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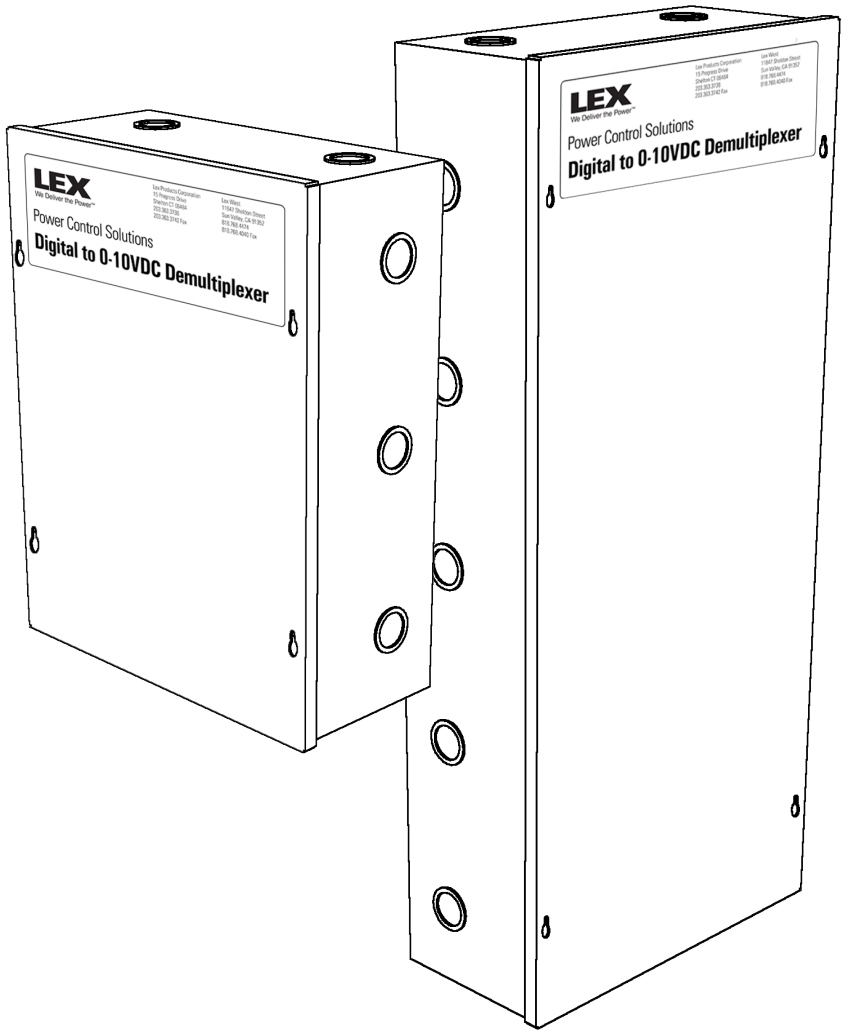
Power Control for Permanent Installation

Digital to 0-10VDC Demultiplexer Panel Installation and Configuration Manual

The Lex Products PCS TRIO™ Digital to 0-10VDC Demultiplexer is a wall-mounted device that converts digital signals into 16 channels of analog control voltage.

The device is designed to work in concert with PCS TRIO™ relays for the control of fully isolated LED fixtures requiring mains switching and 0-10VDC dimming.



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Welcome

Welcome to the installation guide for PCS TRIO™ Digital to 0-10VDC Demultiplexer (Demultiplexer). This guide contains the procedures for safe and efficient installation as well as commissioning of this device.

Incorporating state-of-the-art control the Lex Products PCS TRIO™ supports the most widely sourced protocols: DMX-512A, RDM, sACN and Art-Net. This system may be integrated easily with other dimming and control devices.

The PCS TRIO™ Demultiplexer is a component of certain PCS TRIO™ Installation Systems. Whether the application requires power management of LEDs, moving lights, incandescent lights, motor loads, powered speakers or other relevant equipment, the design of the Lex Products PCS TRIO™ system enables power control over the widest number of applications possible within one panel.

By consolidating single pole relays, double pole relays and dimmers into modules supporting three line circuits fitting into one panel, lighting installation is simplified significantly as the panel requires less cabling and conduit runs

Caution: Changes/Modifications not approved by Lex Products Corporation could void the user's authority to operate the equipment.

⚠ IMPORTANT SAFEGUARDS - Read this first

All equipment represented by Lex Products is designed, built and tested to strict safety regulations. Observe all precautions when installing this unit. By following the safety warnings listed below and elsewhere within this guide, you can ensure the safe and proper installation and operation of these units. Please read and follow all warnings given in this guide.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. All sections of this installation guide MUST be followed in sequence in order to properly install this unit.
2. All installation services must be performed by qualified personnel or service technicians.
3. The high voltage supply should be fed to the PCS TRIO™ Digital to 0-10VDC Demultiplexer (Demultiplexer) via an external main breaker with sufficient capacity for the planned installation.
4. Install in accordance with National Electrical Code (NEC) and any other national or local codes that are in force in your area.
5. Always turn OFF all power before any service is performed on a panel. Test that power is OFF prior to handling conductors.
6. Do not use outdoors. The PCS TRIO™ Demultiplexer to is designed for indoor installation and use only. The units can, however, be used to control appropriately certified exterior lighting fixtures.
7. Use this product only as intended and at the listed voltage(s).
8. Do not mount near gas or electric heaters.
9. Power (voltage) is present inside the Demultiplexer. Use extreme caution when performing maintenance on this equipment. Failure to follow this warning, and proper safety procedures, could result in severe injury and/or damage to the equipment.
10. Document all wiring that is terminated in this installation guide, so that the system can be properly configured and programmed for operation.
11. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
12. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
13. Do not use this equipment for other than intended use.

SAVE THESE INSTRUCTIONS

⚠ GARANTIES IMPORTANTES - Lisez cette première

Tous les appareils sont fabriqués et assemblés par les produits de Lex et sone testés par des règles de sécurité très strictes. Toutes les précautions ont été prises lors de l'installation de cet appareil. Veuillez lire et respecter tous les avertssements donnes dans ce guide. Veuillez lire et respecter tous les avertissements donnés dans ce guide.

LIRE ET SUIVRE TOUTES LES INSTRUCTIONS DE SÉCURITÉ

1. Toutes les sections de ce guide d'installation doit être suivie dans l'ordre afin d'installer correctement cette unité.
2. Tous les services d'installation doit être effectuée par un personnel qualifié ou les techniciens de maintenance.
3. L'alimentation haute tension doivent être nourris de la PCS TRIO™ Digital to 0-10VDC Demultiplexer (Demultiplexer) via un disjoncteur principal avec une capacité suffisante pour l'installation prévue.
4. Suivez conformément le code Electric national et les codes locaux en vigueur dans votre région.
5. Toujours éteindre toutes les sources d'alimentation avant toute opération d'entretien est effectué sur un panneau. Vérifier que l'alimentation est coupée avant de manipuler les conducteurs.
6. Le PCS Trio Demultiplexer est construit uniquement pour être utilise a l'intérieur. Les appareils peuvent toutefois être utilise pour contrôler des lumières à l'extérieur.
7. Utilisez ce produit uniquement comme prévu et à la tension indiquée(s).
8. Ne montez pas là où il y a du gaz ou des chauffages électriques a proximité.
9. Il y a de l'énergie (tension) à l'intérieur de la chambre a balles. Une précaution extrême doit être utilisée lors de l'entretien de cet appareil. Toujours s'assurer que les avertissements sont suivis à la lettre pour éviter des blessures ou endommager l'appareil.
10. Documenter tout le câblage qui est terminée dans ce guide d'installation, de sorte que le système peut être correctement configuré et programmé pour cette opération.
11. L'appareil doit être monte dans des endroits spéciaux et a une certaine hauteur ou il sera accessible seulement au personnel autorisé et non à n'importe qui.
12. Cet appareil ne doit être utiliser seulement que prévue par le manufacturier.
13. Ne pas utiliser ce matériel pour d'autres d'utilisation prévue.

CONSERVEZ CES INSTRUCTIONS

Range Overview

The PCS TRIO™ Demultiplexer has been designed to be installed on site as shown in the following pages. The subsequent Part Number Configuration section shows the components available.

Part Number Configurations

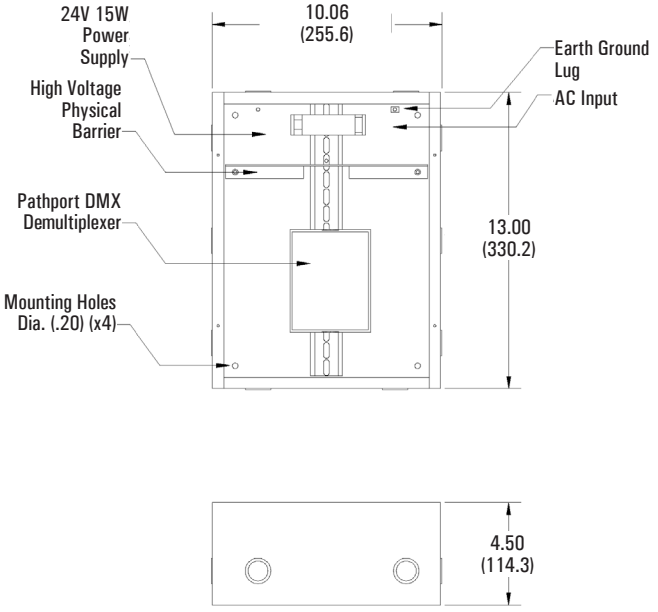
PCS-I-DEMULT-ETHER

- This configuration is to be used with Ethernet-based (E1.31 sACN and Art-Net) communication systems

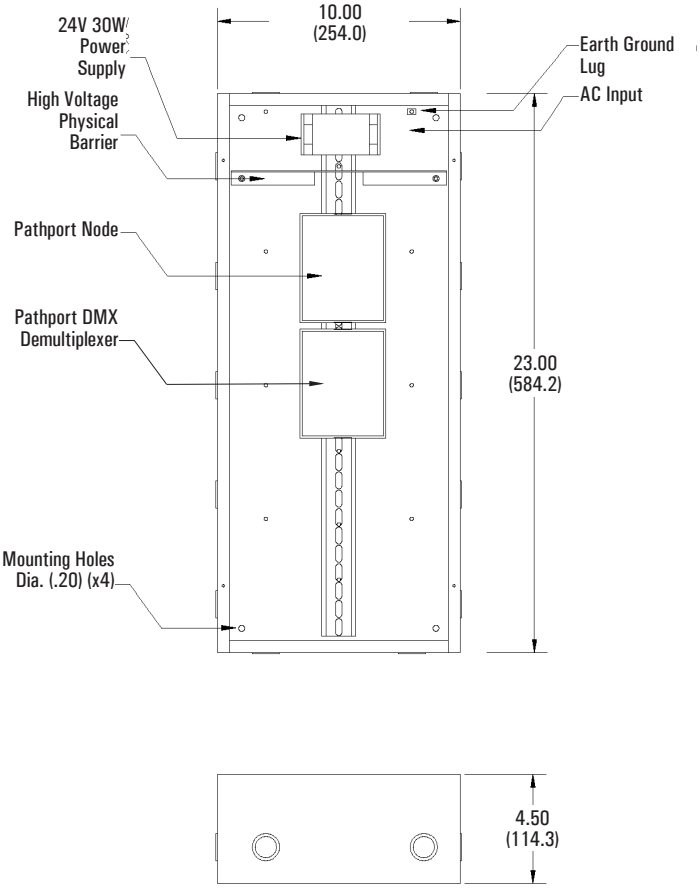
PCS-I-DEMULT-RS485

- This configuration is to be used with RS-485 based (DMX and RDM) communication systems

Panel Dimensions and Details



PCS-I-DEMULT-RS485
(Fig. 1)



PCS-I-DEMULT-ETHER
(Fig. 2)

SAFETY - Ensure service circuit breakers are 'Off' or 'Open' and Lockout/Tagout procedures have been followed prior to proceeding.
SÉCURITÉ - Assurer que les disjoncteurs sont sur 'Fermé' or 'Ouvert' et que les procédures ont été suivies comme recommandé sur l'étiquette.

Panel Location

- The PCS TRIO™ Demultiplexer is intended for installation in dry, indoor, non-hazardous environments suitable for NEMA1 enclosures.
- The PCS TRIO™ Demultiplexer is cooled by natural air convection. It is important to choose a suitable mounting location that allows air to circulate around the installed unit.
- Operating temperature range is 14°F to 122°F (-10°C to +50°C), up to 95% humidity, non-condensing.

Line and Low-Voltage Wiring Installation

The PCS TRIO™ Demultiplexer has been designed to provide a clear layout and logical progression for the power and communication wiring.

- Line wiring should ONLY enter through the top of panels panel ABOVE the high voltage physical barrier. This is to ensure the AC voltage does not interfere with the low-voltage communication signals. Knockouts have been provided to easily identify allowable locations for conduit termination.
- Communication wiring may ONLY enter BELOW the high voltage physical barrier. This is to ensure the AC voltage does not interfere with the low-voltage communication signals. Knockouts have been provided to easily identify allowable locations for conduit termination.
- If the above conditions cannot be met, maintain a minimum 1/2 inch (1.27 cm) separation between low voltage control wiring and high voltage power cabling to ensure safety and control noise immunity.
- PLEASE NOTE: Electrical and communication connections between the Power Supply, Pathport Node and Pathport DMX Demultiplexer have been completed at the factory. No further connections between these devices need be made in the field.

Low-Voltage Wiring Connections

- PCS-I-DEMULT-RS485
  - Proceed to page 8

- PCS-I-DEMULT-ETHER
  - Proceed to page 6

SAFETY - Ensure service circuit breakers are 'Off' or 'Open' and Lockout/Tagout procedures have been followed prior to proceeding.
SÉCURITÉ - Assurer que les disjoncteurs sont sur 'Fermé' or 'Ouvert' et que les procédures ont été suivies comme recommandé sur l'étiquette.

Pathport Node

The Pathport® eDIN one-port node places a fully customized universe of DMX, in a compact, DIN-rail mountable format. Units ship with internal factory wiring complete.

Pathport Node Wiring

- All network wiring should follow standard Ethernet rules and be installed by a qualified person. As part of the installation, all wiring should be certified under the TIA/EIA-568 standard (see Fig. 4).
- Each Pathport eDIN ships with additional serial number stickers. Do not lose these stickers. Because Pathport eDINs are intended for installation within enclosures, maintaining a log of serial numbers and their locations is necessary to configure the system. Losing track of this information will add considerable time to commissioning.
- As each node is installed, remove one of the additional stickers and place it on the Installation Record Sheet included with each Pathport eDIN. Write down the location, jumper settings and any other relevant comments.
- A second serial number sticker may be placed on the exterior cover of the enclosure as a further identifying aid during commissioning. This sticker can easily be removed and discarded when no longer needed.

Pathport Node Testing

- Restore power to the PCS TRIO™ Demultiplexer and observe the status indicators for troubleshooting:

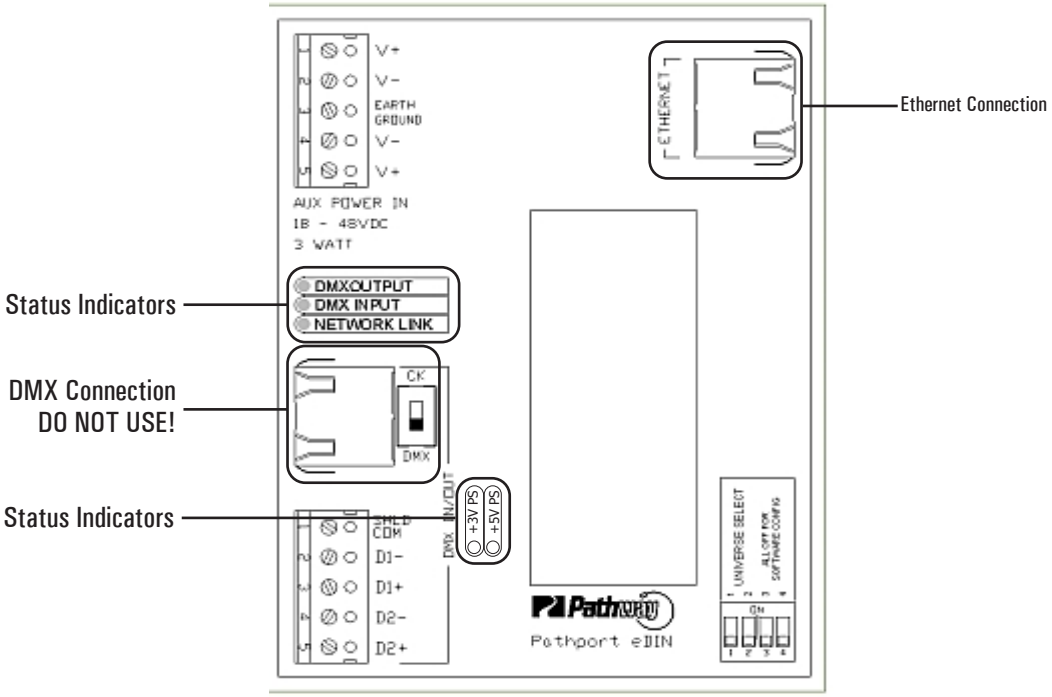
Indicator Label	LED	Status
+3V PS	Blue	Steady glow indicates 3V power supply is OK. Off indicates no power.
+5 PS	Blue	Steady glow indicates 5V power supply is OK. Off indicates no power.
DMX Output	Amber	Steady glow indicates node is actively outputting DMX. Off indicates no DMX output.
DMX Input	Green	Steady glow indicates node is receiving active DMX. Off indicates no incoming DMX signal.
Network Link	Green	Flickering glow means active. Flickering glow means active Ethernet network link.

- Contact technical support with any questions you have by calling 888-LEX-1002 or via email at technical_support@lexproducts.com.
- The Pathport eDIN Node ships as an DMX output node with the following Ethernet receive protocols enabled: Pathport, Strand Shownet, ETC Net2, streaming ACN (E1.31 sACN) and ArtNet. Channel information in DMX universe 1, place on the network using any of these protocols, will cause the eDIN node to actively output DMX to the DMX Demultiplexer.
  - A large number of values and parameters may be customized for the Pathport eDIN, including port direction, output channel patch, input universe number, the transmit and receive protocols, and DMX speed. Network values such as IP address and subnet mask are also customizable by the user.
  - Detailed node configuration and overall network system management are done using Pathport Manager software, which is freely available from www.pathwayconnect.com
- PLEASE NOTE: The connection between the Pathport Node and Pathport DMX Demultiplexer has been completed at the factory. No further connections need to be performed.

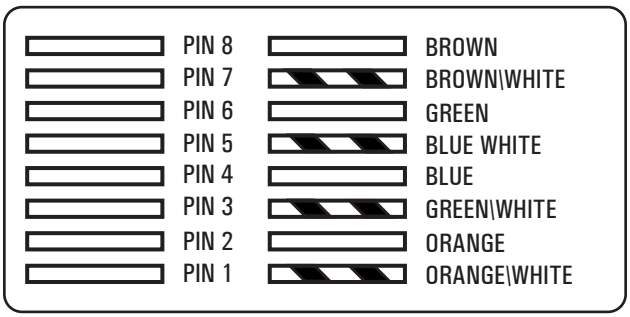
(continued)

Pathport Node Configuration

- The Pathport Node has been configured at the factory. Additional set-up should not be needed in the field.
- Please contact Lex Products Tech Support (888-LEX-1002 or via email at technical_support@lexproducts.com) should there be any questions or concerns. Continue to page 7 in order to complete the PCS TRIO™ Demultiplexer installation.



Pathport Node
(Fig. 3)



Ethernet T568B Wiring Standard
(Fig. 4)

SAFETY - Ensure service circuit breakers are 'Off' or 'Open' and Lockout/Tagout procedures have been followed prior to proceeding.
SÉCURITÉ - Assurer que les disjoncteurs sont sur 'Fermé' or 'Ouvert' et que les procédures ont été suivies comme recommandé sur l'étiquette.

Pathport DMX Demultiplexer

Pathway eDIN Demultiplexer converts DMX512 signals into 16 channels of analog control voltage. The Demultiplexer can also control Mark 7–type fluorescent ballasts, solid state relays or LEDs. The module is RDM discoverable and configurable.

Pathport DMX Demultiplexer Wiring

- **DMX**
  - DMX connections consist of a shield and a data pair. An optional second auxiliary data pair is also occasionally employed.
  - DMX IN usually comes from a control console, Pathport® node, architectural controller or opto-splitter.
  - In the case of P/N PCS-I-DEMULT-ETHER, DMX comes from the Pathport Node detailed previously. DMX between the Pathport Node and the Pathport DMX Demultiplexer has been wired at the factory.
  - DMX THRU provides a means to daisy-chain DMX to other eDIN modules.
  - Connect DATA+ and DATA- to D1+ and D1-.
    - Observe the same polarity convention throughout the system.
    - Connect the cable shield or common to the SHLD COM terminal.
- **Analog Outputs**
  - Sixteen analog output terminals are provided in groups of four, each with a common terminal.
  - All common terminals are internally connected, so only one needs to be tied to the device being controlled.
  - Outputs are rated up to 15 volts DC, 10mA per channel.
  - Maximum wire run is 150 meters (500 ft.).

Pathport DMX Demultiplexer Testing

- Restore power to the PCS TRIO™ Demultiplexer and observe the status indicators

Indicator Label	LED	Status
POWER IN	Blue	Steady glow indicates power supply is OK. Off indicates no power.
PROCESSOR	Green	Steady glow indicates processor is OK. Off when POWER IN is lit indicates processor failure.
DMX Input	Amber	Steady glow indicates data signal received. Off indicates no signal present.
FUNCTION	Amber	Indicates the menu function associated with the numeric display.

- Contact technical support with any questions you have by calling 888-LEX-1002 or via email at technical_support@lexproducts.com.

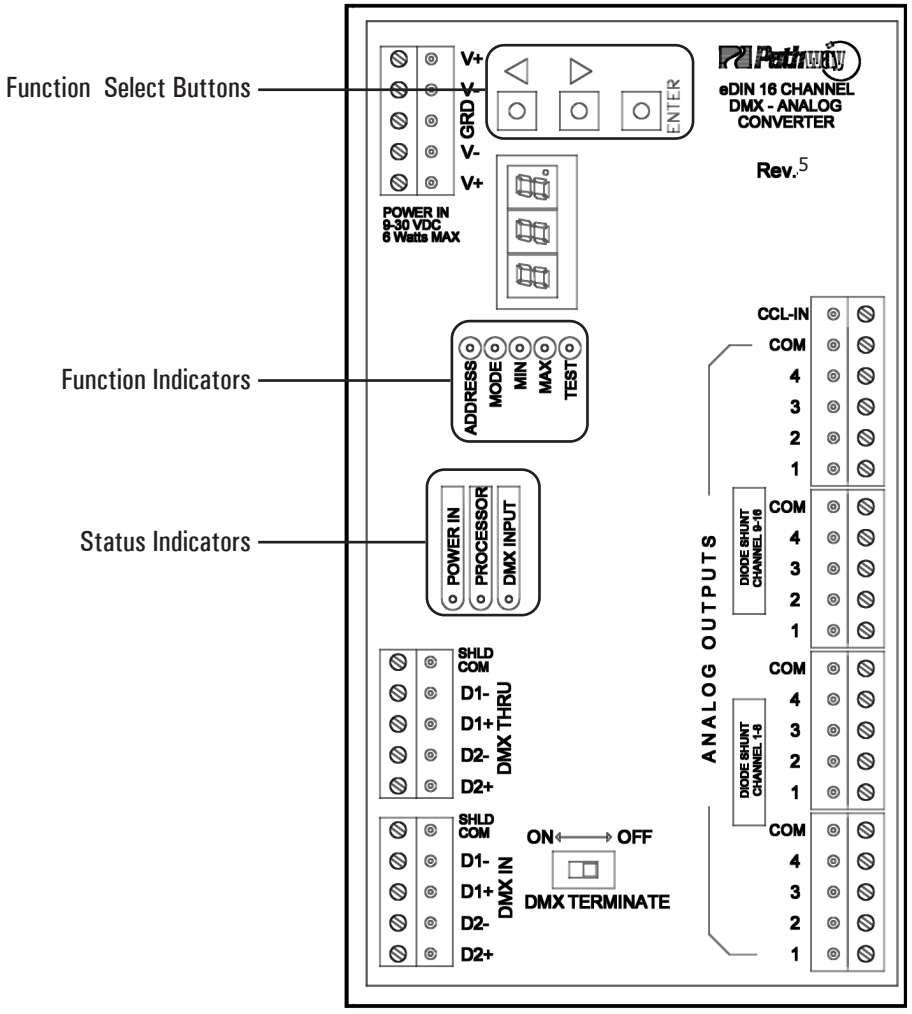
DMX Terminate

DMX rules require the final device in line have a terminating resistor. If no devices or modules are connected to the DMX THRU terminal, the DMX TERMINATE switch should be ON. If other devices or modules are connected to DMX THRU, the DMX TERMINATE should be OFF.

(continued)

Pathport DMX Demultiplexer Configuration

To configure, first press the ◀ or ▶ buttons to select the desired function, as indicated by a lit LED next to ADDRESS, MODE, MIN, MAX, or TEST. Once chosen, press and hold the ENTER button until a dot appears on the right hand display. The function is now editable. When done editing a parameter, press ENTER. The dot will disappear, the new value will be saved and the unit will be ready for operation.



Pathport DMX Demultiplexer
(Fig. 5)

Pathport DMX Demultiplexer (continued)

Set DMX Address

- Once in ADDRESS edit mode, press ◀ or ▶ to change the start address to the desired value. Valid addresses range from 1 to 512.
- Press ENTER to save the address.

Set Operating Mode

- Once in MODE edit, choose from the following:
  - Mode 1: 0—10VDC Output (MAX will read 158)
  - Mode 2: 0—5 VDC Output (MAX will read 79)
  - Mode 3: 0—15VDC Output (MAX will read 237)
  - Mode 4: 0—2.5 VDC Output (MAX will read 40)
  - Mode 5: Custom D-to-A (set your own voltage)
  - Mode 6: 8 Channel EFBC (see below)
  - Mode 7: Non-Dim (see below)

Set MIN and MAX Voltage Output Levels

- To set a custom output voltage, confirm the DMX start address is set to 1. Connect a voltmeter between output 1 and COM on the card. Connect a DMX source to DMX IN. Using your source, vary the DMX level on channel 1 and confirm that the voltage output is changing. Set the DMX level to full.
- Use the ◀ and ▶ buttons and ENTER to select MAX for editing. Use ◀ and ▶ while observing the output on your voltmeter. Once the voltage is at the level you desire, press ENTER to save. Repeat this process to set MIN level. Valid MIN levels are between 0 and 254. Valid MAX levels are between 1 and 255. 255 roughly corresponds to an output of 16VDC.
- Custom values are retained in Mode 5 only. Changing the output voltage in modes 1 to 4 will force the card into Mode 5. MIN and MAX are not editable in Modes 6 and 7.

Electronic Fluorescent Ballast Control

- Mode 6 allows control of up to eight circuits of Mark 7-type ballasts, with a maximum of 20 ballasts on each circuit. Two channels on the card are required for each circuit. The channels are paired, 1 with 9, 2 with 10, and so on. The lower channel provides 0-10VDC dimming control, while the higher acts as a non-dim, switching at 10% and should be connected to a solid state relay controlling the circuit's AC supply. All blocking diodes must be shunted (by-passed) in this mode. (See 'Diode Shunts' information on page 11)

Non-Dim Control

- Mode 7 provides non-dim control of solid state relays or LEDs. At a DMX level of 0%, each channel outputs +10VDC The output voltage drops to zero when DMX passes 50%. All blocking diodes must be shunted (bypassed) in this mode. (See 'Diode Shunts' information on page 11)

Test Mode

- Using the ◀ and ▶ buttons, each output will be toggled on and off. The output number is shown on the right hand display. DMX is ignored while in TEST mode.

(continued)

CCL Pin

- Shorting the CCL pin to COM will drive all outputs to full. The CCL input overrides the DMX input level.

E1.20 Remote Device Management (RDM)

- The eDIN 1004 Demultiplexer is fully compliant with ANSI E.20 Remote Device Management as a responder device.

Diode Shunts - IMPORTANT!

- The diodes prevent the control signal from back-feeding into the output and damaging the module. The diodes must be removed from the circuit to allow sinking control.
- The 16 dip switches are wired as shunts, allowing the diodes to be engaged or disengaged output-by-output.
- The blocking diodes are by-passed by default. With the dip switches in the "off" position, current will back flow through the card. This is the correct arrangement to allow sinking control of EFBCs and LED dimmers. With the dip switches in the "on" position, the diodes will block back flow current. This is the correct arrangement for driving analog dimmers.

TECHNICAL NOTE

- Use of the Pathport DMX Demultiplexer with non-isolated LED fixture drivers is **NOT RECOMMENDED**.
- The Pathport DMX Demultiplexer is designed to provide sinking control of LED fixture drivers the have a secondary Class 2 dimming circuit that is isolated from the mains power input.
- Connection of the Demultiplexer to non-isolated drivers, or drivers with Class 1 rated dimming circuits, will cause damage to the Demultiplexer.
- **THIS DAMAGE IS CONSIDERED NON-WARRANTY FOR THE PURPOSE OF REPAIR AND REPLACEMENT.**

Limited Warranty

- When this PCS TRIO™ Demultiplexer is installed and operated according to this manual's instructions, Lex Products will repair or replace any of its mechanical or electrical parts if they are found to be defective in material or workmanship within two years of the commissioning date.

Technical Support

- Contact technical support with any questions you have by calling 888-LEX-1002 or via email at technical_support@lexproducts.com.

Appendix A - Installation Record Sheet

Demultiplexer Identification:				
Demultiplexer Location:				
Device		Analog Circuit	Emer. (Y/N)	Circuit Notes
Pathport Node - IP Address:	Pathport DMX Demultiplexe - Starting Address:	1		
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
		11		
		12		
		13		
		14		
		15		
		16		
Additional Notes:		Pathport Node S/N: Pathport DMX Demultiplexer S/N:		

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