

TL70 Pro Modbus Modular Tower Light Instruction Manual



Original Instructions
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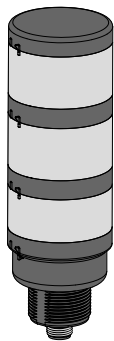
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Models 3

Chapter 1 Features



Banner's TL70 Pro Modbus Modular Tower Light is a 70 mm, modular LED indicator with 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.

- Modbus control allows access to full color, flashing, and dimming settings, as well as advanced animations and audible tones
- Up to five indicator segments and one audible segment 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
- Simple and fast connection with M12 quick-disconnect connector

Models

Segment Models

Model	Description
SG-TL70P-L	RGB light segment
SG-TL70P-A	Audible segment

Pre-Assembled Models

Model	Description
TL70PM3Q	Modbus RS-485 with three RGB segments
TL70PM3AQ	Modbus RS-485 with three RGB segments and an audible segment

Base Models

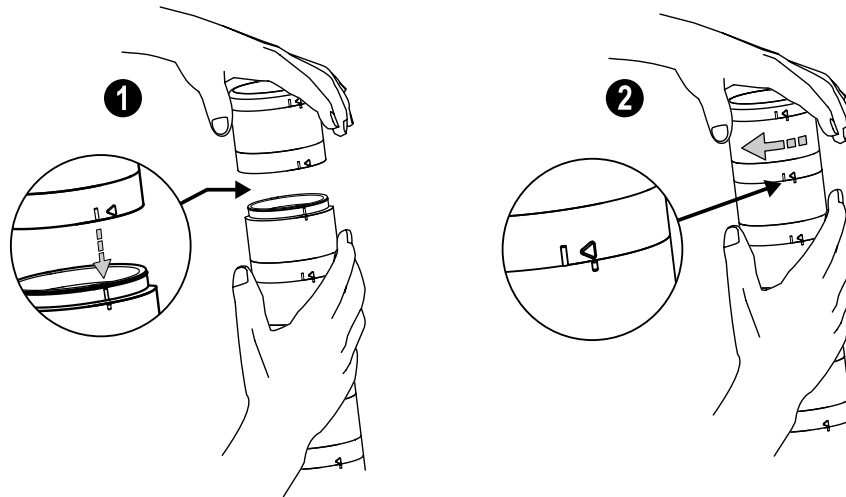
Model	Description
B-TL70PM-Q	Modbus RS-485 base module with an integral 4-pin M12 A-Code male quick-disconnect connector

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Assembling the Modules



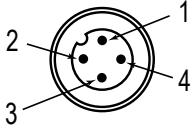
To assemble the modules:

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).

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Chapter 3 Wiring

Wiring for Modbus Models

Integral 4-pin A-Code M12 Male Quick-Disconnect Connector Pinout	Pin	Wire Color	Connection
	1	Brown	18 V DC to 30 V DC
	2	White	RS-485 (+)
	3	Blue	DC common
	4	Black	RS-485 (-)

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Chapter 4 Modbus Configuration Instructions

For more information about the TL70 Pro Modbus Modular Tower Light device registers, refer to document PN [243474](#).

Tower Light Segment Modes

Basic Segment Mode

Use a single run time register per LED segment to set it to Off, On, Flash, or Animation mode.

Use a single run time register for an audible segment to set it to Off or On.

Use additional configuration registers to change color, intensity, flash speed, and select animation type on LED segments and change volume and tone on audible segment.

Advanced Segment Mode

Use multiple run time registers per LED segment to control color, intensity, flash, and other animation types.

Use multiple run time registers for an audible segment to control sync, volume, and tone settings.

Use additional configuration registers to create custom intensity and flash speeds.

LED Segment Control

Animation	Description
Off	Segment is off
Steady	Color 1 is solid on at defined intensity
Flash	Color 1 flashes at defined speed, color intensity, and pattern
Two Color Flash	Color 1 and Color 2 flash alternately at defined speed, color intensities, and pattern
50/50	Color 1 is displayed on 50% of the segment and Color 2 is displayed on the other 50% of the segment at the defined color intensities
50/50 Rotate	Color 1 is displayed on 50% of the segment and Color 2 is displayed on the other 50% of the segment while rotating at the defined speed and color intensities
Chase	Color 1 is displayed as a single spot against the background of Color 2 while rotating at the defined speed, color intensities, and rotational direction
Intensity Sweep	Color 1 repeatedly increases and decreases intensity between 0% to 100% at defined speed and color intensity
Demo	Demo sequence cycles through several sets of colors and configurations to highlight example applications

Audible Segment Control

Setting	Description
Audible State	Sets the segment to off, on, or synced to flash pattern of last LED segment
Audible Volume	Defines the volume of the audible tone
Audible Tone	Defines the audible tone frequency

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Supply Voltage

18 V DC to 30 V DC

Supply Current

Device	Typical Current (mA) per Device			Max Current (mA)
	18 V DC	24 V DC	30 V DC	
Modbus Base	60	45	40	75
Light and Audible segment	110	85	75	125

Environmental Rating

IP65

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Initial Startup Time

30 seconds

Construction

Bases, segments, and covers: polycarbonate

Operating Temperature

-40 °C to +50 °C (-40 °F to +122 °F)

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

Connections

See "Wiring" on page 5

Audible Alarm

Tone 0: 1.7 kHz ± 250 Hz oscillation frequency; maximum intensity (typical) 81 dB at 1 m (3.3 ft)

Tone 1: 2.2 kHz ± 250 Hz oscillation frequency; maximum intensity (typical) 100 dB at 1 m (3.3 ft)

Tone 2: 2.7 kHz ± 250 Hz oscillation frequency; maximum intensity (typical) 104 dB at 1 m (3.3 ft)

Vibration and Mechanical Shock

Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 0.5 mm amplitude, 5 minutes sweep, 30 minutes dwell)

Meets IEC 60068-2-27 requirements (Shock: 15G 11 ms duration, half sine wave)

Certifications



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



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 Blenheim Court
 Wickford, Essex SS11 8YT
 GREAT BRITAIN

Default Light Segment Characteristics

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	Color Coordinates ⁽¹⁾		Lumen Output Per Segment (Typical at 25 °C)
		X	Y	
Green	532	0.181	0.735	34.8
Red	621	0.691	0.308	15.4
Yellow	578	0.473	0.474	21
Blue	467	0.137	0.056	27.6
White	5700K	0.328	0.337	29.7
Cyan	492	0.150	0.334	20.9
Magenta	-	0.379	0.177	18.7
Amber	590	0.552	0.414	6.6
Rose	-	0.508	0.230	9.3
Lime Green	565	0.393	0.535	23.8
Sky Blue	485	0.146	0.241	14.1
Orange	600	0.611	0.370	24.1
Violet	-	0.212	0.091	19.6
Spring Green	509	0.157	0.553	12.7

FCC Part 15 Class A for Unintentional 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.

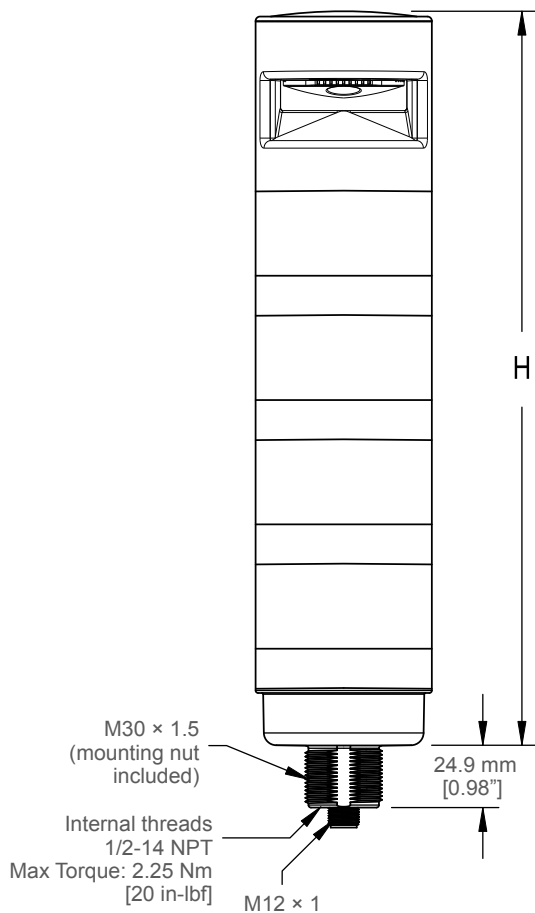
Industry Canada ICES-003(A)

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

⁽¹⁾ Refer to CIE 1931 chromaticity diagram or color chart to show equivalent color with indicated color coordinates. Actual coordinates may differ by 10%.

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 (13.51 in)

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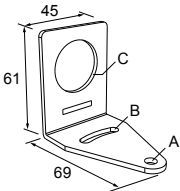
Cordsets

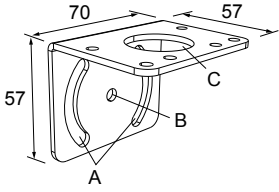
4-Pin Single-Ended, M12 Female Cordsets cUL_{US}				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	2 m (6.56 ft)	Straight		
MQDC-415	5 m (16.4 ft)			
MQDC-430	9 m (29.5 ft)			
MQDC-450	15 m (49.2 ft)	Right-Angle		
MQDC-406RA	2 m (6.56 ft)			
MQDC-415RA	5 m (16.4 ft)			
MQDC-430RA	9 m (29.5 ft)			
MQDC-450RA	15 m (49.2 ft)			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Unused

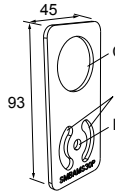
4-Pin Double-Ended, M12 Female-M12 Male Cordsets cUL_{US}				
Model	Length	Style	Dimensions	Pinout
MQDEC-401SS	0.31 m (1 ft)	Male Straight/ Female Straight		Female
MQDEC-403SS	0.91 m (2.99 ft)			
MQDEC-406SS	1.83 m (6 ft)			
MQDEC-412SS	3.66 m (12 ft)			
MQDEC-415SS	4.58 m (15 ft)			
MQDEC-420SS	6.10 m (20 ft)			
MQDEC-430SS	9.14 m (30.2 ft)			
MQDEC-450SS	15.2 m (49.9 ft)			Male

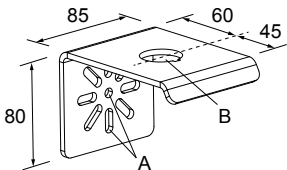
Mounting Brackets

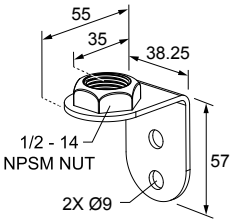
All measurements are listed in millimeters, unless noted otherwise.

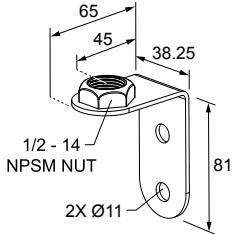
<p>SMB30A</p> <ul style="list-style-type: none"> • Right-angle bracket with curved slot for versatile orientation • Clearance for M6 (¼ in) hardware • Mounting hole for 30 mm sensor • 12-gauge stainless steel <p>Hole center spacing: A to B=40 Hole size: A=∅ 6.3, B= 27.1 × 6.3, C=∅ 30.5</p>	
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<p>SMB30MM</p> <ul style="list-style-type: none"> • 12-gauge stainless steel bracket with curved mounting slots for versatile orientation • Clearance for M6 (¼ in) hardware • Mounting hole for 30 mm sensor <p>Hole center spacing: A = 51, A to B = 25.4 Hole size: A = 42.6 × 7, B = ∅ 6.4, C = ∅ 30.1</p>	
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


<p>SMBAMS30P</p> <ul style="list-style-type: none"> • Flat SMBAMS series bracket • 30 mm hole for mounting sensors • Articulation slots for 90°+ rotation • 12-gauge 300 series stainless steel <p>Hole center spacing: A=26.0, A to B=13.0 Hole size: A=26.8 × 7.0, B=∅ 6.5, C=∅ 31.0</p>	
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<p>SSA-MBK-EEC1</p> <ul style="list-style-type: none"> • Single 30 mm hole • 8 gauge steel, black finish (powder coat) • Front surface for customer-applied labels <p>Hole size: A = ∅ 7 , B = ∅ 30</p>	
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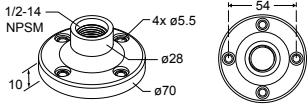
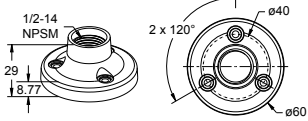
<p>LMBE12RA35</p> <ul style="list-style-type: none"> • Direct mounting of stand-off pipe, with common bracket type • Zinc-plated steel • 1/2-14 NPSM nut • Mounting distance from the wall to the center of the 1/2-14 NPSM nut is 35 mm <p>Hole center spacing: 20.0</p>	
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<p>LMBE12RA45</p> <ul style="list-style-type: none"> • 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 <p>Hole center spacing: 35.0</p>	
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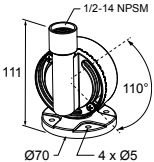
Elevated Mount System

Model			Features	Components
SA-M30 - Black Polycarbonate			<ul style="list-style-type: none"> • Streamlined black PC or Gray PC thread cover • Covers M30 thread on the light base • Mounting hardware included 	
Polished 304 Stainless Steel	Black Anodized Aluminum	Clear Anodized Aluminum	<ul style="list-style-type: none"> • Elevated-use stand-off pipe (½ in. NPSM/DN15) • Polished 304 stainless steel, black anodized aluminum, or clear anodized aluminum surface • ½ in. NPT thread at both ends • Compatible with most industrial environments 	
SOP-E12-150SS 150 mm (6 in) long	SOP-E12-150A 150 mm (6 in) long	SOP-E12-150AC 150 mm (6 in) long		
SOP-E12-300SS 300 mm (12 in) long	SOP-E12-300A 300 mm (12 in) long	SOP-E12-300AC 300 mm (12 in) long		
SOP-E12-900SS 900 mm (36 in) long	SOP-E12-900A 900 mm (36 in) long	SOP-E12-900AC 900 mm (36 in) long		
SA-E12M30 - Black Acetal			<ul style="list-style-type: none"> • Streamlined black acetal or white UHMW mounting base adapter/cover • Connects between ½ in. NPSM/DN15 pipe and 30 mm (1-3/16 in) drilled hole • Mounting hardware included 	



Pipe Mounting Flange

Model	Description	Construction	
SA-F12	<ul style="list-style-type: none"> • Elevated-use stand-off pipes (½ in, NPSM/DN15) • M5 mounting hardware and nitrile gasket included 	Die-cast zinc base with black paint	
SA-F12-3	<ul style="list-style-type: none"> • Elevated-use stand-off pipes (½ in, NPSM/DN15) • M4 mounting hardware and nitrile blend gasket included 	Black Polycarbonate	

Foldable Mounting Brackets

Model	Features	Construction	
SA-FFB12	<ul style="list-style-type: none"> • For use with 1/2 inch stand-off pipes • Stainless steel hardware 	Black polycarbonate	

LMB Sealed Right Angle Bracket

Model	Description	Construction	
LMB30RA	Direct-Mount Models: Bracket kit with base, 30 mm adapter, set screw, fasteners, O-rings, and gaskets.	Black polycarbonate	
LMBE12RA	Pipe-Mount Models: Bracket kit with base, 1/2-14 pipe adapter, set screw, fasteners, O-rings, and gaskets. For use with stand-off pipe (listed and sold separately).	Black polycarbonate	

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Chapter 7 **Banner Engineering Corp Limited Warranty**

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