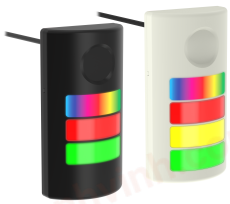
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TLF100 Pro Flush Mount Tower Light

Features

100 mm Programmable Multicolor RGB Flush Mount Tower Light



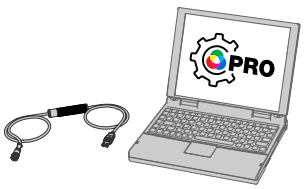
- Rugged, versatile, and easy-to-install 3- and 4-segment tower lights
- Flush mounting allows for easy integration to machines and equipment
- Programmable using Banner's Pro Editor software and Pro Converter Cable
- Illuminated segments provide easy-to-see operator guidance and indication of equipment status
- Audible models available with sealed audible element
- 14 selectable audible tones and audible intensity control
- 12 V DC to 30 V DC operation
- No assembly required
- Available in black or cool gray housing to match different machine styles

Models

Family	Style	Number of Segments	Audible Alarm	Housing Color	Connection
TLF100	P	3		C	QP
	P = Pro	3 = Three segments 4 = Four segments	Blank = None A = Sealed audible	Blank = Black C = Cool gray	Blank = 2 m (6.5 ft) integral PVC-jacketed cable QP = 150 mm (6 in) PVC-jacketed cable with a 5-pin or 8-pin M12 male quick-disconnect connector, depending on model

Configuration Instructions

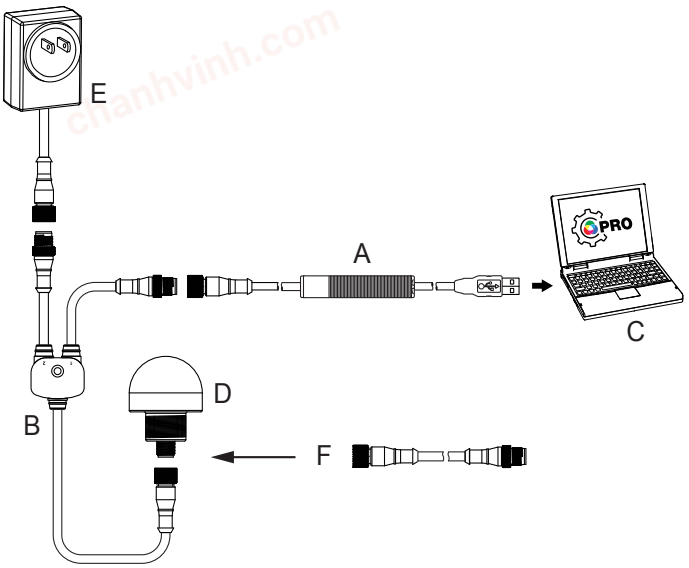
Pro Editor



Use Banner's Pro Editor software and Pro Converter Cable to create custom configurations by selecting different colors, flash patterns, and animations.
For more information visit www.bannerengineering.com/proeditor.

Full Preview Connection (Required)

The full preview connection must be used for the TLF100 Pro Flush Mount Tower Light.



A = Pro Converter Cable (MQDC-506-USB)
B = Splitter (CSB-M1251FM1251M)
C = PC running Pro Editor software
D = Any Banner Pro Series-enabled device (K50 shown)
E = Power Supply (PSW-24-1, PSW-24-2, or PSD-24-4)
F = 8-Pin to 5-Pin Double-Ended Cordset (MQDC-801-5M-PRO), required for 8-Pin models

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p/n: 224883 Rev. A

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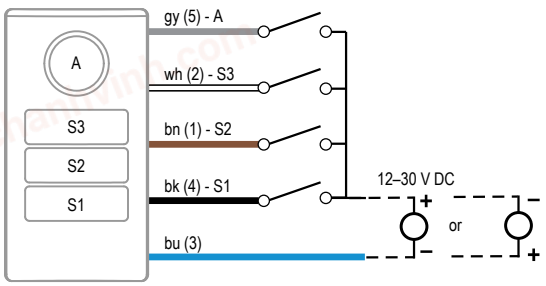
Default Segment Colors

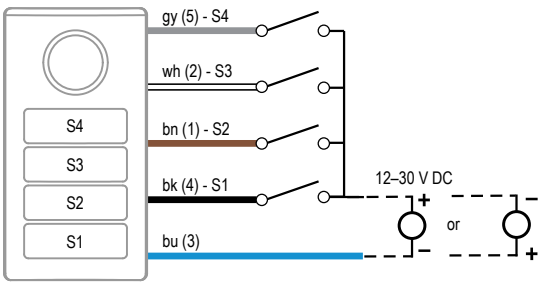
Number of Segments	Colors (Bottom to Top)[1]
3	Green, Yellow, Red
4	Blue, Green, Yellow, Red

Wiring

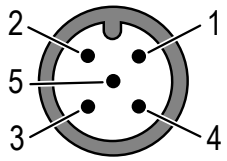
NOTE: All models are bimodal and can be wired as PNP or NPN devices.

5-pin/Wire Models



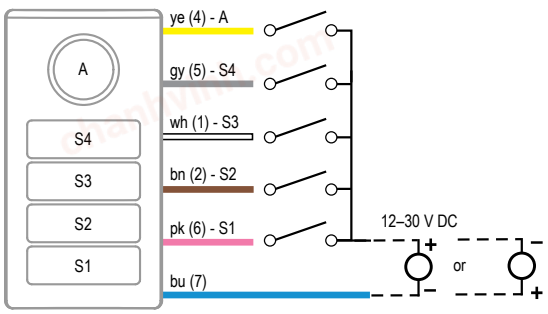


S1 = Segment 1
S2 = Segment 2
S3 = Segment 3
S4 = Segment 4
A = Audible

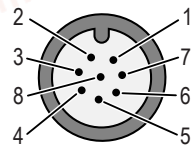


Pin	Color	Segment Mode	Advanced Mode
3	blue	Common	Common (PNP) or 12 V DC to 30 V DC (NPN)
4	black	Segment 1	Reset Input
1	brown	Segment 2	12 V DC to 30 V DC (PNP) or Common (NPN)
2	white	Segment 3	PWM, PFM, Counter, or Timer input
5	gray	Segment 4/Audible	N/A

8-pin/Wire Models



S1 = Segment 1
S2 = Segment 2
S3 = Segment 3
S4 = Segment 4
A = Audible



Pin	Color	Segment Mode	Advanced Mode
7	blue	Common	Common (PNP) or 12 V DC to 30 V DC (NPN)
6	pink	Segment 1	Reset Input
2	brown	Segment 2	12 V DC to 30 V DC (PNP) or Common (NPN)
1	white	Segment 3	PWM, PFM, Counter, or Timer input
5	gray	Segment 4	N/A
4	yellow	Audible	N/A
8	red	N/A	N/A
3	green	N/A	N/A

Pro Editor Configuration for the TLF100

Banner's Pro Editor software offers an easy way to configure Pro Series-enabled touch and indicator devices, allowing users full control of device states. The easy-to-use configuration software provides a variety of tools and capabilities to solve a wide range of applications. Pro Editor includes a preview mode that allows users to verify device performance before writing a configuration to a device. Configure any Pro Series-enabled device using the free Pro Editor software, available for download at www.bannerengineering.com/proeditor.

Segment Mode—Use Segment Mode to activate each segment and to control the input wire, color, animation, intensity, and speed.

Segment Mode Animation	Description
Off	Segment is off
Steady	Color 1 is on at defined intensity

Continued on page 3

[1] Top segment is considered that which is closest to the audible feature.

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Continued from page 2

Segment Mode Animation	Description
Flash	Color 1 flashes at defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Flash	Color 1 and Color 2 flash alternately at defined speed, color intensities, and pattern (normal, strobe, three pulse, SOS, or random)
Intensity Sweep	Color 1 repeatedly increases and decreases intensity between 0% to 100% at defined speed and color intensity

Process Visualization—Use the TLF100's Process Visualization mode to control the entire tower light and to control the input wire, color, animation, intensity, and speed. Animations with a larger assigned run number overrides the lower assigned run numbers.

Process Visualization Animation	Description
Off	All tower light segments are off
Steady	Color 1 is solid on for every tower light segment at defined intensity
Flash	Color 1 flashes on every tower light segment at defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Flash	Color 1 and Color 2 flash alternately on every segment at defined speed, color intensities, and pattern (normal, strobe, three pulse, SOS, or random)
Intensity Sweep	Color 1 repeatedly increases and decreases intensity between 0% to 100% on every segment at defined speed and color intensity
Scroll	Color 1 fills two segments and those segments move in one direction up or down against the background of Color 2 at the defined speed, color intensities, and rotational direction
Bounce	Color 1 fills two segments and those segments move up and down between the top and bottom of the tower against the background of Color 2 at the defined speed, color intensities, and rotational direction
Color Spectrum	The tower light scrolls through the 14 predefined colors with a different color on each segment at the defined speed, Color 1 intensity, and rotational direction

Level—The light adjusts position and color continuously based on the PFM or PWM input value and defined animation in up to four thresholds while maintaining an optional steady background for segments outside the active threshold range. The PFM signal frequency range can be from 100 to 5,000 Hz. The PWM duty cycle range can be from 0 to 100%.

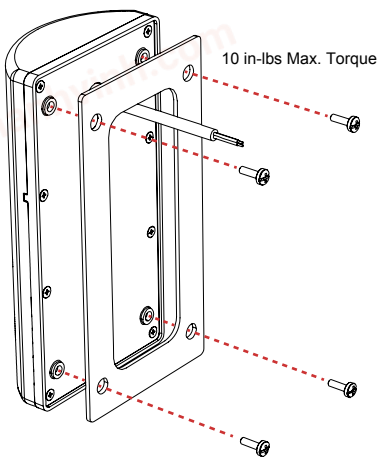
Timer—The timer option uses the TLF100 as a timer, counting up or counting down. Set the total time and choose up to four thresholds to change the visual appearance of the device as time advances. The timer starts when 12 V DC to 30 V DC is applied to the timer run input wire, and paused when left floating or tied to ground. The timer resets when 12 V DC to 30 V DC is applied to the reset wire. The timer automatically resets when it reaches the final count. A steady global background can be applied, from which color and intensity can be defined.

Counter—The counter option counts up or down by converting input pulses into movement of segments along the length of the device based on up to four thresholds that define animations. When the rising edge of an 12 V DC to 30 V DC pulse is applied to the counter input wire, the count increases by one. The user can choose whether the counter resets or the count decreases by one when 12 V DC to 30 V DC is applied to the control input wire. The counter automatically resets when it reaches the final count. A steady global background can be applied, from which color and intensity can also be defined.

Audible Control—Use Audible Control to select the settings for the tower light's audible type, feedback, and volume.

Setting	Description
Audible Feedback	Defines the type of audible feedback
Audible Volume	Defines the volume of the audible tone
Audible Type	Defines the type of audible tone played

Installation Instructions



Mounting Surface Thickness	Length of Mounting Screws
≤ 8 mm	12 mm (supplied)
8 mm to 16 mm	20 mm
16 mm to 26 mm	30 mm
26 mm to 36 mm	40 mm
36 mm to 46 mm	50 mm

NOTE: Do not remove housing screws.

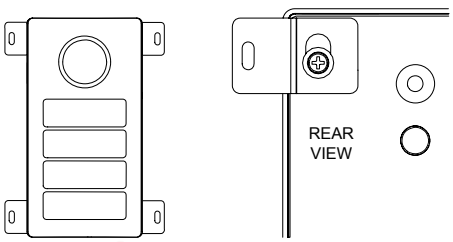
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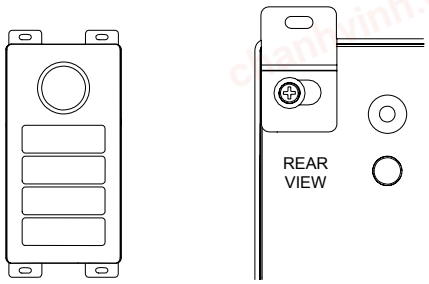
Bracket Mounting Instructions

The TLF100 can be mounted with the SMBTLF100F bracket in the following alternative orientations.

Bracket Orientation - Horizontal



Bracket Orientation - Vertical



Specifications

Supply Voltage and Current

12 V DC to 30 V DC

Typical current per LED segment:

139 mA at 12 V DC
59 mA at 24 V DC
47 mA at 30 V DC

Maximum current for audible: 560 mA

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Input Rating

Leakage Current Immunity: 500 uA

Indicator On/Off Response Time: 250 ms (maximum)

PWM Duty Cycle Range: 0 to 100%

PFM Frequency Range: 100 to 5000 Hz

Connections

150 mm (6 in) PVC-jacketed cable with a 5-pin or 8-pin M12 male quick-disconnect connector, or 2 m (6.5 ft) integral PVC-jacketed cable, depending on model

Models with a quick-disconnect connector require a mating cordset

Construction

Bases, Covers, Light Segment: 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

c UL us LISTED

Advanced Capabilities

PULSE® PRO I/O

Operating Conditions

–40 °C to +50 °C (–40 °F to +122 °F)

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

Environmental Rating

IP65, UL Type 4X, and IP69K per ISO 20653

NOTE: Do not spray cable with high-pressure sprayer, or cable damage will result.

Audible Alarm

Values shown apply to continuous tone. Frequency and intensity response vary depending on the Audible Tone selected.

Oscillation Frequency: 3.0 kHz ± 250 Hz

Intensity:

Low volume (typical): 84 dB at 1 m
Medium volume (typical): 89 dB at 1 m
High volume (typical): 94 dB at 1 m

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

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	Color Coordinates[2]		Lumen Output Per Segment (Typical at 25 °C)
		X	Y	
Green	532	0.181	0.735	7.5
Red	621	0.691	0.308	3.7
Orange	600	0.611	0.37	5.3
Amber	590	0.552	0.414	6.8
Yellow	578	0.473	0.474	9.8
Lime Green	565	0.393	0.535	10.1
Spring Green	509	0.157	0.553	7.8
Cyan	492	0.15	0.334	8.5
Sky Blue	485	0.146	0.241	8.4
Blue	467	0.137	0.056	1.4
Violet	-	0.212	0.091	2.7
Magenta	-	0.379	0.177	5
Rose	-	0.508	0.23	4.1
White	5700K	0.328	0.337	12.1

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:

[2] Refer to CIE 1931 chromaticity diagram or color chart to show equivalent color with indicated color coordinates. Actual coordinates may differ by 10%.

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- 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.

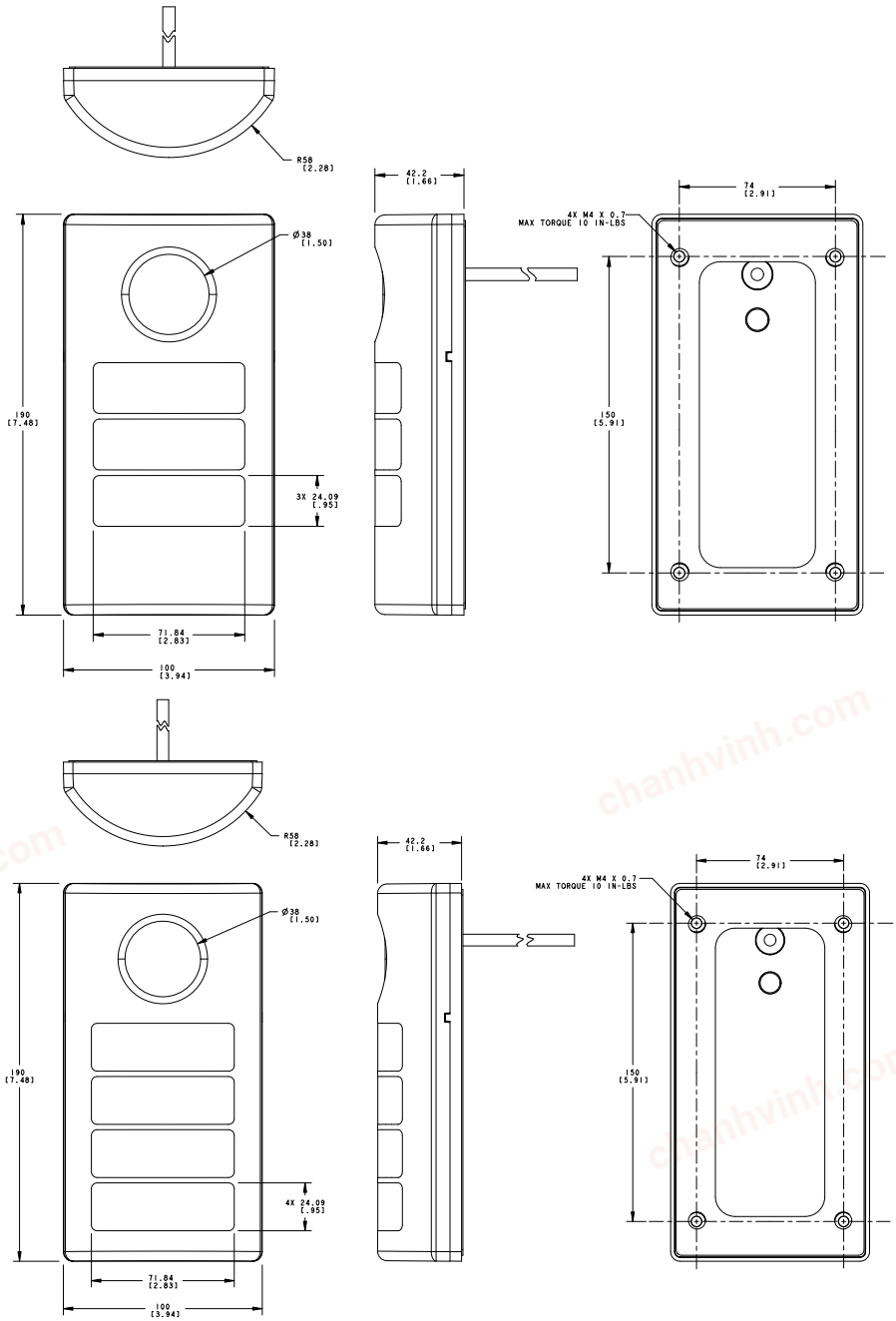
Industry Canada ICES-003(B)

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

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

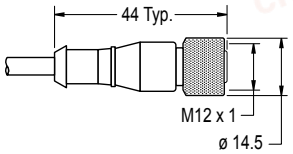
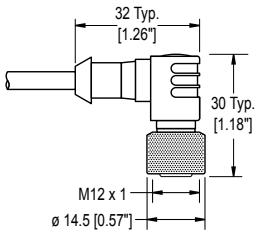


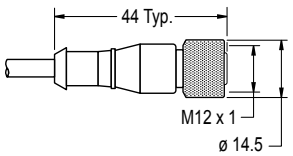
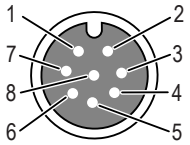
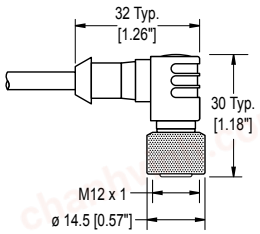
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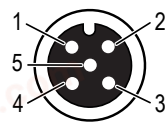
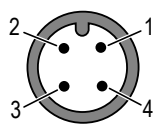
Accessories

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)			

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)			

Splitter Cables for Use with IO-Blocks

5-Pin M12 to 4-Pin M12 Combiner Cordset with Flat Junction			
Model	**Branches (Male)**	**Trunk (Female)**	**Pinout**
CSF-M12F51M12M41	4-pin Quick Disconnect, 2 × 0.31 m (1.02 ft)	5-pin Quick Disconnect, 0.31 m (1.02 ft)	Female  Male  1 = brown (trunk); no connection (branches 1 and 2) 2 = white (trunk); brown (branch 1); gray (branch 2) 3 = blue (trunk; branches 1 and 2) 4 = black (trunk); black (branch 1); white (branch 2) 5 = gray (trunk only)

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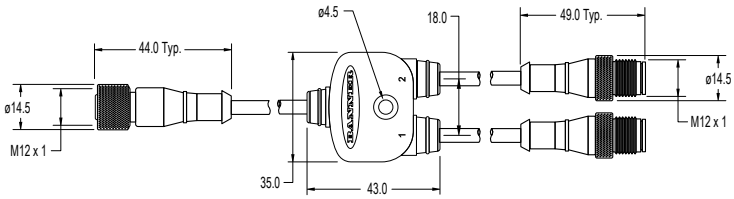
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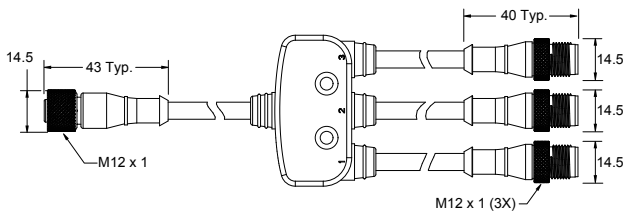
5-Pin M12 to 4-Pin M12 Combiner Cordset with Flat Junction

Model	Branches (Male)	Trunk (Female)	Pinout

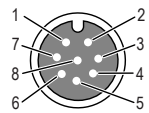


8-Pin M12 Female to 4-Pin M12 Male Combiner Flat Junction Splitter Cordsets

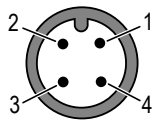
Model	Branches (Male)	Trunk (Female)	Pinout
CSF3A-M12F81M12M41	4-pin M12 Quick Disconnect, 3 × 0.3 m (0.98 ft)	8-pin M12 Quick Disconnect, 0.3 m (0.98 ft)	



Female



Male



	Trunk	Branch 1	Branch 2	Branch 3
1	White	NC	NC	NC
2	Brown	Brown	Gray	Red
3	Green	Blue	Blue	Blue
4	Yellow	Pink	White	Yellow
5	Gray			
6	Pink			
7	Blue			
8	Red			

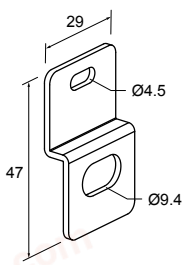
Mounting Bracket

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

SMBTLF100F

- Right-angle
- S bracket
- Mounting hardware included
- CAD Files: DXF, PDF, IGS, STP

Hole center spacing: 26.5
Hole Size: A = 16.6 × 9.4, B = 10.5 × 4.5



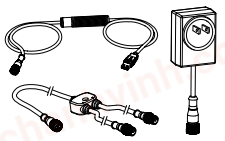
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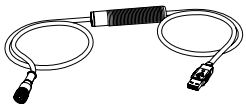
Pro Editor Hardware

PRO-KIT

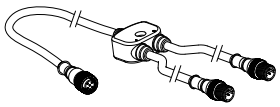
Includes:
- Pro Converter Cable (MQDC-506-USB)
- Splitter (CSB-M1251FM1251M)
- Power Supply (PSW-24-1)



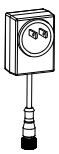
MQDC-506-USB
- Pro Converter Cable
- 1.83 m (6 ft) length 5-pin M12 quick disconnect to Device and USB to PC
- Required for connection to the configuration software



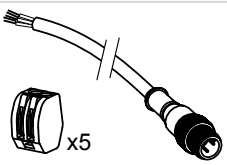
CSB-M1251FM1251M
- 5-pin parallel Y splitter (Male-Male-Female)
- For full Pro Editor preview capability
- Requires external power supply, sold separately



PSW-24-1
- 24 V DC, 1 A power supply
- 2 m (6.5 ft) PVC cable with M12 quick disconnect
- Provides external power with splitter cable, sold separately



ACC-PRO-CABLE5
- Mating accessory for cabled and terminal models
- 150 mm (6 inch) PVC cable with M12 quick disconnect
- Lever wire nuts included (qty 5)
- Required to connect cabled models and screw terminal models to Pro Converter Cable, sold separately



MQDC-801-5M-PRO
- 8-pin to 5-pin double-ended cordset
- 0.31 m (1 ft) PVC cable with M12 quick disconnects
- Required to connect 8-pin Pro Series-enabled devices to Pro Converter Cable (MQDC-506-USB), sold separately



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