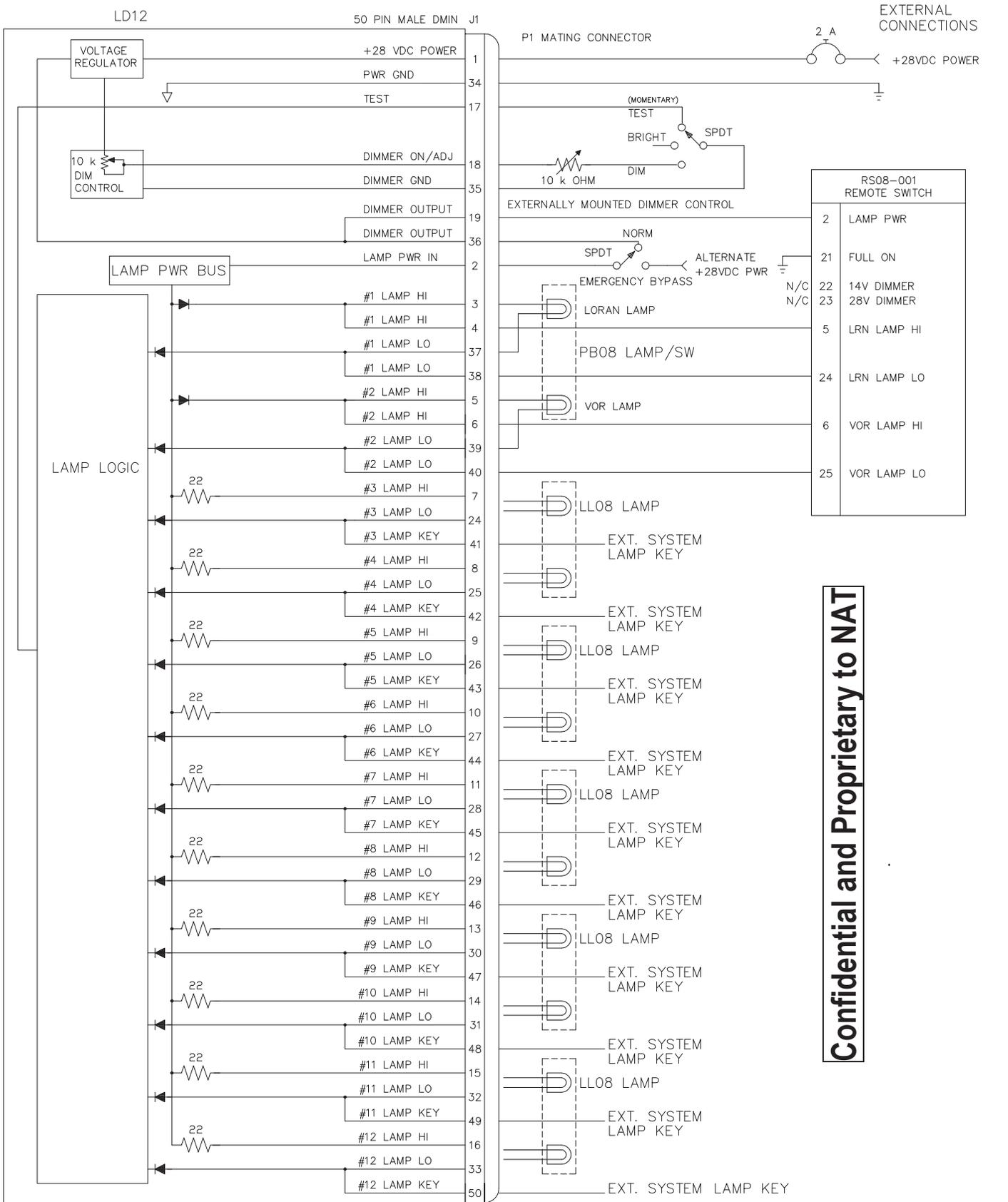
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THIS IS THE LD12-001'S BASIC CONFIGURATION.  
CAN BE USED TO DIM PANEL LIGHTS ON  
REMOTE MOUNTED EQUIPMENT.

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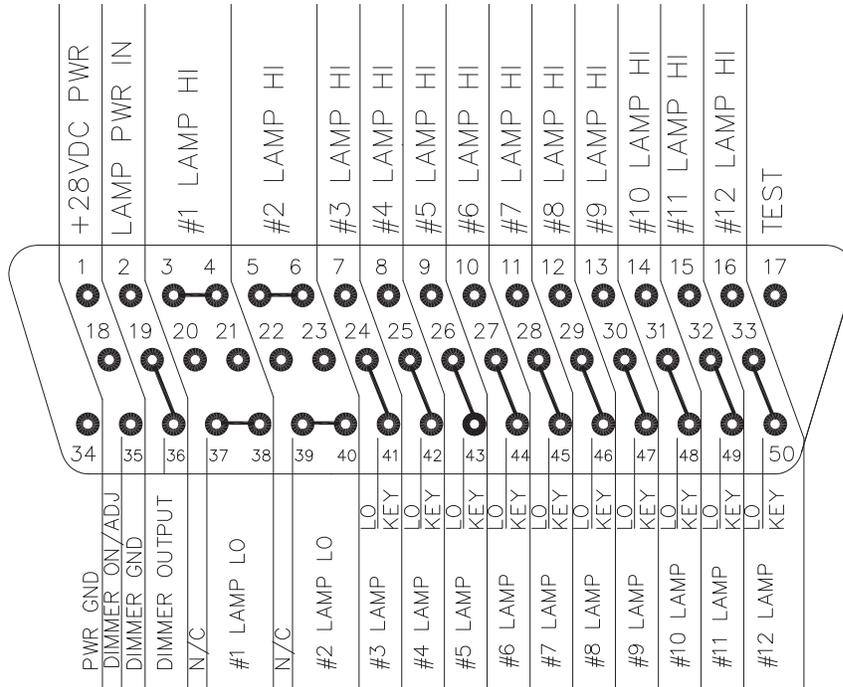
REVISION		DATE	*nat NORTHERN AIRBORNE TECHNOLOGY LTD.			
1.00		DEC 13/95	DESIGNED BY	DESCRIPTION		
			K VEITCH	LAMP DIMMER – EXTERNAL DIMMING		
			DRAWN BY	PART NUMBER	DRAWING TYPE	SHEET
			K VEITCH	LD12-001	INTERCONNECT	1/1
			APPROVED BY	DRAWING NUMBER	FILE NUMBER	
				LD12\001\403-0	LD12\001\403-0100	



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REVISION		DATE	<b>*nat</b> NORTHERN AIRBORNE TECHNOLOGY LTD.		
1.00	DEC 13/95	DESIGNED BY	DESCRIPTION		
		K VEITCH	LAMP DIMMER WITH RS08 – EXTERNAL DIMMING		
		DRAWN BY	PART NUMBER	DRAWING TYPE	SHEET
		K VEITCH	LD12-001	INTERCONNECT	1/1
		APPROVED BY	DRAWING NUMBER	FILE NUMBER	
			LD12\001\403-1	LD12\001\403-1100	

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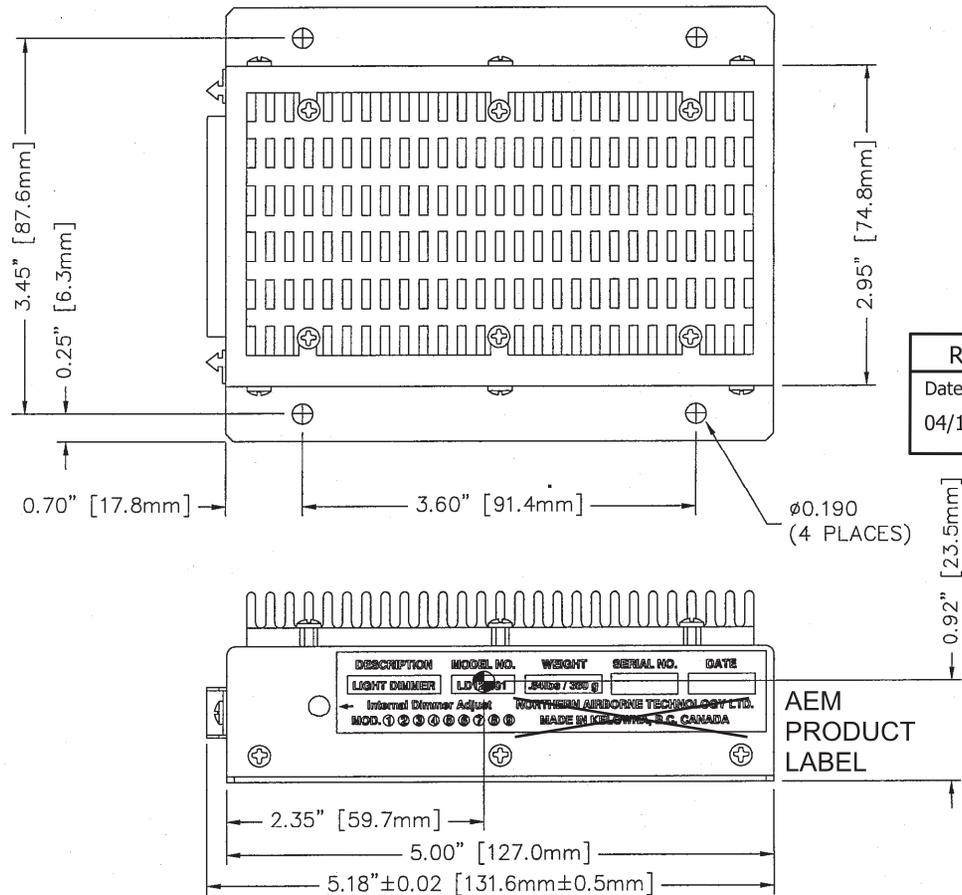
REVISION	DATE	<b>*nat</b> NORTHERN AIRBORNE TECHNOLOGY LTD.			
1.00	DEC 14/95	DESIGNED BY	DESCRIPTION		
		KDV	LAMP DIMMER		
		DRAWN BY	PART NUMBER	DRAWING TYPE	SHEET
		KDV	LD12-001	CONNECTOR MAP	1/1
		APPROVED BY	DRAWING NUMBER	FILE NUMBER	
		<b>NAT</b> 107	LD12\001\405-0	LD12\001\405-0100	

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.01	IEWS CHANGED TO SHOW LABEL.	DEC 15/95	TGM
1.10	ECR #1264 - HEATSINK REDESIGNED. REDRAWN TO MATCH EXISTING PART.	JAN 4/99	TGM
1.20	ECR #1730 - HEATSINK CHANGED BACK TO ORIGINAL, FORMAT CHANGES.	OCT 9/01	TAT

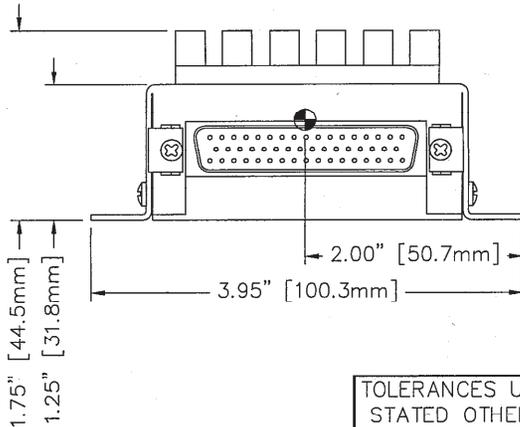
Reviewed/Approved	
Date: Feb 11/10	Initial: <i>JP</i>

LD12-001 WEIGHT: 0.84 ±0.04 lbs (0.38 ±0.02Kg)  
 ● CENTER OF GRAVITY ±0.05" [1.3mm] EST.

LD12-002 WEIGHT: 0.84 lbs MAX.  
 0.69 lbs MIN.



Reviewed/Approved	
Date: 04/11/2011	Initial: Tony Pearson Designer Apr 11, 2011



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TOLERANCES UNLESS STATED OTHERWISE 0.X=+/-0.030 0.XX=+/-0.010 0.XXX=+/-0.005 0.XXXX=+/-0.002 ANGLE=+/- 0.5 DEG.	DIMENSIONS IN INCHES	DESIGNED	KV		*nat NORTHERN AIRBORNE TECHNOLOGY LTD.				
	THIRD ANGLE PROJECTION	DRAWN	TGM						
MATERIAL	FINISH	DATE	JUL 25/95		TITLE				
		CHECKED	NAT 118 / NAT 113		LIGHT DIMMER				
		APPROVED	NAT 117		SIZE	CAGE CODE	PART NO.	REV.	SHEET
		FILE	922-0120.DWG		DWG. TYPE	MECH. INSTALLATION	DWG. NO.	LD12\001\922-0	
					A	3AB01	LD12-001	1.20	1/1



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**Section 3.0 Operation**

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**3.1 Introduction**

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Information in this section consists of the functional and operational procedures for the LD12 Lamp Dimmer.

**3.2 Operation**

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The LD12 Lamp Dimmer has no normal user operational aspects.

During installation, or if the unit has been exchanged, it may be a requirement to change internal adjustments.

This should be done **ONLY BY FULLY QUALIFIED PERSONNEL.**

End of Section 3.0

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