

# Tetra® miniMAX MS

## LED Lighting System

(GEMS71-1, GEMS50-1, GEMS41-1, GEMS32-1, GEMSRD-1, GEMSBL-1, GEMSGL-1)



### BEFORE YOU BEGIN

Read these instructions completely and carefully.

#### ⚠ WARNING/AVERTISSEMENT

##### RISK OF ELECTRIC SHOCK

- Turn power off before inspection, installation or removal.
- Properly ground Tetra® power supply enclosure.

##### RISK OF FIRE

- Use only UL approved wire for input/output connections. Minimum size 18 AWG (0.82mm<sup>2</sup>)
- Follow all NEC and local codes.

##### RISQUES DE DÉCHARGES ÉLECTRIQUES

- Coupez l'alimentation avant l'inspection, l'installation ou le déplacement.
- Assurez-vous de correctement mettre à terre l'alimentation électrique Tetra®.

##### RISQUES D'INCENDIE

- N'utilisez que des fils approuvés par UL pour les entrées/sorties de connexion. Taille minimum 18 AWG (0.82mm<sup>2</sup>)
- Respectez tous les codes NEC et codes locaux.

### Save These Instructions

Use only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer.

This device complies 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. 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.

### Prepare Electrical Wiring



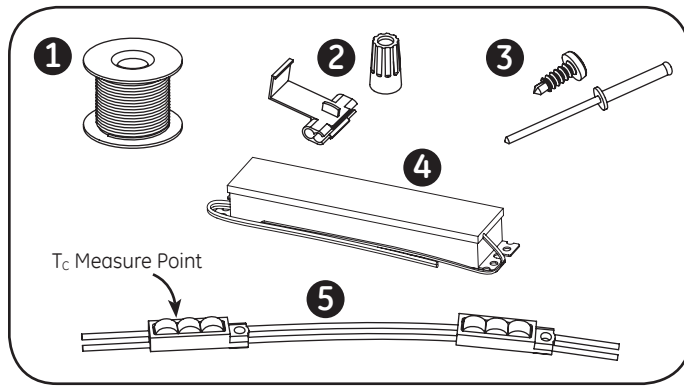
#### Electrical Requirements

- Do not use in wet locations.
- The grounding and bonding of the LED Driver shall be done in accordance with National Electric Code (NEC) Article 600.
- Follow all National Electric Codes (NEC) and local codes.



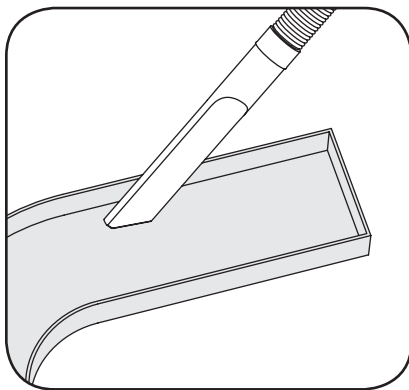
imagination at work

## Components

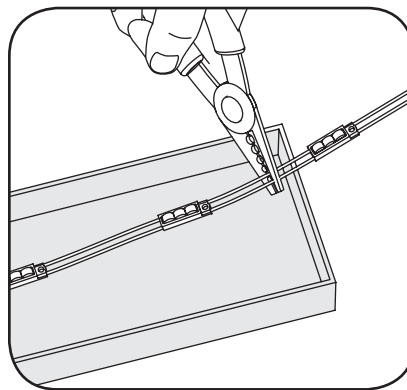


- 1 UL approved 18 AWG (0.82 mm<sup>2</sup>) supply wire
- 2 UL approved 22-14 AWG (0.33-2.08 mm<sup>2</sup>) wire connectors or 22-18 AWG (0.33-0.82 mm<sup>2</sup>) in-line/IDC connectors
- 3 #6 or #8 (M3 or M4) screws, 1/8 inch (3.2 mm) rivets, or electronic grade silicone or equivalent
- 4 Tetra® 12 Volt Power Supply
- 5 Tetra® miniMAX MS LED modules

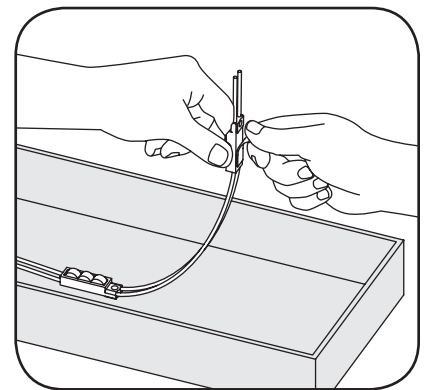
## Layout Modules



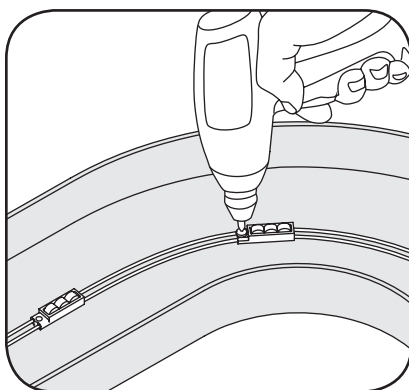
- 1 Clean & remove all debris from the inside of the channel letter before you begin.



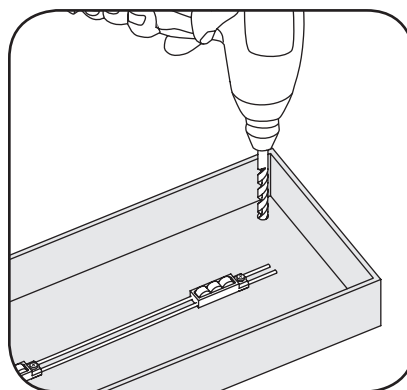
- 2 Measure and cut Tetra LED strip to the appropriate length for each letter. Cuts can be made between any of the modules.



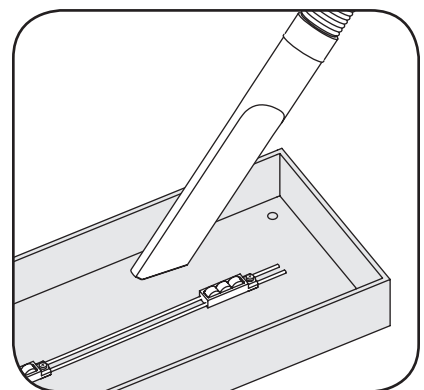
- 3 Remove tape backing and stick LED modules into place. Continue until you have reached the end of the strip.



- 4 Use rivets, screws, or silicone to secure at least every fifth LED module within the channel letter. Use #6 (M3) or #8 (M4) pan headed metal screws, 1/8-inch (3.2 mm) rivets, or silicone.



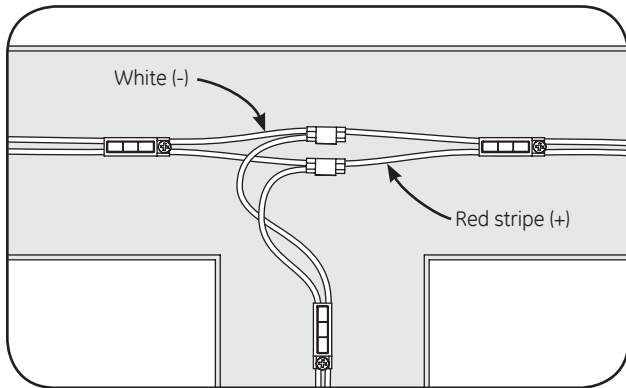
- 5 Drill a 1/4-inch (6.4 mm) hole near the LED strip and grommet the hole for supply wire access.



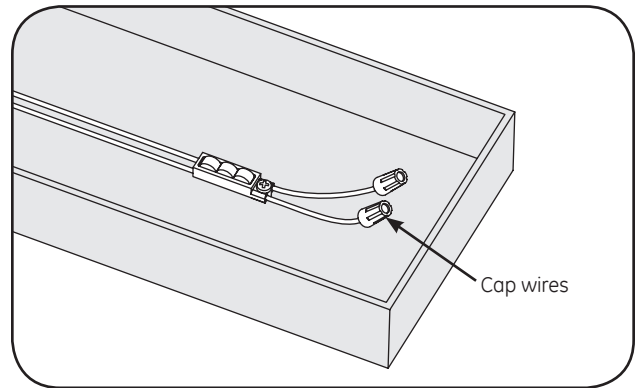
- 6 Clean and remove all debris from the inside of the channel letter. Replace sign face.

**NOTE:** For halo-lit applications LED modules should be mounted on UL recognized clear acrylic or polycarbonate. The light output from the LED system should be directed back into the sign enclosure. This will allow for uniform backlighting of the sign and will provide simple mounting and protection against moisture.

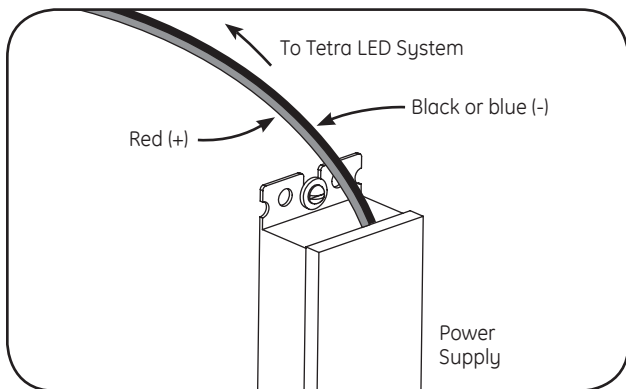
## Electrical Connections



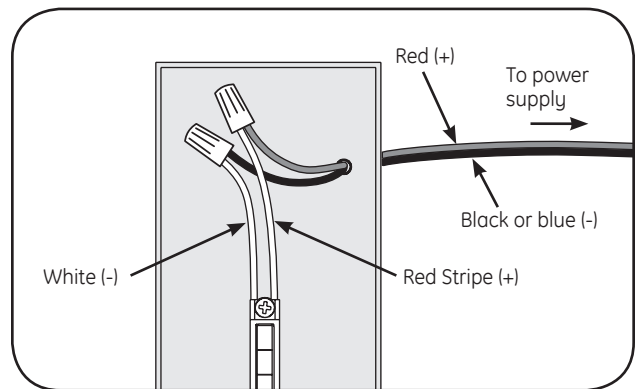
- 1 Connect LED strips using in-line (IDC) connectors or twist-on wire connectors.



- 2 Must cap all exposed wires with appropriate wire connectors or electrical grade silicone or equivalent.



- 3 Run a wire from the Power Supply to each channel letter and connect to the first LED module on the strip.  
Must be used with **Tetra® 12 Volt Power Supplies**.



- 4 Connect the red stripe wire (+) of the LED strip to the red wire (+) of the power supply. Connect the white wire (-) of the LED strip to the black or blue wire (-) of the power supply.

**NOTE:** All electrical connections should be made within the letter.

## Retrofit Instructions

1. **(Existing Signs Only)** Prior to installation, survey the site for information regarding power and accessibility inside and outside the building. Ensure that the branch circuit supplying the existing transformer or ballast will be within the voltage ratings of the new LED power supply, and have a current rating not exceeding 20A, or that permitted by applicable local, state, or country electrical codes (whichever is less).
2. **(Existing Signs Only)** Remove the existing lighting equipment to be replaced, such as neon tubing or fluorescent tubes; and associated transformers and ballasts. Care should be taken not to break the existing neon or fluorescent tubes.  
**NOTE:** Follow all federal and local regulations when disposing of neon tubing, fluorescent tubes, transformers and ballasts.
3. **(Existing Signs Only)** If removal of the existing lighting equipment eliminates the disconnect switch, as required by applicable local, state, or country electrical codes; a new disconnect switch must be installed.
4. **(Existing Signs Only)** Make sure the removal of lighting equipment does not compromise the integrity of the sign body (i.e. water intrusion). Fill in all holes 0.5 in. (13 mm) or smaller with the appropriate amount of rated caulk or sealant. For holes greater than 0.5 in. (13 mm), use an aluminum or zinc coated steel patch with rivets and sealant.
5. **(Existing Signs Only)** A clean and dry mounting surface ensures optimum adhesion if the self-adhesive method of mounting is chosen. Follow the manufacturer's directions when using a non-oil based solvent, such as rubbing alcohol to clean the surface area where you intend to mount the module. Before installing, ensure the surface is dry.
6. Using the layout guidelines above, determine required number of LED modules required to illuminate the sign.
7. A Tetra® 12VDC Class 2 Power Supply, as listed below, must be used with this retrofit kit. Using the Maximum Loading chart below, determine the number of Tetra® Class 2 Power Supplies required to power the number of LED modules required to illuminate the sign, so as not to overload the Tetra® Class 2 Power Supply chosen.
8. Follow the instructions above to properly mount the LED modules.
9. Connect the DC output of the power supply to the LED modules using the Electrical Connections instructions above.
10. Connect the power unit to the supply in accordance with the applicable local, state, and country electrical codes, and the instructions found in the power supply installation guide.
11. If required, the disconnect switch shall be installed by qualified personnel, in accordance with applicable local, state, and country electrical codes.

# Troubleshooting

| Symptom                                 | Solution  |
|---|---|
| All letters are OFF                     | <ul style="list-style-type: none"> <li>• Check AC input connection and/or check circuit breaker.</li> <li>• Check wire connection(s) at the Tetra® LED System and power supply for improper termination(s) or short circuits. Properly terminate or replace the wire connection(s).</li> <li>• Check that connections are the red striped wire (+) of the LED strip to the red wire (+) of the power supply and the white wire (-) of the LED strip to the black or blue wire (-) of the power supply.</li> </ul> |
| Some LEDs appear dim                    | <ul style="list-style-type: none"> <li>• Ensure the overall length of the Tetra® LED System does not exceed the maximum load.</li> <li>• Ensure the length of supply wire is equal to or below the recommended remote mounting distance.</li> </ul>   |
| Some of the letters are not illuminated | <ul style="list-style-type: none"> <li>• Check wire connection(s) at the Tetra® LED System and power supply for improper termination(s) or short circuits. Properly terminate or replace the wire connection(s).</li> <li>• Check that connections are the red striped wire (+) of the LED strip to the red wire (+) of the power supply and the white wire (-) of the LED strip to the black or blue wire (-) of the power supply.</li> </ul>  |
| Shadows                                 | <ul style="list-style-type: none"> <li>• Re-route supply wire and secure to the back of the can with silicone. Adjust wire connector orientation so that it does not cover any LEDs.</li> <li>• Adjust LED layout to ensure uniformity of illumination on the face of the letter.</li> </ul>  |

## Tips

- Tetra® LED systems are rated for damp location use by UL, and should be protected from direct exposure to moisture (i.e., rain & snow).
- For optimal light uniformity in halo-lit applications the Tetra® LED modules should be mounted on UL recognized plastic and the light output from the Tetra® LED system should be directed back into the sign enclosure. This will allow for uniform backlighting of the sign and will provide simple mounting for the Tetra® LED system.
- When mounting LED modules for halo-lit applications the clear acrylic should be recessed into the body of the sign or a bead of silicone should be applied to provide a barrier against the elements.
- A best practice for the supply wire at the point at which it is brought into the sign is to have a drip loop on the inside of the letter to keep water from collecting on the Tetra® LED strip.

## Specifications

### Maximum Loading per Tetra 12 VDC Power Supply

| SKU  | Rating                              | 20W Power Supply<br><i>Note: Load shall not exceed 1.6A</i> | 60W Power Supply<br><i>Note: Load shall not exceed 5A</i> | 180W Power Supply<br><i>Note: Load shall not exceed 5A per each (of 3) output channels</i>              |
|--|-------------------------------------|---|---|---|
| GEMS71-1, GEMS50-1,<br>GEMS41-1, GEMS32-1,<br>GEMSRD-1, GEMSBL-1 | 12VDC, 32mA/module<br>0.384W/module | 50 modules/20 ft. (6.10 m)                                  | 150 modules/60 ft. (18.29 m)                              | 150 modules/60 ft. (18.29 m)<br>per output channel<br>450 modules/180 ft. (54.88 m)<br>per power supply |
| GEMSGL-1   | 12VDC, 26mA/module<br>0.312W/module |   |   |   |

### Maximum Remote Mounting Distance

|                   | 18 AWG/0.82 mm <sup>2</sup><br>Supply Wire | 16 AWG/0.82 mm <sup>2</sup><br>Supply Wire | 14 AWG/0.82 mm <sup>2</sup><br>Supply Wire | 12 AWG/0.82 mm <sup>2</sup><br>Supply Wire |
|-------------------|--|--|--|--|
| 20W Power Supply  | 120 ft./36.6 m                             | -  | -  | -  |
| 60W Power Supply  | 30 ft./9.1 m                               | 50 ft./15.2 m                              | 80 ft./24.4 m                              | 120 ft./36.6 m                             |
| 180W Power Supply | 30 ft./9.1 m                               | 50 ft./15.2 m                              | 80 ft./24.4 m                              | 120 ft./36.6 m                             |

**NOTE:** For linear runs longer than 40ft, center connection to the LED strip is recommended to minimize voltage drop.

This product is intended solely for the use of non-residential signage lighting and is not intended for use in any other applications.

For Dry, Damp or Wet Locations; IP66; Separate Enclosure Required for Outdoor Use.

Conforms to the following standards:



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