Features

The Sure Cross® TL70 Wireless MultiHop Modular Tower Light combines the best of Banner's popular Tower Light family with its reliable, field-proven, Sure Cross wireless MultiHop architecture.



- Available in 900 MHz and 2.4 GHz ISM radio frequencies
- 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
- Two-way communication - light segments can be controlled with the input wires or the client radio

IMPORTANT: Please download the complete TL70 Wireless MultiHop Modular Tower Light technical documentation, available in multiple languages, from www.bannerengineering.com for details on the proper use, applications, Warnings, and installation instructions of this device.

IMPORTANT: Por favor descargue desde www.bannerengineering.com toda la documentación técnica de los TL70 Wireless MultiHop Modular Tower Light, disponibles en múltiples idiomas, para detalles del uso adecuado, aplicaciones, advertencias, y las instrucciones de instalación de estos dispositivos.

IMPORTANT: Veuillez télécharger la documentation technique complète des TL70 Wireless MultiHop Modular Tower Light sur notre site www.bannerengineering.com pour les détails sur leur utilisation correcte, les applications, les notes de sécurité et les instructions de montage.

Models

TL70 Pre-Assembled Models

Model	Radio Frequency	Included modules	Connection
TL70DR9MRYGALQ	900 MHz ISM Band	Red, yellow, green, loud audible	8-pin M12 male quick disconnect

TL70 Base Modules (B-TL70xxx)

Model	Radio Frequency	Connection
B-TL70DR2MQ5	2.4 GHz ISM Band	5-pin M12 male quick disconnect
B-TL70DR2MQ8	2.4 GHz ISM Band	8-pin M12 male quick disconnect
B-TL70DR9MQ5	900 MHz ISM Band	5-pin M12 male quick disconnect
B-TL70DR9MQ8	900 MHz ISM Band	8-pin M12 male quick disconnect

Select the 5-pin base for tower light configurations of up to three segments. Select the 8-pin base for tower light configurations of up to six segments, or when the event counter will be enabled. See "SG-TL70 Tower Light Segment Models" on page 1 for the list of tower light segments that go with this base.

The following models are no longer available for order but are still covered by the information in this document.

- B-TL709M*** or 2M*** (all models not listed above)
- TL70DR2M*** (all models)
- TL70DR9M*** (all models except TL70DR9MRYGALQ)

SG-TL70 Tower Light Segment Models

TL70 Segments (SG-TL70xxx)

Housing	-	Color/Alarm	Housing Color
SG-TL70	**-**	**R**	**C**
SG-TL70		G = Green Y = Yellow R = Red B = Blue W = White O = Orange A = Audible AL = Load audible ALM = Loud, multi-tone audible AP = Programmable audible	Blank = Black C = Gray

Original Instructions
07-May-26

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195287
p/n: 195287 Rev. I

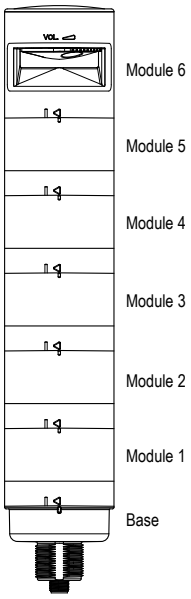
ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

- Example light segment model number: **SG-TL70-G**
- Example audible segment model number: **SG-TL70-A**

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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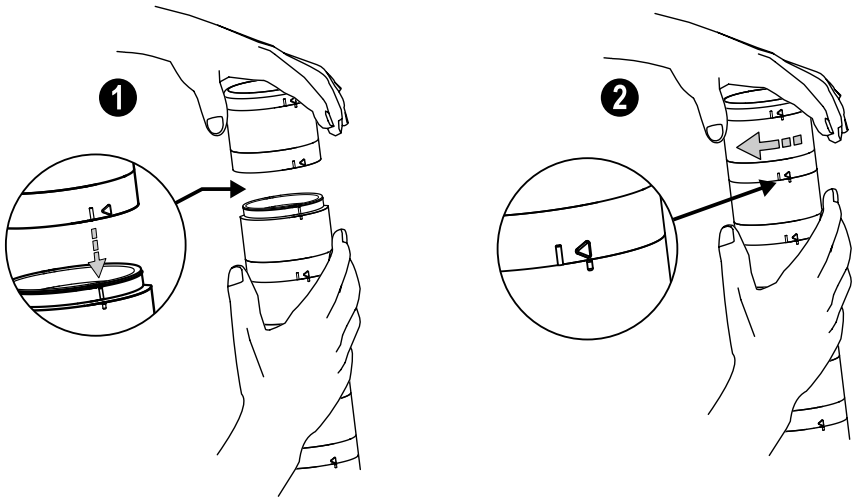
Assembling the Modules



IMPORTANT:
- Do not assemble or swap segments while the unit is powered on.
- Ensure power is off when assembling or swapping segments.

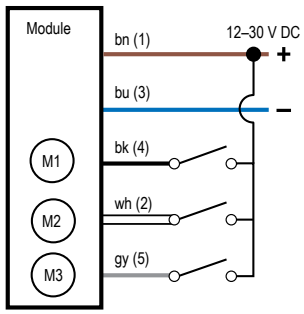
To assemble the modules:

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).

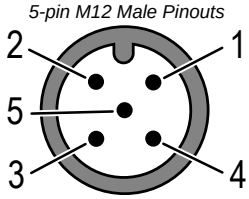
NOTE: DIP switches should remain in the default off position.

Wiring Diagrams

PNP



5-pin M12 Male Pinouts



Key

1 = brown
2 = white
3 = blue
4 = black
5 = gray

M1 = Module 1
M2 = Module 2
M3 = Module 3

Continued on page 4

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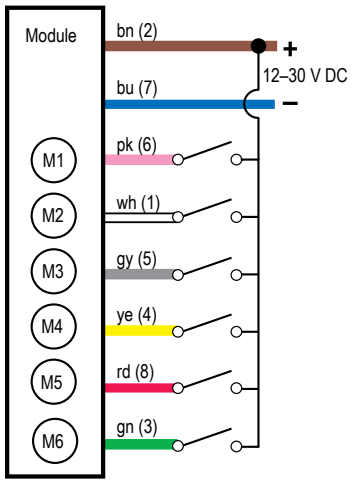
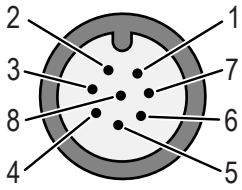
PNP



8-pin M12 Male Pinouts



Key

1 = white
2 = brown
3 = green
4 = yellow
5 = gray
6 = pink
7 = blue
8 = red

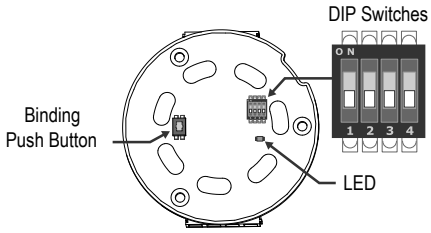
M1 = Module 1
M2 = Module 2
M3 = Module 3
M4 = Module 4
M5 = Module 5
M6 = Module 6

Input wires M1 through M6 can be used to either control the light segments or can be configured as external PNP Inputs. Refer to the DIP switch settings for configuration instructions.

Configuring the Radio Module

Set the Radio Module DIP Switches

Before applying power to the device, set the radio module's DIP switches. Default configurations are noted with (*).



Device Settings	DIP Switches			
	1	2	3	4
Transmit power 900 MHz radios: 500 mW (27 dBm) 2.4 GHz radios: 65 mW (18 dBm) and 60 ms frame	OFF *			
Transmit power 900 MHz radios: 250 mW (24 dBm) 2.4 GHz radios: 65 mW (18 dBm) and 40 ms frame	ON			
Input wires control light segments		OFF *		
Disables wired input control of light segments and converts wires to auxiliary Inputs		ON		
MultiHop radio setting: Server			OFF *	
MultiHop radio setting: Repeater			ON	
Reserved				OFF *

Transmit Power Levels/Frame Size

The 900 MHz data radios can be operated at 500 mW (27 dBm) or 250 mW (24 dBm). For most models, the default transmit power is 500 mW.

For 2.4 GHz radios, the transmit power is fixed at 65 mW (18 dBm) and DIP switch 5 is used to set the frame timing. The default position (OFF) sets the frame timing to 60 milliseconds. To increase throughput, set the frame timing to 40 milliseconds. For battery-powered devices, increasing the throughput decreases battery life.

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MultiHop Radio Overview

MultiHop networks are made up of one client radio and many repeater and server radios.

The MultiHop networks are self-forming and self-healing networks constructed around a parent-child communication relationship. A MultiHop Radio is either a client radio, a repeater radio, or a server radio.

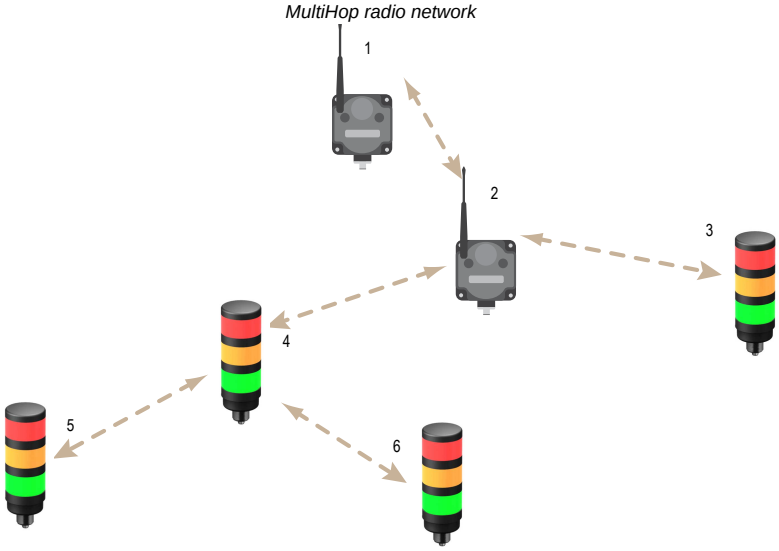
- The client radio controls the overall wireless network.
- The repeater radios extend the range of the wireless network.
- The server radios are the endpoint of the wireless network.

At the root of the wireless network is the client radio. All repeater or server radios within range of the client radio connect as children of the client radio, which serves as their parent. After repeater radios synchronize to the client radio, additional radios within range of the repeater can join the network. The radios that synchronize to the repeater radio form the same parent/child relationship the repeater has with the client radio: the repeater is the parent and the new radios are children of the repeater. The network formation continues to build the hierarchical structure until all MultiHop radios connect to a parent radio. A MultiHop radio can only have one designated parent radio. If a radio loses synchronization to the wireless network it may reconnect to the network through a different parent radio.

For the simple example network shown below, the following relationships exist:

- Radio 1 is the client radio and is parent to radio 2 (repeater).
- Radio 2 (repeater) is a child to radio 1 (client) and parent to radios 3 (server) and 4 (repeater).
- Radio 4 (repeater) is a child to radio 2 (repeater) and parent to radios 5 and 6 (both servers).

MultiHop radio network



On the LCD of each device, the parent device address (PADR) and local device address (DADR) are shown.

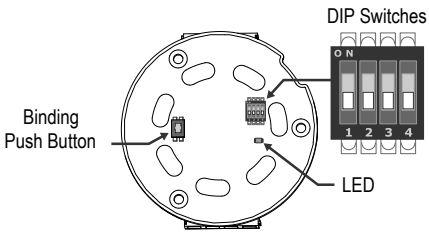
MultiHop Client Radio. Within a MultiHop data radio network, there is only one client radio. The client radio controls the overall timing of the network and is always the parent device for other MultiHop radios. The host system connects to this client radio.

MultiHop Repeater Radio. When a MultiHop radio is set to repeater mode, it acts as both a parent and a child. The repeater receives data packets from its parent, then re-transmits the data packet to the children within the repeater's network. The incoming packet of information is re-transmitted on both the radio link and the local serial link.

MultiHop Server Radio. The server radio is the end device of the MultiHop radio network. A radio in server mode does not re-transmit the data packet on the radio link, only on the local serial (wired) bus.

Bind the TL70 Wireless MultiHop Modular Tower Light to Form Networks

Binding MultiHop radios ensures all MultiHop radios within a network communicate only with other radios within the same network. The MultiHop client radio automatically generates a unique binding (multihop) code when it enters binding mode. This code is transmitted to all radios within range that are also in binding mode. After a repeater/server radio is bound, the repeater/server radio accepts data only from the client radio to which it is bound. The binding code defines the network, and all radios within a network must use the same binding code.



Before using the TL70 devices, you must bind them to the MultiHop client radio and assign a device ID using the client radio's rotary dials. There are no physical switches or dials on the TL70 radio. To bind and address an TL70, follow these steps.

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On the MultiHop Client Radio

1. Apply power to the client radio.
2. Triple-click button 2 to enter binding mode. For the two LED/button models, both LEDs flash red and the LCD shows *BINDNG and *client. For single LED/button models, the LED flashes alternatively red and green.
3. Using the rotary dials, select the Device ID to assign to the TL70. Use the left rotary dial for the left digit and the right rotary dial for the right digit. For example, to assign your TL70 to Device ID 10, set the left dial to 1 and the right dial to 0.

On the TL70 Wireless MultiHop Modular Tower Light

1. Click the button on TL70 three times to place the TL70 into binding mode. After entering binding mode, the TL70 LEDs blink slowly, alternating between red and green. After the TL70 receives a valid binding code from the MultiHop client radio, the red and green LEDs are both illuminated continuously, resulting in a slightly orange light. The red and green LEDs simultaneously flash four times to indicate that the TL70 accepts the binding code. The TL70 enters RUN mode.
2. After binding the TL70 to the MultiHop client radio and assigning it a unique device ID, write the device ID on the TL70's label.
3. Repeat this sequence (TL70 steps 1 and 2) for as many TL70s as you need to bind. If two TL70s are accidentally assigned the same device ID, rerun the binding procedure on one of the TL70s to reassign the ID. The binding sequence may be run on a TL70 as many times as necessary.

On the MultiHop Client Radio

1. To exit binding mode, double-click button 2 on the MultiHop client radio. The client radio reboots and enters RUN mode.

LED Behavior for the TL70 Wireless MultiHop Modular Tower Light

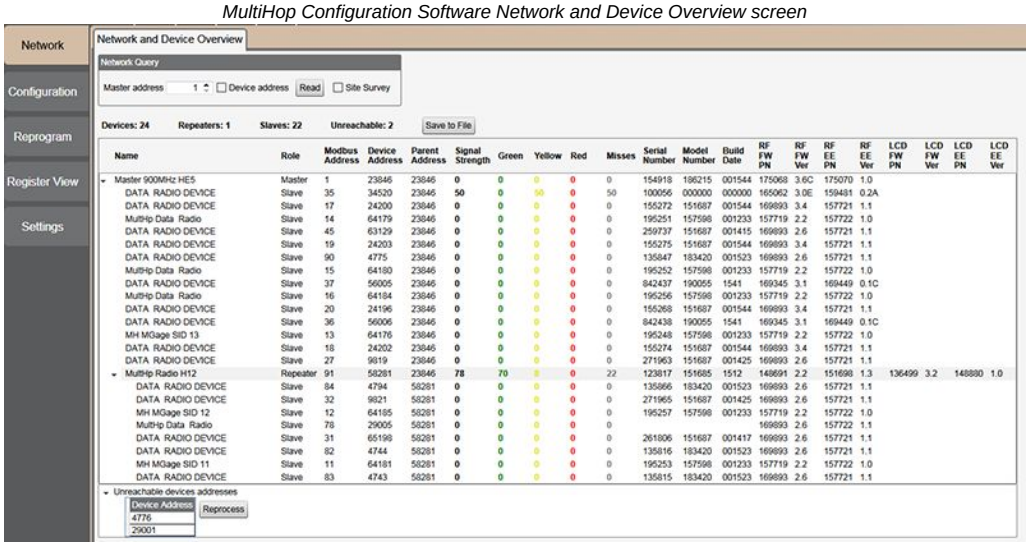
All bound radios set to server or repeater modes follow this LED behavior after powering up.

Process Steps	Response	LED
1	Apply power to the radio	Solid red and green (orange) for 8 seconds
2	The server/repeater searches for a parent device.	Flashes red
3	A parent device is detected. The server/repeater searches for other parent radios within range.	Solid red
4	The server/repeater selects a suitable parent.	Solid red and green (orange)
5	The server/repeater attempts to synchronize to the selected parent.	Solid red
6	The server/repeater enters RUN mode.	Solid green, then flashes green
7	The server/repeater is synchronized to the parent.	Flashes green
	Serial data packets begin transmitting between the server/repeater and its parent radio.	Flashes red and green (orange)

MultiHop Configuration Software

Use Banner's MultiHop Configuration Software to view your MultiHop radio network and configure the radio and its I/O.

MultiHop Configuration Software Network and Device Overview screen



The software connects to a MultiHop client radio using one of four methods.

- Serial; using a USB to RS-485 (for RS-485 radios) or a USB to RS-232 (for RS-232 radios) converter cable.
- Modbus TCP; using an Ethernet connection to an Ethernet radio client.

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- Serial DXM; using a USB cable to a DXM Controller to access a MultiHop client radio.
- TCP DXM: using an Ethernet connection to a DXM Controller to access a MultiHop client radio.

Banner recommends using **BWA-UCT-900**, an RS-485 to USB adapter cable with a wall plug that can power your radio while you configure it. The adapter cable is not required when connecting to a DXM Controller.

Download the most recent software revision from the Wireless Reference Library on Banner Engineering's website: www.bannerengineering.com.

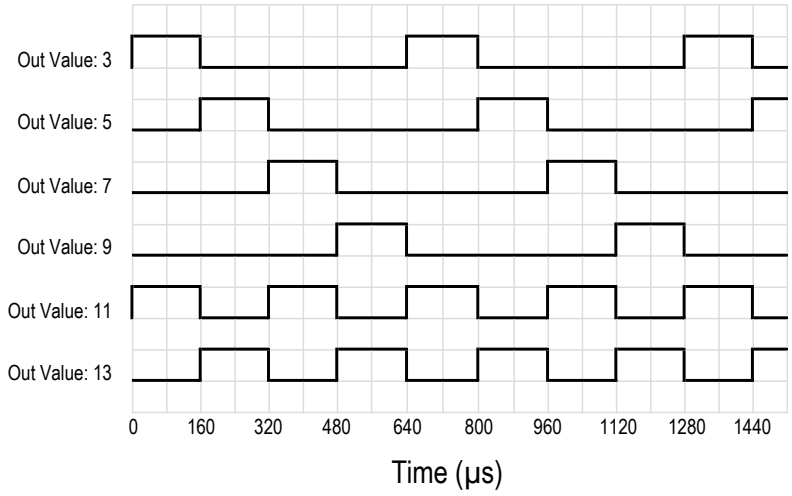
Modbus Registers

Modbus Holding Register (4xxxx)	I/O Type	I/O Range		Holding Register Representation (Dec.)		Module #
		Min.	Max.	Min.	Max.	
1	Discrete IN 1	0	1	0	1	M1
2	Discrete IN 2	0	1	0	1	M2
3	Discrete IN 3	0	1	0	1	M3
4	Discrete IN 4	0	1	0	1	M4
5	Discrete IN 5	0	1	0	1	M5
6	Discrete IN 6	0	1	0	1	M6
501	Light OUT 1	0	65535	0	65535	M1
502	Light OUT 2	0	65535	0	65535	M2
503	Light OUT 3	0	65535	0	65535	M3
504	Light OUT 4	0	65535	0	65535	M4
505	Light OUT 5	0	65535	0	65535	M5
506	Light OUT 6	0	65535	0	65535	M6

Flash Pattern

Write specific values to the light OUT registers to control the light's behavior.

Light OUT Register Value	Light Operation
1	On
3	Flashing at 1.5 Hz
5	Delay of 160 µs, then flashing at 1.5 Hz
7	Delay of 320 µs, then flashing at 1.5 Hz
9	Delay of 480 µs, then flashing at 1.5 Hz
11	Flashing at 3 Hz
13	Delay of 160 µs, then flashing at 3 Hz



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For example, to program all four lights to come on at a different time to appear to race up the light stack, write a 3 to M1, 5 to M2, 7 to M3, and a 9 to M4.

Specifications

TL70 Wireless MultiHop Tower Light Specifications

Supply Voltage and Current

12 V DC to 30 V DC (Outside the USA: 12 V DC to 24 V DC, ± 10%) [1]

900 MHz Consumption: Maximum current draw is < 40 mA and typical current draw is < 30 mA at 24 V DC. (2.4 GHz consumption is less.)

Indicator Color or Audible Model	Maximum Current (mA)	
	at 12 V DC	at 30 V DC
Blue, Green, White	420	150
Red, Yellow, Orange	285	120
Standard Audible	30	30
Loud Audible (Intensity 1)	18	14
Loud Audible (Intensity 2)	40	28
Loud Audible (Intensity 3)	160	70
Loud Audible (Intensity 4)	350	110

Audible Alarm

Standard Audible: 2.6 KHz ± 250 Hz oscillation frequency; maximum intensity (typical) 92 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)

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

Construction

Bases, Segments, Covers: polycarbonate

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

[1] For European applications, power this device from a Limited Power Source as defined in EN 60950-1.

Audible Adjustment

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

Loud Audible Electronic Adjustment: 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:** 16 dB

Connections

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

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

Indicator Characteristics

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	Color Coordinates[2]		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

Operating Conditions

–40 °C to +50 °C (–40 °F to +122 °F)

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

Environmental Rating

IP65

Certifications

CE/UKCA approval only applies to 2.4 GHz models

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

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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	2.0	30	0.5

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Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Para maiores informações, consulte o site da ANATEL www.gov.br/anatel/pt-br/

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Radio Specifications for MultiHop Internal Antennas

Radio Transmit Power (900 MHz, 500 mW radios)

Conducted: 27 dBm (500 mW)

EIRP with the supplied antenna: < 36 dBm

Radio Transmit Power (2.4 GHz radios)

Conducted: < 18 dBm (65 mW)

EIRP with the supplied antenna: < 20 dBm (100 mW)

Radio Range

A 2 dB antenna ships with this device.

Transmit power and range are subject to many factors, including antenna gain, installation methods, characteristics of the application, and environmental conditions.

Please refer to the following documents for installation instructions and high-gain antenna options.

Installing Your Sure Cross® Radios (151514)
Conducting a Site Survey (133602)
Sure Cross® Antenna Basics (132113)

Antenna Minimum Separation Distance

900 MHz radios transmitting at ≤ 250 mW: 2 m (6 ft) with the supplied antenna

900 MHz radios transmitting at ≥ 500 mW: 4.57 m (15 ft) with the supplied antenna

2.4 GHz radios transmitting at 65 mW: 0.3 m (1 ft) with the supplied antenna

Spread Spectrum Technology

FHSS (Frequency Hopping Spread Spectrum)

900 MHz Compliance (SX7023EXT Radio Module)

Radio module is indicated by the product label marking

Contains FCC ID: UE3SX7023EXT

Contains IC: 7044A-SX7023EXT

2.4 GHz Compliance (SX243 Radio Module)

Radio module is indicated by the product label marking

Contains FCC ID: UE3SX243

Radio Equipment Directive (RED) 2014/53/EU

Contains IC: 7044A-SX243

Radio Packet Size (MultiHop)

900 MHz: 175 bytes (85 Modbus registers)

2.4 GHz: 75 bytes (37 Modbus registers)

FCC Part 15 Class A for Intentional Radiators

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.

(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 Statement for Intentional Radiators

This device contains licence-exempt transmitters(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

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

Cet appareil contient des émetteurs/récepteurs exemptés de licence conformes à la norme Innovation, Sciences, et Développement économique Canada. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage.
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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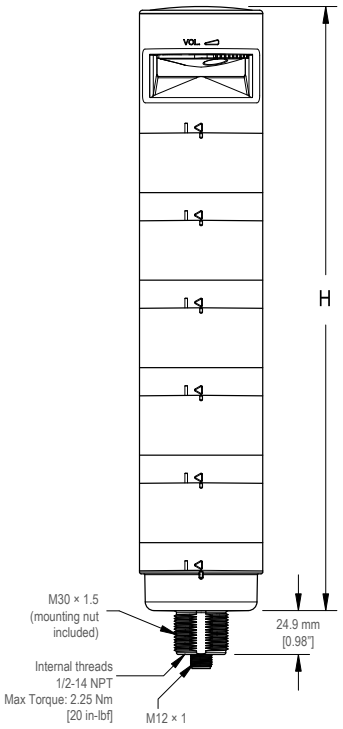
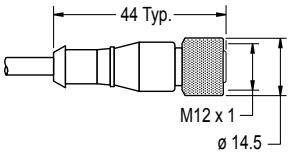
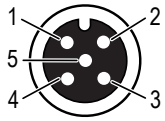
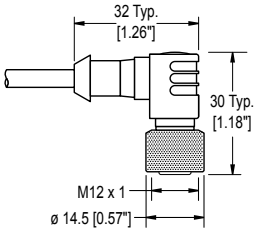
Dimensions



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)

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		 1 = Brown 2 = White 3 = Blue 4 = Black 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)			

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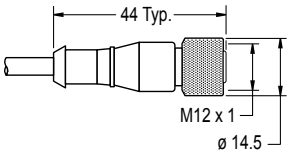
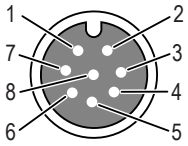
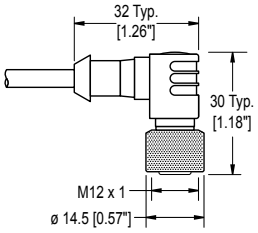
8-Pin Single-Ended M12 Female Open-Shielded Cordsets				
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**
MQDC2S-806	2.04 m (6.7 ft)	Straight		 1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red
MQDC2S-815	5.04 m (16.54 ft)			
MQDC2S-830	10.04 m (32.95 ft)			
MQDC2S-850	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)			

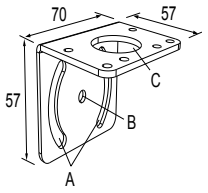
Mounting Brackets

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

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
- CAD Files: DXF, PDF, IGS, STP

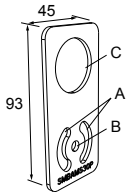
Hole center spacing: A=51, A to B=25.4
Hole size: A=42.6 × 7, B=ø 6.4, C=ø 30.1



SMBAMS30P

- Flat SMBAMS series bracket
- 30 mm hole for mounting sensors
- Articulation slots for 90°+ rotation
- 12-gauge 300 series stainless steel
- CAD Files: DXF, PDF, IGS, STP

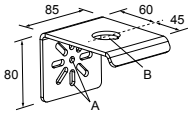
Hole center spacing: A=26.0, A to B=13.0
Hole size: A=26.8 × 7.0, B=ø 6.5, C=ø 31.0



SSA-MBK-EEC1

- Single 30 mm hole
- 8 gauge steel, black finish (powder coat)
- Front surface for customer-applied labels
- CAD Files: DXF, PDF, IGS, STP

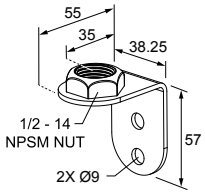
Hole size: A = ø 7 , B = ø 30



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
- CAD Files: DXF, PDF, IGS, STP

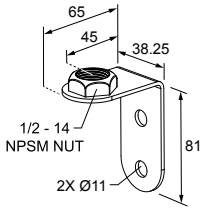
Hole center spacing: 20.0



LMBE12RA45

- 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 45 mm
- CAD Files: DXF, PDF, IGS, STP

Hole center spacing: 35.0



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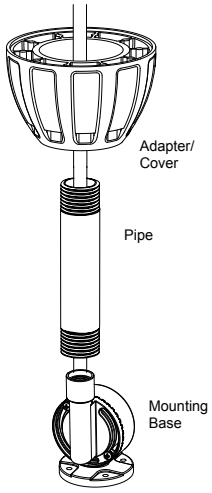
Elevated Mount System

Example Assembly for a TL70 Tower Light

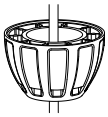


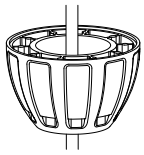
This example uses:

1. Adapter/Cover (SA-M30 shown)
2. Pipe
3. Mounting Base (SA-FFB12 shown)

Other compatible parts are listed in the following tables.

Adapters/Covers



Adapter/Cover Model	Description	
SA-M30 - Black polycarbonate	• Streamlined black PC or Gray PC thread cover • Covers the outer M30 threads on the light's base • Typically used for the TL70 Tower Light and K90 series • Mounting hardware included • CAD files: DXF, PDF, IGS, STP	
SA-M30C - Gray polycarbonate		

Pipes



Black Anodized Aluminum, ½ in. NPT Pipe Models	Clear Anodized Aluminum, ½ in. NPT Pipe Models	Description
SOP-E12-150A, 150 mm (6 in) long	**SOP-E12-150AC**, 150 mm (6 in) long	• Elevated-use stand-off pipe • Threaded at both ends • Compatible with most industrial environments • CAD Files: ◦ **SOP-E12-150A**: DXF, PDF, IGS, STP ◦ **SOP-E12-300A**: DXF, PDF, IGS, STP ◦ **SOP-E12-600A**: DXF, PDF, IGS, STP ◦ **SOP-E12-900A**: DXF, PDF, IGS, STP
SOP-E12-300A, 300 mm (12 in) long	**SOP-E12-300AC**, 300 mm (12 in) long	
SOP-E12-600A, 600 mm (24 in) long	-	
SOP-E12-900A, 900 mm (36 in) long	**SOP-E12-900AC**, 900 mm (36 in) long	

304 Stainless Steel, ½ in. NPT Pipe Models	Description
SOP-E12-150SS, 150 mm (6 in) long	• Elevated-use stand-off pipe • Threaded at both ends • Compatible with most industrial environments • CAD Files: ◦ **SOP-E12-150x**: DXF, PDF, IGS, STP ◦ **SOP-E12-300x**: DXF, PDF, IGS, STP ◦ **SOP-E12-600x**: DXF, PDF, IGS, STP ◦ **SOP-E12-900x**: DXF, PDF, IGS, STP
SOP-E12-300SS, 300 mm (12 in) long	
SOP-E12-600SS, 600 mm (24 in) long	
SOP-E12-900SS, 900 mm (36 in) long	

Bottom Covers and Mounting Bases

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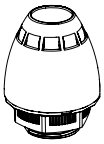
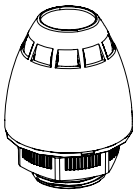
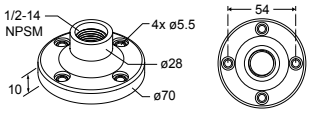
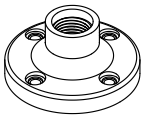
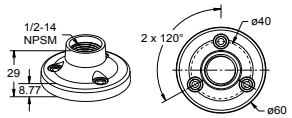
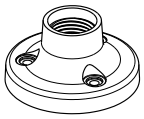


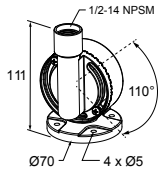
Mounting Base Model	Description	
SA-E12M30 - Black acetal **SA-E12M30C** - White UHMW	• Streamlined black acetal or white UHMW mounting base adapter/cover • Adapter from ½ in. NPSM/DN15 pipe to 30 mm (1-3/16 in) drilled hole • Mounting hardware included • CAD files: DXF, PDF, IGS, STP	

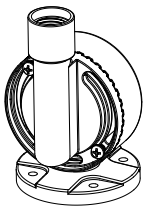


Mounting Base Model	Description	
SA-F12	• Die-cast zinc base with black paint • Elevated-use stand-off pipes (½ in, NPSM/DN15) • M5 mounting hardware and nitrile gasket included • CAD files: DXF, PDF, IGS, STP	



Mounting Base Model	Description	
SA-F12-3	• Black polycarbonate • Elevated-use stand-off pipes (½ in, NPSM/DN15) • M4 mounting hardware and nitrile blend gasket included • CAD files: DXF, PDF, IGS, STP	



Mounting Base Model	Description	
SA-FFB12 - Black polycarbonate **SA-FFB12C** - Gray polycarbonate	• For use with ½ in. stand-off pipes • 110° rotation • Stainless steel hardware • CAD files: DXF, PDF, IGS, STP	

LMB Sealed Right-Angle Bracket

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

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Approved Antennas

BWA-9O2-C--Antena, Omni 902-928 MHz, 2 dBd, junta de caucho, RP-SMA Macho
BWA-9O5-C--Antena, Omni 902-928 MHz, 5 dBd, junta de caucho, RP-SMA Macho
BWA-9O6-A--Antena, Omni 902-928 MHz, 6 dBd, fibra de vidrio, 1800mm, N Hembra
BWA-9Y10-A--Antena, Yagi, 900 MHz, 10 dBd, N Hembra

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