ArcLamp System

Installation Manual

Part Number: 7490M2130 Rev: G

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Introduction

ArcLamp is a range of retrofit screw-in LED lamps for use in any third party lighting fixture with a compatible base. ArcLamp is powered using a dedicated driver that seamlessly integrates into existing building wiring infrastructure and provides advanced level control and dimming features.

This guide provides step by step instruction on the installation of your ArcLamp system.

ArcLamp products are intended for professional use only. **Read the entire manual before using this equipment**.

Document Conventions

This document uses the following conventions to draw your attention to important information.

Note: *Notes are helpful hints and information that is supplemental to the main text.*

CAUTION: ***A Caution statement indicates situations where there may be undefined or unwanted consequences of an action, potential for data loss or an equipment problem.***

WARNING: ***A Warning statement indicates situations where damage may occur, people may be harmed, or there are serious or dangerous consequences of an action.***

WARNING: ***RISK OF ELECTRIC SHOCK! This warning statement indicates situations where there is a risk of electric shock.***

All ETC documents are available for free download from our website: etcconnect.com.

Please email comments about this manual to: TechComm@etcconnect.com.

Help from ETC Technical Services

If you have questions that are not answered by this document, try the ETC support website at support.etcconnect.com or the main ETC website at etcconnect.com. If none of these resources are sufficient, contact ETC Technical Services directly at one of the offices identified below. Emergency service is available from all ETC offices outside of normal business hours.

When calling for help, take these steps first:

- Prepare a detailed description of the problem
- Go near the equipment for troubleshooting
- Find your notification number if you have called in previously

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Safety

ArcSystem products are intended for professional use only. **Read the entire manual before using this equipment.**

Note: *ArcSystem products contain FCC ID for US: TY0JN5168M6 and Industry Canada (IC) ID: IC 7438A CY05168M6.*

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

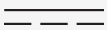
READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- Do not use outdoors.
- Do not let power supply cords touch hot surfaces.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than intended use.

SAVE THESE INSTRUCTIONS

Label Symbols

ArcLamp drivers are conveniently labeled with relevant symbols for your safety. Refer to the product label to see which symbols apply to your product.

	Risk of electric shock	Risque de décharge éléctrique
	General warning	Avertissement général
	This product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.	Ce produit ne doit pas être jeté avec les déchets ménagers mais doit être déposé dans une collecte de déchets électroniques ou dans un point de collecte.
	The product input or output is suitable for direct current only.	L'entrée et la sortie de ce produit convient uniquement au courant continu.
	The product input or output is suitable for alternating current only.	L'entrée et la sortie de ce produit convient uniquement au courant alternatif.
	Independent lighting control gear	Appareil de contrôle d'éclairage indépendant.

Chapter 1

System Overview

The ArcLamp System is comprised of ArcLamps and the ArcLamp Driver. This system of products is designed to provide for easy retrofit of an existing space, or simple straight-forward installation for new construction.

For renovation installations, ArcLamps simply connect to the ArcLamp Driver using the wires from existing incandescent luminaires, eliminating the need for invasive rewiring.

ArcLamp is an LED source that is available in several models including the choice of screw base, color temperature, and clear or frosted glass finish. ArcLamp is designed to be the energy-efficient solution for chandeliers, sconces, wall lights, proscenium lights and more.

The DMX-controlled ArcLamp Driver includes onboard device management with up to four individually addressable output channels per driver, ensuring fast and simple installation. ArcLamp Systems are available different models, supporting 25, 60, or 120 individual 4.4 W replacement ArcLamps.

Maximum System Limits

Models are available to meet your installation requirements:

ArcLamp 150 Systems	Features
Standard Wall-Mount ARCLMD with ArcMesh ARCLRDMD with RDM *Emergency Wall-Mount* ARCLMDE with ArcMesh ARCLRDMDE with RDM	Supports 25 total 4.4 W ArcLamps, 6 per channel Max. current per channel: 1.5 A Max. power per channel: 36 W

ArcLamp 350 Systems	Features
Standard Wall-Mount ARCLMD350CV24W with ArcMesh ARCLMDRDM350CV24W with RDM *Standard Rack-Mount* ARCLMD350CV24R with ArcMesh ARCLMDRDM350CV24R with RDM *Emergency Wall-Mount* ARCLEMD350CV24W with ArcMesh ARCLEMDRDM350CV24W with RDM *Emergency Rack-Mount* ARCLEMD350CV24R with ArcMesh ARCLEMDRDM350CV24R with RDM	Supports 60 total 4.4 W ArcLamps, 15 per channel Max. current per channel: 3 A Max. power per channel: 72 W

ArcLamp 700 Systems	Features
Standard Wall-Mount ARCLMD700CV24W with ArcMesh ARCLMDRDM700CV24W with RDM *Standard Rack-Mount* ARCLMD700CV24R with ArcMesh ARCLMDRDMR700CV24R with RDM *Emergency Wall-Mount* ARCLEMD700CV24W with ArcMesh ARCLEMDRDM700CV24W with RDM *Emergency Rack-Mount* ARCLEMD700CV24R with ArcMesh ARCLEMDRDM700CV24R with RDM	Supports 120 total 4.4 W ArcLamps, 30 per channel Max. current per channel: 6.1 A Max. power per channel: 146 W

Note: *It is possible to add a seventh ArcLamp to one channel of an ArcLamp Driver 150 (standard or emergency model) for a total of 25 ArcLamps.*

Note: *Each ArcLamp Driver provides up to four individually addressable output channels.*

All output channels have onboard overload protection. See *Overload Protection on page 35*.

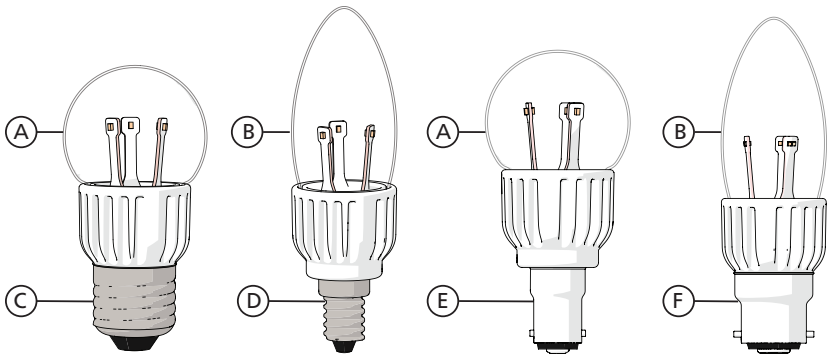
ArcLamps

Overview

Both the candle and globe shape provide a low-voltage LED lighting solution for chandeliers, sconces, wall lights, proscenium lights, and more.

- full load power consumption (4.4 W)
- available in Fade to Warm (FTW) version with color temperature red-shift as it dims
- available in Flicker that simulates a random flickering candle flame
- available in CCT 2700 K (fixed white, FTW, and Flicker) or 3000 K (fixed white only) versions
- low voltage (24 VDC) operation, powered and controlled from an ArcLamp Driver
- dimmable from 0 to 100%
- silent operation

ArcLamp LED lamps install directly to fixtures compatible with standard medium screw style (E26 or E27), candelabra style (E12 or E14), and bayonet style (B15 or B22) bases.



A	Globe Style	D	E12 or E14 candelabra style base
B	Candle Style	E	B15 bayonet style base
C	E26 or E27 standard medium screw style base	F	B22 bayonet style base

ArcLamp Driver

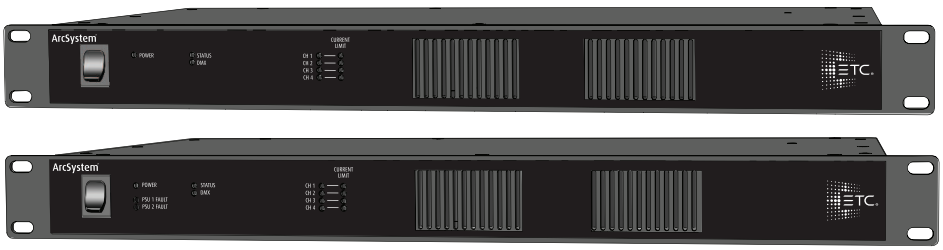
The DMX-controlled ArcLamp driver includes onboard device management with up to four individually addressable output channels per driver, ensuring fast and simple installation. ArcLamp drivers are available in wall-mounted and rack-mounted models.

ArcLamp Emergency System drivers are available for systems requiring emergency lighting control. Each fixture with ArcLamps installed can be configured to be UL924 listed when wired to an existing emergency response system.

ArcLamp drivers are available in RDM models, which control an ArcLamp System with wired DMX/RDM, or models with wireless capability that control an ArcLamp System using ArcMesh wireless protocol.

Wall-Mount ArcLamp Driver 700 | Wall-Mount ArcLamp Driver 150 | Wall-Mount ArcLamp Driver 350

Rack-Mount ArcLamp Driver 350



Rack-Mount ArcLamp Driver 700

ArcLamp Driver Specifications

See recommended wire gauges at *Electrical and Wiring Specification on page 15* for wall-mount models and *Electrical and Wiring Specification on page 25* for rack-mount models.

Electrical Specification

Driver Description	Mounting Type	Cooling	Input	Output
ArcLamp Driver 150	wall-mount	convection cooled	Normal: 100-277 VAC, 50/60 Hz Maintained (emergency): 100–277 VAC, 50/60 Hz (emergency drivers only)	24 VDC, 4 channels
ArcLamp Emergency Driver 150				
ArcLamp Driver 350	rack-mount	single fan	Normal: 100-240 VAC, 50/60 Hz Maintained (emergency): 100–240 VAC, 50/60 Hz (emergency drivers only)	24 VDC, 4 channels
ArcLamp Emergency Driver 350				
ArcLamp Driver 350	rack-mount	dual fans		
ArcLamp Emergency Driver 350				
ArcLamp Driver 700	wall-mount	single fan		
ArcLamp Emergency Driver 700				
ArcLamp Driver 700	wall-mount	dual fans		
ArcLamp Emergency Driver 700				

Channel Electrical Specifications

Driver Description	Maximum Current per Channel	Maximum Power per Channel	Maximum 4.4 W ArcLamps per Channel
150 W standard and emergency	1.1 A	27 W	6
350 W standard and emergency	3 A	72 W	15
700 W standard and emergency	6.1 A	146 W	30

Note: *It is possible to add a seventh ArcLamp to one channel of an ArcLamp Driver 150 (standard or emergency model) for a total of 25 ArcLamps.*

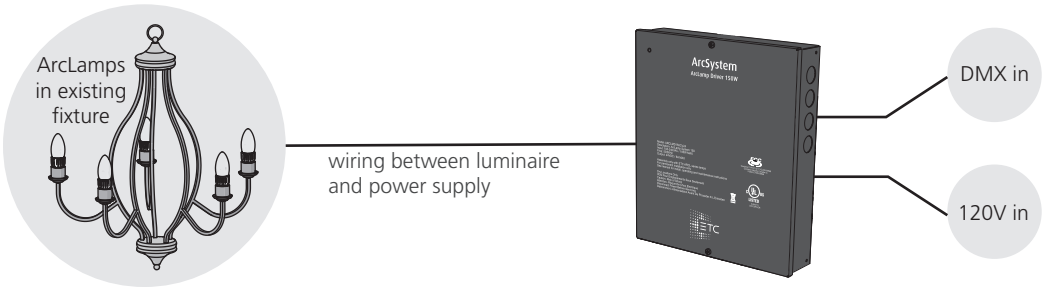
New Construction

Control and power circuit wiring must be in accordance with Class 1 wiring methods as specified in the NEC. Class 1 circuits are permitted to be installed with other power circuits that are functionally associated:

725.48 (B) (1): "Class 1 circuits and power-supply circuits shall be permitted to occupy the same cable, enclosure, or raceway only where the equipment powered is functionally associated."

Renovation

For renovation installations, the output of the ArcLamp driver is reclassified as a Class 1 circuit. The image below shows an example of a typical retrofit system installation.



National Electric Code (NEC) specifies the following for Class 1 installations:

- **725.130 (A) Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source:** Class 2 and Class 3 circuits shall be permitted to be reclassified and installed as Class 1 circuits if the Class 2 and Class 3 markings required in 725.124 are eliminated and the entire circuit is installed using the wiring methods and materials in accordance with Part II, Class 1 circuits.

All wiring methods must be in accordance with Class 1 control circuits in the NEC. Class 1 circuits are permitted to be installed with other power circuits that are functionally associated:

- **725.48 (B) (1): "Class 1 circuits and power-supply circuits shall be permitted to occupy the same cable, enclosure, or raceway only where the equipment powered is functionally associated."**

Following these NEC specifications for renovation installations, ArcLamp circuits are permitted to share the same containment as other house lighting circuits since they are functionally associated.

Note: *ArcLamp System circuits may only share the same containment as other house lighting circuits.*

If the ArcLamp circuit must share the same containment as non-functionally associated circuits, separate multiconductor Type AC, Type MC, Type MI, or Type TC cables must be used, and all conductors in the cables must be insulated at 600V or greater according to NEC 725.48 (B)(4)(2).

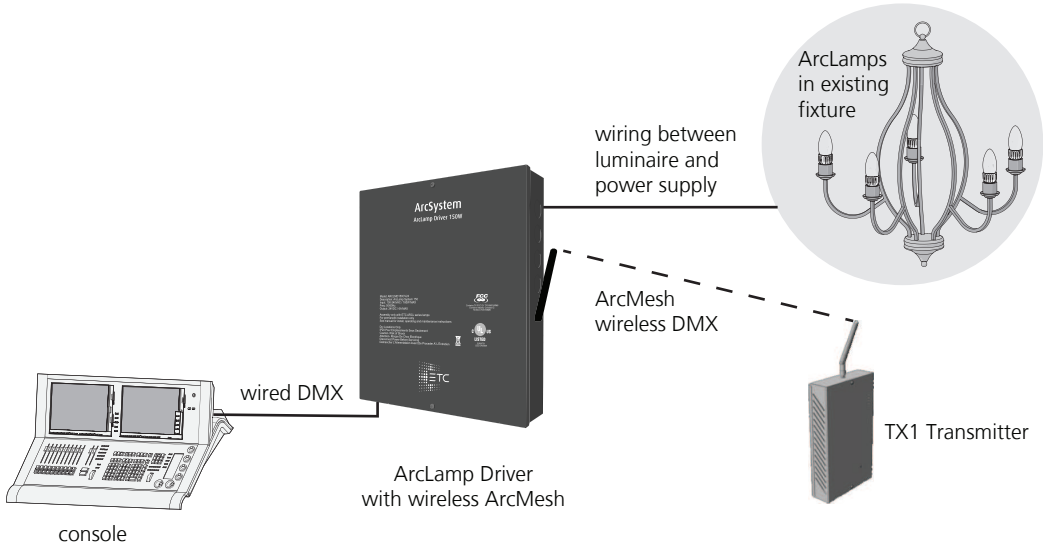
Note: *These retrofit kits can include certified emergency lighting equipment (such as an emergency LED driver) that has been investigated and found to comply with the requirements of ANSI/UL 924, Emergency Lighting and Power Equipment. When installed per the kit instructions, the converted luminaire is eligible to serve as part of a facility's emergency lighting system in accordance with ANSI/NFPA 101, Life Safety Code, Article 700 of ANSI/NFPA 70, National Electrical Code, and the International Building Code.*

Note: *Each ArcLamp driver provides up to four individually addressable output channels.*

All output channels have onboard overload protection. See *Overload Protection on page 35*.

ArcLamp System products can be controlled using wired DMX connections to the ArcLamp driver or controlled using wireless ArcMesh protocol. The following graphic shows a basic hybrid ArcLamp system installation with a wireless ArcLamp driver, ArcLamps, transmitter, and a wired DMX console for the main control source.

- ArcLamp systems are compliant with DMX 512-A (ANSI E1.11-2008 (R2013)).
- DMX loss behavior is hold last look.



ArcLamp systems with an RDM driver can be controlled over wired DMX from a lighting console or ETC Concert software. Concert is available for free download at etcconnect.com/Concert.

Chapter 2

Prepare for Installation

This chapter details the installation and wire termination for each ArcLamp System product.

WARNING: ***RISK OF ELECTRIC SHOCK! LED Retrofit Kit installation requires knowledge of luminaire electrical systems. If not qualified, do not attempt installation. Contact a qualified electrician.***

AVERTISSEMENT : ***RISQUE DE CHOC ELECTRIQUE! L'installation du kit de conversion LED nécessite une connaissance des systèmes électriques des luminaires. N'entreprenez pas l'installation si vous n'êtes pas qualifié. Contactez un électricien qualifié.***

WARNING: ***RISK OF ELECTRIC SHOCK! Risk of fire or electric shock. Install this kit only in the luminaires that have the construction features and dimensions shown in the photographs and/or drawings.***

Do not make or alter any open holes in an enclosure of wiring or electrical components during kit installation.

AVERTISSEMENT : ***RISQUE DE CHOC ÉLECTRIQUE! Risque d'incendie ou de choc électrique. Installez ce kit uniquement dans des luminaires qui ont les caractéristiques de construction et les dimensions indiquées sur les photographies et / ou les dessins.***

Ne percez ou ne modifiez aucun trou ouvert dans un boîtier de câblage ou de composants électriques pendant l'installation du kit.

WARNING: ***To prevent wiring damage or abrasion, do not expose wiring to edges of sheet metal or other sharp objects***

AVERTISSEMENT : ***Pour éviter les dommages ou l'abrasion du câblage, n'exposez pas le câblage aux bords du métal ou autres objets pointus.***

Installation Location

ArcLamp System is designed for use in 0–40°C (32–104°F) ambient temperature.

ArcLamp Drivers

Note: *Mounting hardware and installation location must support the ArcLamp driver, conduit hardware, and all cable required for installation.*

ArcLamp Rack-Mount Driver

Rack-mounted ArcLamp drivers require a 19-inch equipment rack. Each ArcLamp driver requires one unit (1U) of rack space.

Note: *Install this device in a location with restricted access where only qualified personnel and service persons can gain access with the use of a key. If this equipment is installed in a location without restricted access, the wiring area of the rack should only be accessible with the use of a tool.*

ArcLamp Wall-Mount Driver

Wall-mounted ArcLamp drivers require 7.6 cm (3 in) clearance around the side vents for proper ventilation.

Power Disconnect Device

Before installation, make sure you have a main circuit breaker cabinet or other readily accessible input power disconnect device installed ahead of your ArcLamp driver.

WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the system before installation, maintenance, cleaning, or any other system modification could result in serious injury or death.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Négliger de débrancher toutes les sources d'alimentation du système avant l'installation, l'entretien, le nettoyage ou toute autre modification du système peut causer des blessures graves ou la mort.***

De-energize main feed to ArcLamp drivers and follow appropriate Lockout/Tagout procedures as mandated by NFPA 70E. It is important to note that this electrical equipment can present an arc flash hazard if improperly serviced. This is due to the high amounts of short-circuit current available on the electrical supply to this equipment. Any work must comply with OSHA Safe Working Practices.

WARNING: ***RISK OF ELECTRIC SHOCK! Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***RISQUE DE DÉCHARGE ÉLECTRIQUE! Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

ArcLamp Installation

ArcLamps install directly to a standard E26, E27, E12, E14, B15, or B22 base. Fixtures with ArcLamps installed must only be powered by an ArcLamp driver.

CAUTION: ***ArcLamp is not suitable for use in enclosed luminaires or in spaces with restricted air flow. Should maximum temperature be exceeded, ArcLamp will thermally throttle output to reduce temperature.***

CAUTION: ***ArcLamp must not be connected to line voltage!***

Only install ArcLamp in fixtures powered by an ArcLamp Driver. Connecting ArcLamp to drivers or voltages greater than 24 V will cause permanent damage to ArcLamp.

ArcLamp must only be used in fixtures with compatible bases.

Note: *The fixture and its installation location must support the ArcLamp.*

Note: *The number of designated emergency lamps and their height is the responsibility of the specifier and installer in order to achieve the minimum FC levels of NFPA101. Other installation scenarios should be evaluated by the AHJ to confirm illuminance and performance requirements of ANSI/NFPA and the IBC.*

The LED driver has been evaluated for use with the Recognized OOLV2/8 lamps, models ARCL-E26, ARCL-E12, ARCLFE12, and ARCLFE26 under the following conditions:

- *in open luminaires (no lens or diffuser)*
- *with the lamps at a maximum height of 17 ft (5.2 m)*

Note: *ArcLamp is supplied with a caution label that must be applied to the fixture with the ArcLamp installed. The label states "This luminaire has been modified to operate LED lamps. Do not attempt to install or operate incandescent lamps in this luminaire."*

ArcLamp Voltage Drop

Note: *The installation site must consider power requirements at the fixture and allow for voltage drop with distance.*

ArcLamp is a 180 mA, 24 VDC lamp that contains onboard voltage drop compensation technology. However, correct operation requires a minimum of 21 VDC provided by the ArcLamp driver at the ArcLamp. Voltage drop calculations vary by project and are based on the type, length, and gauge of wire used between the ArcLamp driver and ArcLamp. Contact a qualified electrician or ETC technical services for further information.

The ArcLamp driver must be installed within a maximum distance of the fixture with ArcLamps installed. The table below lists the maximum distance between the ArcLamp driver and ArcLamp based on using each driver at its maximum rated capacity. These distances will be reduced when bridging driver output channels together (see *Bridge Output Channels on page 37*). Maximum distances depend on wire gauge. See recommended wire gauges at *Electrical and Wiring Specification on page 15* for wall-mount models and *Electrical and Wiring Specification on page 25* for rack-mount models. For your convenience, an interactive voltage drop calculator is available at etcconnect.com/ArcLamp.

Maximum Distance Between ArcLamp Driver and Fixture with ArcLamps Installed

Driver Description	Wire Gauge	ArcLamps Installed on a Single Channel	Maximum Run Length (Copper Wire)
ArcLamp Driver 150 or ArcLamp Emergency Driver 150	2.5 mm^2	6	201 m
	14 AWG	6	551 ft
ArcLamp Driver 350 or ArcLamp Emergency Driver 350	2.5 mm^2	15	80 m
	12 AWG	15	350 ft
	14 AWG	15	220 ft
ArcLamp Driver 700 or ArcLamp Emergency Driver 700	2.5 mm^2	30	40 m
	12 AWG	30	175 ft
	14 AWG	30	110 ft

Chapter 3

Wall-Mount Driver Installation

This chapter provides instructions for installing the standard wall-mount models of ArcLamp driver. Instructions for standard rack-mount or emergency wall-mount and emergency rack-mount drivers are in these chapters:

- *Rack-Mount Driver Installation on page 25*
- *Wall-Mount Emergency Drivers on page 48*

Electrical and Wiring Specification

WARNING: ***RISK OF ELECTRIC SHOCK! Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***RISQUE DE DÉCHARGE ÉLECTRIQUE! Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

Install the ArcLamp Driver on a power distribution system with reliably identified earthed neutral and install a maximum appropriately-sized circuit breaker on the line conductor.

ETC recommends installing all wiring to and from wall-mount drivers in grounded metal conduit.

The wall-mount ArcLamp Driver accepts 100–277 VAC (150 models) or 100–240 VAC (350 and 700 models), 50/60 Hz. Emergency models only: requires normal sense and maintained (emergency) input power.

Note: *Minimum 2.5 mm^2 (14 AWG) output wire size is recommended. See etcconnect.com/compatibility and contact Systems for assistance with voltage drop calculations based on power required and run length.*

Wire and Terminal Specifications

Terminal / Connector	Wire Range / Specification	Strip Length	Torque Rating
ArcLamp 150 standard and emergency driver Power Input	ArcLamp Driver 150 standard and emergency (line/neutral/ground): 2.5–4 mm^2 (14–12 AWG, solid or stranded)	7 mm (1/4 in)	0.5 Nm (4 in-lb)
ArcLamp Driver 350 and 700 standard and emergency Power Input	line/neutral/ground: 0.5–1.5 mm^2 (22–16 AWG)	10 mm (3/8 in)	none
24 VDC Power Output	ArcLamp Driver 150 standard and emergency models: 2.5 mm^2 (14–12 AWG solid or stranded). Follow Class 1 wiring methods.	7 mm (1/4 in)	0.5 Nm (4 in-lb)
	ArcLamp 350 and 700 standard and emergency drivers: 2.5 mm^2 (14–12 AWG, solid or stranded). Follow Class 1 wiring methods.	10–12 mm (3/8–1/2 in)	none
DMX In/Thru RJ45 Connectors	Cat5e (or equivalent) 0.2 mm^2 (24 AWG) or larger conductors terminated to T568B standard. You must terminate the last driver in line with a DMX terminator plug in the RJ45 Thru receptacle. See *RJ45 DMX Termination on page 22*		
DMX In/Thru Eight-pin Connector	ArcLamp 350 and 700 standard and emergency drivers: Belden 9729 (or equivalent). A 120Ω resistor (not provided) is required to terminate the last DMX device in a control run. See *DMX Cable Preparation and Termination on page 23*.		

Refer to *Channel Electrical Specifications on page 8* for the limits on current, power, and number of 4.4 W ArcLamps per output channel and driver.

Note: *All output channels have onboard electronic overload protection. See* *Overload Protection on page 35*.

Prepare for Wall-Mount Installation

Note: *Mounting hardware and installation location must support the weight of the driver, conduit hardware, and all cable required for installation.*

Wall-Mounting Supplies

The following supplies are required, but not provided, for ArcLamp Driver installation:

- flexible conduit and conduit fittings
- appropriate strain relief connectors for the installation type, as needed
- Phillips screwdriver
- four each mounting bolts or screws and wall anchors, as needed

Wall-Mount the Driver

1. Using a Phillips screwdriver, remove the two screws securing the cover to the ArcLamp Driver enclosure. Set screws aside for later re-installation. The cover is grounded by a tether to the enclosure.
   - ArcLamp Driver 350 and 700 wall-mount drivers have two hooks inside the cover and slots on the bottom side of the enclosure so that you can hang the cover during installation.
2. Align the ArcLamp Driver in its desired installation location and mark, then pre-drill the four mounting holes.

Note: *Vents on back of driver must* **not** *make contact with the wall for proper airflow.*

3. Install wall anchors as needed.
4. Align the driver to the mounting location and install the mounting hardware. Secure the hardware.
5. Install conduit hardware as required for your installation wire plan.
   - ArcLamp Driver 150 wall-mount drivers: Remove the knockouts required based on your installation wire plan and install conduit hardware accordingly.
   - ArcLamp Driver 350 and 700 wall-mount drivers:
     a. Using a Phillips screwdriver, remove the five screws securing the removable panel on the left side of the enclosure.
     b. Punch holes as needed for conduit for power connection and data connection.
     c. Reinstall the removable panel to the backbox.

Note: *Make sure that the flexible electrical supply can extend through the ceiling opening so that the driver and luminaire can be inspected and serviced when needed.*

Note: *Use suitable conduit where required by national and local codes.*

Note: *Drivers may require additional means of securement. Installation must follow all national and local codes for electrical equipment.*

Terminate Wiring

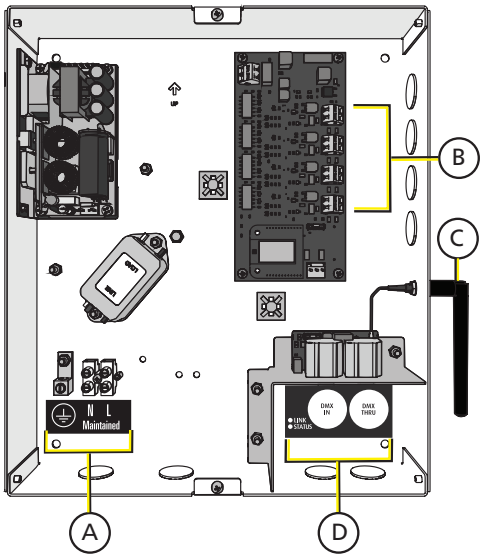
WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp Driver enclosure, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Avant de passer le câblage et de le raccorder au boîtier du driver ArcLamp, s'assurer de la coupure électrique du disjoncteur principal ou d'une autre arrivée électrique pour l'alimentation normale (et l'alimentation de secours lorsqu'elle est utilisée); s'assurer aussi que le disjoncteur ou le dispositif de déconnexion est verrouillé et identifié.***

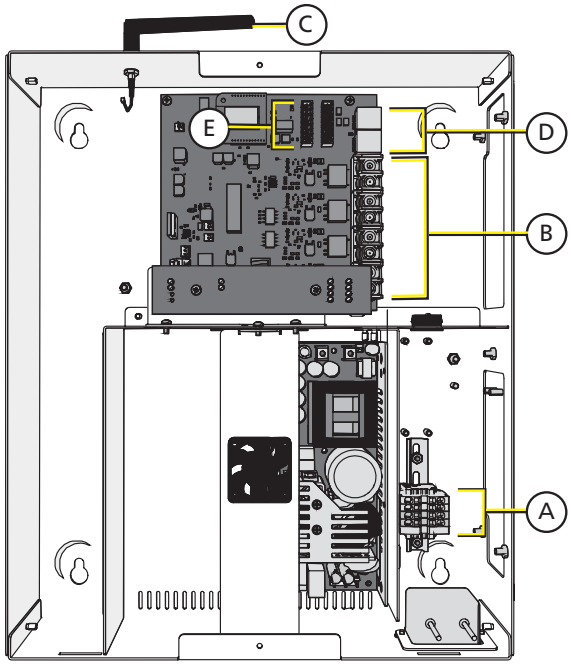
Diagrams and instructions for ArcLamp Emergency System drivers are located in *Emergency Driver Power Input Wiring on page 46*.

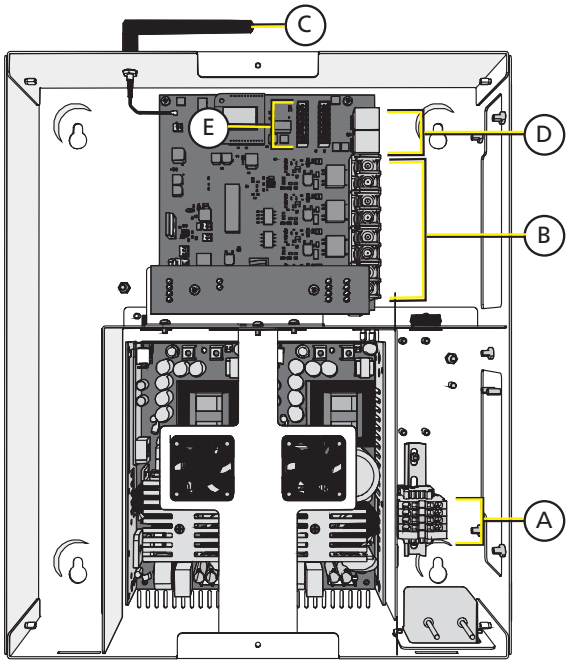
Wall-Mount Driver Wiring Overview

ArcLamp Driver 150 Wall-Mount



ArcLamp Driver 350 Wall-Mount





ArcLamp Driver 700 Wall-Mount

A	Power input
B	Output channels
C	Antenna*
D	DMX input and thru (RJ45)
E	DMX input and thru (eight-pin terminal blocks)†

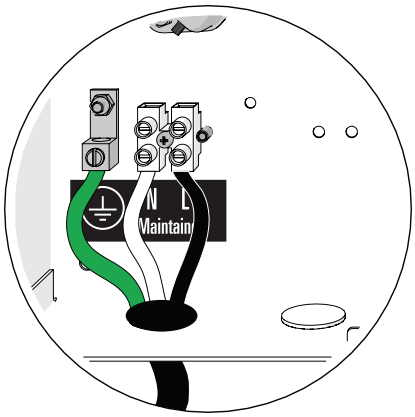
*The antenna is not present on RDM models.

†Eight-pin terminal blocks are not present on ArcLamp Driver 150.

Power Input Wiring

This section provides power input wiring termination for standard wall-mount ArcLamp Driver models. See *Emergency Driver Power Input Wiring on page 46* for instructions to terminate normal sense and emergency power input wiring.

ArcLamp 150 Driver



ArcLamp Driver 150

Power Input Detail

Factory Wire Colors

Model	Color	Type
North America and Europe	green/yellow	ground/earth
North America	black	line/hot
North America	white	neutral
Europe	brown	live
Europe	blue	neutral

Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

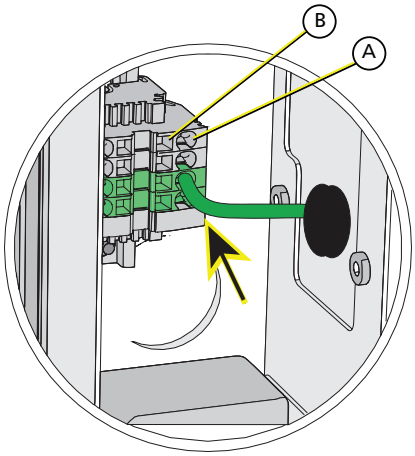
1. Make sure power is off at the main circuit breaker.
2. See *Wire and Terminal Specifications on page 16* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
3. Loosen the three screw terminals for NEUTRAL (N), GROUND⏚, and LINE (L) connections.
4. Insert the ground wire (typically green) into the GROUND⏚ terminal and tighten the screw.
5. Insert the neutral wire (typically white) into the NEUTRAL (N) terminal and tighten the screw.
6. Connect the hot wire (typically black) into the HOT (L) terminal and tighten the screw.
7. Tug gently on the wires to ensure they are secure.

Wall-Mount ArcLamp Driver 350 and 700

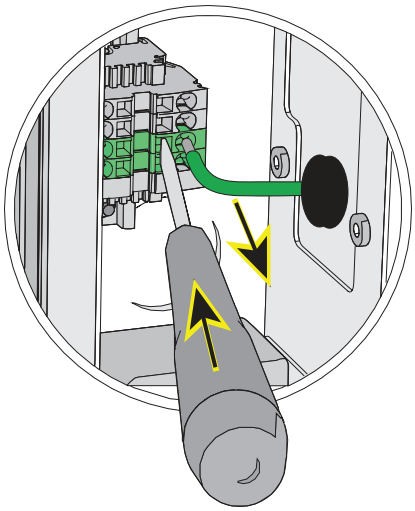
Push-In Terminal Blocks

ArcLamp Driver 350 and 700 wall-mount drivers have push-in terminal blocks. No tools are required to insert wires into the terminal block.

Install Wire

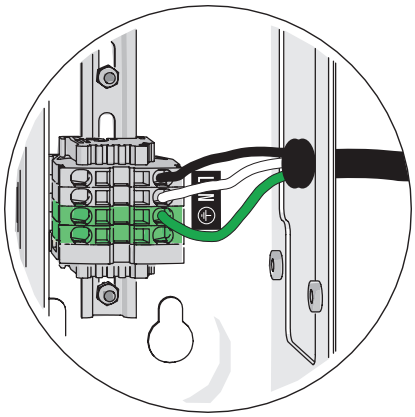


Remove Wire



A	terminal
B	tool slot (square)

- To install wire, insert the wire into the terminal.
- To remove wire, insert a 3.5 mm flatblade screwdriver into the tool slot next to the wire terminal to release the wire, then pull the wire out of the terminal.



Wall-Mount ArcLamp Driver 350 and 700 Power Input Detail

Factory Wire Colors

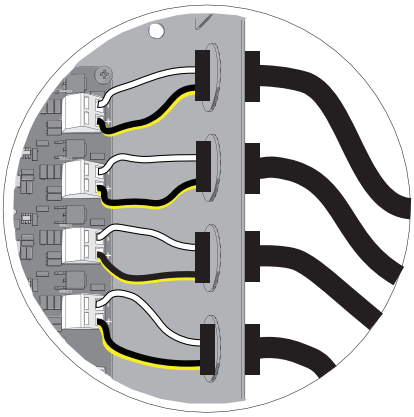
Model	Color	Type
North America and Europe	green/yellow	ground/earth
North America	black	line/hot
North America	white	neutral
Europe	brown	live
Europe	blue	neutral

Connect the Input Power

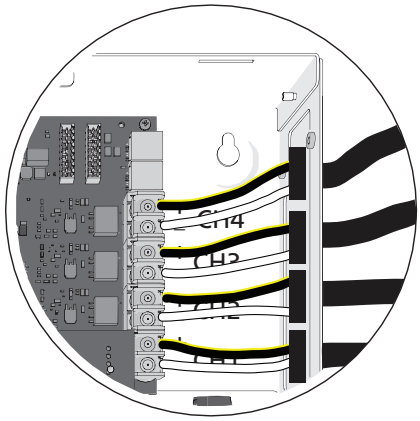
1. Make sure power is off at the main circuit breaker.
2. See *Wire and Terminal Specifications on page 16* for specification of wire size and strip length. Prepare the wires accordingly.
3. See *Push-In Terminal Blocks on the previous page* for general instructions on using the push-in terminal blocks.
4. Insert the ground wire (typically green) into the terminal marked "⏚."
5. Insert the neutral wire (typically white) into the terminal marked "N."
6. Terminate the line (hot) wire (typically black) into the terminal marked "L."
7. Tug gently on the wires to ensure they are secure.

Output Wiring to Fixture

ArcLamp Driver 150
wall-mount standard and emergency
output channel wiring detail



ArcLamp Driver 350/700 wall-mount
standard and emergency
output channel wiring detail



All four output channels are shown wired.

Power wires (line wire (hot) and neutral wire) from the installed fixture are terminated to output terminals on the ArcLamp Driver. Termination is available for up to four uniquely addressable outputs (channels).

Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

1. Make sure power is off at the main circuit breaker.
2. See *Wire and Terminal Specifications on page 16* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
3. Terminate neutral and line (hot) wires to an output.
   a. Run a neutral wire (typically white) and a line wire (typically black) through conduit from the fixture to the ArcLamp Driver output terminals. Output channels are labeled LED OUT 1, LED OUT 2, LED OUT 3, and LED OUT 4 on ArcLamp Driver 150 standard and emergency models. Wall-Mount ArcLamp Driver 350 and 700 standard and emergency models are labeled "CH 1", "CH 2", "CH 3", "CH 4".
   b. Terminate the neutral wire to the output channel "-" terminal, securing the terminal screw onto the wire.
   c. Terminate the line (hot) wire to the output channel "+" terminal, securing each terminal screw onto the wire.
   d. Tug gently on the wires to ensure they are secure.

Bridging Output Channels

It is acceptable to bridge multiple output channels together, ganging the maximum output allowed into a single combined output channel. See *Bridge Output Channels on page 37* for examples of the configurations made possible by bridging output channels.

For example, bridging all four output channels on an ArcLamp Driver 350 or two channels on an ArcLamp Driver 700 creates a single bridged output channel that can support 60 ArcLamps. 60 ArcLamps on a bridged channel draw about 8 A, allowing the single bridged channel to support the large number of ArcLamps.

Note: *This installation technique reduces the number of available output channels. See Bridge Output Channels on page 37.*

Note: *A maximum of two output channels can be bridged together on an ArcLamp Driver 700 (standard or emergency model).*

For more information, see *Bridge Output Channels on page 37*.

DMX In and DMX Thru

DMX In and DMX Thru cables terminate to RJ45 connectors (all models) or to eight-pin connectors (ArcLamp Driver 350 and 700 standard and emergency models). DMX is installed in a daisy chain topology and includes one pair of wires (data +, data -) plus an ISO ground (common).

RJ45 DMX Termination

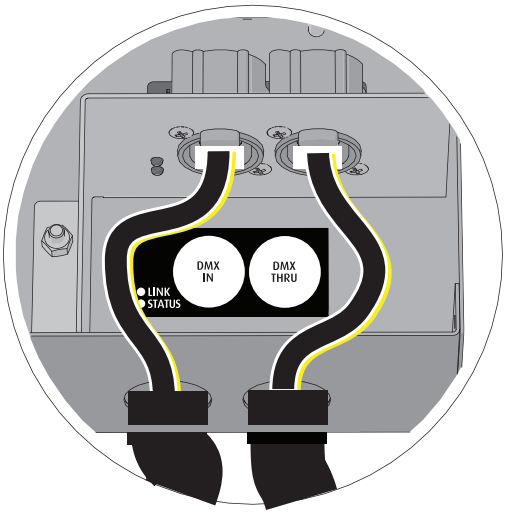
All models of ArcLamp Driver have RJ45 receptacles for DMX In and Thru.

ETC recommends Cat5e (or equivalent) minimum 0.2 mm^2 (24 AWG) conductors terminated to T568B standard. The DMX In and Thru RJ45 connectors on the wall-mount ArcLamp Driver 350 and 700 are not labeled and are interchangeable. Their locations are shown below.

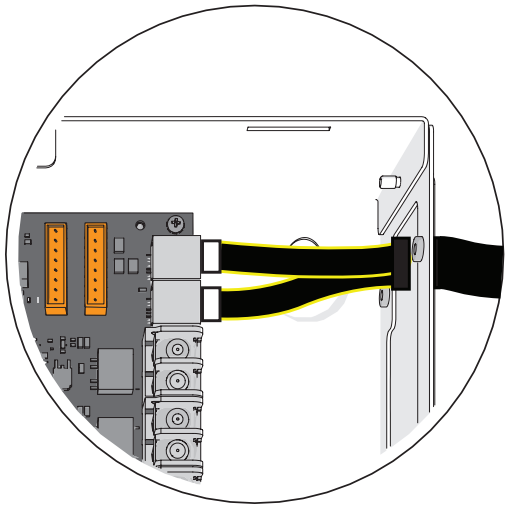
RJ45 Pinout Information

Pin	Description
1	Data +
2	Data -
7&8	ISO ground (common)

Detail of DMX in and thru plugged into RJ45 connectors in wall-mount drivers



Wall-Mount ArcLamp Driver 150
(Wall-Mount ArcLamp Emergency Driver 150 is similar.)



Wall-Mount ArcLamp Driver 350 or 700
(Wall-Mount ArcLamp Emergency Driver 350 or 700 is similar.)

Note: *ArcLamp drivers are not self-terminating. You must terminate the last driver in line with a DMX terminator plug in the RJ45 Thru receptacle. To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.*

Eight-Pin DMX Termination

ArcLamp Driver 350 and 700 standard and emergency models have eight-pin headers for DMX In and Thru in addition to the RJ45 receptacles described in the previous section.

Eight-Pin Connector Pinout

Pin	Description
1	ground ("Screen")
2	data -
3	data +

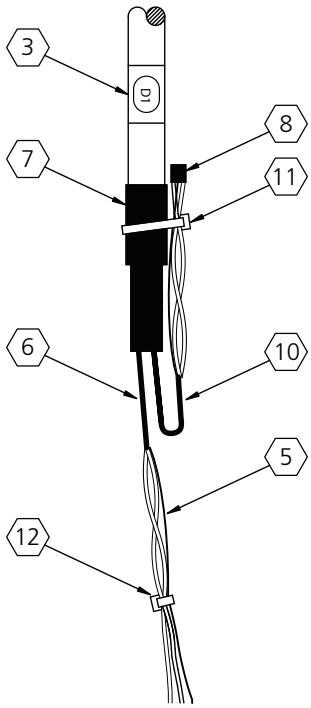
Note: *Total length of Belden 9729 should not exceed 500 m (1640 ft) between the control source and the ArcLamp Driver.*

DMX Cable Preparation and Termination

This instruction assumes preparation of Belden 9729 (or equivalent) cable for termination to the provided screw-terminal connector.

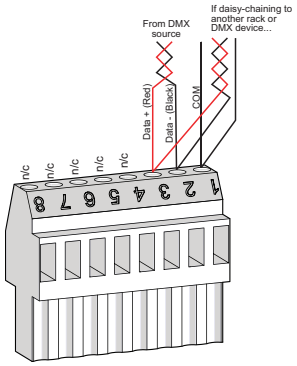
Note: *Not for use with Cat5, Cat5e, or Cat6 cable. When running DMX with these cable types, use the IDC connector.*

1. Leave approximately 20 cm (8 in) of wiring to allow slack for future service needs.
2. Strip 18 cm (7 in) off the outer jacket.
3. Label the cable with the data type and run designation. (DMX1, DMX2, etc.)
4. Strip the foil shielding from each wire set to within 6 mm (1/4 in) of the outer jacket.
5. Untwist the shield wire from each pair and apply a piece of 1.6 mm (1/16 in) clear heat shrink to each shield wire.
6. Twist each shield wire back onto its data pair, and then apply a 4 cm (1.5 in) piece of 0.5 cm (3/16 in) heat shrink all the way down each 3-wire set. Make sure to capture the foil shielding at the base.
7. Apply the 5 cm (2 in) piece of the 1 cm (3/8 in) heat shrink, centered on the end of the cable jacket and the bases of all the wires in the cable.
8. Cap the ends of the unused pair of wires with a 2.5 cm (1 in) piece of 0.5 cm (3/16 in) heat shrink centered over the end of the wires.
9. Strip 6 mm (1/4 in) of insulation from all of the wires to be used.
10. Maintain the wire pair twist as close to the screw terminal connector as possible and terminate the wires.
    - Insert the data - wire (typically black) into the terminal labeled “DMX -” and secure.
    - Insert the data + wire (typically red or white) into the terminal labeled “DMX +” and secure.
    - Insert the common (shield) wire into the terminal labeled “DMX " and secure.
11. Bend back the unused set of wires and secure them to the cable with a wire tie.
12. Secure the terminated wire sets together with a wire tie 5 cm (2 in) from the connector.



Note: *Specific wire colors will vary based on the DMX cable used.*

Note: *ArcLamp drivers are not self-terminating. You must terminate the last driver in line with a 120 Ω resistor (not provided) installed between terminals/pins 2 & 3 of the Thru output.*



The graphic on the left illustrates DMX In and Thru termination using screw terminal connectors intended for use with Belden 9729 cable (or equivalent).

Screw terminal connectors are supplied in the DMX Preparation Kit w/Screw Connector (part number 4100A1012) and shipped with your ArcLamp product.

Cable other than Belden 9729 may have a different color code for its wire pairs.

Chapter 4

Rack-Mount Driver Installation

This chapter provides instructions for installing the standard rack-mount models of ArcLamp driver. Instructions for standard wall-mount, emergency wall-mount, and emergency rack-mount drivers are in these chapters:

- *Wall-Mount Driver Installation on page 15*
- *Emergency Driver Power Input Wiring on page 46*

Note: *Install this device in a location with restricted access where only qualified personnel and service persons can gain access with the use of a key. If this equipment is installed in a location without restricted access, the wiring area of the rack should only be accessible with the use of a tool.*

Electrical and Wiring Specification

WARNING: ***Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

The rack-mount ArcLamp Driver accepts 100–240 VAC, 50/60Hz. Emergency models only: requires normal sense and maintained (emergency) input power. Wire and terminal specifications are the same for all rack-mount drivers.

Note: *Minimum 2.5 mm^2 (14 AWG) output wire size is recommended. See etcconnect.com/compatibility and contact Systems for assistance with voltage drop calculations based on power required and run length.*

Wire and Terminal Specifications

Terminal / Connector	Wire Range / Specification	Strip Length	Torque Rating
100–240 V Power Input	power cord(s) provided	• standard models: not applicable • emergency models: may depend on installation	
24 V Power Output, four two-position screw terminal connectors, provided	2.5 mm^2 (14–12 AWG) Follow Class 1 wiring methods.	7 mm (1/4 in)	0.5–0.6 Nm (4.4–5.3 in-lb)
DMX In/Thru RJ45 Connectors	Cat5e (or equivalent) minimum 24 AWG conductors terminated to T568B standard		

Refer to *Channel Electrical Specifications on page 8* for the limits on current, power, and number of 4.4 W ArcLamps per output channel and driver.

Note: *All output channels have onboard electronic overload protection. See Overload Protection on page 35.*

Prepare for Rack-Mount Installation

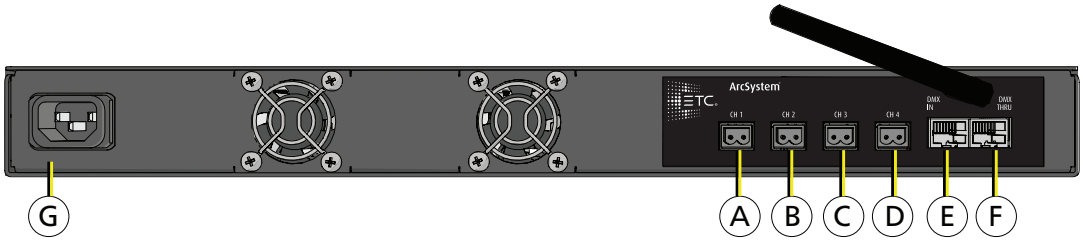
Rack-mounted drivers must be installed in a rack in a horizontal flat orientation. Rack-mounted drivers install into a standard 19-inch rack enclosure. One ArcLamp Driver requires one unit (1U) of rack space.

Rack-Mounting Safety

- **Installation Location:** Install the rack in a location where it will not readily be subjected to tampering by unauthorized personnel.
- **Elevated Operating Ambient:** If the ArcLamp Driver is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may elevate above the room ambient. Do not operate the device in an enclosed environment above 40°C (104°F).
- **Reduced Air Flow:** When installing the ArcLamp Driver in an equipment rack, the rack must be vented and have adequate airflow to maintain an operating temperature below 40°C (104°F).
- **Mechanical Loading:** Only mount the ArcLamp Driver in an equipment rack using the included ETC rack-mount hardware. Mount in a horizontal orientation to ensure even mechanical loading in the rack, avoiding hazardous or dangerous loading conditions.
- **Circuit Overloading:** When installing the ArcLamp Driver in an equipment rack, consider the connection of the equipment to the rack or power source to avoid overloading the rack circuit or supply wiring. Consider the rack or power distribution in the equipment rack during installation.
- **Reliable Grounding:** Maintain reliable grounding of the rack-mounted equipment. Give particular attention to any supply connections other than direct connections to the branch circuit (for example, the use of power strips).

Terminate Wiring

Rack-Mount ArcLamp Driver 350



Rack-Mount ArcLamp Driver 700

A	Output channel "CH 1"	E	"DMX In"
B	Output channel "CH 2"	F	"DMX Thru"
C	Output channel "CH 3"	G	Power input
D	Output channel "CH 4"		

Power Input Wiring

1. Ensure power to the rack is off.
2. Connect the AC input to the AC power source using the provided power input cord.

Output Wiring to Fixture

Power wires (line wire (hot) and neutral wire) from the installed fixture are terminated to the provided two-position screw-terminal connectors preinstalled in the output terminals on the ArcLamp Driver. Termination is available for up to four uniquely addressable outputs (channels).

Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

1. Make sure rack power is off.
2. See *Wire and Terminal Specifications on page 26* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
3. Terminate neutral and line (hot) wires to an output.
   a. Run a neutral wire (typically white) and a line wire (typically black) through conduit from the fixture to the rack and route it to the ArcLamp Driver output terminals. Output channels are labeled CH1, CH2, CH3, CH4.
   b. Loosen the terminal screws on the provided two-position screw-terminal connector.
   c. Terminate the neutral wire to the "-" terminal, securing the terminal screw onto the wire.
   d. Terminate the line (hot) wire to the "+" terminal, securing the terminal screw onto the wire.
   e. Tug gently on the wires to ensure they are secure.
   f. Insert the connector into a two-pin output channel receptacle on the back of the driver.

Bridging Output Channels

It is acceptable to bridge multiple output channels together, ganging the maximum output allowed into a single combined output channel. See *Bridge Output Channels on page 37* for examples of the configurations made possible by bridging output channels.

For example, bridging all four output channels on an ArcLamp Driver 350 or two channels on an ArcLamp Driver 700 creates a single bridged output channel that can support 60 ArcLamps. 60 ArcLamps on a bridged channel draw about 8 A, allowing the single bridged channel to support the large number of ArcLamps.

Note: *This installation technique reduces the number of available output channels. See Bridge Output Channels on page 37.*

Note: *A maximum of two output channels can be bridged together on an ArcLamp Driver 700 (standard or emergency model).*

For more information, see *Bridge Output Channels on page 37*.

DMX In and DMX Thru

DMX In and DMX Thru cables terminate to RJ45 connectors. DMX is installed in a daisy chain topology and includes one pair of wires (data +, data -) plus an ISO ground (common).

RJ45 Pin	Description
1	data +
2	data -
7 & 8	ground

Terminate DMX In and Thru

ETC recommends Cat5e (or equivalent) minimum 0.2 mm^2 (24 AWG) conductors terminated to T568B standard.

Note: *ArcLamp drivers are not self-terminating. You must terminate the last driver in line with a DMX terminator plug in the RJ45 Thru receptacle. To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.*

Chapter 5

Final Installation and Operation

ArcMesh

A wireless installation using ArcMesh control is an ideal solution for retrofit situations, where installing additional cable is not practical. For more information on ArcMesh, consult the *ArcSystem Wireless Information Guide* available for download from etcconnect.com/ArcSystem.

Antenna

ArcLamp drivers with ArcMesh are supplied with a 2 dBi antenna providing 90 degree omni-directional coverage. Install this antenna to the antenna receptacle.

TX1 Transmitter

Using ArcMesh requires a minimum of one TX1 Transmitter. The TX1 converts wired DMX data into the wireless ArcMesh protocol. See *TX1 Installation on page 57*.

Power Up Procedure

WARNING: ***Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible***

Note: *Read this section completely before powering up the system.*

1. Verify that all fixtures to be powered by the ArcLamp Driver have ArcLamps installed and the provided caution label has been installed on the fixture for future lamp replacement reference.
2. Check the DMX control source to ensure proper installation and termination per the manufacturer's instruction.
3. Check that all wires are terminated properly and secure in the ArcLamp Driver terminals.
4. Replace the front cover of the ArcLamp Driver.
5. Apply power at the main circuit breaker providing power to the ArcLamp Driver.
6. 350W and 700W standard and emergency drivers only: verify LED status on the front of the ArcLamp Driver. See *LED Indicators on page 34*.

ArcLamps will light.

Note: *When commissioning a system installation, check all ArcLamp Drivers to ensure that the latest firmware is present. If the firmware is not up to date, upgrade it following the instructions at Updating the Driver Firmware on the facing page.*

Note: *All ArcLamp Drivers are factory set to provide 100% output level to all circuits. This allows an electrical contractor to check that all products are properly installed and wired. During system commissioning, the certified ETC technician will remove this setting and configure DMX addresses for normal use. During normal use after commissioning is complete, ArcLamps will light if the DMX Control level is greater than 0.*

Updating the Driver Firmware

When commissioning a system installation, check all ArcSystem drivers and multi-cell luminaires to ensure that the latest firmware is present. If the firmware is not up to date, upgrade it following the instructions below for your luminaire type.

Wireless ArcMesh Luminaires

Upgrade luminaire firmware using the ArcSystem Configuration Software. The fixture firmware file and ArcSystem Configuration Software are available for free at etcconnect.com.

RDM Luminaires

Upgrade luminaire firmware using ETC Concert and ETC UpdaterAtor software before commissioning is completed. For more information on UpdaterAtor, download the *UpdaterAtor Software Quick Guide* for free at etcconnect.com.

When commissioning a system installation, check all ArcSystem drivers and multi-cell luminaires to ensure that the latest firmware is present. If the firmware is not up to date, upgrade it using ETC Concert and ETC UpdaterAtor software before commissioning is completed. For more information on UpdaterAtor, download the *UpdaterAtor Software Quick Guide* for free at etcconnect.com.

ArcLamp with ArcMesh Configuration and Commissioning

Initial system programming of a wireless ArcLamp system requires a USB commissioning tool (ARCMCT) and existing hardware such as a laptop or desktop computer that is connected to the ArcMesh network. This programming will be carried out by an ETC certified technician at the time of system commissioning and training.

The following checklist will be included during the configuration process:

- patching groups of fixtures to specific DMX channels
- assigning minimum and maximum dimming levels per group
- assigning power fail/recovery options per group

Note: *To ensure a smoother transition from an emergency state to a standard run state, ETC recommends setting DMX Loss behavior as "Go to Full" on ArcSystem TX1 Transmitters. In the ArcSystem Configuration Software, this setting is at Edit Wireless Gateway>DMX and is called Fade on loss of DMX.*

ArcLamp RDM Configuration

RDM Values

Manufacturer ID: 0x6574 (Electronic Theatre Controls)

ArcLamp Drivers	Model ID
ArcLamp Driver 150	0x120E
ArcLamp Driver 350	0x120F
ArcLamp Driver 700	0x1210

ArcLamp Emergency Drivers	Model ID
ArcLamp Emergency Driver 150	0x130E
ArcLamp Emergency Driver 350	0x130F
ArcLamp Emergency Driver 700	0x1310

DMX Personality

ArcLamp drivers support two personality types: single-channel and multi-channel. The single-channel personality controls all output channels with a single DMX address. The multi-channel personality controls individual output channels using four DMX addresses. See *DMX Personality below*.

Note: *You cannot manually assign DMX addresses to each output channel in the driver. You can specify the DMX start address and the output channels will be addressed automatically.*

Parameter	RDM PID	Value	Notes
DMX Start Address	0x0F0	Range = 001 to 512	Default is 001. The upper limit is 508 if the DMX Personality is set to 1 (multi-channel). See *DMX Personality above* and DMX Personality in the next row.
DMX Personality	0x00E0	1 or 2	Default is 2. See *DMX Personality above* for an explanation of single-channel and multi-channel DMX addressing. Set to 1 sets DMX personality to multi-channel. Set to 2 sets DMX personality to single-channel.
Identify Device	0x1000	0 for stop identify, 1 for start identify	Set causes to 1 causes the outputs and LEDs of the unit to blink in a one second on, one second off pattern.
Minimum Level	0x0341	0 to 255	Default is 99%. The driver will not accept a Minimum Level that is higher than the Maximum Level.
Maximum Level	0x0342	0 to 255	Default is 100%. The driver will not accept a Minimum Level that is higher than the Maximum Level.
ArcLamp Dimming Steps	0x8031	0 to 254	Default is 17. This parameter controls how many steps the ArcLamps take while dimming.
ArcLamp Enable FTW Support	0x8032	boolean	Default is enabled (true). This parameter enables or disables ArcLamp fade-to-warm functionality.
Restore Factory Defaults	0x0090		Set resets the driver configuration to default settings.
Software Version Label	0x00C0		Get returns the current software version as an ASCII text string.
Bootloader Version Label	0x00C2		Get returns the current bootloader version as an ASCII text string.

Maintenance

WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the system before installation, maintenance, cleaning, or any other system modification could result in serious injury or death.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Négliger de débrancher toutes les sources d'alimentation du système avant l'installation, l'entretien, le nettoyage ou toute autre modification du système peut causer des blessures graves ou la mort.***

De-energize main feed to ArcLamp and follow appropriate Lockout/Tagout procedures as mandated by NFPA 70E. It is important to note that electrical equipment such as the ArcLamp driver can present an arc flash hazard if improperly serviced. This is due to the high amounts of short-circuit current available on the electrical supply to this equipment. Any work must comply with OSHA Safe Working Practices.

WARNING: ***Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

ArcLamps

Inspect the ArcLamps for dust. As needed, use a lint-free cloth to wipe the lamps.

ArcLamp Driver

- Inspect the all mounting hardware for secure installation. As needed, replace worn or damaged hardware.
- Check for excessive dust or debris in the air flow vents around the ArcLamp Driver enclosure. Clean the vents using compressed air or a soft lint-free cloth. Keeping the components of the enclosure clean facilitates efficient cooling.

Note: *A can of compressed air or oil-free air from an air compressor, set at a low setting, can be used to blow dust and debris from the vents on the ArcLamp Driver. Dust buildup can cause overheating and premature failure of the system.*

CAUTION: ***Never spray liquids into the ArcLamp Driver and never spray compressed air into an ArcLamp Driver that is powered up.***

Troubleshooting

LED Indicators

ArcLamp Driver 350 and 700 wall-mount and rack-mount, standard and emergency models have LED indicators. The Status LED will blink or stay solid for short periods during normal operation. See the table below for LED behavior.

Power LED	On: power is present Off: power is not present
EM Active (emergency models only)	On: ArcLamp Driver has lost its normal sense input and is currently in emergency override state - all output channels are on at 100%.
PSU 1 Fault	ArcLamp Driver 700 and ArcLamp Emergency Driver 700 only On: power supply 1 has a fault. Contact ETC Technical Services for assistance.
PSU 2 Fault	ArcLamp Driver 700 and ArcLamp Emergency Driver 700 only On: power supply 2 has a fault. Contact ETC Technical Services for assistance.
DMX In	Slow Flash (wireless operation): normal operation. DMX broadcast is being received and DMX data is not changing. Solid On (wireless operation): active DMX signal is being received Solid On (wired DMX): DMX is present
Status	Steady blinking: processor is operating normally Solid On: system is responding to DMX instruction Solid On when no DMX command is being sent: there is a processor fault. Contact ETC Technical Services for assistance.
Channel OK LEDs	Solid On with no Channel Limit LEDs lit: channel is outputting normally Off: main power to ArcLamp Driver is off. Steady blinking, alternating with Channel Limit LED: channel output exceeded the trip limit. Lamps will flash. See *Overload Protection on the facing page*. Contact ETC Technical Services for assistance.
Channel Limit LEDs	Solid on: channel output exceeded the warning limit. See *Overload Protection on the facing page*. Contact ETC Technical Services for assistance. Steady blinking, alternating with Channel OK LED: channel output exceeded the trip limit.Lamps will flash. See *Overload Protection on the facing page*. Contact ETC Technical Services for assistance.

Note: *For more information about warning and trip behavior, see Overload Protection on the facing page.*

Overload Protection

There are two types of maximum output limit: warning and trip. Contact ETC technical services for assistance with warning and fault conditions.

Warning

On ArcLamp Driver 350 and 700 models only, the "Channel OK" LED will remain solid on and the Channel Limit LED will light if the current drawn on any channel exceeds the warning limits.

Trip

On all models, lamps will flash if the current drawn on any output channel exceeds the trip limits. The protection circuit retries the connection every 1 second until the trip condition is resolved or the main circuit breaker supplying power to the ArcLamp Driver is shut off. If all channels draw current below the trip limits, the circuit will reconnect and lamps will stop flashing.

Trip LED behavior

On ArcLamp Driver 350 and 700 models only, the "Channel OK" LED and Channel Limit LED will alternate flashing if the current drawn on any output channel exceeds the trip limits. Channel Limit LEDs will turn off and "Channel OK" LEDs will turn solid on when the circuit reconnects.

Warning Limits and Trip Limits

Driver Description	Warning Limits				Trip Limits			
	Single Channel	Number of Channels Per Bridge			Single Channel	Number of Channels Per Bridge		
		2	3	4		2	3	4
ArcLamp Driver 150 or ArcLamp Emergency Driver 150	NO WARNING OR TRIP LEDs If circuits are overloaded on an ArcLamp Driver 150, output may appear dim or loads may not light. Contact ETC Technical Services for assistance.							
Wall-Mount ArcLamp Driver or ArcLamp Emergency Driver350	3.0 A	5.8 A	8.1 A	9.8 A	3.6 A	7.0 A	9.8 A	12.0 A
Rack-Mount ArcLamp Driver or ArcLamp Emergency Driver 350	3.0 A	5.6 A	8.6 A	11.0 A	3.6 A	6.7 A	10.6 A	13.0 A
Wall-Mount ArcLamp Driver or ArcLamp Emergency Driver700	6.1 A	12.0 A	NOT POSSIBLE		7.1 A	14.2 A	NOT POSSIBLE	
Rack-Mount ArcLamp Driver or ArcLamp Emergency Driver 700	6.1 A	11.0 A	NOT POSSIBLE		7.1 A	13 A	NOT POSSIBLE	
The current drawn by large numbers of ArcLamps is less than the calculated ideal, which allows more ArcLamps to be driven by a single bridged channel than you might expect from calculations.								

See *Bridge Output Channels on page 37* for more information about bridging channels.

Fade to Warm Behavior

In order to enable fade to warm behavior, ArcLamp systems with ArcMesh must have Fade to Warm Inhibit **unchecked** in ArcSystem commissioning software at the time of initial system setup.

ArcLamp systems with RDM must have the ArcLamp Enable FTW Support parameter set to true. See *ArcLamp Enable FTW Support on page 32*.

Appendix A

Bridge Output Channels

It is acceptable to bridge multiple output channels together, ganging the maximum output allowed into a single combined output channel. See below for examples of the configurations made possible by bridging output channels.

For example, bridging all four output channels on an ArcLamp Driver 350 or two channels on an ArcLamp Driver 700 creates a single bridged output channel that can support 60 ArcLamps.60 ArcLamps on a bridged channel draw about 8 A, allowing the single bridged channel to support the large number of ArcLamps.

Note: *A maximum of two output channels can be bridged together on an ArcLamp Driver 700 (standard or emergency model).*

WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp driver enclosure or TX1 Transmitter, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Avant de passer le câblage et de le raccorder au boîtier du driver ArcLamp ou à l'émetteur TX1, s'assurer de la coupure électrique du disjoncteur principal ou d'une autre arrivée électrique pour l'alimentation normale (et l'alimentation de secours lorsqu'elle est utilisée); s'assurer aussi que le disjoncteur ou le dispositif de déconnexion est verrouillé et identifié.***

WARNING: ***You must use an approved wiring kit provided by ETC. Do not bridge output channels with unapproved wire or hardware.***

AVERTISSEMENT : ***Vous devez utiliser un kit de câblage agréé et fourni par ETC. Ne pontez pas les circuits de sortie avec des fils ou du matériel non agréés.***

Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

Note: *This installation technique reduces the number of available output channels.*

Bridge Specifications

ArcLamp Driver Model	Bridge Configuration	Max. 4.4 W ArcLamps on new Channel	Max. Current on new Channel	Max. Power on new Channel
ArcLamp Driver 150 or ArcLamp Emergency Driver 150	2 bridged into 1	12	2.2 A	53 W
	3 bridged into 1	18	3.4 A	79 W
	4 bridged into 1	25	4.4 A	110 W
Wall-Mount ArcLamp Driver 350 or ArcLamp Emergency Driver 350	2 bridged into 1	30	5.8 A	139 W
	3 bridged into 1	45	8.3 A	199 W
	4 bridged into 1	60	11 A	264 W
Rack-Mount ArcLamp Driver 350 or ArcLamp Emergency Driver 350	2 bridged into 1	30	5.6 A	134 W
	3 bridged into 1	45	8.6 A	206 W
	4 bridged into 1	60	11 A	264 W
Wall-Mount ArcLamp Driver 700 or ArcLamp Emergency Driver 700	2 bridged into 1	60	12 A	288 W
	3 bridged into 1	NOT POSSIBLE		
	4 bridged into 1			
Rack-Mount ArcLamp Driver 700 or ArcLamp Emergency Driver 700	2 bridged into 1	60	11 A	264 W
	3 bridged into 1	NOT POSSIBLE		
	4 bridged into 1			
The current drawn by large numbers of ArcLamps is less than the calculated ideal, which allows more ArcLamps to be driven by a single bridged channel than you might expect from calculations.				

Note: *All output channels have on-board overload protection. See* *Overload Protection on page 35*.

Note: *The installation site must consider power requirements at the fixture and allow for voltage drop with distance. See* *Voltage Drop below*.

Voltage Drop

Correct operation of an ArcLamp requires a minimum of 21 VDC provided by the ArcLamp Driver at the ArcLamp. Voltage drop calculations vary by project and are based on the type, length, and gauge of wire used between the ArcLamp Driver and ArcLamp. Contact a qualified electrician or ETC technical services for further information.

The ArcLamp Driver must be installed within a maximum distance of the fixture with ArcLamps installed. Maximum distances will be reduced when bridging driver output channels together and are dependent on wire gauge. See recommended wire gauges at *Electrical and Wiring Specification on page 15* for wall-mount models and *Electrical and Wiring Specification on page 25* for rack-mount models. For your convenience, an interactive voltage drop calculator is available at etcconnect.com/ArcLamp.

Wall-Mount Bridging Kits

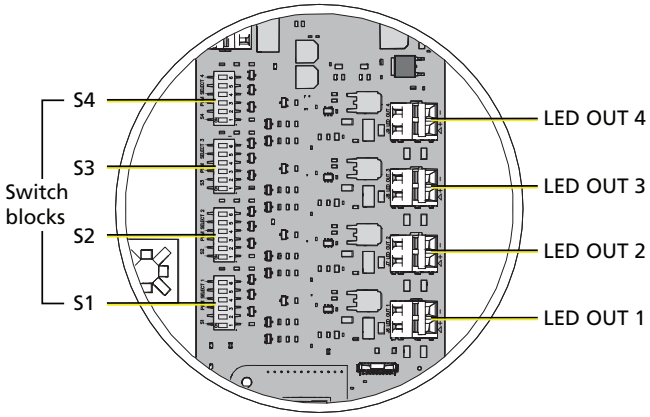
1. 7490K2002 bridging kit for ArcLamp Driver 150 and ArcLamp Emergency Driver 150
    - for bridging combinations of 2, 3, or 4 channels
    - four 3-position WAGO® connectors, each with two attached wires, pre-stripped
    - two 5-position WAGO connector with four attached wires, pre-stripped
2. 7490K2003 bridging kit for ArcLamp Driver 350 and ArcLamp Emergency Driver 350
    - for bridging combinations of 2, 3, or 4 channels
    - four 3-position WAGO connectors, each with two attached wires terminated with forks
    - two 5-position WAGO connector with four attached wires terminated with forks
3. 7490K2004 bridging kit for ArcLamp Driver 700 or ArcLamp Emergency Driver 700
    - for bridging combinations of 2 channels
    - four 3-position WAGO connectors, each with two attached wires terminated with forks

Rack-Mount Bridging Kits

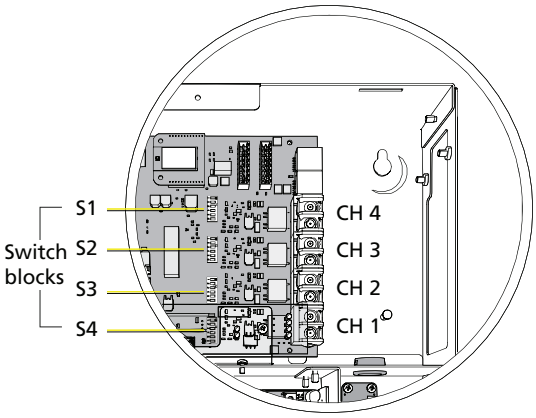
1. 7490K2005 bridging kit for rack-mount ArcLamp Driver 350
    - for bridging combinations of 2, 3, or 4 channels
    - four 3-position WAGO connectors, each with two attached wires, pre-stripped
    - two 5-position WAGO connector, with four attached wires, pre-stripped
2. 7490K2006 bridging kit for rack-mount ArcLamp Driver 700
    - for bridging combinations of 2 channels
    - four 3-position WAGO connectors, each with two attached wires, pre-stripped

Output Channel Control Switches

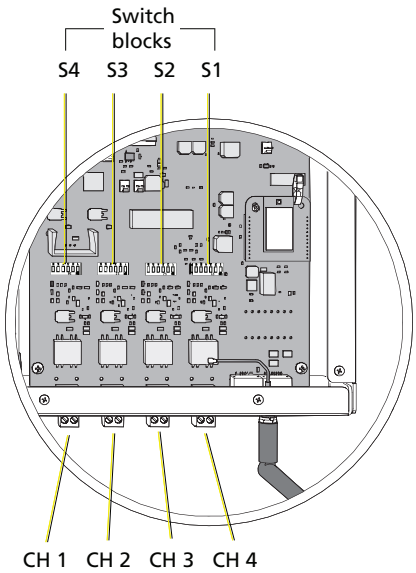
Each output channel on the ArcLamp Driver is controlled by a switch block (S1–S4, shown below). Switch positions 2–5 are factory set to allow individual control of each output. In order to bridge channels together, you must adjust the positions of switches 2–5.



ArcLamp Driver 150



Wall-Mount ArcLamp Driver 350/
Wall-Mount ArcLamp Driver 700



Rack-Mount ArcLamp Driver 350/
Rack-Mount ArcLamp Driver 700

Switch Blocks

Each of the four switch blocks controls one output channel.

- Switch block S1 controls the output channel labeled "LED OUT 1" on ArcLamp Driver 150 or "CH 4" on ArcLamp Driver 350 and 700.
- Switch block S2 controls the output channel labeled "LED OUT 2" on ArcLamp Driver 150 or "CH 3" on ArcLamp Driver 350 and 700.
- Switch block S3 controls the output channel labeled "LED OUT 3" on ArcLamp Driver 150 or "CH 2" on ArcLamp Driver 350 and 700.
- Switch block S4 controls the output channel labeled "LED OUT 4" on ArcLamp Driver 150 or "CH 1" on ArcLamp Driver 350 and 700.

Switch Functions

There are six switches on each switch block.

- Switch positions 1 and 6 are factory set and should not be adjusted.
- Switch positions 2 through 5 are factory set to allow each output to be controlled individually. You must adjust these switches on the switch block that controls each output channel that you want to bridge.

ArcLamp Driver 150 Factory Settings for Individual Output Channel Control

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S1 (LED OUT 1)	Do not adjust from factory setting	**ON**	OFF	OFF	OFF	Do not adjust from factory setting
S2 (LED OUT 2)		OFF	**ON**	OFF	OFF	
S3 (LED OUT 3)		OFF	OFF	**ON**	OFF	
S4 (LED OUT 4)		OFF	OFF	OFF	**ON**	

ArcLamp Driver 350 and 700 Factory Settings for Individual Output Channel Control

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S4 (CH 1)	Do not adjust from factory setting	**ON**	OFF	OFF	OFF	Do not adjust from factory setting
S3 (CH 2)		OFF	**ON**	OFF	OFF	
S2 (CH 3)		OFF	OFF	**ON**	OFF	
S1 (CH 4)		OFF	OFF	OFF	**ON**	

Setting Switches 2 Through 5 for Bridged Output Channels

Note: *Each output channel that you want to bridge must have the same setting for switch positions 2–5 as the other output channels in the bridge. Output channels that are electrically connected (bridged) with different switch settings may have reduced capacity.*

Note: *If you are using a wireless ArcLamp Driver with ArcMesh, you must also set bridged outputs to the same DMX address in the ArcSystem Configuration Software so that they function as one output channel.*

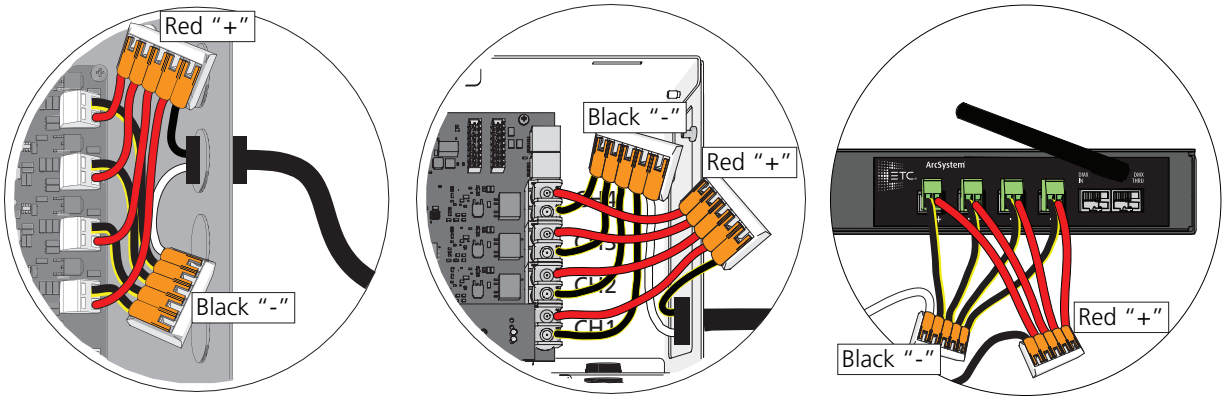
All output channels with the same settings on switch positions 2–5 will respond to the same DMX address even if they are not electrically connected (bridged).

Example Bridge Configurations

All Four Output Channels Bridged

Bridging four output channels can be done as shown below for maximum load capacity on one circuit and control on output channel 1. The bridged circuit can be assigned to any output channel as long as all four switch blocks (S1–S4) are set the same. The illustration and table below show all four output channels bridged together to form bridged output channel 1.

Detail of four output channels bridged into one.



ArcLamp Driver 150 | Wall-Mount ArcLamp Driver 350 | Rack-Mount ArcLamp Driver 350

Note: *Do not bridge three or four output channels into one output channel on an ArcLamp Driver 700.*

ArcLamp Driver 150 Switch Settings for Four Output Channels Bridged into One

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S1 (LED OUT 1)	Do not adjust from factory setting	ON	OFF	OFF	OFF	Do not adjust from factory setting
S2 (LED OUT 2)		ON	OFF	OFF	OFF	
S3 (LED OUT 3)		ON	OFF	OFF	OFF	
S4 (LED OUT 4)		ON	OFF	OFF	OFF	

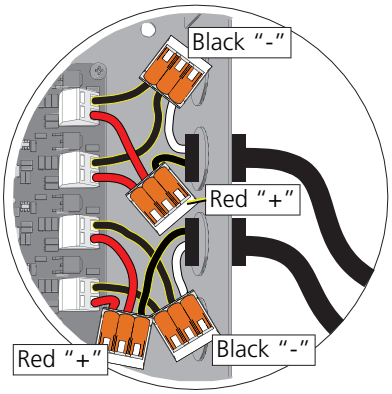
ArcLamp Driver 350 Switch Settings for Four Output Channels Bridged into One

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S4 (CH 1)	Do not adjust from factory setting	ON	OFF	OFF	OFF	Do not adjust from factory setting
S3 (CH 2)		ON	OFF	OFF	OFF	
S2 (CH 3)		ON	OFF	OFF	OFF	
S1 (CH 4)		ON	OFF	OFF	OFF	

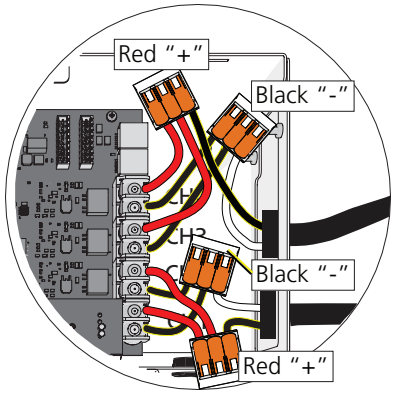
Output Channels Bridged in Pairs

Bridging pairs of output channels can be done as shown below for control on output channel 1 and output channel 2, or on any pair of output channels as long as the output channels that are electrically connected (bridged) have the same switch block settings. The illustrations and table below show output channel 1 and output channel 2 bridged to form bridged output channel 1 and output channel 3 and output channel 4 bridged to form bridged output channel 3.

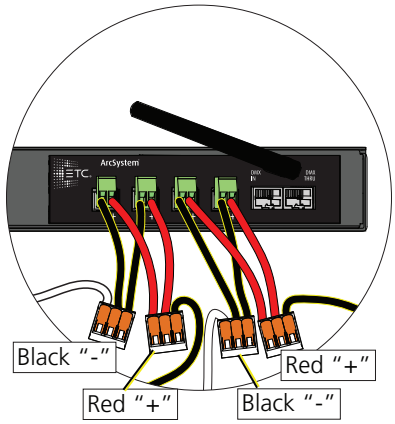
Detail of output channels bridged in pairs.



ArcLamp Driver 150



Wall-Mount ArcLamp Driver 350/ Wall-Mount ArcLamp Driver 700



Rack-Mount ArcLamp Driver 350/ Rack-Mount ArcLamp Driver 700

ArcLamp Driver 150 Switch Settings for Output Channels Bridged in Pairs

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S1 (LED OUT 1)	Do not adjust from factory setting	**ON**	OFF	OFF	OFF	Do not adjust from factory setting
S2 (LED OUT 2)		**ON**	OFF	OFF	OFF	
S3 (LED OUT 3)		OFF	OFF	**ON**	OFF	
S4 (LED OUT 4)		OFF	OFF	**ON**	OFF	

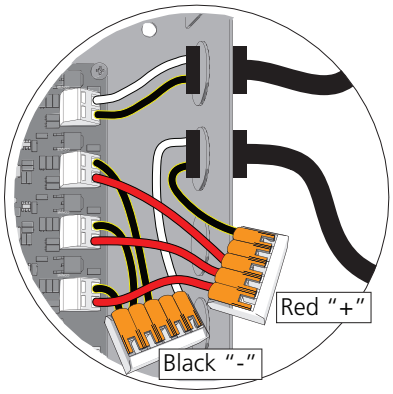
ArcLamp Driver 350 and 700 Switch Settings for Output Channels Bridged in Pairs

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S4 (CH 1)	Do not adjust from factory setting	**ON**	OFF	OFF	OFF	Do not adjust from factory setting
S3 (CH 2)		**ON**	OFF	OFF	OFF	
S2 (CH 3)		OFF	OFF	**ON**	OFF	
S1 (CH 4)		OFF	OFF	**ON**	OFF	

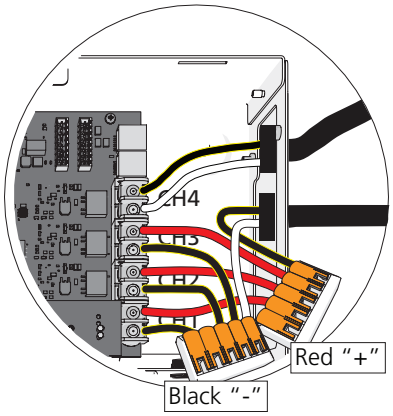
Three Output Channels Bridged

Bridging three output channels can be done as shown below for control on output channel 1, or on any channel as long as the three output channels that are electrically connected (bridged) have the same switch block settings. The fourth output channel can be assigned to any of the three remaining channels. The table below shows output channels 1, 2, and 3 bridged to form bridged output channel 1 with output channel 4 at its factory setting.

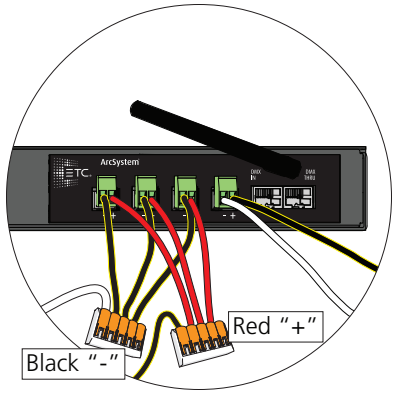
Detail of three output channels bridged into one.



ArcLamp Driver 150



Wall-Mount ArcLamp Driver 350



Rack-Mount ArcLamp Driver 350

Note: *Do not bridge three or four output channels into one output channel on an ArcLamp Driver 700.*

ArcLamp Driver 150 Switch Settings for Three Output Channels Bridged into One

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S1 (LED OUT 1)	Do not adjust from factory setting	ON	OFF	OFF	OFF	Do not adjust from factory setting
S2 (LED OUT 2)		ON	OFF	OFF	OFF	
S3 (LED OUT 3)		ON	OFF	OFF	OFF	
S4 (LED OUT 4)		OFF	OFF	OFF	ON	

ArcLamp Driver 350 Switch Settings for Three Output Channels Bridged into One

Switch Block (Output)	Switch Positions					
	1	2	3	4	5	6
S4 (CH 1)	Do not adjust from factory setting	ON	OFF	OFF	OFF	Do not adjust from factory setting
S3 (CH 2)		ON	OFF	OFF	OFF	
S2 (CH 3)		ON	OFF	OFF	OFF	
S1 (CH 4)		OFF	OFF	OFF	ON	

Bridging Procedure

The steps below describe how to bridge output channels on wall-mount and rack-mount ArcLamp Driver models. Wall-mount ArcLamp Driver models have four two-position screw-terminal connections located inside the enclosure. Rack-mount ArcLamp Driver 350 and 700 models have four two-position screw-terminal plugs installed in the back of the enclosure. Outputs are labeled "LED OUT 1", "LED OUT 2", "LED OUT 3" and "LED OUT 4" (ArcLamp Driver 150) or "CH 1", "CH 2", "CH 3", and "CH 4" (ArcLamp Drivers 350/700). See the illustrated examples in *Example Bridge Configurations on page 42*.

1. Turn off power to the ArcLamp Driver or equipment rack.
2. Remove the cover of the driver to access the Output Channel Control Switches.
   Wall-Mount ArcLamp Driver:
   - Use a Phillips screwdriver to remove the two screws securing the lid to the enclosure. Set the cover and screws aside. You will reinstall them later.

   Rack-Mount ArcLamp Driver:
   - Remove the rack-mount ArcLamp Driver to access its cover.
   - Use a Phillips screwdriver to remove the four screws securing the ArcLamp Driver cover. Set the cover and screws aside. You will reinstall them later.
3. Set switches 2–5 of switch blocks S1–S4 to the same output channel setting for each set of output channels that you want to bridge. See the explanation and examples in *Output Channel Control Switches on page 40*.
4. **Rack-Mount ArcLamp Driver:** Replace the cover on the rack-mount ArcLamp Driver and reinstall the driver in the equipment rack.
5. Choose the WAGO connector with black wires from the bridging kit. The WAGO connector should have at least one more position than the number of channels to be bridged.
6. Bus the negative poles of the output channel connectors. Output channels are labeled "LED OUT 1", "LED OUT 2", "LED OUT 3", and "LED OUT 4" on ArcLamp Driver 150 or "CH 1", "CH 2", "CH 3", and "CH 4" on ArcLamp 350 and 700.
   - Terminate one black jumper wire to each negative terminal (“-”) of the output channels to be bridged, securing each terminal screw onto the fork or wire. Tug gently to make sure the wires are secure.
7. Run neutral and line wires through conduit from the fixture to the driver or equipment rack.
8. Use a free position on the negative WAGO connector as the negative terminal of the new output channel. Terminate the neutral wire (typically white) from the installed fixture to the negative terminal.
   - Run a neutral wire through conduit from the fixture to a free position on the WAGO connector. Lift up the orange clip, insert the wire, and press the clip down onto the wire. Tug gently to make sure the wire is secure.
9. Remove any unused wires from the WAGO connector.
10. Repeat steps 5–9 to bus together positive ("+") terminals using the WAGO connector with red jumper wires.
11. Use a free position on the positive WAGO connector as the positive terminal of the new output channel. Terminate the line (hot) wire (typically black) from the installed fixture to the positive terminal.
    - Run a positive (formerly line) wire through conduit from the fixture to a free position on the WAGO connector. Lift up the orange clip, insert the wire, and press the clip down onto the wire. Tug gently to make sure the wire is secure.
12. **Wall-Mount ArcLamp Driver:** Reinstall the lid with the two screws removed in step 2.

Appendix B

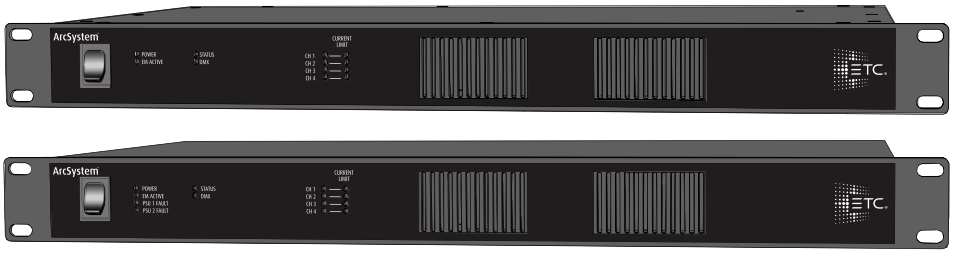
Emergency Driver Power Input Wiring

Wall-Mount ArcLamp Emergency Driver 700

Wall-Mount ArcLamp Emergency Driver 150

Wall-Mount ArcLamp Emergency Driver 150

Rack-Mount ArcLamp Emergency Driver 350



Rack-Mount ArcLamp Emergency Driver 700

ArcLamp Emergency Drivers are available for systems requiring emergency lighting control. Each fixture with ArcLamps installed can be configured to be UL924 listed when wired to an existing emergency response system.

Note: *Fixtures with ArcLamps installed must be hard wired to an ArcLamp Emergency Driver to be considered for UL924 certification.*

The installation must conform to local and national codes.

ArcLamp Drivers are available in UL924 listed variants including:

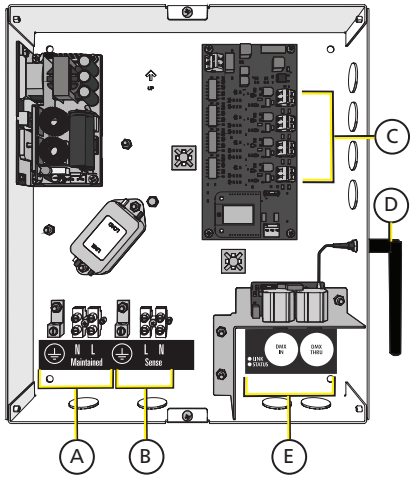
- ArcLamp Driver 150: 115 W (convection cooled) supplies power for up to 25 individual 4.4 W ArcLamps
- ArcLamp Driver 350 (wall-mount or rack-mount): 264 W (single fan) supplies power for up to 60 individual 4.4 W ArcLamps
- ArcLamp Driver 700 (wall-mount or rack-mount): 528 W (dual fans) supplies power for up to 120 individual 4.4 W ArcLamps

ArcLamp Emergency Drivers require two branch circuit power input connections, normal sense and maintained (emergency).

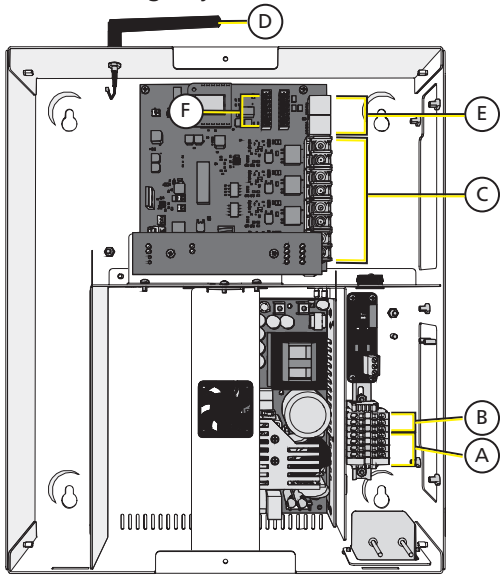
- Maintained (emergency) provides constant power to the ArcLamp Driver regardless of the state, enforcing the ability to maintain a lights on condition when needed. The power source must be connected to an emergency branch circuit with an upstream UL1008 automatic transfer switch.
- Normal sense detects when normal power is present. In the event of a normal power failure, the ArcLamp Driver will force all output channels on the ArcLamp Driver to full (100%). Any control of the connected output channels will be unavailable until normal power has been restored.

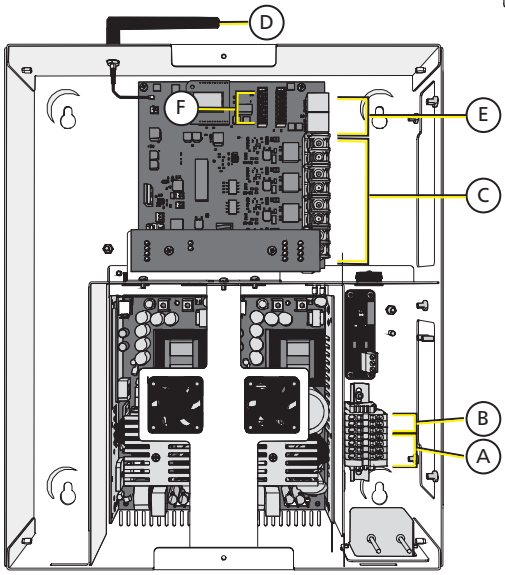
Wall-Mount Emergency Drivers

Wall-Mount ArcLamp
Emergency Driver 150



Wall-Mount ArcLamp
Emergency Driver 350





Wall-Mount ArcLamp
Emergency Driver 700

A	Maintain (emergency) power input
B	Sense (normal sense) power input
C	Output channels
D	Antenna*
E	DMX input and thru (RJ45)
F	DMX input and thru (eight-pin terminal blocks)†

*The antenna is not present on RDM models.

†Eight-pin terminal blocks are not present on 150 W models.

Wall-Mount Emergency Driver Installation

CAUTION: ***RISK OF SHOCK AND FIRE - This unit has more than one power supply connection point. To reduce the risk of electric shock disconnect both the branch circuit-breakers or fuses and emergency power supplies before servicing.***

ATTENTION : ***RISQUE D'INCENDIE ET DE CHOC - Cet appareil posséde plusieurs points de connexion d'alimentation. Pour réduire le risque de choc électrique déconnecter les disjoncteurs de dérivation ou les fusibles et les alimentations de secours avantl'entretien.***

CAUTION: ***Service by qualified personnel only. De-energize before opening.***

ATTENTION : ***Service par du personnel qualifié uniquttes. Hors tension avant d'ouvrir.***

With the exception of power input terminations, Wall-Mount ArcLamp Emergency Driver installation requirements are the same as those of the standard Wall-Mount ArcLamp Driver. Complete the installation as follows, referencing these sections for installation details:

- Review *Prepare for Wall-Mount Installation on page 16*
- Review *Electrical and Wiring Specification on page 15*
- Complete *Wall-Mount the Driver on page 17*
- Complete *Terminate Normal Sense Input on the next page*
- Complete *Terminate Maintained (Emergency) Input on page 52*
- Complete *Power Input Wiring on page 19*
- Complete *DMX In and DMX Thru on page 22*

After completing ArcLamp Emergency Driver installation, see *Final Installation and Operation on page 30*.

Note: *Normal and emergency wiring cannot be contained in the same conduit according to NEC 700.10(B).*

Note: *Use suitable conduit where required by local or national code.*

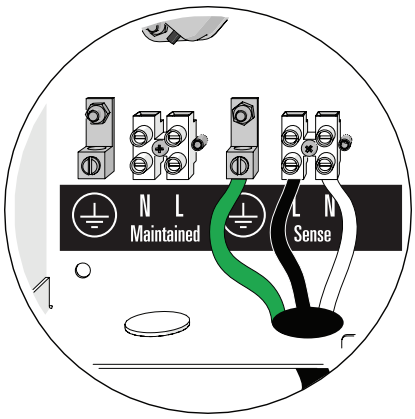
Terminate Normal Sense Input

WARNING: ***Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

Note: *Power wiring should only be installed and terminated by a qualified electrician and should follow standard wiring installation practices.*

ArcLamp Emergency Driver 150



ArcLamp Emergency Driver 150
Sense Input Detail

Factory Wire Colors

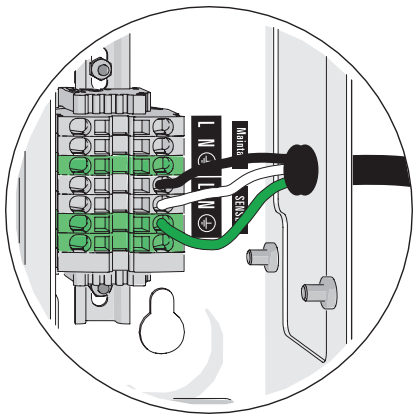
Model	Color	Type
North America and Europe	green/yellow	ground/earth
North America	black	line/hot
North America	white	neutral
Europe	brown	live
Europe	blue	neutral

1. See *Wire and Terminal Specifications on page 16* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
2. Run ground, neutral and line (hot) wires between the ArcLamp Emergency Driver Sense input terminals and a normal power branch circuit.
   a. Terminate the ground wire (typically green/yellow) to the ground screw provided. Insert the pre-stripped wire and tighten the screw to secure it in place.
   b. Terminate normal neutral and normal line (hot) wires to the Sense input terminals.
      - Insert the neutral wire (typically white) into the Sense N terminal and tighten the screw firmly to secure it in place.
      - Insert the line (hot) wire into the Sense L terminal and tighten the screw firmly to secure it in place.

Wall-Mount ArcLamp Emergency Driver 350 or 700

Wall-Mount ArcLamp Emergency Driver 350 and 700 have push-in terminal blocks on the "Sense" and "Maintain" inputs. No tools are required to insert wires into the terminal block. See *Push-In Terminal Blocks on page 20* for an illustration of the push-in terminal blocks.

- To install wire, insert the wire into the terminal.
- To remove wire, insert a 3.5 mm flatblade screwdriver into the tool slot next to the wire terminal to release the wire, then pull the wire out of the terminal.



Wall-Mount
ArcLamp Emergency Driver 350/700
Sense Input Detail

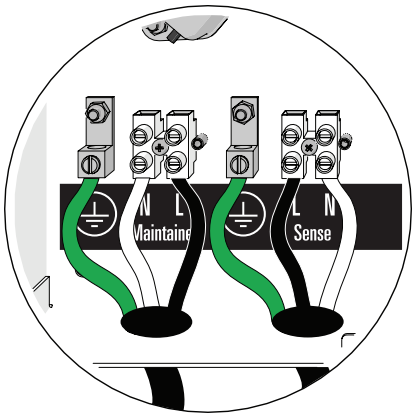
Factory Wire Colors

Model	Color	Type
North America and Europe	green/yellow	ground/earth
North America	black	line/hot
North America	white	neutral
Europe	brown	live
Europe	blue	neutral

1. Make sure power is off at the main circuit breaker.
2. See *Wire and Terminal Specifications on page 16* for specification of wire size and strip length. Prepare the wires accordingly.
3. See *Push-In Terminal Blocks on page 20* for general instructions on using the push-in terminal blocks.
4. Insert the ground wire (typically green) into the terminal marked "Sense ⏚."
5. Insert the neutral wire (typically white) into the terminal marked "Sense N."
6. Terminate the line (hot) wire (typically black) into theterminal marked "Sense L."
7. Tug gently on the wires to ensure they are secure.

Terminate Maintained (Emergency) Input

ArcLamp Emergency Driver 150



ArcLamp Emergency Driver 150
Sense and Maintained Input Detail

Factory Wire Colors

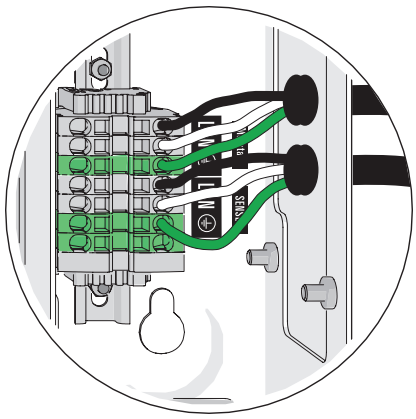
Model	Color	Type
North America and Europe	green/yellow	ground/earth
North America	black	line/hot
North America	white	neutral
Europe	brown	live
Europe	blue	neutral

1. See *Wire and Terminal Specifications on page 16* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
2. Run ground, neutral, and line (hot) wires between the ArcLamp Emergency Driver Maintained input terminals and an emergency branch circuit with an upstream UL1008 automatic transfer switch.
   a. Terminate the ground wire (typically green/yellow) to the ground screw provided.
      - Loosen the ground screw, insert the pre-stripped emergency ground wire, and tighten the screw firmly to secure both wires in place.
   b. Terminate emergency neutral and line (hot) wires to the Maintained input terminals.
      - Insert the neutral wire (typically white) into the Maintained N terminal and tighten the screw firmly to secure it in place.
      - Insert the line (hot) wire into the Maintained L terminal and tighten the screw firmly to secure it in place.

Wall-Mount ArcLamp Emergency Driver 350 and 700

Wall-Mount ArcLamp Emergency Driver 350 and 700 have push-in terminal blocks on the "Sense" and "Maintain" inputs. No tools are required to insert wires into the terminal block. See *Push-In Terminal Blocks on page 20* for an illustration of the push-in terminal blocks.

- To install wire, insert the wire into the terminal.
- To remove wire, insert a 3.5 mm flatblade screwdriver into the tool slot next to the wire terminal to release the wire, then pull the wire out of the terminal.



Wall-Mount
ArcLamp Emergency Driver 350/700
Sense and Maintained Input Detail

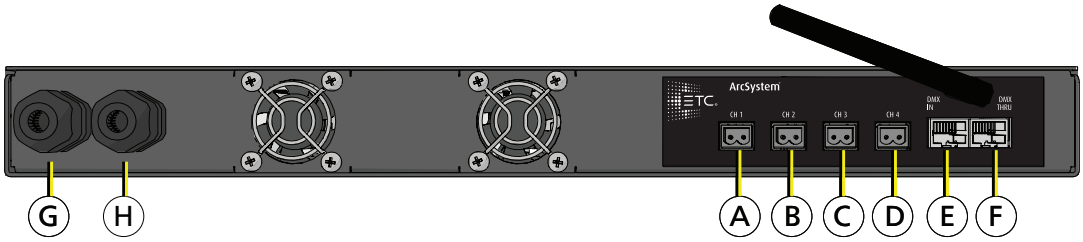
Factory Wire Colors

Model	Color	Type
North America and Europe	green/yellow	ground/earth
North America	black	line/hot
North America	white	neutral
Europe	brown	live
Europe	blue	neutral

1. Make sure power is off at the main circuit breaker.
2. See *Wire and Terminal Specifications on page 16* for specification of wire size and strip length. Prepare the wires accordingly.
3. See *Push-In Terminal Blocks on page 20* for general instructions on using the push-in terminal blocks.
4. Insert the ground wire (typically green) into the terminal marked "Maintain ⏚."
5. Insert the neutral wire (typically white) into the terminal marked "Maintain N."
6. Terminate the line (hot) wire (typically black) into theterminal marked "Maintain L."
7. Tug gently on the wires to ensure they are secure.

Rack-Mount Emergency Drivers

Rack-Mount ArcLamp Emergency Driver 350



Rack-Mount ArcLamp Emergency Driver 700

A	Output channel "CH 1"	E	"DMX In"
B	Output channel "CH 2"	F	"DMX Thru"
C	Output channel "CH 3"	G	Maintained power input cord (bare end)
D	Output channel "CH 4"	H	Normal/Sense power input cord (bare end)

Rack-Mount Emergency Driver Installation

WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcLamp driver enclosure or TX1 Transmitter, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Avant de passer le câblage et de le raccorder au boîtier du driver ArcLamp ou à l'émetteur TX1, s'assurer de la coupure électrique du disjoncteur principal ou d'une autre arrivée électrique pour l'alimentation normale (et l'alimentation de secours lorsqu'elle est utilisée); s'assurer aussi que le disjoncteur ou le dispositif de déconnexion est verrouillé et identifié.***

Rack-mount ArcLamp Emergency Drivers sold in North America have hard-wired power input cables with plugs. Rack-mount ArcLamp Emergency Drivers sold outside of North America have hard-wired power input cables with bare ends for direct connection to your maintained/emergency and normal sense power supplies. The cables are labeled near the strain reliefs for "Maintained Input" and "Sense Input".

With the exception of power input terminations, rack-mount ArcLamp Emergency Driver installation requirements are the same as those of the standard rack-mount ArcLamp Driver. Complete the installation as follows, referencing these sections for installation details:

- Review *Electrical and Wiring Specification on page 25*
- Review *Prepare for Rack-Mount Installation on page 26*
- Connect the Normal/Sense input to the normal sense AC power source using the provided power input cord.
- Connect the Maintained (Emergency) input to the maintained emergency AC power source using the provided power input cord.
- Complete *Output Wiring to Fixture on page 28*
- Complete *DMX In and DMX Thru on page 29*

After completing ArcLamp Emergency Driver installation, see *Final Installation and Operation on page 30*.

Appendix C

Emergency Operation and Test

It is important to test ArcSystem ArcLamp emergency systems regularly because they are life safety devices. NOT SELF-TESTING PER ANSI/NFPA 101 - This equipment is not self-testing in conformance with the Life Safety Code, ANSI/NFPA 101. ANSI/NFPA 101 Life Safety Code requires testing of life safety devices every 30 days.

To test the emergency functionality of this device, disconnect the sense circuit.

WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the system before installation, maintenance, cleaning, or any other system modification could result in serious injury or death.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Négliger de débrancher toutes les sources d'alimentation du système avant l'installation, l'entretien, le nettoyage ou toute autre modification du système peut causer des blessures graves ou la mort.***

De-energize main feed to ArcSystem ArcLamp and follow appropriate Lockout/Tagout procedures as mandated by NFPA 70E. It is important to note that electrical equipment such as breaker panels can present an arc flash hazard if improperly serviced. This is due to the high amounts of short-circuit current available on the electrical supply to this equipment. Any work must comply with OSHA Safe Working Practices.

CAUTION: ***This equipment is provided with more than one supply source. To reduce the risk of electric shock, disconnect both normal and emergency sources within this unit before servicing any equipment connected to this unit.***

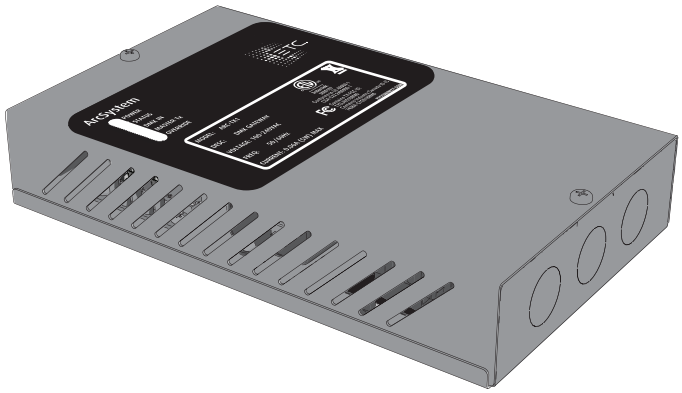
Cet équipement possède plus d'une source d'alimentation. Pour réduire les risques de décharge électrique, débrancher les sources d'alimentation normale et de secours dans l'unité avant de faire l'entretien d'un équipement branché à cette unité.

Test the ArcSystem ArcLamp emergency system as described:

1. Turn off power at the normal circuit breaker
2. Test the system per ANSI/NFPA 101 Life Safety Code.

Appendix D

TX1 Installation



WARNING: ***RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the TX1 Transmitter, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for the normal power input (and emergency power input when used) is locked out and tagged out.***

AVERTISSEMENT : ***RISQUE DE MORT PAR DÉCHARGE ÉLECTRIQUE! Avant de passer le câblage et de le raccorder à l'émetteur TX1, s'assurer de la coupure électrique du disjoncteur principal ou d'une autre arrivée électrique pour l'alimentation normale (et l'alimentation de secours lorsqu'elle est utilisée); s'assurer aussi que le disjoncteur ou le dispositif de déconnexion est verrouillé et identifié.***

WARNING: ***RISK OF ELECTRIC SHOCK! Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***RISQUE DE DÉCHARGE ÉLECTRIQUE! Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

Note: *Read this section completely before beginning your system installation.*

Note: *Mounting hardware and installation location must support the TX1 Transmitter, conduit hardware, and all cable required for installation.*

Supplies

The TX1 Transmitter includes four #10 mounting screws.

The following supplies are required, but not provided, for TX1 Transmitter installation:

- conduit and conduit fittings
- Phillips screwdriver
- Four each wall anchors, as needed

Electrical and Wiring Specifications

The TX1 Transmitter accepts 100–240 VAC, 50/60 Hz power input. ETC recommends installing all wiring in grounded metal conduit.

Wire and Terminal Specifications

Terminal / Connector	Conduit Entry	Wire Range / Specification	Strip Length	Torque
power input (hot/neutral/ground)	½ in conduit	up to 10 AWG (solid or stranded) (up to 6 mm^2)	7 mm (1/4 in)	0.5 Nm (4 in-lb)
AUX contact inputs (input 1/input 2/ground)	½ in conduit	22–14 AWG (solid or stranded) (0.6–1.6 mm^2)	5 mm (3/16 in)	0.5 Nm (4 in-lb)
DMX in/out terminals	½ in conduit	Belden 9729 (or equivalent)	See *Terminate Wiring on the facing page*.	

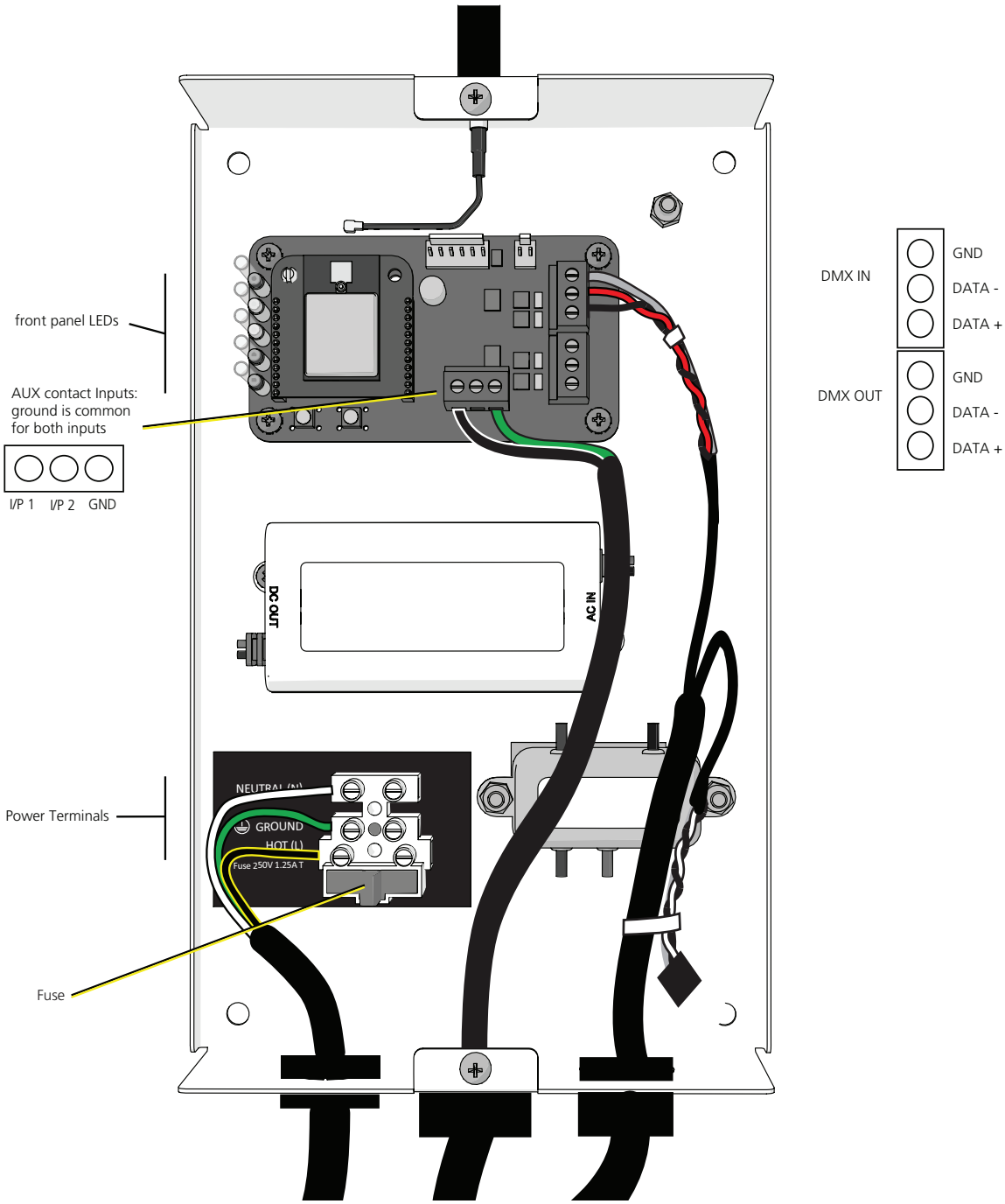
Mounting

The TX1 Transmitter can be set on a flat horizontal surface, such as a table top, or surface-mounted using the four holes located on the back side of the enclosure.

1. Remove the two screws securing the front of the TX1 to the enclosure.
   - Save these screws for reinstallation later.
   - The cover is tethered to the enclosure. Be careful when handling.
2. Align the TX1 to the installation location and secure it in place using the four #10 screws provided.
3. The TX1 enclosure has three conduit knockouts. As required by local code, remove the knockouts and attach conduit.

Note: *Use suitable conduit where required by local or national code.*

Terminate Wiring

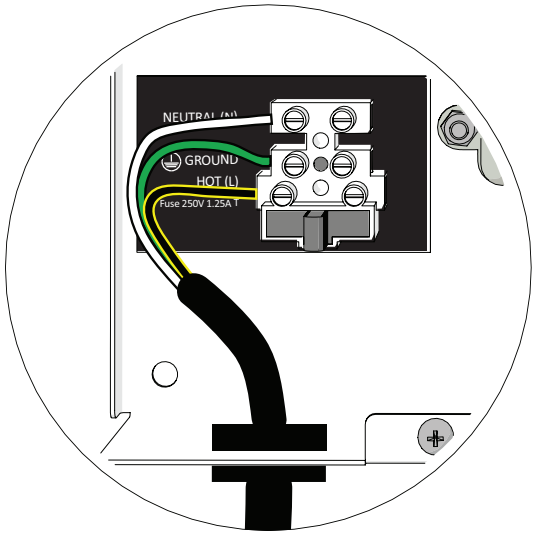


WARNING: ***RISK OF ELECTRIC SHOCK! Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***RISQUE DE DÉCHARGE ÉLECTRIQUE! Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

Note: *ETC recommends powering multiple TX1 transmitters from separate branch circuits.*

1. Make sure all power is off at the main circuit breaker. ETC recommends powering multiple TX1 transmitters from separate branch circuits.
2. See *Wire and Terminal Specifications on page 58* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
3. Loosen the three screw terminals for NEUTRAL (N), GROUND (⏚), and LINE (L) connections.
4. Insert the ground wire (typically green) into the GROUND (⏚) terminal and tighten the screw.
5. Insert the neutral wire (typically white) into the NEUTRAL (N) terminal and tighten the screw.
6. Connect the hot wire (typically black) into the HOT (L) terminal and tighten the screw.
7. Tug gently on the wires to ensure they are secure.



Detail of TX1 Transmitter power input

DMX In and DMX Out

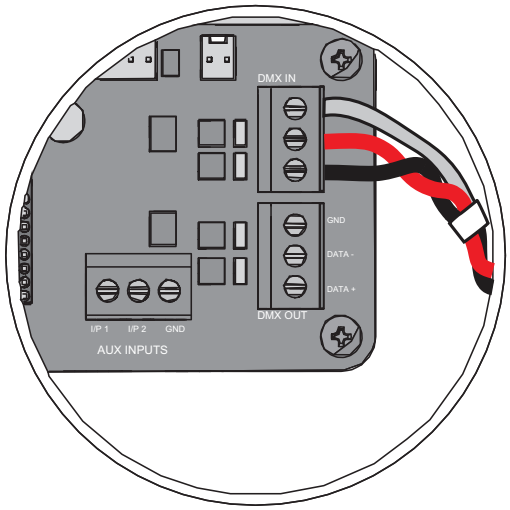
DMX In and DMX Out cables terminate to terminal connections on the TX1 Transmitter board. Wire preparation and installation is the same for both In and Out.

DMX is installed in a daisy-chain topology and includes one pair of wires (data +, data -) plus an ISO ground (common). ETC recommends the use of Belden 9729 (or approved equal) wire. For best DMX performance, twist the wires together as close to the terminals as possible.

Note: *Total length of Belden 9729 should not exceed 500 m (1640 ft) between the control source and the TX1 Transmitter.*

On board DMX In and Out terminal connections

Pin	Description
1	common/ground (GND)
2	Data -
3	Data +



Detail of TX1 Transmitter with DMX IN connected

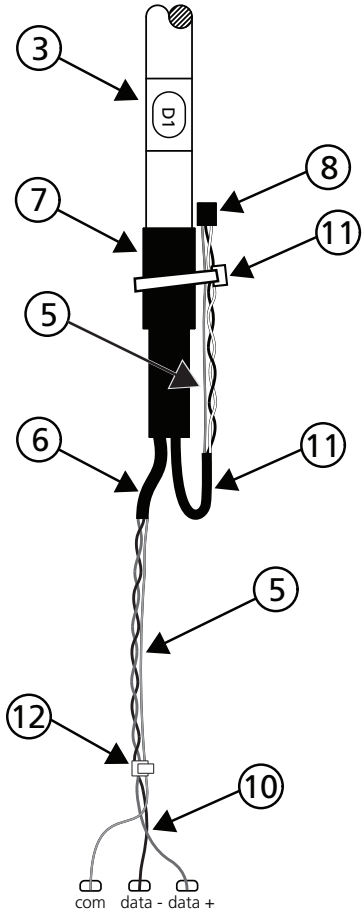
See *DMX Cable Preparation and Termination on page 23*.

DMX Cable Preparation and Termination

This instruction assumes preparation of Belden 9729 (or equivalent) cable for termination to the three-position screw terminal connector provided.

Note: *Not for use with Cat5, Cat5e, or Cat6 cable. When running DMX with these cable types, use the 3-position IDC connector.*

1. Leave approximately 20 cm (8 in) of wiring to allow slack for future service needs.
2. Strip 18 cm (7 in) off the outer jacket.
3. Label the cable with the data type and run designation. (DMX1, DMX2, etc.)
4. Strip the foil shielding from each wire set to within 6 mm (1/4 in) of the outer jacket.
5. Untwist the shield wire from each pair and apply a piece of 1.6 mm (1/16 in) clear heat shrink to each shield wire.
6. Twist each shield wire back onto its data pair, and then apply a 4 cm (1.5 in) piece of 0.5 cm (3/16 in) heat shrink all the way down each 3-wire set. Make sure to capture the foil shielding at the base.
7. Apply the 5 cm (2 in) piece of the 1 cm (3/8 in) heat shrink, centered on the end of the cable jacket and the bases of all the wires in the cable.
8. Cap the ends of the unused pair of wires with a 2.5 cm (1 in) piece of 0.5 cm (3/16 in) heat shrink centered over the end of the wires.
9. Strip 6 mm (1/4 in) of insulation from all of the wires to be used.
10. Maintain the wire pair twist as close to the screw terminal connector as possible and terminate the wires.
    - Insert the data - wire (typically black) into the terminal labeled “DMX -” and secure.
    - Insert the data + wire (typically red or white) into the terminal labeled “DMX +” and secure.
    - Insert the common (shield) wire into the terminal labeled “DMX " and secure.
11. Bend back the unused set of wires and secure them to the cable with a wire tie.
12. Secure the terminated wire sets together with a wire tie 5 cm (2 in) from the connector.



Note: *Specific wire colors will vary based on the DMX cable used.*

Note: *ArcLamp drivers are not self-terminating. You must terminate the last driver in line with a 120 Ω resistor (not provided) installed between terminals/pins 2 & 3 of the Thru output.*

DMX Wire Termination

DMX In and DMX Out termination is the same.

1. Loosen all three screw terminals for "GND", "Data +", and "Data -" on the DMX header.
2. Insert the common wire into the "GND" terminal and tighten the screw, securing the wire in place.
3. Insert the Data + wire into the "Data +" terminal and tighten the screw.
4. Insert the Data - wire into the "Data -" terminal and tighten the screw.
5. Tug gently on the wires to ensure they are secure.

Note: *Specific wire colors will vary based on the DMX cable used.*

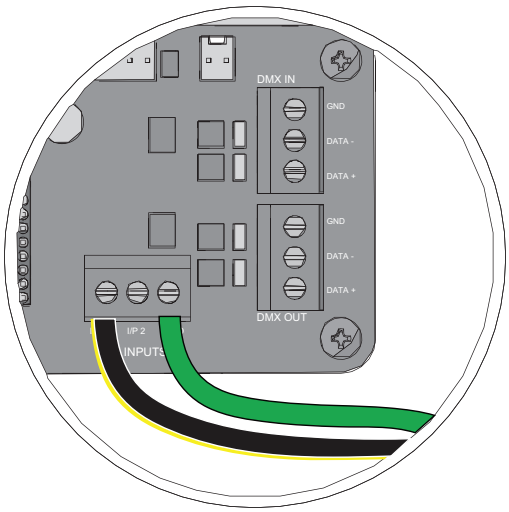
Auxiliary Input

The AUX closed contact input allows the recall of two additional scenes within the TX1. An installation may utilize the two contact inputs to recall two additional scenes within the TX1 Transmitter when not connected to an external control system, such as a DMX control source. These can be used in conjunction with a fire alarm system or momentary remote push buttons.

CAUTION: ***Do not connect line voltage to the AUX closed contact input terminals.***

If applicable to your installation:

1. Make sure all power is off at the remote contact accessory.
2. See *Wire and Terminal Specifications on page 58* for specification of wire, strip length, and terminal torque ratings. Prepare the wires accordingly.
3. Terminate ground and auxiliary contact wires to the auxiliary input terminals.
   a. Install the ground (common) wire (typically green/yellow) to the "GND" terminal and secure the screw onto the wire. If your system requires two auxiliary contact inputs, the ground terminal will accept both wires.
   b. Install the auxiliary input wire to the "I/P 1" terminal and secure the screw onto the wire.
   c. As needed, for systems requiring an additional auxiliary contact input, install the auxiliary input wire to the "I/P 2" terminal and secure the screw onto the wire.



Detail of TX1 Transmitter AUX input with input 1 ("I/P 1") and ground ("GND") connected

Final Installation and Power Up

1. Check that all wires are terminated properly and secure in their terminals.
2. Reinstall the cover using the two screws previously removed.
3. Check the front panel LEDs for status indication.

Front Panel LEDs

LED Indicator	Description
POWER	Solid red indicates the unit is powered
STATUS	Pulsing indicates normal operation
DMX IN	Solid when valid DMX is present
MASTER Tx	Solid when the TX1 is the master
OVERRIDE	Solid when Aux is active

Attach Antenna

The TX1 is supplied with a 2 dBi antenna providing 90 degree omni-directional coverage. Install this antenna to the TX1 antenna receptacle.

Luminaires outside the coverage area will be unable to communicate effectively. Due to the nature of the ArcMesh protocol, networked luminaires outside of the transmission range may be able to connect through another in-range luminaire. However, keeping as many luminaires as possible within range of the TX1 broadcast will strengthen system reliability. When possible, it is best to keep the transmitter within the same plane as the luminaires.

Dual Redundancy Operation

TX1 transmitters can be set up with dual redundancy, allowing a backup transmitter to take control if the master transmitter fails.

Note: *Transmitter switch-over may take up to 1 minute to complete depending on the size of the network.*

Dual redundancy requires the use of two TX1 transmitters and two separate and dedicated DMX inputs split using a third-party splitter. It is not possible to daisy-chain DMX through the TX1 transmitters because they have active outputs.

Note: *DMX Out is a regenerated data output signal, and not a passive through. Only the DMX channels that are patched to the 64 ArcSystem channels are available on the DMX Out port.*

When two transmitters are used on the same wireless network ID/radio channel, the system will determine a master transmitter and a backup transmitter. The TX1 with the highest MAC address will become the master. All system preset and configuration data is stored on both transmitters. The master transmitter is indicated by solid red on the LED on the front panel labeled "MASTER Tx". See *Front Panel LEDs on the previous page*.

Setup of dual redundancy is done at the time of system commissioning by an ETC certified technician. For more information on this process, contact ETC Technical Services.

Maintenance

WARNING: ***RISK OF ELECTRIC SHOCK! Circuits that are installed without an accessible power disconnect device cannot be serviced or operated safely.***

AVERTISSEMENT : ***RISQUE DE DÉCHARGE ÉLECTRIQUE! Il est imprudent d'utiliser ou de réparer les circuits installés sans qu'un dispositif de déconnexion de l'alimentation ne soit accessible.***

Fuses

The TX1 Transmitter has one 3.150 A, 250 V, 5x20 mm fuse located on the power input terminal block.

Appendix E

Compliance

For current and complete compliance information, view the product datasheets at etcconnect.com/Products/Lighting-Fixtures/ArcLamp/Documentation.aspx.

FCC Compliance

ArcLamp Series Drivers and ArcSystem Pro TX1 Transmitter

(For any FCC matters):
Electronic Theatre Controls, Inc.
3031 Pleasant View Road
Middleton, WI 53562
+1 (608) 831-4116
etcconnect.com

FCC Compliance Statement:

ArcLamp products comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: *This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Any modifications or changes to this product not expressly approved by Electronic Theatre Controls, Inc. could void the user's authority to operate the product. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

ArcLamp wireless ArcMesh drivers contain a wireless module with the following identification numbers:

FCC ID: TYOJN5168M5

ISED Compliance

This device contains a license-exempt transmitter/receiver that complies with Innovation, Science, and Economic Development Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Contains IC ID: 7438A CYO5168M5

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