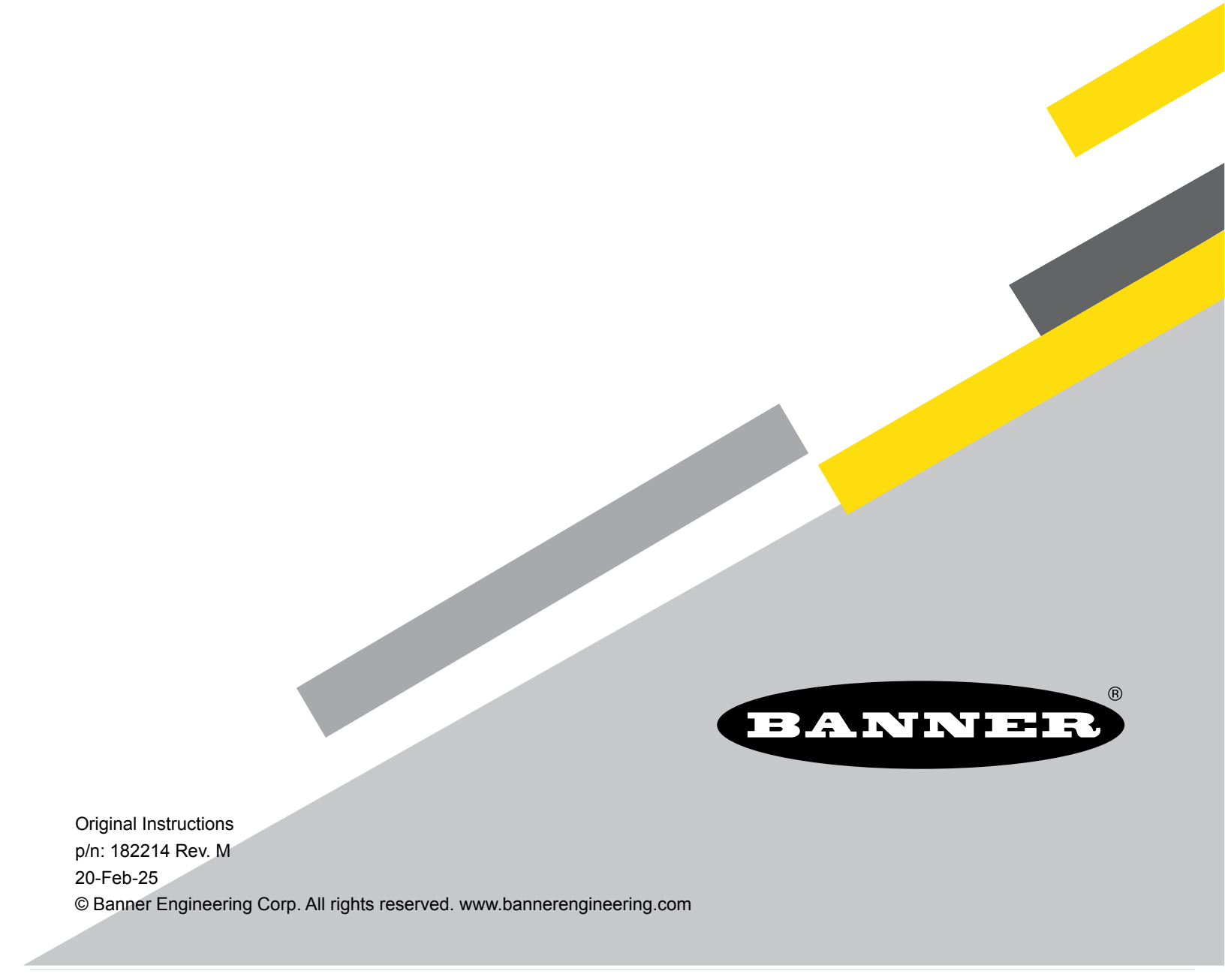
# TL70 Modular Tower Light Product Manual



Original Instructions
p/n: 182214 Rev. M
20-Feb-25
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ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

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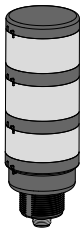
# Chapter 1 Features



Banner's TL70 Tower Light is a 70 mm, modular LED indicator with extremely bright and uniform light. The modularity gives the user flexibility to customize tower lights as needed and change positions in the field. The TL70 is also available preassembled for easy installation.

- Light segments have user-selectable solid ON or flashing
- Up to six colors, or five colors plus audible, in one device
- Rugged, water-resistant IP65 housing with UV-stabilized material
- Bright, uniform indicator segments appear gray when off to eliminate false indications from ambient light
- Several connection options to choose from, including M12 quick-disconnect connector, cabled, and terminal-wired

## Models

*TL70 Base Model Key*

| Housing | — | Connection[1] | Housing Color |
|---|---|---|---|
| **B-TL70** | — | **Q5** | |
| Base Segment | | 5 = 2 m (6.5 ft) unterminated 5-wire PVC-jacketed cable<br>8 = 2 m (6.5 ft) unterminated 8-wire PVC-jacketed cable<br>T = Terminal block<br>Q5 = Integral 5-pin M12 male quick-disconnect connector<br>Q8 = Integral 8-pin M12 male quick-disconnect connector<br>QP5 = 150 mm (6 in) PVC-jacketed cable with a 5-pin M12 male quick-disconnect connector<br>QP8 = 150 mm (6 in) PVC-jacketed cable with an 8-pin M12 male quick-disconnect connector | Blank = Black<br>C = Gray |

*TL70 Segments Model Key*

| Housing | — | Color/Alarm | Housing Color |
|---|---|---|---|
| **SG-TL70** | — | **R** | |

Continued on page 4

[1] Models with a quick-disconnect connector require a mating cordset.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Continued from page 3

| Housing | — | Color/Alarm | Housing Color |
|---|---|---|---|
| TL70 Segment | | G = Green<br>Y = Yellow<br>R = Red<br>B = Blue<br>W = White<br>O = Orange<br>A = Standard Audible<br>AL = Loud Audible<br>ALM = Loud Multi-tone Audible<br>AP = Programmable Audible | Blank = Black<br>C = Gray |

Select the 5-pin base for tower light configurations of up to 4 modules. Select the 8-pin base for tower light configurations of up to 6 modules.

- Example base model number: B-TL70-Q5
- Example light segment model number: SG-TL70-G
- Example audible segment model number: SG-TL70-A

*TL70 Pre-Assembled Model Key*

| Housing | Color/Position | | | | | | Audible Alarm[2] | Housing Color | Connection[3] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | | |
| TL70 | W | B | G | Y | R | O | | | Q |
| | Blank = None<br>G = Green<br>Y = Yellow<br>R = Red<br>B = Blue<br>W = White<br>O = Orange | | | | | | Blank = None<br>A = Standard Audible<br>AL = Loud Audible<br>AP = Programmable Audible | Blank = Black<br>C = Gray | Blank = 2 m (6.5 ft) unterminated PVC-jacketed cable<br>T = Terminal block<br>Q = Integral M12 male quick-disconnect connector<br>QP = 150 mm (6 in) PVC-jacketed cable with a M12 male quick-disconnect connector |

- Example pre-assembled model number: TL70GYRAQ.

[2] Not available with six-light models.
[3] Models with a quick-disconnect connector require a mating cordset.


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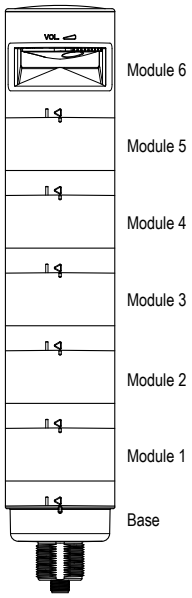
# Chapter 2 Configuring the Modules




Turn on the appropriate DIP switch to set the order of the components, counting up from the tower light's base.




| Assembly Options | | DIP Switches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Light and Standard Audible Components | Module 1 | ON | | | | | | | |
| | Module 2 | | ON | | | | | | |
| | Module 3 | | | ON | | | | | |
| | Module 4 | | | | ON | | | | |
| | Module 5 | | | | | ON | | | |
| | Module 6 | | | | | | ON | | |
| Light and Module Flash Rate | 3 Hz | | | | | | | ON | OF |
| | 1.5 Hz | | | | | | | ON | ON |
| | Solid On* | | | | | | | OFF | OFF |
| Standard Audible Module Settings | Pulse 1.5 Hz | | | | | | | ON | OFF |
| | Chirp Alarm | | | | | | | ON | ON |
| | Siren Alarm | | | | | | | OFF | ON |
| | Continuous Alarm* | | | | | | | OFF | OFF |

| Assembly Options | | DIP Switches | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Loud Audible Module Settings | Pulse 1.5 Hz | | | | | | | ON | OFF | | |
| | Chirp Alarm | | | | | | | ON | ON | | |
| | Siren Alarm | | | | | | | OFF | ON | | |
| | Continuous Alarm* | | | | | | | OFF | OFF | | |
| | Low Intensity* | | | | | | | | | OFF | OFF |
| | Med. Intensity | | | | | | | | | ON | OFF |
| | Med./Loud Intensity | | | | | | | | | OFF | ON |
| | Loud Intensity | | | | | | | | | ON | ON |

* Factory default setting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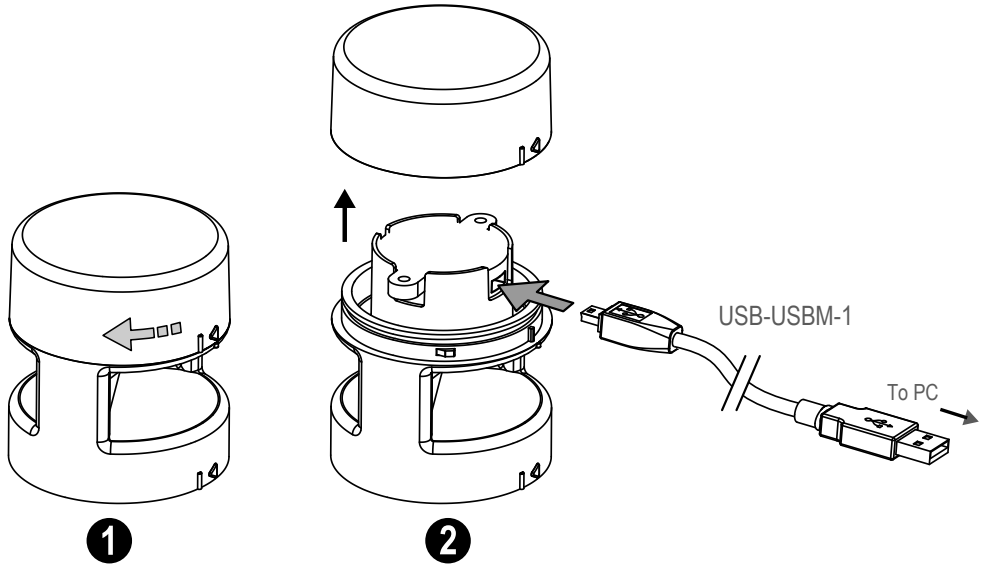
# Programming the Audible Tower Module




### Loading Files into the SG-TL70-AP

The SG-TL7-AP has 4MB of on-board flash memory and can playback any WAV or MP3 audio file that is 4MB or smaller. If the file is too large, a program such as Audacity can be used to compress or shorten the file to decrease the size.

Multiple files can be loaded onto the SG-TL70-AP. Files playback according to the file name in alpha-numeric order.

> **NOTE:** Add a number to the beginning of the file name to create the order in which the files run. Files play consecutively without any pause.

To program the module:

1. Remove the module top cover by rotating counterclockwise.
2. Connect the programming cable (USB-USBM-1) from the PC's USB connection to the USB mini-connection of the audible module.
   The SG-TL70-AP is recognized by the PC as a USB flash drive. The default drivers for a USB drive are assigned to the device, as well as a unique disk drive letter assignment (such as D:).
3. Drag-and-drop the audio files that are saved on the PC to the USB drive location.
4. Assign numbers to each file to designate their playback order, otherwise files playback in alpha-numeric order.
5. Remove the cable from the audio module.
6. Re-install the top cover by aligning the protruding alignment marks and turning clockwise.
7. The audible module is now ready for use with a compatible TL70 DC Base or Universal Voltage AC Base.

When the selected Input Channel is activated, the audible module begins playing the files in sequential order.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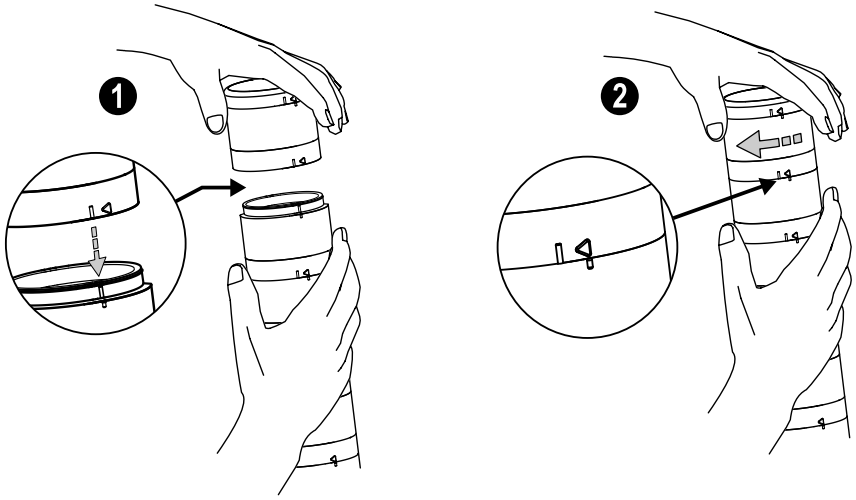
# Assembling the Modules




To assemble the modules:

1. Align the notches on each module and press together.
2. Rotate the top module clockwise to lock into place (notches shown in the locked position).

**NOTE:** DIP switches should remain in the default off position.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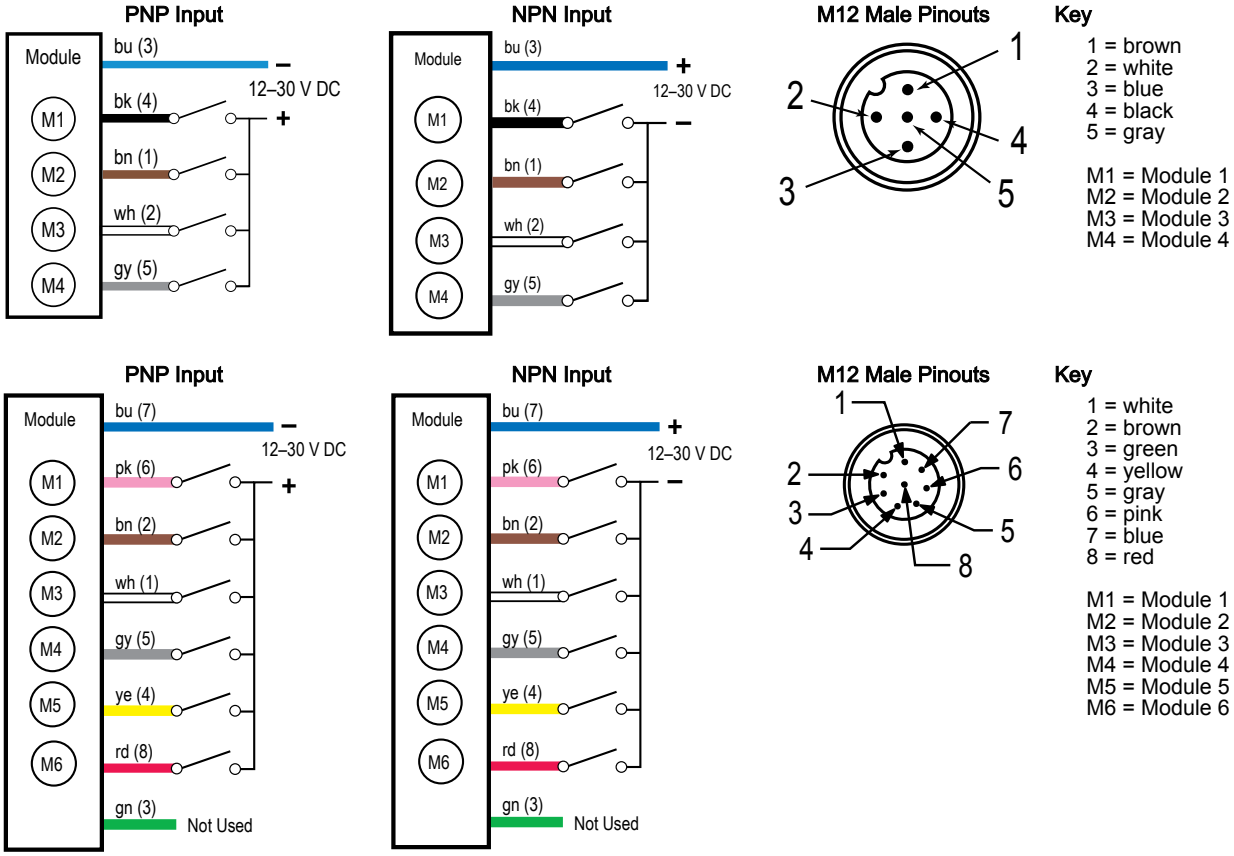
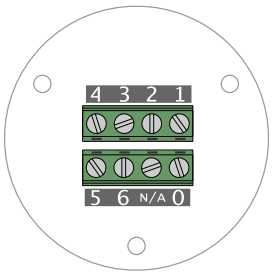
# Chapter 3 Wiring Diagrams




**NOTE:** Models SG-TL70-ALM and SG-TL70-ALMC are not compatible with NPN input wiring.

**Wiring Terminal Block**




**Terminal Block Key**

0 = DC common
1 = Module 1
2 = Module 2
3 = Module 3
4 = Module 4
5 = Module 5
6 = Module 6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# Chapter 4 Specifications

### Supply Voltage and Current

12 V DC to 30 V DC

| Indicator Color or Audible Model | Maximum Current (mA) | | |
|---|---|---|---|
| | at 12 V DC | at 24 V DC | at 30 V DC |
| Blue, Green, White | 420 | 200 | 150 |
| Red, Yellow, Orange | 285 | 145 | 120 |
| Standard Audible | 30 | 30 | 30 |
| Loud Audible (Intensity 1) | 30 | 28 | 25 |
| Loud Audible (Intensity 2) | 50 | 45 | 40 |
| Loud Audible (Intensity 3) | 165 | 90 | 75 |
| Loud Audible (Intensity 4) | 350 | 160 | 120 |
| Programmable Audible | 290 | 140 | 125 |

### Supply Protection Circuitry

Protected against transient voltages

### Indicators

1 to 6 colors depending on model (Green, Red, Yellow, Blue, White, and Orange)

LEDs are independently selected

**Flash Rates:** 1.5 Hz ±10% and 3 Hz ±10%

### Indicator Response Time

**Off Response:** 150 µs (maximum) at 12 V DC to 30 V DC

**On Response:** 180 ms (maximum) at 12 V DC; 50 ms (maximum) at 30 V DC

### Indicator Characteristics

| Color | Dominant Wavelength (nm) or Color Temperature (CCT) | Color Coordinates[4] | | Lumen Output (Typical at 25 °C) |
|---|---|---|---|---|
| | | x | y | |
| Green | 525 nm | – | – | 92 |
| Red | 625 nm | – | – | 40 |
| Yellow | 590 nm | – | – | 22 |
| Blue | 470 nm | – | – | 32 |
| White | 5000 K | – | – | 125 |
| Orange | – | 0.66 | 0.33 | 33 |

### Connections

Integral 5-pin M12 male quick-disconnect connector, 8-pin M12 male quick-disconnect connector, 150 mm (5.9 in) PVC cable with an M12 male quick-disconnect connector, terminal block, or 2 m (6.5 ft) unterminated cable, depending on model

[4] Refer to CIE 1931 chromaticity diagram or color chart, to show equivalent color with indicated color coordinates.

### Terminal Block Models

14 to 28 AWG wire

### Operating Conditions

–40 °C to +50 °C (–40 °F to +122 °F)

95% at +50 °C maximum relative humidity (non-condensing)

### Environmental Rating

IP65

### Audible Alarm

**Standard Audible:** 2.6 kHz ± 250 Hz oscillation frequency; maximum intensity (typical) 98 dB at 1 m (3.3 ft)

**Loud Audible:** 2.6 kHz ± 250 Hz oscillation frequency; maximum intensity (typical) at 1 m (3.3 ft) (see table)

| DIP Switches | | Maximum Intensity (typical) at 1 meter dB |
|---|---|---|
| 9 | 10 | |
| ON | ON | Intensity 4: 109 dB |
| OFF | ON | Intensity 3: 106 dB |
| ON | OFF | Intensity 2: 101 dB |
| OFF | OFF | Intensity 1: 94 dB |

### Audible Adjustment

**Standard Audible:** Rotate the cover until the desired volume is reached

**Loud Audible Alarm:** Select the desired volume using DIP switches 9 and 10

**Typical Reduction in Sound Intensity with Audible Adjustment (maximum to minimum):**

- **Standard Audible:** 8 dB
- **Loud Audible:** 15 dB

### Construction

**Bases, Segments, Covers:** polycarbonate

### Vibration and Mechanical Shock

Vibration: 10 Hz to 55 Hz, 0.5 mm peak-to-peak amplitude per IEC 60068-2-6

Shock: 15G 11 ms duration, half sine wave per IEC 60068-2-27

### Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Turck Banner LTD Blenheim House
Blenheim Court
Wickford, Essex SS11 8YT
GREAT BRITAIN


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### Required Overcurrent Protection

**WARNING:** Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

| Supply Wiring (AWG) | Required Overcurrent Protection (A) | Supply Wiring (AWG) | Required Overcurrent Protection (A) |
|---|---|---|---|
| 20 | 5.0 | 26 | 1.0 |
| 22 | 3.0 | 28 | 0.8 |
| 24 | 1.0 | 30 | 0.5 |

# FCC Part 15 Class B for Unintentional Radiators

(Part 15.105(b)) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

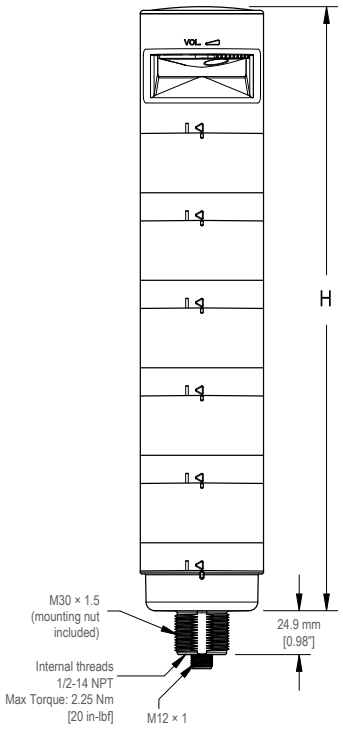
(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

# Industry Canada ICES-003(B)

This device complies with CAN ICES-3 (B)/NMB-3(B). 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.

Cet appareil est conforme à la norme NMB-3(B). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

# Dimensions




| Model | Height (H) |
|---|---|
| 1 light module | 87.6 mm (3.45 in) |
| 1 light module, 1 audible module | 144.3 mm (5.68 in) |
| 2 light modules | 137.3 mm (5.41 in) |
| 2 light modules, 1 audible module | 194 mm (7.64 in) |
| 3 light modules | 187 mm (7.36 in) |
| 3 light modules, 1 audible module | 243.7 mm (9.59 in) |
| 4 light modules | 236.7 mm (9.32 in) |
| 4 light modules, 1 audible module | 293.4 mm (11.55 in) |
| 5 light modules | 286.4 mm (11.28 in) |
| 5 light modules, 1 audible module | 343.1 mm (13.5 in) |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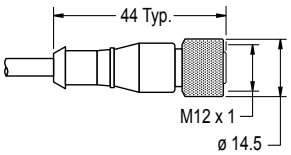
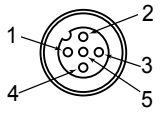
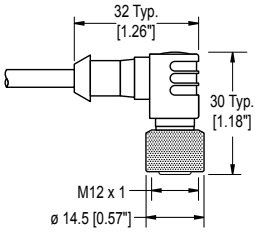
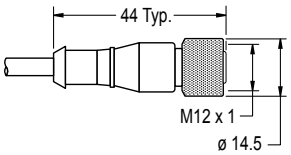
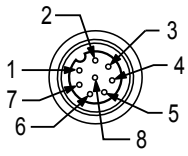
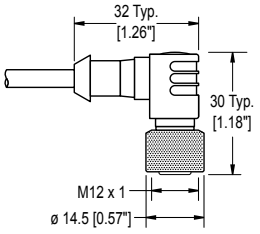
# Chapter 5 Accessories

## Cordsets

| 5-Pin Single-Ended M12 Female Cordsets | | | | |
|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** |
| **MQDC1-501.5** | 0.5 m (1.5 ft) | Straight |  | <br>1 = Brown<br>2 = White<br>3 = Blue<br>4 = Black<br>5 = Gray |
| **MQDC1-503** | 0.9 m (2.9 ft) | | | |
| **MQDC1-506** | 2 m (6.5 ft) | | | |
| **MQDC1-515** | 5 m (16.4 ft) | | | |
| **MQDC1-530** | 9 m (29.5 ft) | | | |
| **MQDC1-560** | 18 m (59 ft) | | | |
| **MQDC1-5100** | 31 m (101.7 ft) | | | |
| **MQDC1-506RA** | 2 m (6.5 ft) | Right-Angle |  | |
| **MQDC1-515RA** | 5 m (16.4 ft) | | | |
| **MQDC1-530RA** | 9 m (29.5 ft) | | | |
| **MQDC1-560RA** | 19 m (62.3 ft) | | | |

| 8-Pin Single-Ended M12 Female Open-Shielded Cordsets | | | | |
|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** |
| **MQDC2S-806** | 2.04 m (6.7 ft) | Straight |  | <br>1 = White<br>2 = Brown<br>3 = Green<br>4 = Yellow<br>5 = Gray<br>6 = Pink<br>7 = Blue<br>8 = Red |
| **MQDC2S-815** | 5.04 m (16.54 ft) | | | |
| **MQDC2S-830** | 10.04 m (32.95 ft) | | | |
| **MQDC2S-850** | 16 m (52.49 ft) | | | |
| **MQDC2S-806RA** | 2 m (6.56 ft) | Right-Angle |  | |
| **MQDC2S-815RA** | 5 m (16.4 ft) | | | |
| **MQDC2S-830RA** | 10 m (32.81 ft) | | | |
| **MQDC2S-850RA** | 16 m (52.49 ft) | | | |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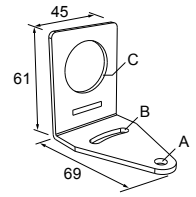
# Mounting Brackets

All measurements are listed in millimeters, unless noted otherwise. The measurements provided are subject to change.

**SMB30A**

- Right-angle bracket with curved slot for versatile orientation
- Clearance for M6 (¼ in) hardware
- Mounting hole for 30 mm sensor
- 12-gauge stainless steel

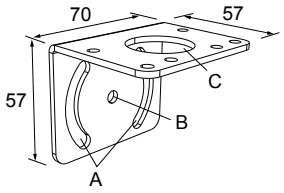
**Hole center spacing:** A to B=40
**Hole size:** A=ø 6.3, B= 27.1 × 6.3, C=ø 30.5




**SMB30MM**

- 12-gauge stainless steel bracket with curved mounting slots for versatile orientation
- Clearance for M6 (¼ in) hardware
- Mounting hole for 30 mm sensor

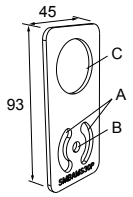
**Hole center spacing:** A = 51, A to B = 25.4
**Hole size:** A = 42.6 × 7, B = ø 6.4, C = ø 30.1




**SMBAMS30P**

- Flat SMBAMS series bracket
- 30 mm hole for mounting sensors
- Articulation slots for 90°+ rotation
- 12-gauge 300 series stainless steel

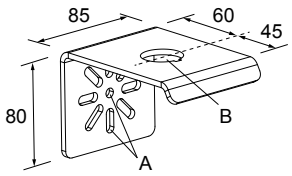
**Hole center spacing:** A=26.0, A to B=13.0
**Hole size:** A=26.8 × 7.0, B=ø 6.5, C=ø 31.0




**SSA-MBK-EEC1**

- Single 30 mm hole
- 8 gauge steel, black finish (powder coat)
- Front surface for customer-applied labels

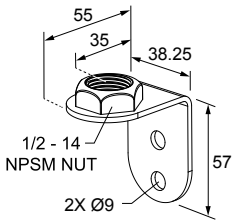
**Hole size:** A = ø 7 , B = ø 30




**LMBE12RA35**

- Direct mounting of stand-off pipe, with common bracket type
- Zinc-plated steel
- 1/2-14 NPSM nut
- Mounting distance from the wall to the center of the 1/2-14 NPSM nut is 35 mm

**Hole center spacing:** 20.0





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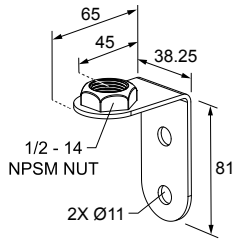
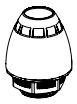
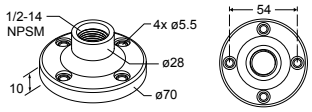
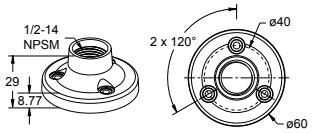
| | |
|---|---|
| **LMBE12RA45**<br>• Direct mounting of stand-off pipe, with common bracket type<br>• Zinc-plated steel<br>• 1/2-14 NPSM nut<br>• Mounting distance from the wall to the center of the 1/2-14 NPSM nut is 45 mm<br>**Hole center spacing:** 35.0 |  |

# Elevated Mount System

| Model | | | Description | Components |
|---|---|---|---|---|
| **SA-M30** - Black Polycarbonate | | | • Streamlined black PC or Gray PC thread cover<br>• Covers the outer M30 threads on the light's base<br>• Mounting hardware included |  |
| **SA-M30C** - Gray Polycarbonate | | | | |
| **Polished 304 Stainless Steel** | **Black Anodized Aluminum** | **Clear Anodized Aluminum** | • Elevated-use stand-off pipe (½ in. NPSM/DN15)<br>• Polished 304 stainless steel, black anodized aluminum, or clear anodized aluminum surface<br>• ½ in. NPT thread at both ends: one end screws into the internal threads of the light's base, and one end screws into the mounting base adapter/ cover<br>• Compatible with most industrial environments |  |
| **SOP-E12-150SS**<br>150 mm (6 in) long | **SOP-E12-150A**<br>150 mm (6 in) long | **SOP-E12-150AC**<br>150 mm (6 in) long | | |
| **SOP-E12-300SS**<br>300 mm (12 in) long | **SOP-E12-300A**<br>300 mm (12 in) long | **SOP-E12-300AC**<br>300 mm (12 in) long | | |
| **SOP-E12-900SS**<br>900 mm (36 in) long | **SOP-E12-900A**<br>900 mm (36 in) long | **SOP-E12-900AC**<br>900 mm (36 in) long | | |
| **SA-E12M30** - Black Acetal | | | • Streamlined black acetal or white UHMW mounting base adapter/cover<br>• Connects between ½ in. NPSM/DN15 pipe and 30 mm (1-3/16 in) drilled hole<br>• Mounting hardware included |  |
| **SA-E12M30C** - White UHMW | | | | |

| Pipe Mounting Flange | | | |
|---|---|---|---|
| **Model** | **Description** | **Construction** | |
| **SA-F12** | • Elevated-use stand-off pipes (½ in, NPSM/DN15)<br>• M5 mounting hardware and nitrile gasket included | Die-cast zinc base with black paint |  |
| **SA-F12-3** | • Elevated-use stand-off pipes (½ in, NPSM/DN15)<br>• M4 mounting hardware and nitrile blend gasket included | Black Polycarbonate |  |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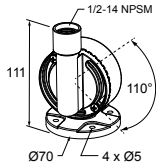
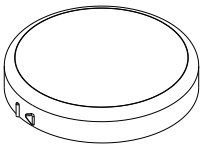
| Foldable Mounting Brackets | | | |
|---|---|---|---|
| **Model** | **Description** | **Construction** | |
| **SA-FFB12** | • For use with 1/2 inch stand-off pipes<br>• Stainless steel hardware | Black polycarbonate |  |
| **SA-FFB12C** | | Gray polycarbonate | |

# LMB Sealed Right-Angle Bracket

| Model | Description | |
|---|---|---|
| **LMB30RA** - Black polycarbonate<br>**LMB30RAC** - Gray polycarbonate | • **Direct-Mount Models**<br>• Bracket kit with base, 30 mm adapter, set screw, fasteners, O-rings, and gaskets. |  |
| **LMBE12RA** - Black polycarbonate<br>**LMBE12RAC** - Gray polycarbonate | • **Pipe-Mount Models**<br>• Bracket kit with base, ½-14 pipe adapter, set screw, fasteners, O-rings, and gaskets<br>• For use with stand-off pipe (listed and sold separately) |  |

# Top Replacement Cover

| | |
|---|---|
| **C-TL70** Replacement Top Cover<br>• Black polycarbonate housing<br>• Fits TL70 tower lights<br>• IP65 rated |  |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# Chapter 6 Product Support and Maintenance

## Clean with Mild Detergent and Water

Wipe down the enclosure and the display with a soft cloth that has been dampened with a mild detergent and warm water solution.

## Repairs

Contact Banner Engineering for troubleshooting of this device. **Do not attempt any repairs to this Banner device; it contains no field-replaceable parts or components.** If the device, device part, or device component is determined to be defective by a Banner Applications Engineer, they will advise you of Banner's RMA (Return Merchandise Authorization) procedure.

> **IMPORTANT:** If instructed to return the device, pack it with care. Damage that occurs in return shipping is not covered by warranty.

## Contact Us

Banner Engineering Corp. headquarters is located at: 9714 Tenth Avenue North | Plymouth, MN 55441, USA | Phone: + 1 888 373 6767

For worldwide locations and local representatives, visit www.bannerengineering.com.

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