ArcSystem

Installation Manual

Part Number: 7490M2100 Rev: G

Released: 2019-11

Table of Contents

Introduction

Congratulations on your purchase of ArcSystem products. ArcSystem is a family of overhead LED products designed for installations where dimming, light quality, and ease of installation are absolutely essential. With ArcSystem, you will experience perfectly smooth dimming from 100% down to absolute zero. ArcSystem luminaires come in a variety of form factors, beam angles, and color-temperature options, all with high-efficiency optics and an outstanding quality of light ideal for any application.

ArcSystem products with ArcMesh can be controlled using wired DMX or the wireless ArcMesh protocol. This manual provides step by step instruction on the installation of ArcSystem products as well as full system integration.

For information on ArcSystem products with RDM control, see etcconnect.com/ArcSystem and the *ArcSystem Pro One-Cell RDM Installation Guide* and *ArcSystem Pro Multi-Cell RDM Installation Guide*.

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 are having difficulties and your problem is not addressed 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

Americas

ETC, Inc.
Technical Services Department
3031 Pleasant View Road
Middleton, WI 53562
800-775-4382 (USA, toll-free)
+1-608 831-4116
service@etcconnect.com

Asia

ETC Asia
Technical Services Department
Room 1801, 18/F
Tower 1, Phase 1 Enterprise Square
9 Sheung Yuet Road
Kowloon Bay, Kowloon, Hong Kong
+852 2799 1220
techservasia@etcasia.com

France

ETC France
62-64 rue Danielle
Casanova
Saint-Denis Cedex,
F93200
+33 1 4243 3535
techservltd@etcconnect.com

United Kingdom

ETC Ltd
Technical Services Department
26-28 Victoria Industrial Estate
Victoria Road,
London W3 6UU England
+44 (0)20 8896 1000
techservltd@etcconnect.com

Germany

ETC GmbH
Technical Services Department
Ohmstrasse 3
83607 Holzkirchen, Germany
+49 (80 24) 47 00-0
techserv-hoki@etcconnect.com

Safety

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

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

Compliance

ArcSystem One-Cell Luminaires		
Model	**Description**	**Compliance**
ARCP1	ArcSystem Pro One-Cell	**cULus** • Conforms to UL 2108 • Conforms to UL 924 • Conforms to UL 2043 plenum rating (ARCP1, ARCP1S, and ARCP1H, recessed variants only) • Certified to CSA C22.2 No. 250.0 • Certified to CSA C22.2 No. 141 **EU** CE certified **FCC compliant**
ARCP1S	ArcSystem Pro One-Cell Small	
ARCP1H	ArcSystem Pro One-Cell High Output	
ARCP1M	ArcSystem Pro One-Cell Micro	

ArcSystem D1 Series, D2 Series, and D4 Series Standard Drivers		
Model	**Description**	**Compliance**
ARCPD1DM*	ArcSystem D1 Driver	**cULus** • Conforms to UL 8750 • Certified to CSA C22.2 No. 250.13 **EU** CE Certified **FCC compliant**
ARCPD1DRDMM	ArcSystem D1 RDM Driver	
ARCPD1HDM*	ArcSystem D1 High Output Driver	
ARCPD1HDRDMM	ArcSystem D1 High Output RDM Driver	
ARCPD2DM*	ArcSystem D2 Driver	
ARCPD2DRDMM	ArcSystem D2 RDM Driver	
ARCPD4DCCMM*	ArcSystem D4 Constant Current Driver with Molex Connectors	
ARCPD4DCCMRDMM	ArcSystem D4 Constant Current RDM Driver with Molex Connectors	
ARCPD4DCCTMM*	ArcSystem D4 Constant Current Driver with Two-Pin Terminals	
ARCPD4DCCTRDMM	ArcSystem D4 Constant Current RDM Driver with Two-Pin Terminals	
ARCPD4DCVTM*	ArcSystem D4 Constant Voltage Driver with Two-Pin Terminals	
ARCPD4DCVTRDMM	ArcSystem D4 Constant Voltage RDM Driver with Two-Pin Terminals	

*wireless-capable

ArcSystem D1, D1HO, D2, and D4 Emergency Drivers		
Model	**Description**	**Compliance**
ARCPED1DM*	ArcSystem D1 Emergency Driver	**cULus** • Conforms to UL 8750 • Conforms to UL 924 • Certified to CSA C22.2 No. 250.13 • Certified to CSA C22.2 No. 141 **EU** CE certified **FCC compliant**
ARCPED1DRDMM	ArcSystem D1 RDM Emergency Driver	
ARCPED1HDM*	ArcSystem D1 High Output Emergency Driver	
ARCPED1HDRDMM	ArcSystem D1 High Output RDM Emergency Driver	
ARCPED2DM*	ArcSystem D2 Emergency Driver	
ARCPED2DRDMM	ArcSystem D2 RDM Emergency Driver	
ARCPED4DCCMM*	ArcSystem D4 Constant Current Emergency Driver with Molex Connectors	
ARCPED4DCCMRDMM	ArcSystem D4 Constant Current RDM Emergency Driver with Molex Connectors	
ARCPED4DCCTM*	ArcSystem D4 Constant Current Emergency Driver with Two-Pin Terminals	
ARCPED4DCCTRDMM	ArcSystem D4 Constant Current RDM Emergency Driver with Two-Pin Terminals	
ARCPED4DCVTM*	ArcSystem D4 Constant Voltage Emergency Driver with Two-Pin Terminals	
ARCPED4DCVTRDMM	ArcSystem D4 Constant Voltage Emergency Driver with Two-Pin Terminals	

ArcSystem Multi-Cell Standard Luminaires with Integral Drivers		
Model	**Description**	**Compliance**
ARCP2*	100–240 V or 100–277 V Pro Two-Cell	**cULus** • Conforms to UL 1598 • Certified to CSA 22.2 No. 250.0 **EU** CE certified **FCC compliant**
ARCP2RDM	100–240 V or 100–277 V Pro Two-Cell RDM	
ARCP4L*	100–240 V or 100–277 V Pro Four-Cell Linear	
ARCP4LRDM	100–240 V or 100–277 V Pro Four-Cell Linear RDM	
ARCP4S*	100–240 V or 100–277 V Pro Four-Cell Square	
ARCP4SRDM	100–240 V or 100–277 V Pro Four-Cell Square RDM	
ARCP4R*	100–125 V or 100–240 V Pro Four-Cell Round	
ARCP4RRDM	100–125 V or 100–240 V Pro Four-Cell Round RDM	
ARCP8*	100–240 V or 100–277 V Pro Eight-Cell	
ARCP8RDM	100–240 V or 100–277 V Pro Eight-Cell RDM	

*wireless-capable

ArcSystem Multi-Cell Emergency Luminaires with Integral Drivers		
Model	**Description**	
ARCPE2*	100–277 V Pro Two-Cell Emergency	**cULus** • Conforms to UL 924 • Certified to CSA C22.2 No. 141 **EU** CE certified **FCC compliant**
ARCPE2RDM	100–277 V Pro Two-Cell RDM Emergency	
ARCPE4L*	100–277 V Pro Four-Cell Linear Emergency	
ARCPE4LRDM	100–277 V Pro Four-Cell Linear RDM Emergency	
ARCPE4S*	100–277 V Pro Four-Cell Square Emergency	
ARCPE4SRDM	100–277 V Pro Four-Cell Square RDM Emergency	
ARCPE4R*	100–125 V or 100–240 V Pro Four-Cell Round Emergency	
ARCPE4RRDM	100–125 V or 100–240 V Pro Four-Cell Round RDM Emergency	
ARCPE8*	100–277 V Pro Eight-Cell Emergency	
ARCPE8RDM	100–277 V Pro Eight-Cell RDM Emergency	

*wireless-capable

FCC Compliance

Wireless-capable ArcSystem 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.

ArcSystem wireless products contain FCC ID for US: TYOJN5168M5 and Industry Canada (IC) ID: IC 7438A CYO5168M5.

Note: *Wireless-capable ArcSystem products have 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 instructions, may cause harmful interference to radio communications. 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.*

EU Declaration of Conformity

Wireless-capable ArcSystem products comply with the essential requirements of the RED Directive of the European Union (2014/53/UE).

Wireless-capable ArcSystem products also comply with the following standards:

ETSI EN 301 489-17 V2.1.1 (2009), ETSI EN 301 489-1 V2.2.0 (2011), Draft ETSI EN 301 489-17 V3.2.0 (2017), Draft EN 301 489-1 V3.2.0 (2017), ETSI EN 300 328 V1.8.1 (2012), ETSI EN 300 328 V1.9.1 (2015), ETSI EN 300 328 V2.1.1 (2016)

Chapter 1

System Overview

ArcSystem luminaires are available in 100–240 V standard models with IEC connectors, 100–125 V emergency models with NEMA 5-15 connectors, or 100–277 V hard-wired standard or emergency models. ArcSystem Pro One-Cell luminaires require an external driver.

ArcSystem Pro One-Cell

- external 100–277 V D1 Series or D4 Series driver required
- ideal for short/medium throw
- 25 W full load power consumption
- fixed version recessed/flush mount only
- adjustable version recessed/flush mount with two-axis tip and tilt
- yoke mount version with two-axis tip and tilt
- beam angle options: 18°, 30°, 50°

ArcSystem Pro One-Cell High Output

- external 100–277 V D1 HO driver required
- ideal for long throw
- 100 W full load power consumption
- fixed version recessed/flush mount only
- adjustable version recessed/flush mount with two-axis tip and tilt
- beam angle options: 18°, 30°, 50°

ArcSystem Pro Two-Cell

- integral driver
- ideal for medium throw
- 55 W full load power consumption
- Standard: 100–240 V with IEC connector or 100–277 V hard-wired input options
- Emergency: 100–277 V hard-wired input options
- yoke-mount only
- beam angle options: 19°, 24°, 37°, 60°

ArcSystem Pro Eight-Cell

- integral driver
- ideal for long throw
- 200 W full load power consumption
- Standard: 100–277 V hard-wired input options
- Emergency: 100–125 V with NEMA 5-15 connectors or 100–277 V hard-wired input options
- yoke-mount only
- beam angle options: 19°, 24°, 37°, 60°

ArcSystem Pro One-Cell Small

- external 100–277 V D1 Series or D4 Series driver required
- ideal for short/medium throw
- 25 W full load power consumption
- adjustable version recessed/flush mount with single-axis tilt
- yoke mount version with single-axis tilt
- beam angle options: 19°, 24°, 37°, 60°

ArcSystem Pro One-Cell Micro

- external 100–277 V D2 driver required
- ideal for short/medium throw
- 20 W full load power consumption
- adjustable version recessed/flush mount with two-axis tip and tilt
- yoke mount version with two-axis tip and tilt
- beam angle options: 19°, 24°, 37°, 60°

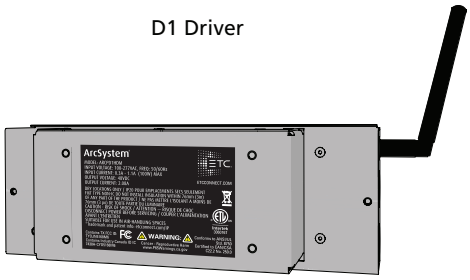
ArcSystem Pro Four-Cell

- integral driver
- ideal for medium/long throw
- 100 W full load power consumption
- Standard: 100–240 V with IEC connector or 100–277 V hard-wired input options
- Emergency: 100–277 V hard-wired input options (linear and square); 100–125 V hard-wired cables with NEMA 5-15 connectors (four-cell round, North America only); 100–240 V hard-wired cables with bare ends (four-cell round, Europe)
- linear and square yoke-mount and round options
- beam angle options: 19°, 24°, 37°, 60°

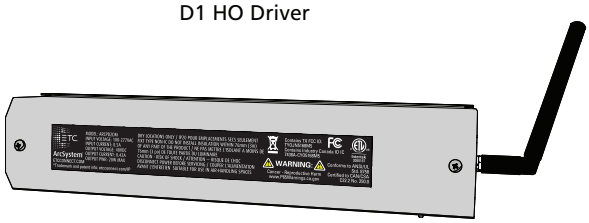
Note: *The ArcSystem Pro One-Cell Micro is not available in 5000 K or Fade to Warm variants. The ArcSystem Pro One-Cell High Output is not available in 3500 K, 4000 K, 5000 K, or Fade to Warm variants.*

D1 Series, D2 Series, and D4 Series Drivers

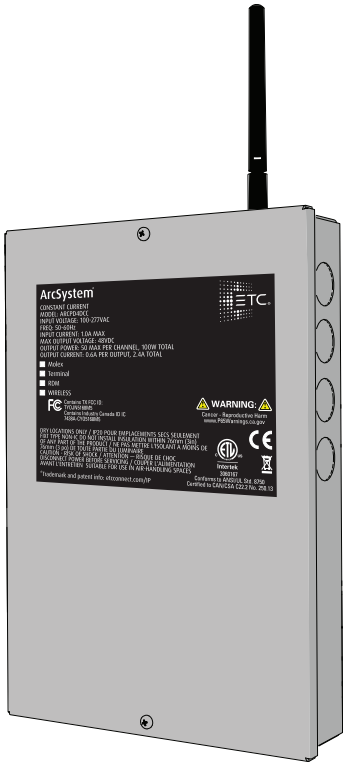
D1 Driver



D1 HO Driver



D2 Driver



D4 Driver

ArcSystem Pro One-Cell luminaires require an external driver. ArcSystem D1, D2, and D4 Series drivers use standard RJ45 connectors for DMX control.

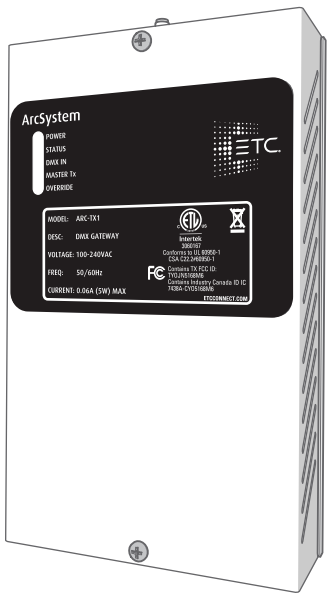
- The D1 Driver provides up to 25 W to a single One-Cell or One-Cell Small luminaire.
- The D1 HO Driver provides up to 100 W to a single One-Cell High Output luminaire.
- The D2 Driver supports one or two One-Cell Micro luminaires and provides up to 10 W per output.
- The D4 Constant Current Driver with Molex connectors supports four One-Cell or One-Cell Small luminaires.
- The D4 Constant Current Driver with terminals provides 48 VDC and 400 mA or 600 mA per output channel, with a maximum total output of 2.4 A or 100 W.
- The D4 Constant Voltage Driver with terminals provides 24 VDC and up to 50 W per output channel, with a maximum total output of 2 A or 150 W.

For more information on installation of standard or emergency system drivers, see *Standard System One-Cell Installation on page 14* or *Emergency System One-Cell Installation on page 26*.

Note: *ArcSystem Pro One-Cell Micro and ArcSystem Pro One-Cell standard luminaires are not interchangeable. One-Cell Micro luminaires require a D2 driver to function; One-Cell and One-Cell Small luminaires require a D1 driver or D4 driver to function.*

Note: *All ArcSystem wireless luminaires require a TX1 Transmitter and commissioning tool to set DMX addresses for both wired DMX and wireless installations. Contact your ETC Service Technician for more information.*

TX1 Transmitter



The TX1 Transmitter is the DMX wireless gateway for the ArcMesh protocol.

One transmitter:

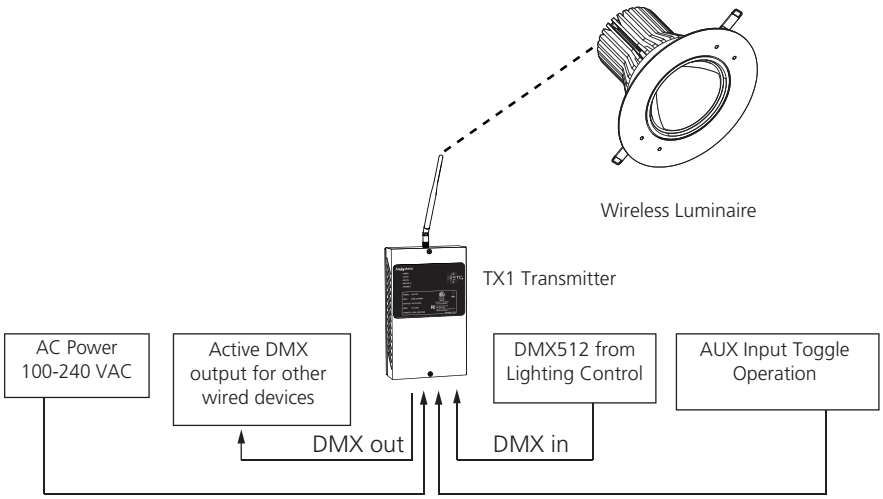
- Controls up to 100 devices across 64 DMX addresses.
- Has a 24 preset scene memory.
- Has DMX wired output for control of third party equipment within scene store.
- Has two auxiliary inputs for closed contact connection to trigger a stored scene.

Each transmitter can be set to one of 16 available network IDs allowing multiple transmitters to be used concurrently without "cross-talk." When two or more transmitters are set to the same network ID and radio channel, the transmitter with the highest MAC address acts as a master with the others assuming the role of backup.
For information on system installation, see *TX1 Installation on page 47*.

ArcMesh

ArcSystem products can be controlled using wired DMX through RJ45 connections, or the wireless ArcMesh protocol. A wireless installation is an ideal solution for retrofit situations where installing additional cable is not practical.

The following diagram illustrates a basic hybrid ArcSystem installation with a wireless luminaire, TX1 Transmitter, and a wired DMX console for the main control source.



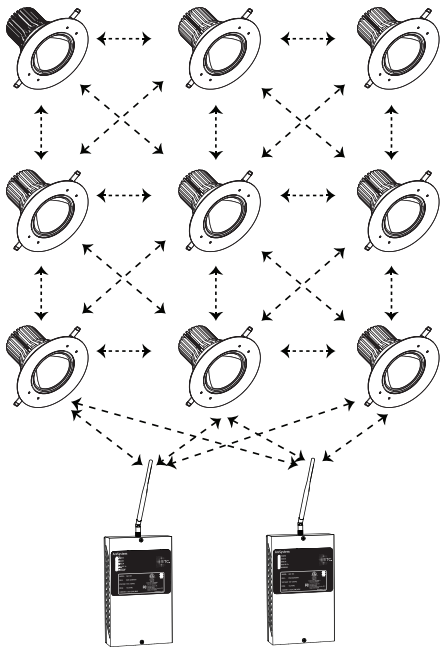
Each system requires a minimum of one TX1 Transmitter. The TX1 is used as a transmitter of wireless data to luminaires or other devices within a system.

Note: *By default the TX1 DMX output is disabled. If you require DMX output from the TX1, you must use the ArcSystem comissioning tool software to add DMX fixtures.*

ArcMesh Specifications

- Use up to 100 devices per TX1 transmitter.
- Patch up to 64 ArcMesh channels to 512 DMX channels.
- Use up to 16 TX1 transmitters per system.

There are no system range limitations for transmitting data between luminaires because each luminaire has the ability to act as a repeater (see Re-Broadcast Mode below). ArcSystem is self-regulating and continues to reconfigure the communication "mesh" to establish the most successful path of communication transmission.



Re-Broadcast Mode

By default all ArcSystem luminaires are shipped with Re-broadcast Mode turned off to reduce the amount of wireless activity. In areas of poor wireless reception, re-broadcast mode may be enabled on a luminaire-by-luminaire basis to improve the overall signal level of the system.

CAUTION: *If re-broadcast mode is required, use this feature in as few luminaires as possible to avoid unnecessary traffic on the network and possible system performance issues.*

Emergency System Overview

ArcSystem drivers and luminaires can be purchased in UL924 listed variants. Each of the luminaires can be configured to be UL924 listed when wired into an existing emergency response system.

- See *Emergency System One-Cell Installation on page 26*.
- See *Emergency System Multi-Cell Installation on page 37*.

Install the ArcSystem D1, D2, or D4 Series driver or multi-cell luminaire in a location that is accessible by qualified personnel for testing of the emergency operation.

Install the ArcSystem multi-cell luminaire in a location that is accessible by qualified personnel for testing of the emergency operation.

Note: *Luminaires must be hard-wired to emergency certified drivers to be considered for UL924 certification.*

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. Installation scenarios should be evaluated by the AHJ to confirm illuminance and performance requirements of ANSI/NFPA 101 and the IBC.*

Note: *ArcSystem Pro One-Cell Micro luminaires in emergency installations must be installed with a maximum mounting height of 23.2 ft (7.07 m).*

Note: *Installation must follow all national and local codes for electrical equipment.*

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

Emergency drivers and luminaires require two branch circuit connections. These inputs have the following functions:

1. Normal branch circuit to sense failure of the normal supply. Connect to Sense Input connector.
2. Normal/Emergency branch circuit providing power to the luminaire in both conditions. Connect to Maintained Input connector.

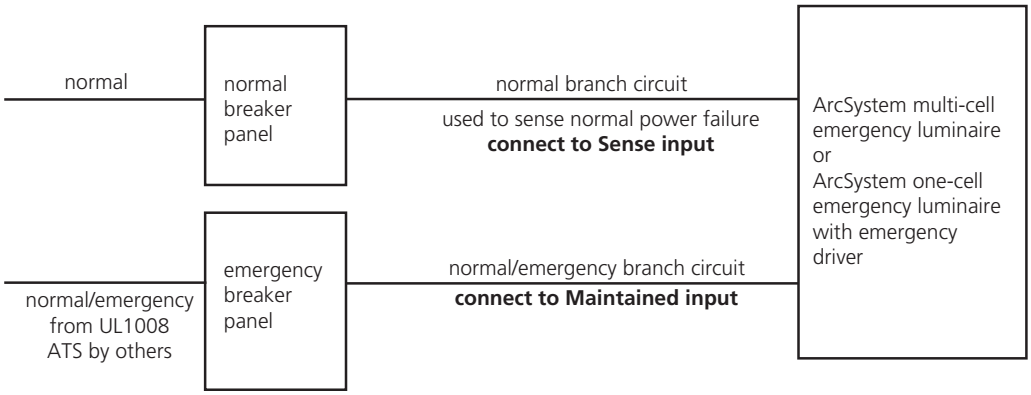
Sense detects when power is lost and forces the luminaire to a full-on state, powered by the emergency supply through the Constant Power input. Control of the luminaire will not be available until the sense input has been restored.

WARNING: Do not mix 120 V and 277 V between the sense and emergency feeds.

AVERTISSEMENT : Ne pas inverser les alimentations à 120 V et 277 V entre les alimentations de détection et de secours.

WARNING: Sense (normal) and Maintained (normal/emergency) feeds must have the same phase. The diagram below shows the recommended installation.

AVERTISSEMENT : Les alimentations de détection (normale) et d'entretien (normal/secours) doivent être sur la même phase. Le schéma ci-dessous présente l'installation recommandée.



Before You Begin Installation

Review the following sections before beginning your ArcSystem installation. ArcSystem products should only be installed by a qualified installer or electrician.

Power Disconnect Device

Before installation, make sure you have a readily accessible input power disconnect device installed ahead of your ArcSystem products.

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 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.

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.

Site Survey for Wireless Installations

ArcSystem transmitters and luminaires operate in the unlicensed 2.4 GHz band using the IEEE 802.15.4 standard. This band is shared with other technologies such as Wi-Fi, Bluetooth, low power sensor networks, wireless AV transmitters and some radio microphones.

Before commissioning a system, a wireless site survey is essential.

Gathering information on how your wireless lighting system will overlap with all other Wi-Fi traffic in the area will help determine setup of transmitters and which luminaires should be re-broadcasting, not just receiving wireless data.

Installation Requirements

- Indoor installation only: 0–40°C (32–104°F), 5–95% non-condensing humidity.
- Dry locations only.
- Installation location must support the weight of the luminaire, driver, and applicable mounting hardware.

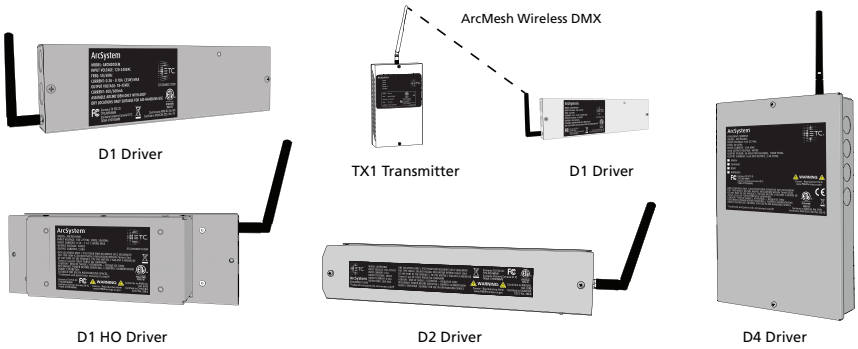
CAUTION: *ArcSystem luminaires and drivers are not suitable for use in spaces with restricted air flow. Enclosing the luminaires or drivers temporarily or permanently may cause damage to the luminaires or drivers.*

Chapter 2

Standard System One-Cell Installation

This chapter provides information on how to install One-Cell drivers and luminaires in a standard ArcSystem installation.

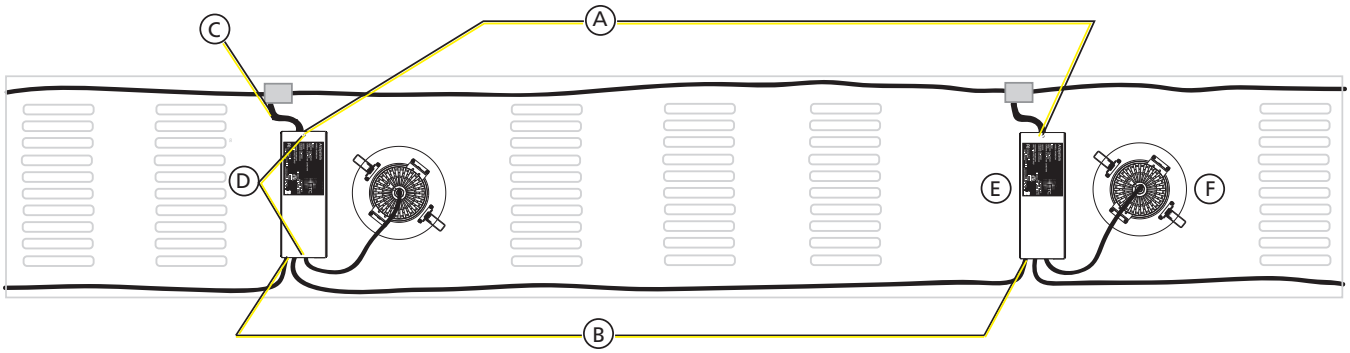
Preparing to Install the Driver



The D1, D2, and D4 Series drivers are compact, convection cooled LED drivers with RJ45 connections for local DMX and wireless capability for the ArcMesh protocol. Each driver has an IN and THRU option, using two separate connectors. The D1 and D1 HO drivers can control a single luminaire each. The D2 driver can control two ArcSystem Pro One-Cell Micro luminaires. The D4 driver can control up to four ArcSystem Pro One-Cell or Pro One-Cell Small luminaires. Up to 32 drivers can be installed on one hard-wired line of DMX.

The following illustration shows an example of a linear ceiling installation with one luminaire for each D1 Series driver. The cable between an ArcSystem Pro One-Cell Series luminaire and its driver is approximately 1 m (40 in) long.

Note: *If you want to daisy chain power wiring, it must be connected through a junction box as shown below. Follow all applicable local and national electrical codes.*



A	Power connections	D	Screw mounting locations
B	DMX In and Thru connections	E	D1 or D1 HO driver
C	Flexible conduit	F	Luminaire

Installation Spacing - High Output Luminaires

ArcSystem Pro One-Cell High Output luminaires must be installed with the spacings listed below.

Install with minimum spacings between

a. Center-to-center of adjacent luminaires: 609.6 mm (24 in)
b. Top of luminaire to overhead building member: 76.2 mm (3 in)
c. Luminaire center to side building member: 304.8 mm (12 in)

Supplies

The following supplies are required, but not provided:

- ½ in flexible conduit and conduit fittings, as needed
- Romex or nonmetallic screw-clamp style conduit connectors for outputs
- Phillips screwdriver
- Four #10 screws and other mounting hardware as needed

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

Electrical and Wiring Specifications

Install the driver on a power distribution system with reliably identified earthed neutral (ground) and install a maximum 20 A circuit breaker on the line conductor. The D1, D2, and D4 Series drivers accept 100–277 VAC, 50/60 Hz. ETC recommends installing all wiring in grounded metal conduit.

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.

Wire and Terminal Specifications

Terminal/Connector	Conduit Entry	Wire Range/Specifications	Strip Length	Torque Rating
D1 power input line/neutral/ground	½ in conduit	Up to 6 mm^2 (10 AWG) solid or stranded	7 mm (1/4 in)	0.8 Nm (7 in-lb)
D1 HOand D2 power input line/neutral	½ in conduit	0.5–10 mm^2 (22–6 AWG)	7 mm (1/4 in)	0.5 Nm (4.4 in-lb)
D4 maintained power input line/neutral				
D4 emergency drivers sense power input line/neutral/ground	½ in conduit	0.2–2.5 mm^2 (24–14 AWG)	6.5 mm (1/4 in)	0.5–0.6 Nm (4.4–5.3 in-lb)
Power Input ground	½ in conduit	2.5–10 mm^2 (6–14 AWG)	10 mm (3/8 in)	4.0 Nm (35 in-lb)
DMX In/Thru RJ45 Connectors	½ in conduit	Cat5e (or better) minimum 0.2 mm^2 (24 AWG) conductors terminated to T568B standard	N/A	N/A
Outputs for all D1, D2, and D4 Series Drivers with Molex connectors	½ in conduit	Follow Class 2 wiring methods.		
Outputs for D4 drivers with terminals	½ in conduit	0.2–2.5 mm^2 (26–14 AWG) using the provided two-terminal connectors. Follow Class 1 wiring methods.	6 mm (1/4 in)	0.4–0.5 Nm (3.5–4.4 in-lb)

Note: *Maximum supported wire length between One-Cell luminaires and D1 Series and D2 Series drivers is 15 m (49 ft).*

Maximum supported wire length between any load and a D4 Series driver is 10 m (33 ft).

Mounting the Driver

Depending on your installation, you might want to surface-mount the driver. Any ArcSystem standalone driver can be surface-mounted to any surface capable of supporting its weight using the four holes located on the back side of the enclosure. Contact ETC for custom mounting bracket options.

1. Remove the two screws on the cover of the driver and set them aside.
2. Remove the driver cover. The cover is tethered to the backbox. Be careful when handling.

Note: *If you are installing a D1 High Output driver, the power supply is inside the cover and has wiring that runs to the driver board in the back panel of the driver. Be careful when handling. It may help to nest the back panel of the driver inside the cover as shown in* *Wiring the Driver and Luminaire on page 19*.

3. Using four #10 screws, mount the back panel to the mounting surface.
4. Attach flexible conduit to the driver. There are four conduit knockouts available.
5. Install Romex or nonmetallic screw-clamp conduit connectors to output knockouts, as needed.

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.*

Preparing the Ceiling for Recessed Luminaires

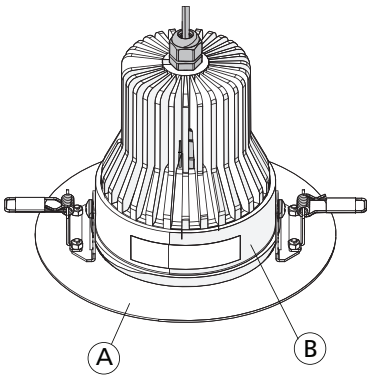
This section is specific to the recessed/flush mounted variant of luminaires. For Pro One-Cell yoke-mounted luminaires, proceed to *Wiring the Driver and Luminaire on page 19*.

Cut a hole in the ceiling or ceiling tile to accommodate the luminaire's retaining clip anchors. Cut the hole larger than the minimum hole diameter listed below and smaller than the luminaire's outer bezel. The images below provide an example of the bezels on the Pro One-Cell luminaires.

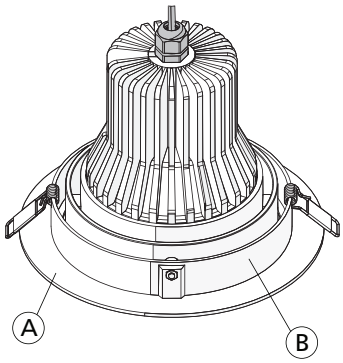
Luminaire	Minimum Hole Diameter
Pro One-Cell	16.5 cm (6-1/2 in)
Pro One-Cell High Output	17.0 cm (6-11/16 in)
Pro One-Cell Small	9.5 cm (3-3/4 in)
Pro One-Cell Micro	7.6 cm (3 in)

Note: *If you are installing the luminaire into an ArcSystem Recessed Ceiling Adapter, refer to the* ArcSystem Recessed Ceiling Adapter Installation Guide *for the minimum diameter hole to cut in the ceiling to clear the flange on the bottom of the bracket.*

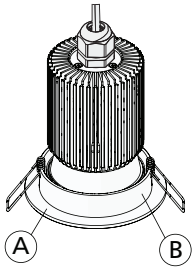
Note: *Maximum ceiling thickness for safe use of the luminaire retaining clips is 1.9 cm (¾ in).*



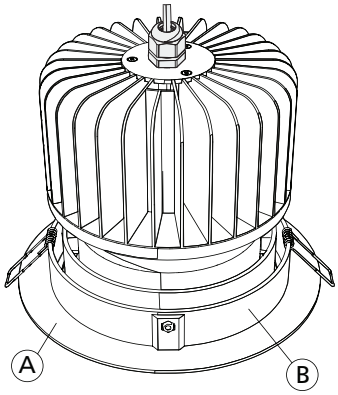
Pro One-Cell
fixed model



Pro One-Cell
adjustable model

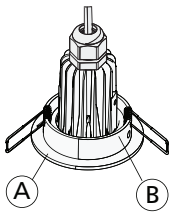


Pro One-Cell Small
adjustable model



Pro One-Cell High Output
adjustable model

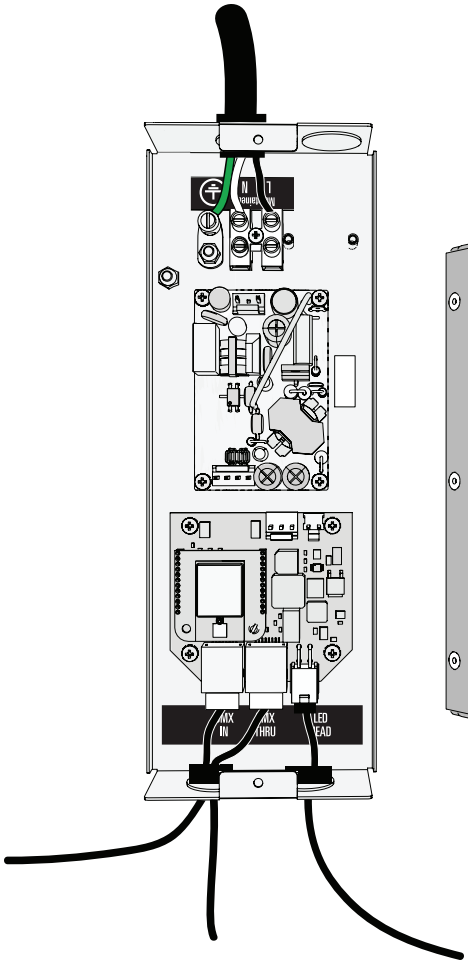
A	Outer bezel
B	Inner bezel



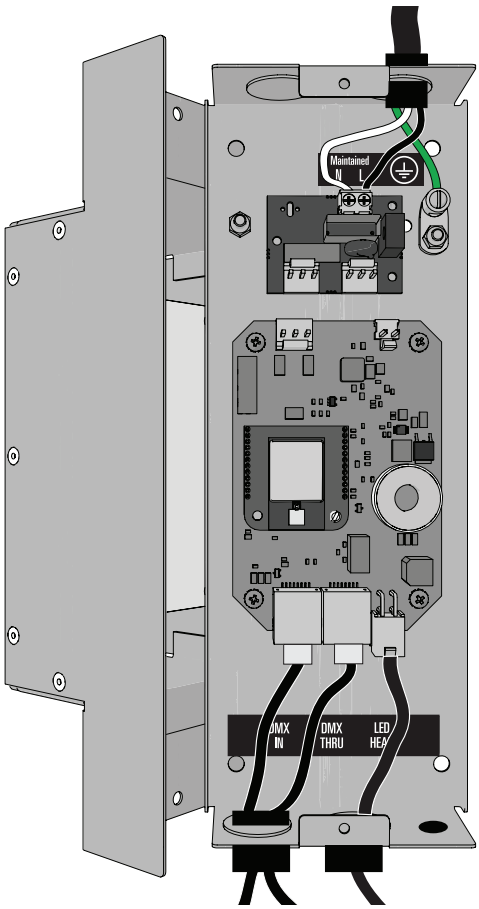
Pro One-Cell Micro
adjustable model

Wiring the Driver and Luminaire

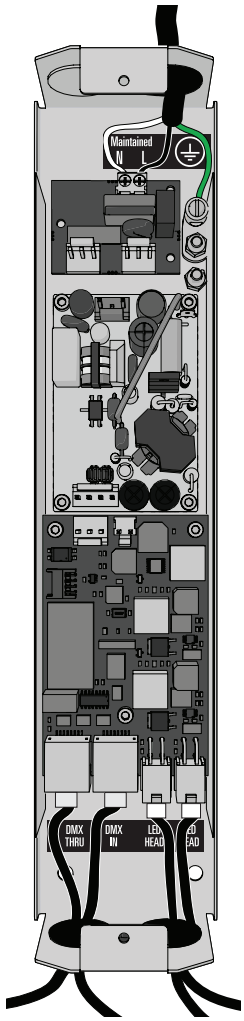
Wiring of the driver consists of wiring power and data (DMX) to the driver for your luminaire and then running power out to the luminaire from the driver. If you are installing emergency system drivers, see *Emergency System One-Cell Installation on page 26*.



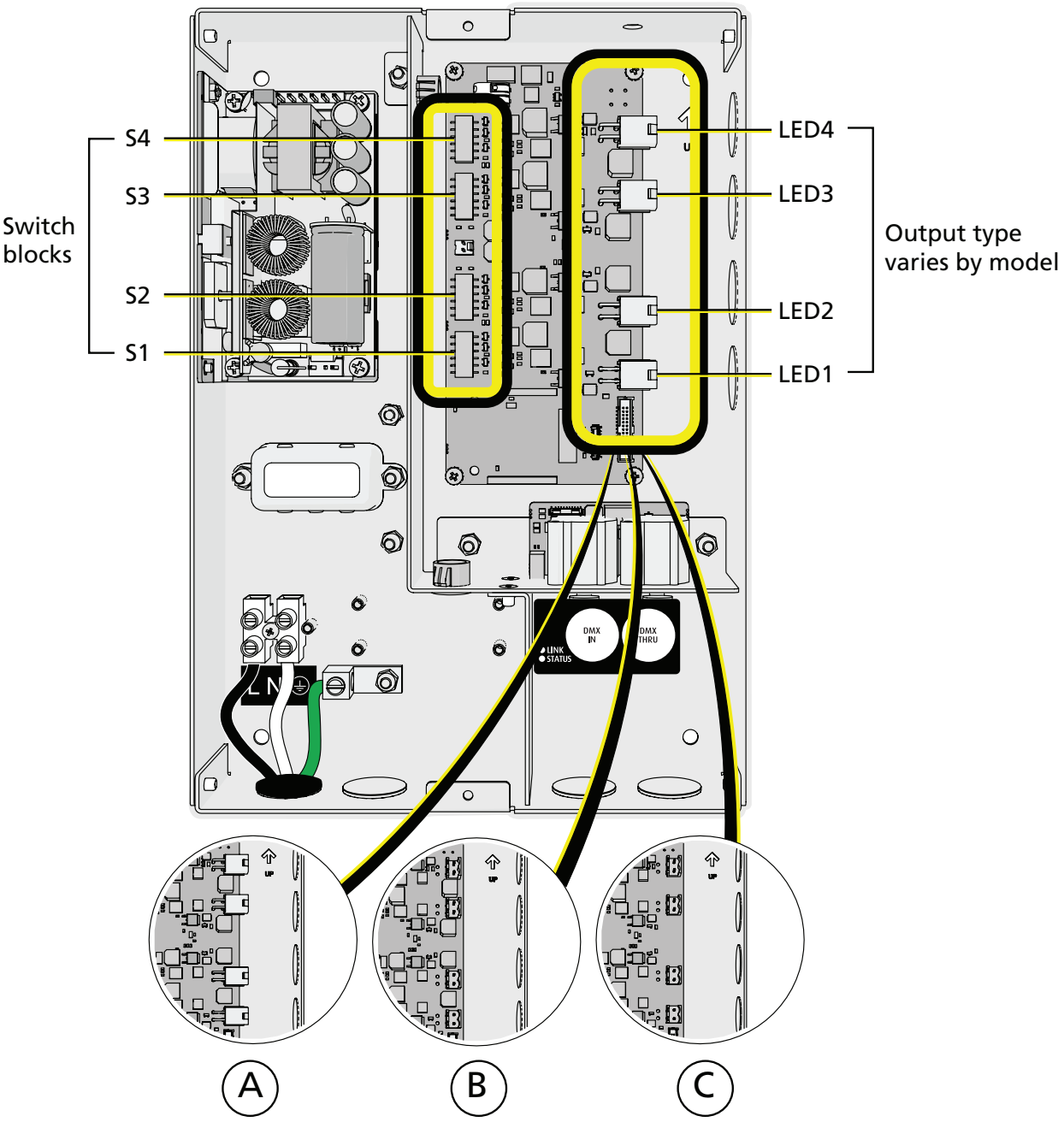
D1 Driver



D1 HO Driver



D2 Driver



D4 Driver

A	Constant Current with Molex connectors
B	Constant Current with terminal outputs
C	Constant Voltage with terminal outputs

Power

Internal wire colors vary by model.

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

Perform the following steps to wire power to the driver.

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.

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. Insert the line wire (typically black) into the LINE (L) terminal and tighten the screw.
7. Tug gently on the wires to ensure they are secure.

Luminaire Connection to Driver

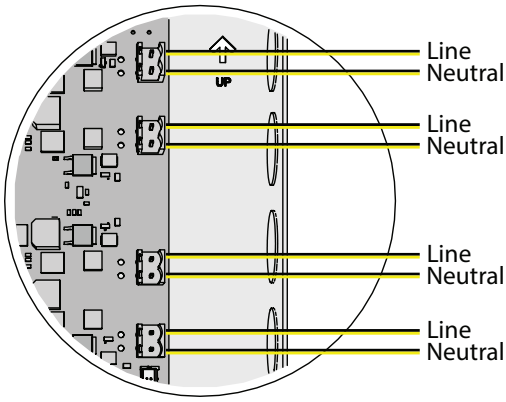
ArcSystem Pro One-Cell luminaires connect to a driver using Molex receptacles labeled "LED Head" for D1 and D2 Series Drivers and "LED" followed by output channel number for D4 Series drivers. All D1 Series and D2 Series drivers and some models of D4 Series drivers have Molex receptacles for ArcSystem Pro One-Cell luminaire connections. Models of D4 Series drivers with two-pin terminal outputs can be used to provide power and data to other fixtures.

Note: *Maximum supported wire length between One-Cell luminaires and D1 Series and D2 Series drivers is 15 m (49 ft).*

Maximum supported wire length between any load and a D4 Series driver is 10 m (33 ft).

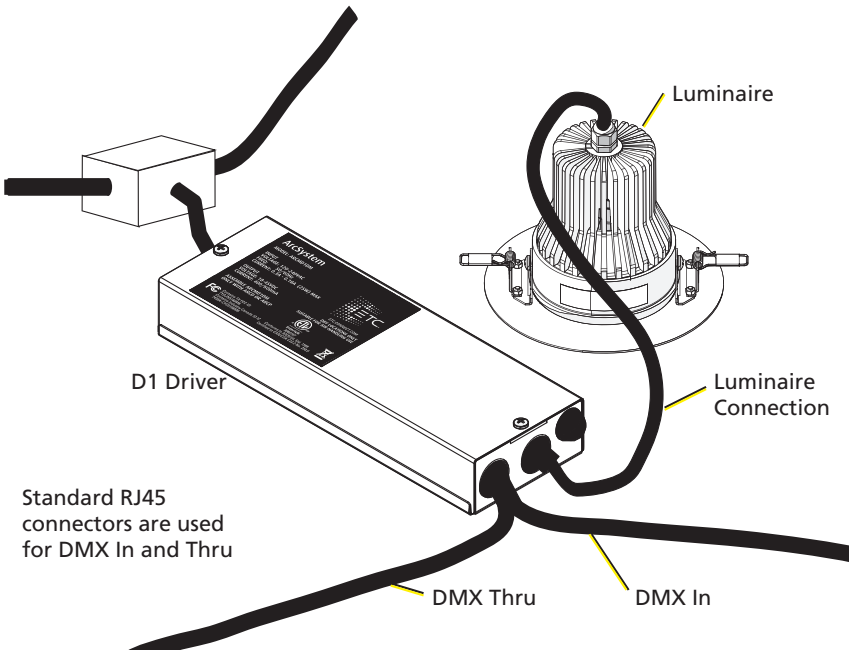
1. Install the ceiling with the prepared mounting hole for the luminaire.
2. Run the luminaire cable through the previously installed screw-clamp conduit connector at one of the driver knockouts.
3. Connect the luminaire cable to the driver output.
   - **D1 Series, D2 Series, and D4 Series Drivers with Molex receptacles:** connect the four-pin luminaire cable(s) to the Molex receptacle(s) inside the driver. See *Wiring the Driver and Luminaire on page 19*. Support the luminaire(s). Do not let luminaires hang by their cables.
   - **D4 Drivers with terminal outputs:** wire loads (luminaires) to a provided two-pin connector and insert the connector into a two-pin terminal inside the driver. See the illustration at right.
     - Constant Current (CC) drivers: verify that each output channel's current output is configured correctly. See *D4 Series Driver Current Configuration on page 24*.

Two-pin terminal wiring



DMX In and DMX Thru

The following image shows a hard-wired DMX topology for the D1 Series driver.



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

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 + and Data -) plus an ISO ground (common). ETC recommends Cat5e (or better) minimum 24 AWG conductors terminated to T568B standard. Up to 32 D1, D2, or D4 series drivers can be connected per DMX run.

RJ45 Pinout Information

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

DMX Connection to Driver

1. Run your DMX lines through the other previously installed screw-clamp conduit connector and terminate the RJ45 connectors to the DMX In and DMX Thru terminals accordingly.
2. Reinstall the driver cover using the two previously removed screws.

Note: *ArcSystem multi-cell luminaires and standalone drivers are not self-terminating. You must terminate the last multi-cell luminaire or standalone driver in line with a 120Ω resistor.*

To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.

D4 Series Driver Current Configuration

See *D4 Series Emergency Driver Current Configuration on page 29* for information on configuring the driver current in D4 emergency drivers.

Note: *Do not change the switch settings on a D4 Constant Voltage (CV) model driver.*

D4 Series Constant Current (CC) drivers can be configured for 400 mA or 600 mA output using the four switch blocks shown in the illustration of the *D4 Driver on page 20*.

Outputs

Each of the four switch blocks controls one output.

- Switch block S1 controls LED1.
- Switch block S2 controls LED2.
- Switch block S3 controls LED3.
- Switch block S4 controls LED4.

Switch Functions

Each switch block has six switches.

- Switch 1 sets the current output threshold.
  ON = 400 mA, OFF = 600 mA.

Note: *Do not change the switch 1 settings on a D4 Constant Voltage (CV) model driver.*

- Switches 2 through 5 control the DMX channel assigned to the output.
- Switch 6 enables emergency functionality.

Switches 2 through 5 are factory set to allow each output to be controlled by an individual DMX address. ETC recommends leaving the DMX channel switches (positions 2 through 5) at their factory settings and using the ArcSystem Configuration Software to control the behavior of each output.

Note: *ArcSystem D4 Drivers are factory configured for 600 mA output for compatibility with ArcSystem Pro One-Cell and One-Cell Small luminaires. If you power a One-Cell or One-Cell Small luminaire from a D4 output channel that is configured for 400 mA, the output of the luminaire may be dim.*

Note: *If you set an output on a non-emergency driver to emergency operation, the output will remain at full (or their configured emergency behavior) because there is no normal/sense input to the driver.*

Installing One-Cell Recessed Luminaires

The installation procedure is similar for all recessed one-cell luminaires (fixed and adjustable). For Pro One-Cell yoke-mounted luminaires, continue on to *Installing One-Cell Yoke-Mounted Luminaires below*.

WARNING: ArcSystem Pro One-Cell, One-Cell Small, and One-Cell High Output fixtures and D1 and D1 High Output drivers are NON-IC rated and therefore NOT suitable for installation in direct contact with combustible materials or thermal insulation.

DO NOT INSTALL INSULATION WITHIN 76 mm (3 in) OF ANY PART OF THE FIXTURE OR DRIVER.

AVERTISSEMENT : Les lampes One-Cell, One-Cell Small, One-Cell High Output, et les drivers D1 and D1 High Output ArcSystem sont classés NON-IC, ils ne conviennent donc PAS pour une installation en contact direct avec des matières combustibles ou une isolation thermique.

NE PAS INSTALLER D'ISOLATION À MOINS DE 76 mm (3 po) DE TOUTE PARTIE DE LA LAMPE OU DU DRIVER (DISPOSITIF ÉLECTRONIQUE DE PUISSANCE).

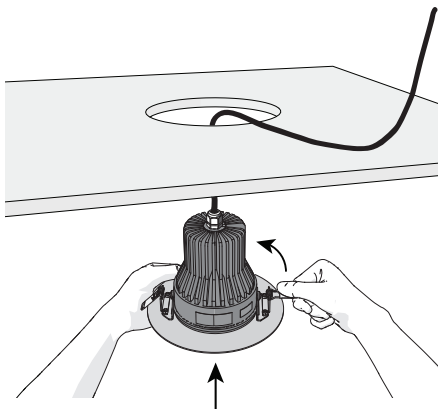
WARNING: Adjustable ArcSystem Pro One-Cell fixtures and adjustable ArcSystem Pro One-Cell Small fixtures are suitable for Non-Fire Rated installations ONLY.

AVERTISSEMENT : Les lampes Pro One-Cell ArcSystem réglables et Pro One-Cell Small ArcSystem réglables sont parfaites UNIQUEMENT pour les installations sans indice de résistance au feu.

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: *ArcSystem Pro One-Cell Micro luminaires and D2 drivers are Type IC - inherently protected and suitable for installation in contact with insulation.*

1. Fold both retaining clips towards the luminaire body.
2. Place the luminaire through hole.
3. Release the clips, securing the luminaire in place.
4. When applicable, rotate the luminaire so it is roughly focused to its final resting position. This will assist in final focus procedures.



Installing One-Cell Yoke-Mounted Luminaires

1. Attach a C-clamp or other mounting hardware (not provided) to the yoke of the luminaire.
2. Attach the luminaire to a pipe or other approved mounting device.

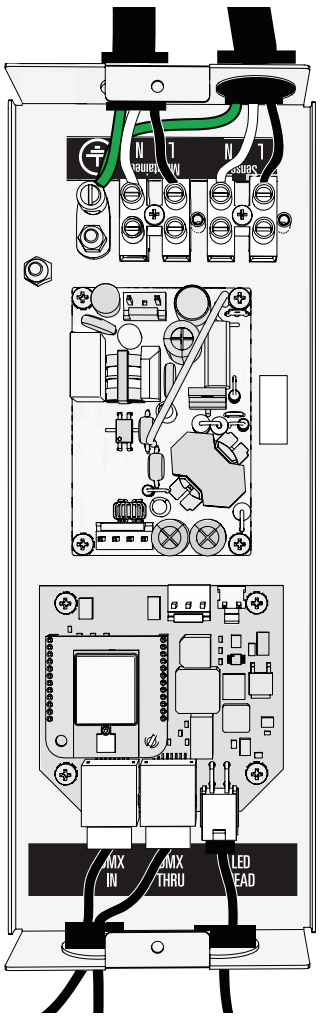
Chapter 3

Emergency System One-Cell Installation

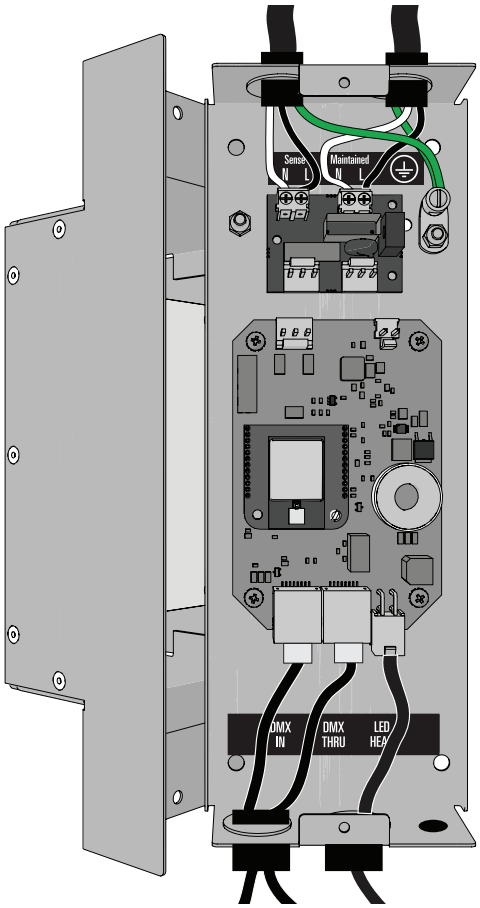
With the exception of power input terminations, ArcSystem emergency system installation requirements are the same as those of the standard ArcSystem. Complete the installation as follows, referencing the following sections for any additional installation details before wiring the power:

- *Preparing to Install the Driver on page 14*
- *Mounting the Driver on page 17*
- *Preparing the Ceiling for Recessed Luminaires on page 18*

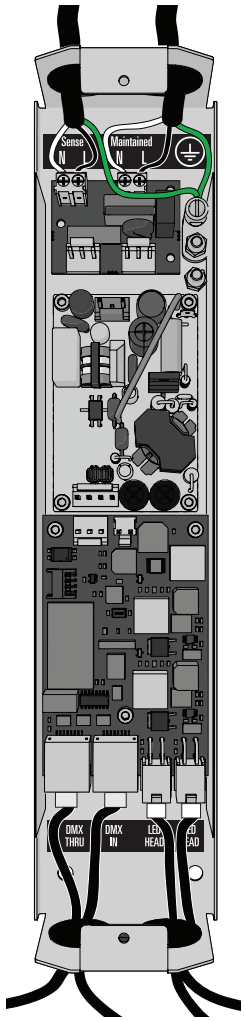
Wiring D1 Series, D2 Series, and D4 Series Emergency Drivers



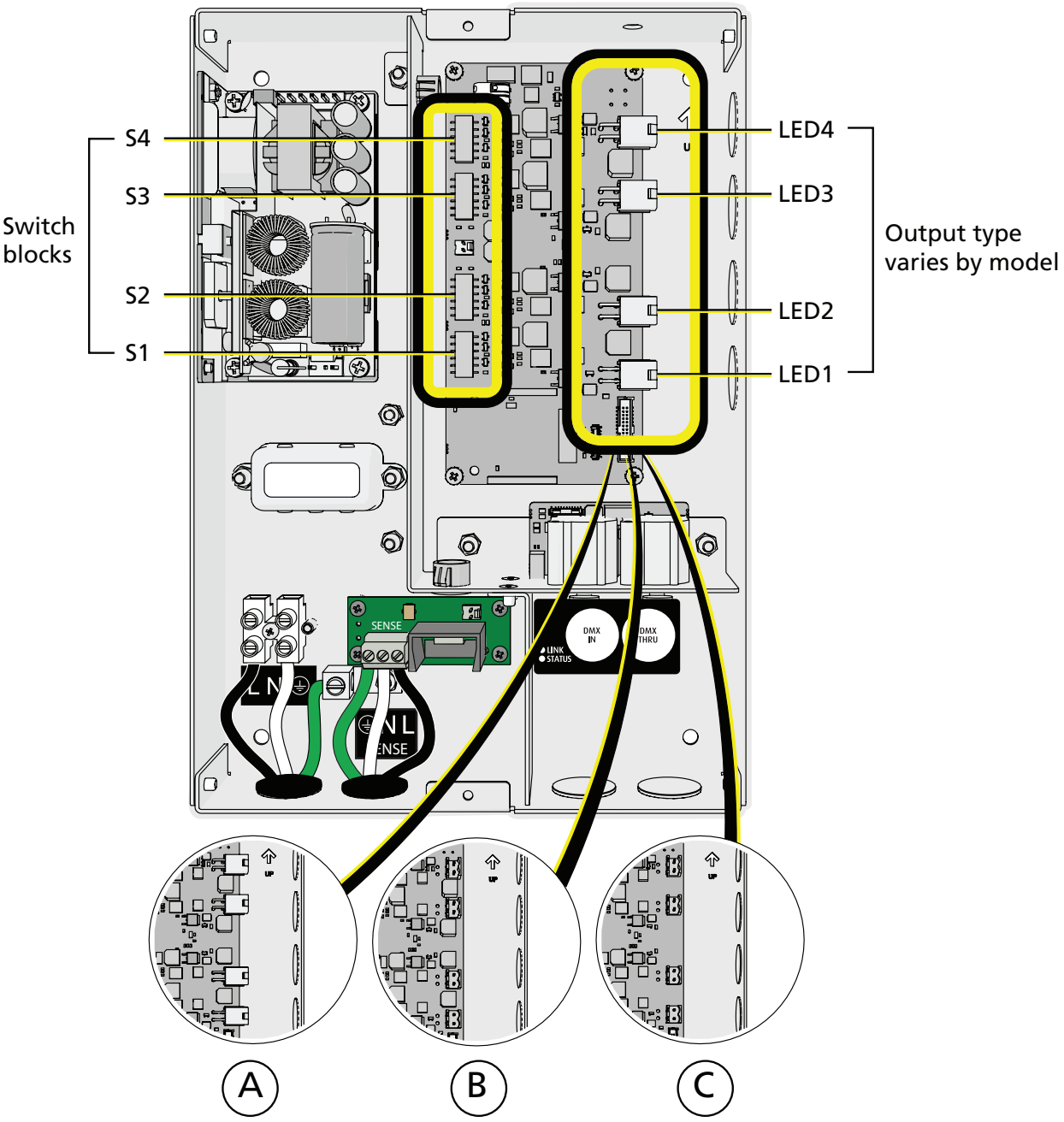
D1 Emergency Driver



D1 HO Emergency Driver



D2 Emergency Driver



D4 Emergency Driver

A	Constant Current with Molex connectors
B	Constant Current with terminal outputs
C	Constant Voltage with terminal outputs

Note: *If you are installing a D1 High Output driver, the power supply is inside the cover and has wiring that runs to the driver board in the back panel of the driver. Be careful when handling. It may help to nest the back panel of the driver inside the cover as shown in D1 HO Driver on page 19.*

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.*

Connect Sense Input

Connect the mains sense input to a normal branch circuit. See *Factory Wire Colors on page 21*.

1. Make sure power is off at the main circuit breaker.
2. Loosen the three screw terminals for NEUTRAL (N), GROUND (⏚), and LINE (L) connections.
3. Insert the ground wire (typically green) into the GROUND (⏚) terminal and tighten the screw.
4. Insert the neutral wire (typically white) into the NEUTRAL (N) terminal and tighten the screw.
5. Connect the line wire (typically black) into the LINE (L) terminal and tighten the screw.
6. Tug gently on the wires to ensure they are secure.

Connect Maintained Input

Note: *The maintained input in a D4 Series driver is the input labeled "L N ⏚". The D4 sense input is labeled "⏚ N L Sense". D1 Series and D2 Series drivers have inputs labeled with "Sense" and "Maintained".*

Connect maintained input to a normal/emergency branch circuit with upstream UL 1008 automatic transfer switch. See *Factory Wire Colors on page 21*.

1. Loosen the three screw terminals for NEUTRAL (N), GROUND (⏚), and LINE (L) connections.
2. Insert the ground wire (typically green) into the GROUND (⏚) terminal and tighten the screw.
3. Insert the neutral wire (typically white) into the NEUTRAL (N) terminal and tighten the screw.
4. Connect the line wire (typically black) into the LINE (L) terminal and tighten the screw.
5. Tug gently on the wires to ensure they are secure.

D4 Series Emergency Driver Current Configuration

See *D4 Series Driver Current Configuration on page 24* for information on configuring the driver current in D4 non-emergency drivers.

Note: *Do not change the switch settings on a D4 Constant Voltage (CV) model driver.*

D4 Series Constant Current (CC) drivers can be configured for 400 mA or 600 mA output using the four switch blocks shown in the illustration of the *D4 Emergency Driver on page 27*.

Outputs

Each of the four switch blocks controls one output.

- Switch block S1 controls LED1.
- Switch block S2 controls LED2.
- Switch block S3 controls LED3.
- Switch block S4 controls LED4.

Switch Functions

Each switch block has six switches.

- Switch 1 sets the current output threshold.
  ON = 400 mA, OFF = 600 mA.

Note: *Do not change the switch 1 settings on a D4 Constant Voltage (CV) model driver.*

- Switches 2 through 5 control the DMX channel assigned to the output.
- Switch 6 enables emergency functionality.

Switches 2 through 5 are factory set to allow each output to be controlled by an individual DMX address. ETC recommends leaving the DMX channel switches (positions 2 through 5) at their factory settings and using the ArcSystem Configuration Software to control the behavior of each output.

Complete Installation

Now that you have completed wiring the power to your emergency system driver, standard installation procedures can be completed. Refer to the following sections once power wiring is completed:

- *Luminaire Connection to Driver on page 22*
- *DMX In and DMX Thru on page 23*
- *Installing One-Cell Recessed Luminaires on page 25*
- *Installing One-Cell Yoke-Mounted Luminaires on page 25*

Chapter 4

Standard System Multi-Cell Installation

This chapter provides information on how to install all standard variants of multi-cell luminaires in your ArcSystem installation.

Installing 100–240 V Multi-Cell Luminaires

100–240 V multi-cell yoke mounted luminaires include the Pro Two-Cell, Pro Four-Cell Linear, Pro Four-Cell Square, and Pro Eight-Cell. For 100–240 V Pro Four-Cell Round, see *Installing 100–240 V Four-Cell Round Luminaires on the facing page*. For 100–277 V luminaires, see *Installing 100–277 V Multi-Cell Luminaires on page 32*.

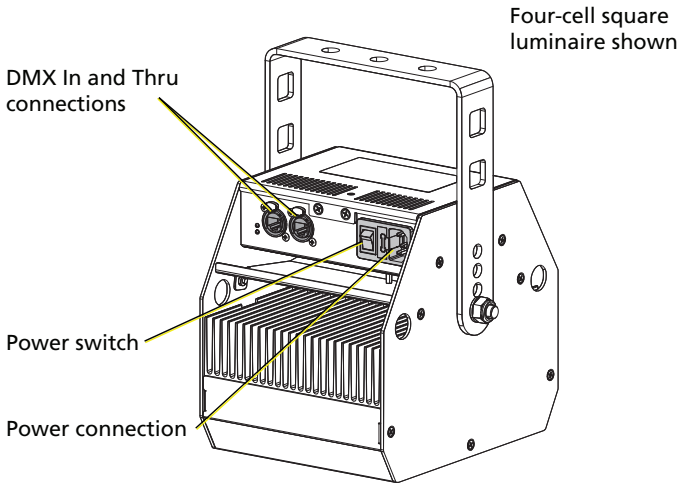
Note: *Mounting hardware and installation location must support the weight of the luminaire.*

DMX

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). ETC recommends Cat5e (or better) minimum 24 AWG conductors terminated to T568B standard. Up to 32 multi-cell luminaires can be connected per DMX run.

RJ45 Pinout Information

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



Installation Procedure

1. Attach a C-clamp or other mounting hardware (not provided) to the yoke of the luminaire.
2. Attach the luminaire to a pipe or other approved mounting device.
3. Insert or attach additional accessories, if desired.
4. Connect the provided power cable.
5. If using hard wired DMX, plug the RJ45 connector into the DMX in port on the rear of the luminaire.
6. If linking additional luminaires via DMX, plug a RJ45 cable into the DMX thru port on the rear of the luminaire.

Note: *ArcSystem luminaires are not self terminating. You must terminate the last luminaire in line with a 120Ω resistor.*

To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.

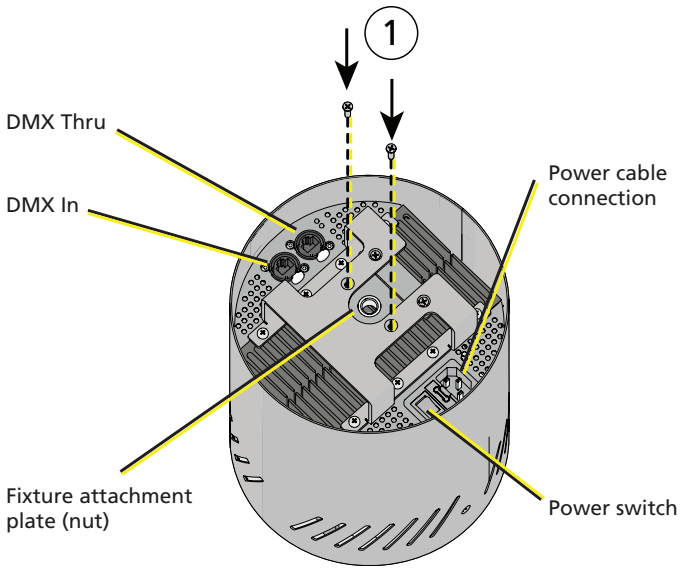
7. Toggle the power switch to "ON".
8. Rotate the luminaire so it is roughly focused to its final resting position. This will assist in final focus procedures.

Installing 100–240 V Four-Cell Round Luminaires

Note: *Mounting hardware and installation location must support the weight of the luminaire.*

Installing to Threaded Rod

1. Install one of the provided fixture attachment plates (nuts), M10-1.5 mm or 1/2-13 in, with the two provided screws.
2. Attach the luminaire to installed threaded rod.
3. Plug in the provided power cable.
4. If using hard wired DMX, plug in the RJ45 connector into the DMX In port on the top of the luminaire.
5. If linking additional luminaires via DMX, plug a RJ45 cable into the DMX Thru port on the rear of the luminaire.
6. Toggle the power switch to "ON".



Note: *ArcSystem luminaires are not self terminating. You must terminate the last luminaire in line with a 120Ω resistor.*

To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.

Installing 100–277 V Multi-Cell Luminaires

This section provides the information needed to install 100-277 V Multi-Cell luminaires.

Supplies

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

- ½ in flex conduit and conduit fittings
- Appropriate strain relief connectors for the installation type, as needed
- Phillips screwdriver
- 120Ω RJ45 terminator for DMX termination. See *Terminate DMX on page 35*.

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

Electrical and Wiring Specification

Install ArcSystem 100–277 V luminaire on a power distribution system with reliably identified earthed neutral and install a maximum 20 A circuit breaker on the line conductor.

ArcSystem 100–277 V luminaires and drivers accept 100–277 VAC, 50/60 Hz. ETC recommends installing all wiring in grounded metal conduit.

Wire and Terminal Specifications

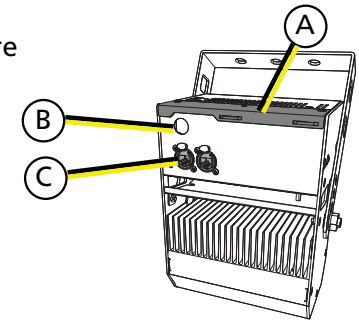
Luminaire Type	Terminal / Connector	Conduit Entry	Wire Range / Specification	Strip Length
Two-Cell, Four-Cell Square, Four-Cell Linear, Eight-Cell	Power Input - line/neutral/ground	½ in conduit	0.2–4 mm (24–12 AWG)	11 mm (0.43 in)
	DMX In/Thru RJ45 Connectors	N/A	Cat5e (or better) minimum 24 AWG conductors terminated to T568B standard	N/A

Note: *ArcSystem luminaires are not self-terminating. You must terminate the last luminaire in line with a 120Ω resistor. To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.*

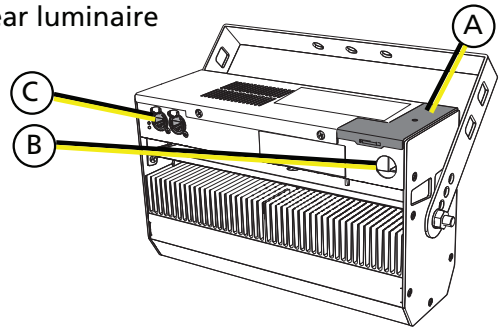
Install the Luminaire

Instructions for installing 100–277 V standard luminaires are below. See *Installing 100–277 V Emergency Multi-Cell Luminaires on page 38* for instructions on installing 100–277 V emergency luminaires.

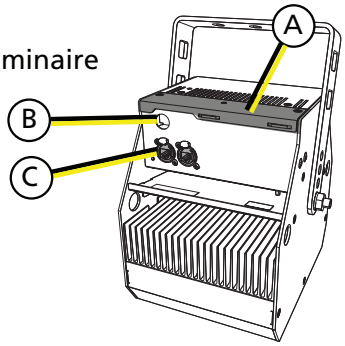
Two-cell luminaire



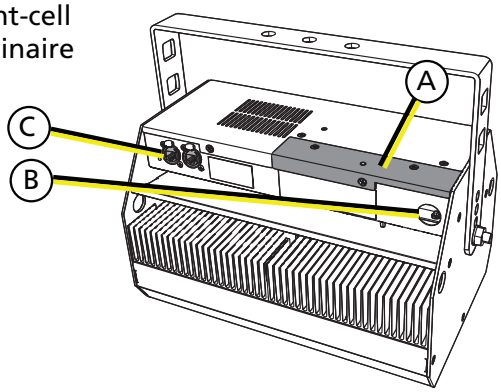
Four-cell linear luminaire



Four-cell square luminaire



Eight-cell luminaire



A	wiring compartment
B	conduit entry for 1/2 in conduit
C	DMX in and thru

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

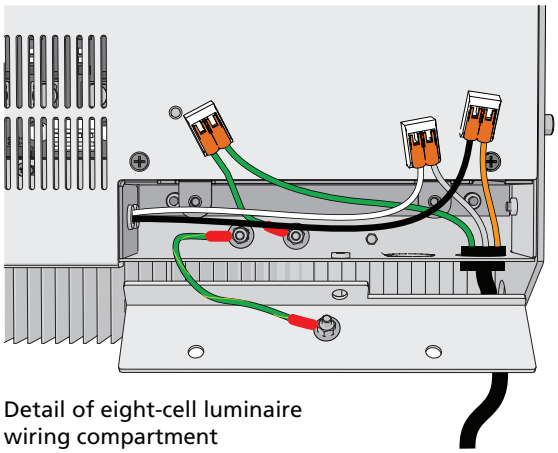
1. Make sure power is off at the main circuit breaker.
2. Attach a C-clamp or other mounting hardware (not provided) to the yoke of the luminaire.
3. Attach the luminaire to a pipe or other approved mounting device.
4. Insert or attach additional accessories, if desired.
5. Using a Phillips head screw driver, remove the screws securing the cover to the luminaire's wiring compartment. Set the screws aside for later re-installation. The cover is grounded to the enclosure by a tether.
6. Install conduit hardware at the conduit entry in the side of the wiring compartment.

Terminate Power Wiring

ArcSystem 100–277 V systems are supplied with WAGO® connectors in the wiring compartment for convenient power connections in normal and emergency luminaires. Non-emergency ArcSystem
100–277 V systems are supplied with three two-position WAGO connectors (ETC part number J4717, WAGO part number 221-412). See *Installing 100–277 V Emergency Multi-Cell Luminaires on page 38* for more information about wiring for emergency installations.

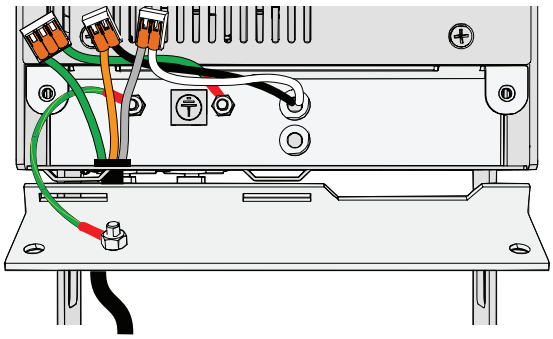
Factory Wire Colors

Color	Type
green	ground
black	line/hot
white	neutral

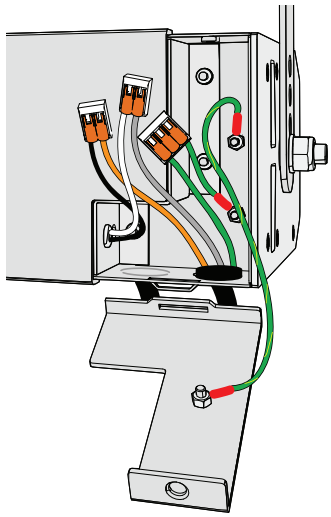


Detail of eight-cell luminaire wiring compartment

Detail of two-cell luminaire or four-cell square luminaire wiring compartment



Detail of four-cell linear luminaire wiring compartment



Note: *Building wire colors may be different than shown.*

Connect the Maintained Input

1. See *Wire and Terminal Specifications on page 32* for specification of wire and strip length. Prepare wires accordingly.
2. Remove the three screws securing the wiring compartment cover to the luminaire. The cover is grounded by a tether to the enclosure. Set the screws aside.
3. Terminate ground.
   a. Locate the WAGO connector on the ground wire (green) connected to the bottom of the wiring compartment (⏚).
   b. Run a ground wire (typically green/yellow) through conduit to a free position on the WAGO connector.
   c. Lift up the orange clip, insert the ground wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.
4. Terminate neutral.
   a. Locate the WAGO connector on the neutral wire (white) from the input.
   b. Run a neutral wire (typically white or grey) through conduit to a free position on the WAGO connector.
   c. Lift up the orange clip, insert the neutral wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.
5. Terminate line (hot).
   a. Locate the WAGO connector on the line (hot) wire (black) from the input.
   b. Run a line (hot) wire through conduit to a free position on the WAGO connector.

Note: *Line (hot) wire color varies based on voltage and region but is typically black, brown, orange, or yellow.*

   c. Lift up the orange clip, insert the line wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.

Terminate DMX

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). ETC recommends Cat5e (or better) minimum 24 AWG conductors terminated to T568B standard. Up to 32 luminaires can be connected per DMX run.

1. If using hard wired DMX, plug the RJ45 connector into the DMX in port on the rear of the luminaire.
2. If linking additional luminaires via DMX, plug a RJ45 cable into the DMX thru port on the rear of the luminaire.

RJ45 Pinout Information

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

Note: *ArcSystem luminaires are not self-terminating. You must terminate the last luminaire in line with a 120Ω resistor. To purchase an RJ45 terminator, please contact your ETC customer service representative and request part number N4086.*

Complete Installation

1. Check that all wires are terminated properly and secure in their terminals.
2. Tuck wiring and WAGO connectors inside wiring compartment. Replace the wiring compartment cover using the screws set aside previously.
3. Rotate the luminaire so it is roughly focused to its final resting position. This will assist in final focus procedures.

Chapter 5

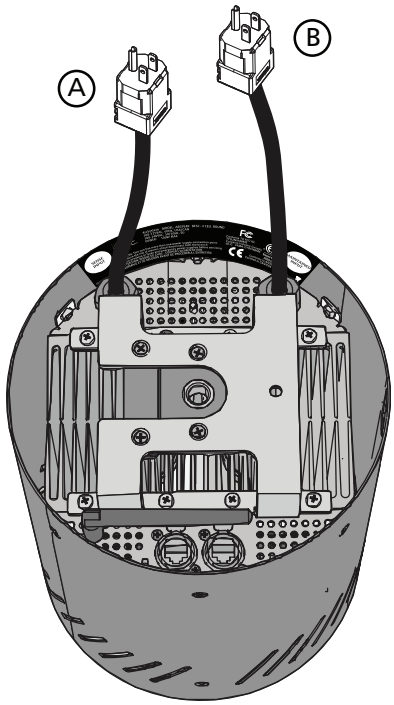
Emergency System Multi-Cell Installation

With the exception of power input terminations, ArcSystem emergency system installation requirements are the same as those of the standard ArcSystem.

Installing Four-Cell Round Emergency Luminaires

ArcSystem Pro Four-Cell Round emergency luminaires are supplied with hard-wired power cables with NEMA 5-15 connectors for North America and bare ends for Europe and the rest of the world. The cables are labeled near the strain reliefs for Maintained Input and Sense Input.

Aside from having multiple power cables, these luminaires are installed in the same way that standard ArcSystem Pro Four-Cell Round luminaires are installed. See *Installing 100–240 V Four-Cell Round Luminaires on page 31*.



A	Sense Input*
B	Maintained Input*
* European models have cables with bare ends. Actual cable length is 2.1 m (7 ft) for all models.	

Note: *Luminaires with NEMA 5-15 connectors are only for use in 100–125 V applications.*

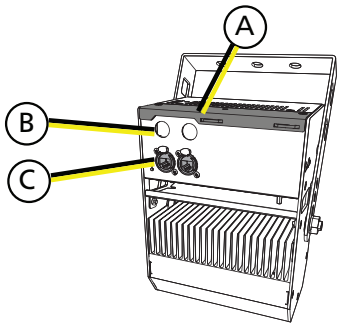
Factory Wire Colors

Model	Color	Type
Europe	green/yellow	earth
Europe	brown	live
Europe	blue	neutral

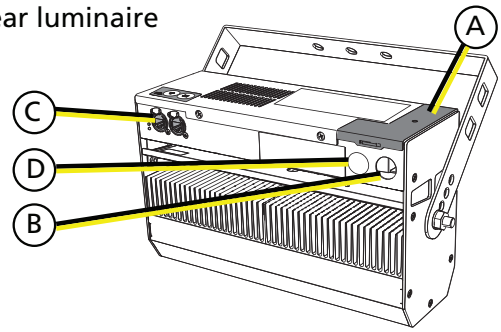
Installing 100–277 V Emergency Multi-Cell Luminaires

Instructions for installing 100–277 V emergency luminaires are below. See *Installing 100–277 V Multi-Cell Luminaires on page 32* for instructions on installing 100–277 V standard luminaires.

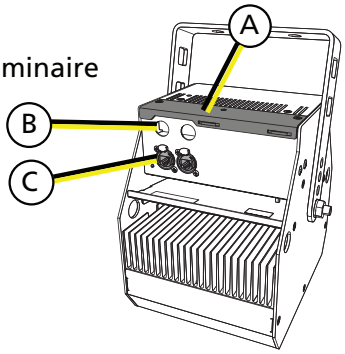
Two-cell luminaire



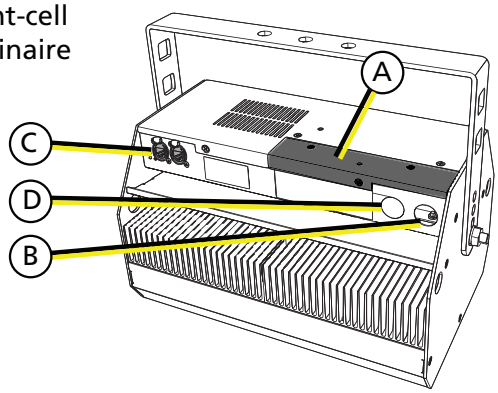
Four-cell linear luminaire



Four-cell square luminaire



Eight-cell luminaire



A	wiring compartment
B	conduit entry for 1/2 in conduit
C	DMX in and thru
D	knockout for 1/2 in conduit

With the exception of power input terminations, ArcSystem 100–277 V emergency system installation requirements are the same as those of ArcSystem 100–277 V non-emergency systems. Complete the installation as follows, referencing these sections for installation details:

1. Complete the steps of *Installing 100–277 V Multi-Cell Luminaires on page 32*.
2. Install conduit hardware at the knockout or second hole in the side of the wiring compartment.

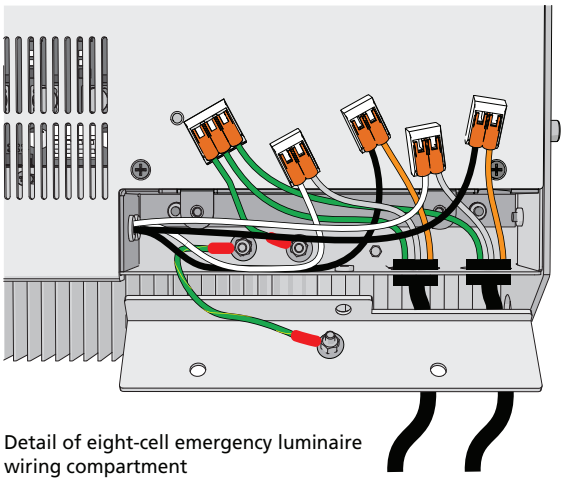
Note: *Use flexible metal conduit when installing and focusing 277 V emergency multi-cell luminaires.*

Terminate Power Wiring

ArcSystem 100–277 V systems are supplied with WAGO connectors in the wiring compartment for convenient power connections in normal and emergency luminaires. ArcSystem 100–277 V emergency systems are supplied with one three-position WAGO (ETC part number J4629, WAGO part number 221-413) and four two-position WAGO connectors (ETC part number J4717, WAGO part number 221-412).

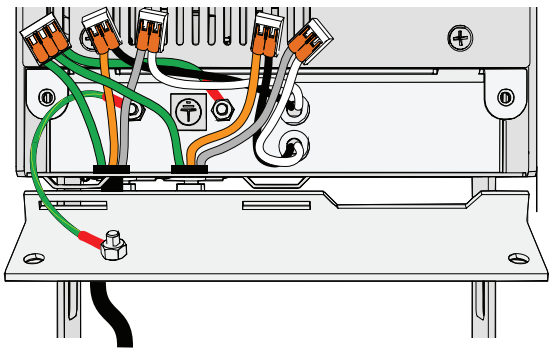
Factory Wire Colors

Color	Type
green	ground
black	line/hot
white	neutral

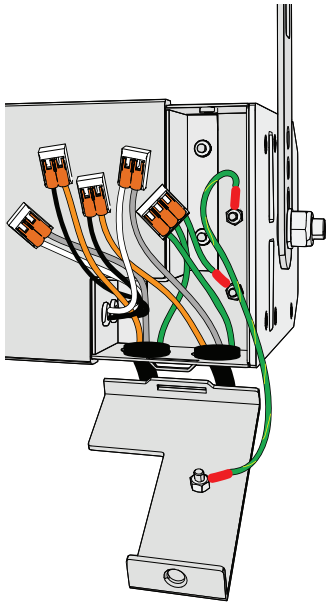


Detail of eight-cell emergency luminaire wiring compartment

Detail of two-cell emergency luminaire or four-cell square emergency luminaire wiring compartment



Detail of four-cell linear emergency luminaire wiring compartment



Note: *Building wire colors may be different than shown.*

Connect the Maintained Input

1. See *Wire and Terminal Specifications on page 32* for specification of wire and strip length. Prepare wires accordingly.
2. Remove the screws securing the wiring compartment cover to the luminaire. The cover is grounded to the enclosure by a tether. Set the screws aside.
3. Terminate ground.
   a. Locate the WAGO connector on the ground wire (green) connected to the bottom of the wiring compartment (⏚).
   b. Run a ground wire (typically green/yellow) through conduit to a free position on the WAGO connector.
   c. Lift up the orange clip, insert the ground wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.
4. Terminate neutral to the Maintained input.
   a. Locate the WAGO connector on the neutral wire (white) from the input labeled Maintained.
   b. Run a neutral wire (typically white or grey) through conduit to a free position on the WAGO connector.
   c. Lift up the orange clip, insert the neutral wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.
5. Terminate line (hot) to the Maintained input.
   a. Locate the WAGO connector on the line (hot) wire (black) from the input labeled Maintained.
   b. Run a line (hot) wire through conduit to a free position on the WAGO connector.

Note: *Line (hot) wire color varies based on voltage and region but is typically black, brown, orange, or yellow.*

   c. Lift up the orange clip, insert the line wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.

Connect the Sense Input

1. Make sure power is off at the main circuit breaker.
2. See *Wire and Terminal Specifications on page 32* for specification of wire and strip length. Prepare wires accordingly.
3. Terminate ground.
   a. Locate the WAGO connector on the ground wire (green) connected to the bottom of the wiring compartment.
   a. Run a ground wire (typically green/yellow) through other conduit to a free position on the WAGO connector.
   b. Lift up the orange clip, insert the ground wire, and press the clip down onto the wire.
   c. Tug gently to make sure the wire is secure.
4. Terminate neutral to the Sense input.
   a. Locate the WAGO connector on the neutral wire (white) from the input labeled Sense.
   b. Run a neutral wire (typically white or grey) through conduit to a free position on the WAGO connector.
   c. Lift up the orange clip, insert the neutral wire, and press the clip down onto the wire.
   d. Tug gently to make sure the wire is secure.

5. Terminate line (hot) to the Sense input.
    a. Locate the WAGO connector on the line (hot) wire (black) from the input labeled Sense.
    b. Run a line (hot) wire (typically brown, orange, or yellow) through conduit to a free position on the WAGO connector.
    c. Lift up the orange clip, insert the line wire, and press the clip down onto the wire.
    d. Tug gently to make sure the wire is secure.
6. Continue by connecting DMX (see *Terminate DMX on page 35*), then complete the installation.

Complete Installation

1. Check that all wires are terminated properly and secure in their terminals.
2. Tuck wiring and WAGO connectors inside wiring compartment. Replace the wiring compartment cover using the screws set aside previously.
3. Rotate the luminaire so it is roughly focused to its final resting position. This will assist in final focus procedures.

Chapter 6

Power Up and Control

Final Installation

ArcSystem D1, D1 HO, D2, and D4 drivers and ArcSystem multi-cell luminaires are supplied with a 5 dB antenna providing 90 degree omni-directional coverage. Install this antenna to the antenna receptacle.

Note: *Incorrect installation of recessed luminaires may cause output to turn on and off periodically due to built-in protection against overheating. Leave the lamp on for several hours to check for overheating caused by improper installation. The driver can overheat even if the lamp is off.*

Power Up Procedure

1. Check that luminaire power switch is on, if applicable.
2. Check the DMX control source to ensure proper installation and termination per the manufacturer's instructions.
3. Apply power at the main circuit breaker.

After the power up procedure, the luminaire will light.

Note: *All ArcSystem luminaires are factory set to provide 100% output level. 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, ArcSystem luminaires will light if the DMX Control level is greater than 0.*

DMX System Control

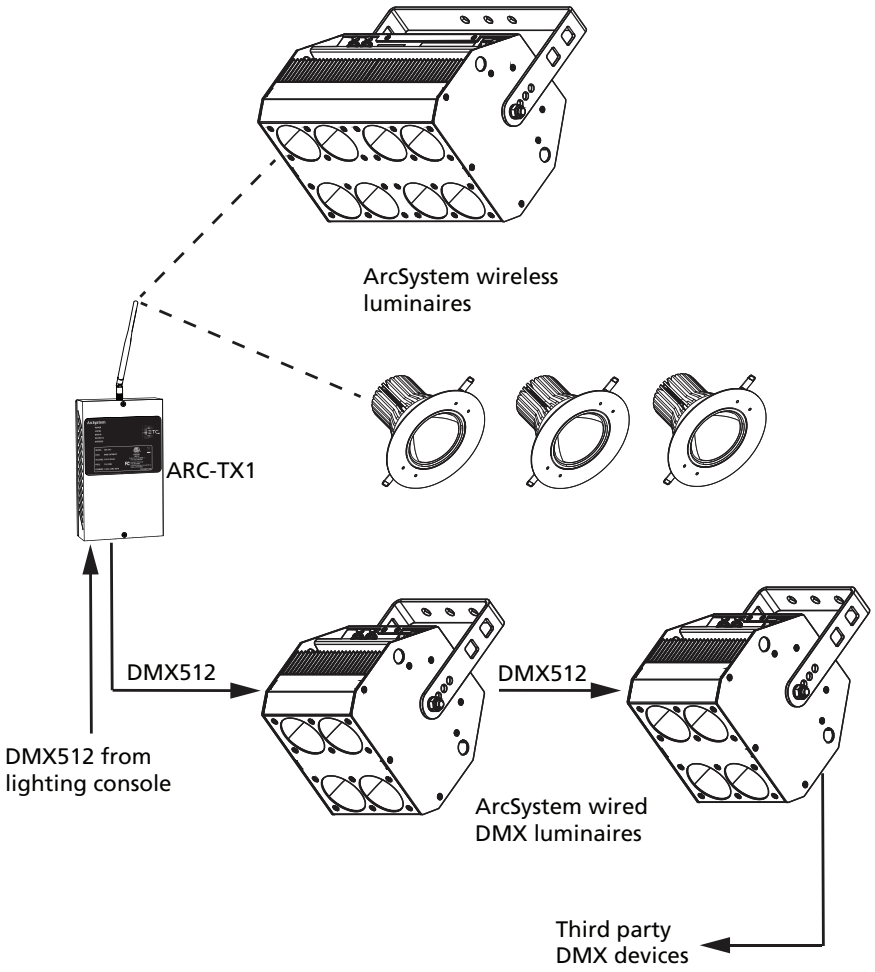
ArcSystem can be installed and controlled over the wireless ArcMesh protocol, hard wired DMX, or a hybrid of the two, making it a great solution for both new construction and retrofit situations.

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

For wired DMX installation, each luminaire can be addressed to any one of the 512 DMX addresses up to the maximum device limit of 32 devices on each DMX line. For wireless DMX installation, there are up to 64 control channels available. See *TX1 Installation on page 47*.

Channels can be grouped and programmed into presets per the needs of your space. Groups and presets can be recalled through a lighting console or other devices.

Both wired and wireless products can be used within a single system. The following graphic shows an example of how a system with wired luminaires, wireless luminaires, and a transmitter may be installed.



Note: *By default the TX1 DMX output is disabled. If you require DMX output from the TX1, you must use the ArcSystem comissioning tool software to add DMX fixtures.*

Commissioning a Wireless ArcSystem

Initial programming of a wireless ArcSystem requires a USB commissioning tool (ARC-CT), and existing hardware such as a laptop or desk top computer that is connected to ArcSystem. This programming will be carried out by an ETC certified technician at the time of system commissioning and training.

The following is a list of procedures included in the configuration process:

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

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 ArcSystem 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.

WARNING: Disconnect the fixture from power and DMX and allow it to cool before performing any cleaning and maintenance.

AVERTISSEMENT : Débrancher la lampe de son alimentation et du DMX et la laisser refroidir avant d'effectuer un nettoyage ou un entretien.

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.

CAUTION: *Check for excessive dust or debris in the heat-dissipating fins around the entire luminaire enclosure. Clean using compressed air or a soft cloth. Keeping the components of the enclosure clean facilitates efficient cooling and extends LED longevity.*

NEVER spray liquids into the luminaire.

NEVER spray compressed air into a luminaire that is powered-up.

Note: *The light source(s) contained within ArcSystem luminaires shall only be replaced by the manufacturer or his service agent or a similar qualified person.*

A can of compressed air or oil-free air from an air compressor set at a low setting can be used to blow through the vent holes and remove dust or other debris. Dust buildup can cause overheating and premature shutdown.

All components can be cleaned using compressed, oil-free air as described above or a clean micro-fiber cloth. The use of any liquid cleaning solution is not recommended.

Inspect all mounting hardware for wear and, if necessary, clean using compressed, oil-free air or a soft, lint-free cloth.

Fuses

Some ArcSystem luminaires have a user-serviceable fuse located in the power switch. Consult the table below for your luminaire type. All emergency luminaires, 100–277 V luminaires, and luminaire types that are not listed do not have user-serviceable fuses.

Voltage	Luminaire	Fuse Quantity	Fuse
100–240 V	Pro Two-Cell	1	3.150 A, 250 V, class T 5x20 mm
	Pro Four-Cell Square		
	Pro Four-Cell Linear		
	Pro Four-Cell Round		
	Pro Eight-Cell		

Troubleshooting

ArcSystem multi-cell luminaires have DMX LEDs that indicate the status of the processor and DMX communication.

DMX Link LED

- 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 operation): DMX is present

DMX Status LED

- 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.

Emergency Operation and Test

It is important to test ArcSystem 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 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.*

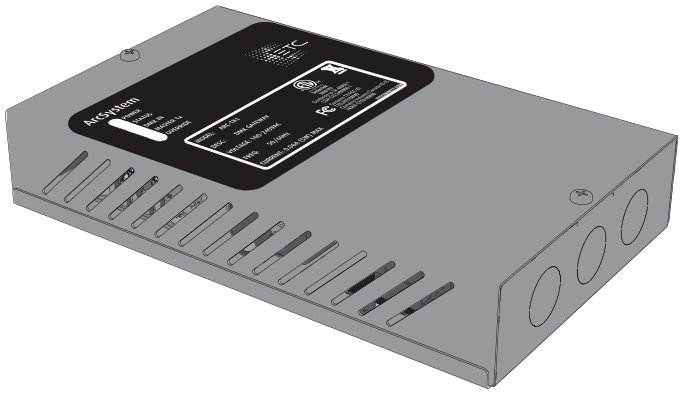
ATTENTION : *Cet équipement possède plus d'une source d'alimentation. Pour réduire les risques de décharge électrique, débrancher les sources d'alimentation normale et de secours dans l'unité avant de faire l'entretien d'un équipement branché à cette unité.*

Test the ArcSystem 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 A

TX1 Installation



WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Before you begin pulling and terminating wire to the ArcSystem 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 ArcSystem 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: 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 beginning your system installation.*

Preparing for 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:

- ½ in conduit and conduit fittings
- Phillips head screw driver
- 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 *DMX (Belden 9729) Cable Preparation on page 51*.	

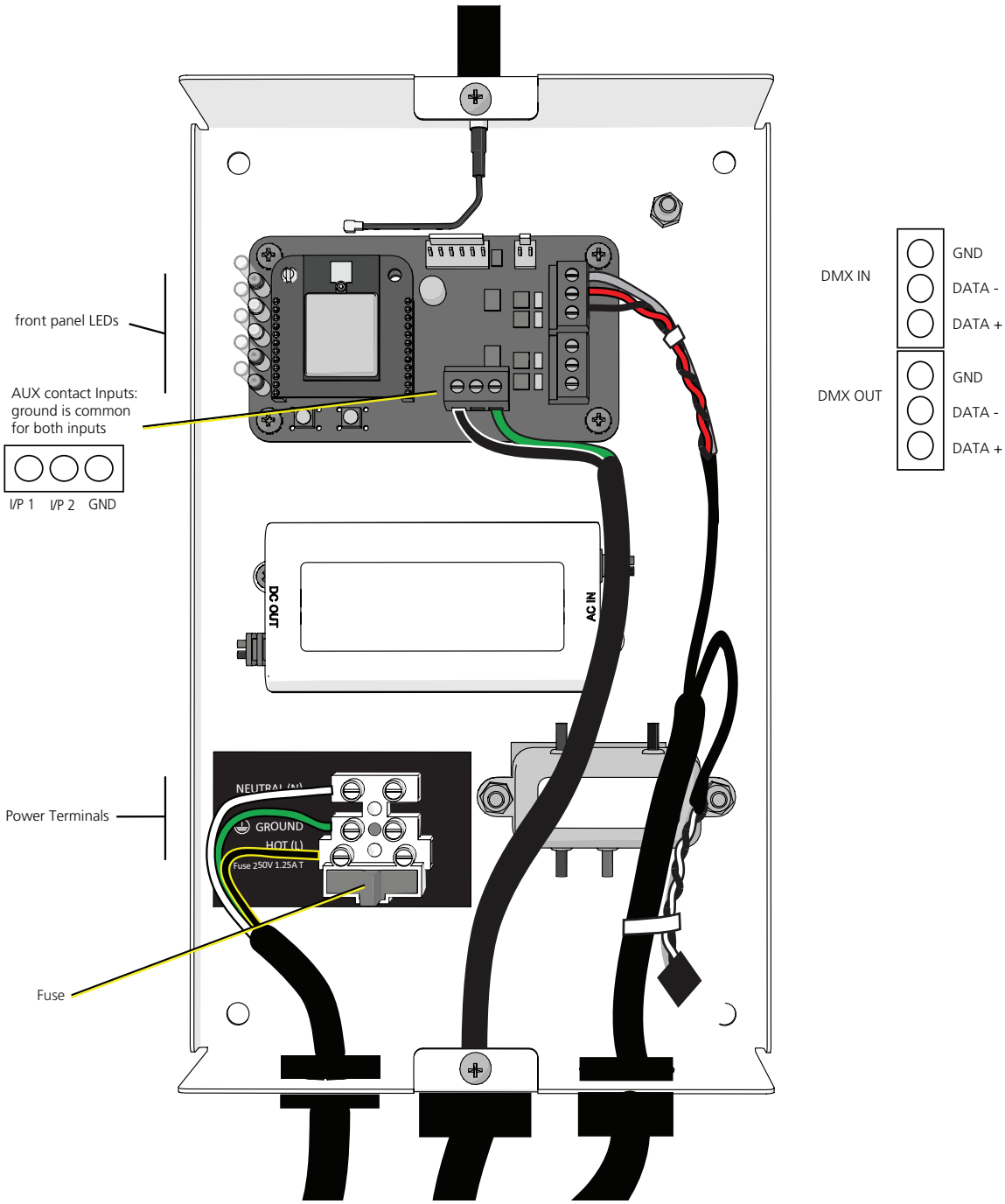
Mounting

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



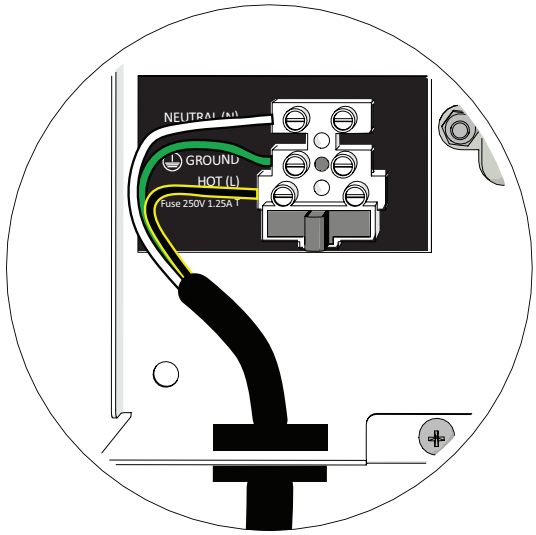
Power

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: *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 48* 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

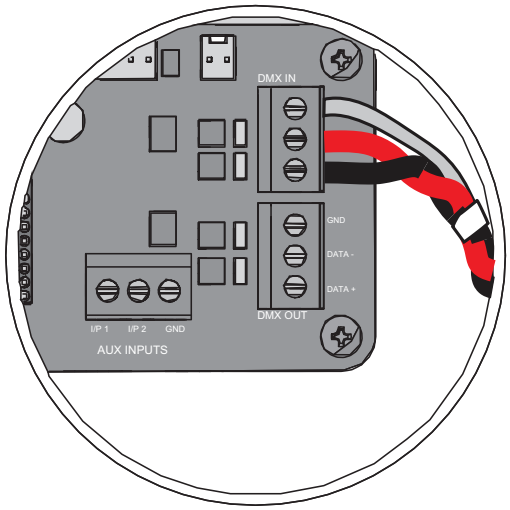
DMX In and DMX Out cables terminate to terminal connections on the TX1 Transmitter board. Wire preparation and installation is the same for both In and Out.

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 487 m (1600 ft) between the control source and the TX1 Transmitter.*

On board DMX In and Out terminal connections

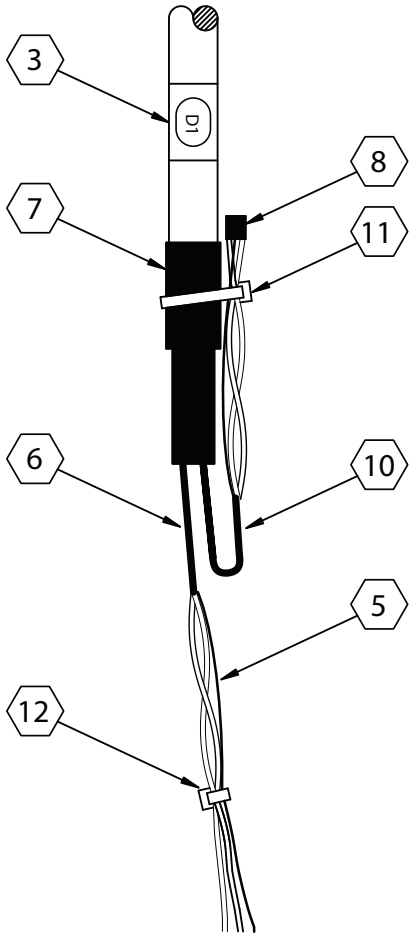
Pin	Description
1	common/ground (GND)
2	Data -
3	Data +



Detail of TX1 Transmitter with DMX IN connected

DMX (Belden 9729) Cable Preparation

1. Cut cable (if necessary), leaving an 20 cm (8 in) tail extending from the edge of the box.
2. Strip 18 cm (7 in) of the outer jacket off.
3. Label the cable with the data type and run designation. (DMX1, DMX2, etc.)
4. Strip the foil shielding from each wire set back to within 6 mm (1/4 in) of the outer jacket.
5. Untwist the shield wire from each pair and apply a piece of 2 mm (1/16 in) clear heat shrink to each shield wire.
6. Twist each shield wire back onto its data pair, then apply a 38 mm (1.5 in) piece of 5 mm (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 50 mm (2 in) of the 10 mm (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 25 mm (1 in) of 5 mm (3/16 in) heat shrink centered over the end of the wires.
9. Strip 5 mm (3/16 in) of insulation off all of the wires to be used.



Note: *In the case of two wires landing at the same terminal, strip both wires to 19 mm (3/4 in), twist them together tightly and then trim them to 5 mm (3/16 in).*

10. Bend back the unused set of wires.
11. Secure the unused wires to the cable with a wire tie.
12. Secure the terminated wire set(s) together with a wire tie 50 mm (2 in) from the termination point.

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.*

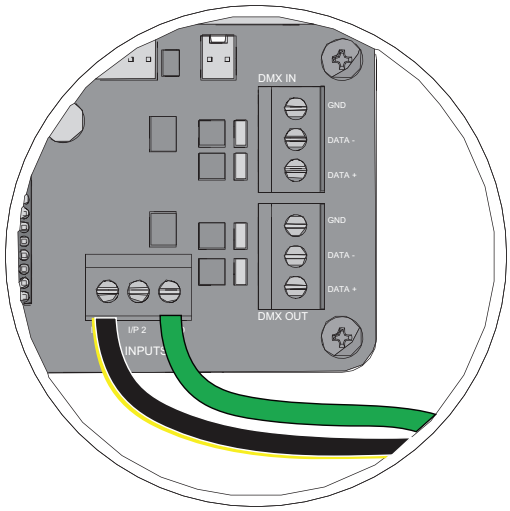
Auxiliary Input

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 48* 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 above*.

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: 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.

Fuses

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

Corporate Headquarters Middleton, WI, USA +1 608 831 4116 **London, UK** +44 (0)20 8896 1000
Holzkirchen, DE +49 (80 24) 47 00-0 **Rome, IT** +39 (06) 32 111 683 **Hong Kong** +852 2799 1220 **Paris, FR** +33 1 4243 3535
Web etcconnect.com **Support** support.etcconnect.com **Contact** etcconnect.com/contactETC

7490M2100 Rev G Released 2019-11