LC25 LED Controller Instruction Manual

Original Instructions
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Contents

Chapter 1 LC25 LED Controller Features

LC25 LED Controller Models 3

Chapter 2 Configuration Instructions

Pro Editor 4
LC25C-WLF12 Full Preview Connection (Required) 4
LC25 LED Controller with WLF12 Wiring 5
LC25 LED Controller Remote TEACH Instructions 5
LC25 LED Controller Pro Editor TEACH Instructions 5
Pro Editor Configuration 6

Chapter 3 LC25 LED Controller Specifications

FCC Part 15 Class A for Unintentional Radiators 9
Industry Canada ICES-003(A) 9
LC25 LED Controller Dimensions 9

Chapter 4 LC25 LED Controller Accessories 10

Chapter 5 Banner Engineering Corp Limited Warranty

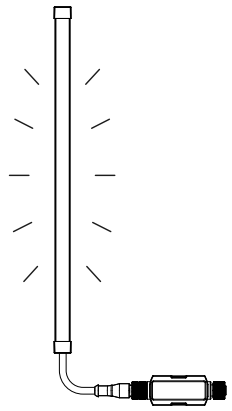
Document Information 14

Chapter Contents

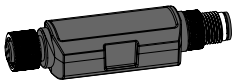
LC25 LED Controller Models 3

Chapter 1 LC25 LED Controller Features

Banner's LC25 LED Controller is designed to work with the WLF12 Pro Flexible Multicolor Strip Light product family. It has a low profile, rugged, water-resistant design, making the LC25 ideal for indoor and outdoor applications.



- In-line controller with M12 connectors
- Industrial controller between the WLF12 Pro and a PLC
- IP65, IP67, and IP68 housing simplifies installation in any location by eliminating the need for a control cabinet
- Rugged waterproof and dustproof overmolded design
- Voltage rating of 12 to 30 V DC



IMPORTANT: Read the following instructions before operating the light. Please download the complete LC25 LED Controller 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: Lea el siguiente instructivo antes de operar el luminario. Por favor descargue desde www.bannerengineering.com toda la documentación técnica de los LC25 LED Controller, disponibles en múltiples idiomas, para detalles del uso adecuado, aplicaciones, advertencias, y las instrucciones de instalación de estos dispositivos.

IMPORTANT: Lisez les instructions suivantes avant d'utiliser le luminaire. Veuillez télécharger la documentation technique complète des LC25 LED Controller sur notre site www.bannerengineering.com pour les détails sur leur utilisation correcte, les applications, les notes de sécurité et les instructions de montage.

LC25 LED Controller Models

Model	For Use With
LC25C-WLF12-RGB7Q	WLF12 Pro Flexible Multicolor Strip Light

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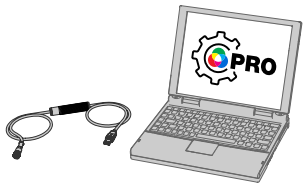
Chapter Contents

Pro Editor 4
LC25C-WLF12 Full Preview Connection (Required) 4
LC25 LED Controller with WLF12 Wiring 5
LC25 LED Controller Remote TEACH Instructions 5
LC25 LED Controller Pro Editor TEACH Instructions 5
Pro Editor Configuration 6

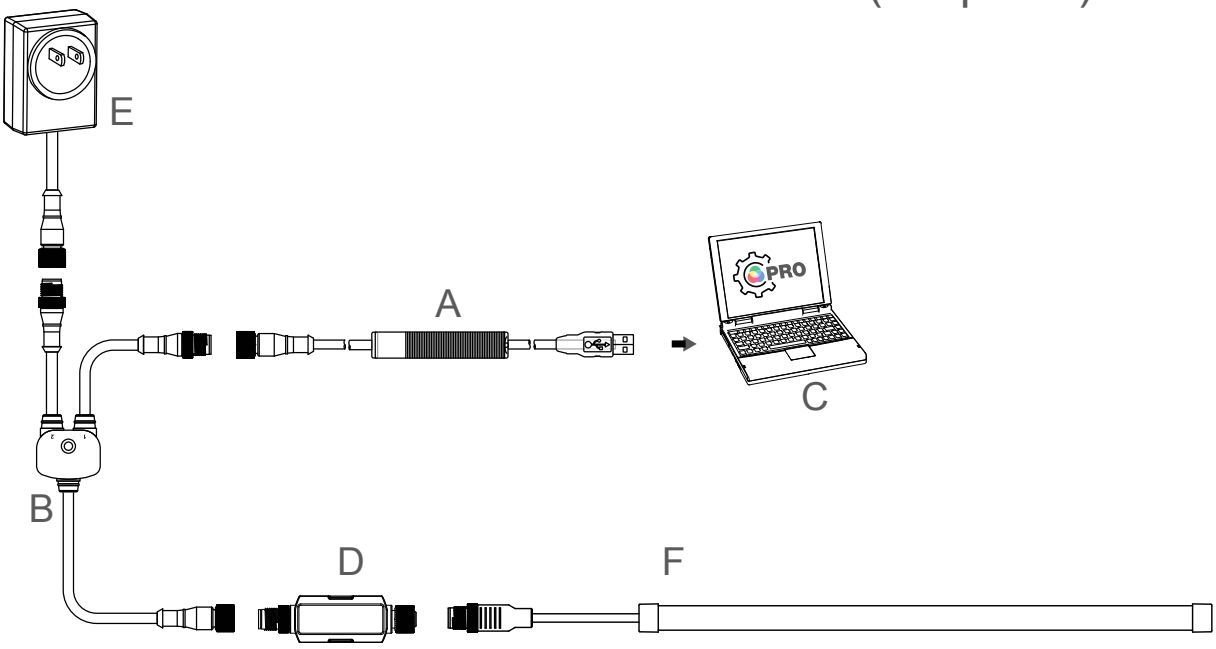
Chapter 2 Configuration Instructions

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.

LC25C-WLF12 Full Preview Connection (Required)



A = Pro Converter Cable (MQDC-506-USB)
B = Splitter (CSB-M1251FM1251M)
C = PC running Pro Editor software
D = LC25 LED Controller (LC25C-WLF12-RGB7-Q)
E = Power Supply (PSW-24-1 or PSD-24-4)
F = WLF12 Pro Flexible Multicolor Strip Light

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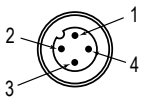
LC25 LED Controller with WLF12 Wiring

LED Controller Wiring

4-pin Male M12 Pinout	Pinout Key and Wiring [1]
	1. Brown - Input 1: 12 V DC to 30 V DC 2. White - Input 3: 12 V DC to 30 V DC 3. Blue - DC Common 4. Black - Input 2: 12 V DC to 30 V DC

LC25 LED Controller Remote TEACH Instructions

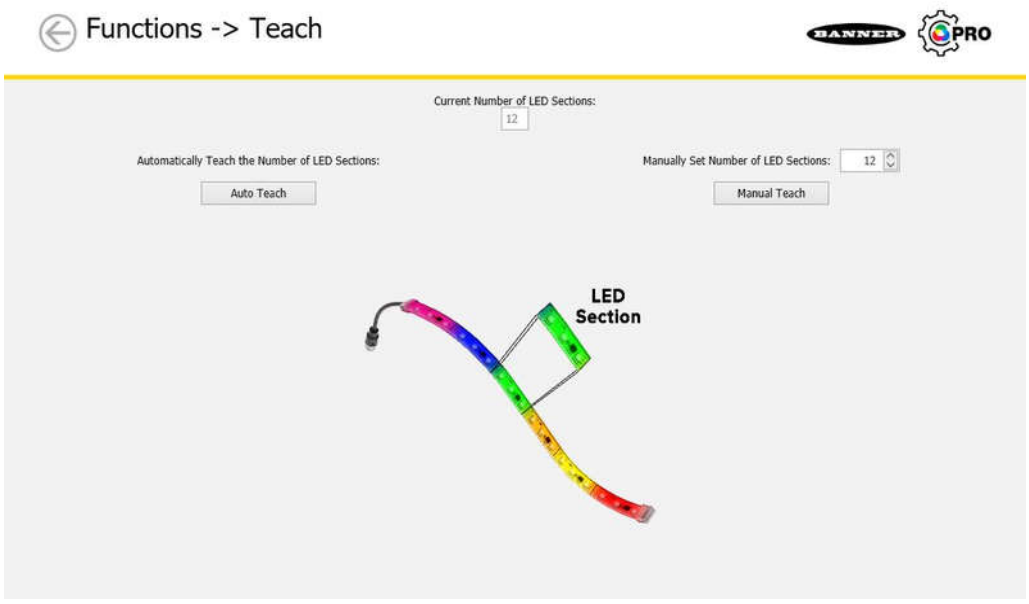
To permanently TEACH the length of the WLF12 Pro Flexible Multicolor Strip Light attached to the LC25 LED Controller, follow these instructions.

1. Connect the WLF12 Pro Flexible Multicolor Strip Light to the LC25 LED Controller.
2. Apply power to the brown wire (pin 1) and DC common to the blue wire (pin 3).
3. Pulse the black wire (pin 4) five times.
4. Wait for the light to finish flashing.

LC25 LED Controller Pro Editor TEACH Instructions

To permanently TEACH the length of the WLF12 Pro Flexible Multicolor Strip Light attached to the LC25 LED Controller with the Pro Editor software, follow these instructions.

Pro Editor TEACH screen



1. Connect the WLF12 Pro Flexible Multicolor Strip Light to the LC25 LED Controller.
2. Connect the LC25 LED Controller to the Pro Converter Cable as shown in the Full Preview Connection image.
3. Use Pro Editor software to connect to the LC25 LED Controller and click on the **Teach** button.

[1] Input functionality can change depending on the configuration created with Pro Editor. Refer to wiring diagrams in the selected mode in Pro Editor.

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4. Click **Auto Teach** to teach the full length of the connected WLF12 or enter a value and click the **Manual Teach** button to teach the number of LED sections.
5. Wait for the light to finish flashing.

Pro Editor Configuration

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. Configure any Pro Series-enabled device using the free Pro Editor software, available for download at www.bannerengineering.com/proeditor.

Machine and Work Cell—Choose colors and animations to create up to seven discretely controlled illumination and status states. Spans functionality from single-segment to two-colored animations.

Single Segment—The single segment option shows the work light in one solid color. The input wires are used to change colors. Flashing and intensity options are available. Presets are available for common configurations, which can be adjusted as desired.
End Status—The end status option shows the inside (LED) section of the work light in one color and the ends of the light in another. The size of the two sections are customizable. The input wires are used to change color states. Flashing and intensity options are available.
Process Visualization—The process visualization option enables a choice of colors, animations, speeds, and intensities to provide visual information that corresponds to equipment or process status. Single-color illumination states are also available.

Tower Light—Choose colors, intensities, and animations to create a discretely controlled two or three-segment indicator. The segments are controlled independently with input wires.

Mobile—Choose colors and animations to create states that can be used for advanced and intuitive indication on mobile equipment.

Basic Warning—Choose colors, intensities, and animation to create a discretely controlled three-segment indicator for communication of equipment status. The segments are controlled independently with input wires.
Advanced Warning—Create up to seven discretely controlled status indicators, and use presets for Loading and Emergency Stop conditions. Colors, animations, speeds, and intensities provide equipment status.

Timer—The timer option uses the work light 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 light as time advances. The timer starts when 12 V DC to 30 V DC is applied to the timer run input wire (pin 2 or white 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 (pin 4 or black wire). The timer automatically resets when it reaches the final count. A steady global background or threshold markers 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 LEDs along the length of the light based on up to four thresholds that define colors, intensity, and flashing. When the rising edge of a 12 V DC to 30 V DC pulse is applied to the counter input wire (pin 2 or white 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 (pin 4 or black wire). The counter automatically resets when it reaches the final count. A steady global background or threshold markers can be applied, from which color and intensity can also be defined.

Pick Put Build—Choose colors and animations to create states that can be used to guide operators, signal material status, enable light-guided assembly, create pick-to-light operations, and enable kitting operations.

Basic Segment—Choose colors, intensities, and animation to create a discretely controlled two or three-segment indicator for communication of processes.
Advanced Segment—Enable up to seven discretely controlled segments to be used as individual indication states. Only one segment can be enabled at once.

Distance—The distance mode uses the light to display colored LEDs proportional to a PFM (pulse frequency modulation) or PWM (pulse width modulation) input and set range or with discretely controlled levels.

Distance—The light adjusts position and color continuously based on the PFM or PWM input value (pin 2 or white wire) and defined color, flash, and intensity in up to four thresholds while maintaining an optional steady background for LEDs outside the active threshold range. Threshold markers can be applied, from which color and intensity can also be defined. The PFM signal frequency range can be from 100 to 10,000 Hz. The PWM duty cycle range can be from 0 to 100%.
Coarse Distance—Choose colors, intensities, and flash patterns to create up to seven discretely controlled levels based upon input wiring logic states for simple distance and level indication.

Gauge—The gauge option controls the color and position of a band of LEDs based on a defined PFM or PWM input value (pin 2 or white wire) and range. The width of the band is defined as a percentage of the total lighted length. The light adjusts the position and color of the band and background continuously based on the input signal and defined color, flash, intensities, and animations in upper, lower, and center thresholds. Threshold markers can be applied, from which color and intensity can

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also be defined. The PFM signal frequency range can be from 100 to 10,000 Hz. The PWM duty cycle range can be from 0 to 100%.

Animation Settings

Animation	Description
Off	Device OFF, no animation displays
Steady	Color 1 is solid ON at the defined intensity
Flash	Color 1 flashes at the defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Flash	Color 1 and Color 2 flash alternately at the defined speed, color intensities, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Shift	Color 1 and Color 2 flash alternately on adjacent LEDs at defined speed and color intensities
Ends Steady	Color 1 defines the center 75% of the light. Color 2 defines the 12.5% of the light on each end. Center and ends are on steady. Center proportion can be defined in **End Status** mode
Ends Flash	Color 1 defines the center 75% of the light. Color 2 defines the 12.5% of the light on each end. The ends will flash at defined speed and pattern. Center proportion can be defined in **End Status** mode
Scroll	Color 1 defines a band 20% of the length of the light that moves in one direction up or down against the background of Color 2 at the defined speed and color intensities
Center Scroll	Color 1 defines a band 10% the length of the light that moves from the center of the light to the ends against the background of Color 2 at the defined speed and color intensity
Bounce	Color 1 defines a band 20% of the length of the light that moves up and down between the top and bottom of the light against the background of Color 2 at the defined speed and color intensities
Center Bounce	Color 1 defines a band 10% the length of the light that moves from the center of the light to the ends and back against the background of Color 2 at the defined speed and color intensity
Intensity Sweep	Color 1 continuously increases and decreases intensity between 0% to 100% at defined speed and color intensity
Two Color Sweep	Color 1 and Color 2 define the end values of a line across the color gamut. The light continuously displays a color by moving along the line at the defined speed and color intensity
Color Spectrum	The light scrolls through the 13 predefined colors with a different color on each LED at the defined speed, Color 1 intensity, and direction
Single End Steady	Color 1 is solid ON at the defined intensity on one end of the device
Single End Flash	Color 1 flashes at the defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random) on one end of the device

By default, when the sub-applications for Machine and Work Cell are selected, Pro Editor opens **I/O State** configuration in **Advanced**. Three **I/O states** are available:

I/O State Configuration Settings	Description
Basic	Configurations made in this state assign one wire to one state, with the following override control: • Pin 4 (Black) overrides Pin 1 (Brown) • Pin 2 (White) overrides Pins 1 and 4 (Brown and Black)
Advanced	I/O state with full seven state options for maximum configuration. Configurations made in Advanced assign binary wiring combinations of all valid inputs to each state.
I/O Block	Three state control for use with I/O block. Configurations made in I/O Block assign states to the black, white, and combination of black and white wires for use with I/O blocks for which power (brown) and common (blue) are always on for five pin connections.

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Chapter Contents

FCC Part 15 Class A for Unintentional Radiators 9
Industry Canada ICES-003(A) 9
LC25 LED Controller Dimensions 9

Chapter 3 LC25 LED Controller Specifications

Supply Voltage

12 V DC to 30 V DC at 30 mA maximum

Use only with a suitable Class 2 power supply (UL) or a SELV power supply (CE)

See the WLF12 Pro Flexible Multicolor Strip Light Instruction Manual for the WLF12 supply voltage and current.

NOTICE: The WLF12 is designed to be used with an LC25 and must be no more than 3.05 m (10 ft) apart. Contact the factory for instructions on how to use a WLF12 without an LC25.

WARNING: The WLF12 will be permanently damaged if a supply voltage of greater than 12 V DC is applied directly to the light.

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Connections

Integral 4-pin M12 male and female quick-disconnect connectors

Mounting

A strip of double-sided very high bonding strength tape is supplied

Multiple bracket options available

Secure cables within 150 mm (5.9 in) of the light

Environmental Rating

IP65, IP67, IP68

Suitable for wet locations per UL 2108

Do not spray cable with a high-pressure sprayer or cable damage will result.

Input Rating

Leakage Current Immunity: 400 µA

Indicator On/Off Response Time: 300 ms (maximum)

PWM Input Characteristics

Duty Cycle Range: 0 to 100%
Constant Frequency Range: 100 to 10000 Hz

PFM Input Characteristics

Frequency Range: 100 to 10000 Hz
Constant Duty Cycle Range: 10 to 90%

Construction

Connector Body: PVC translucent black

Coupling Material: Nickel-plated brass

Indicators

Green: Power

Vibration and Mechanical Shock

Vibration: 10 Hz to 55 Hz, 1.0 mm peak-to-peak amplitude per IEC 60068-2-6

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

Operating Temperature

–40 °C to +50 °C (–40 °F to +122 °F)

Storage Temperature: –40 °C to +70 °C (–40 °F to +158 °F)

Certifications

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Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

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

Advanced Capabilities

PULSE® PRO I/O

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

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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.

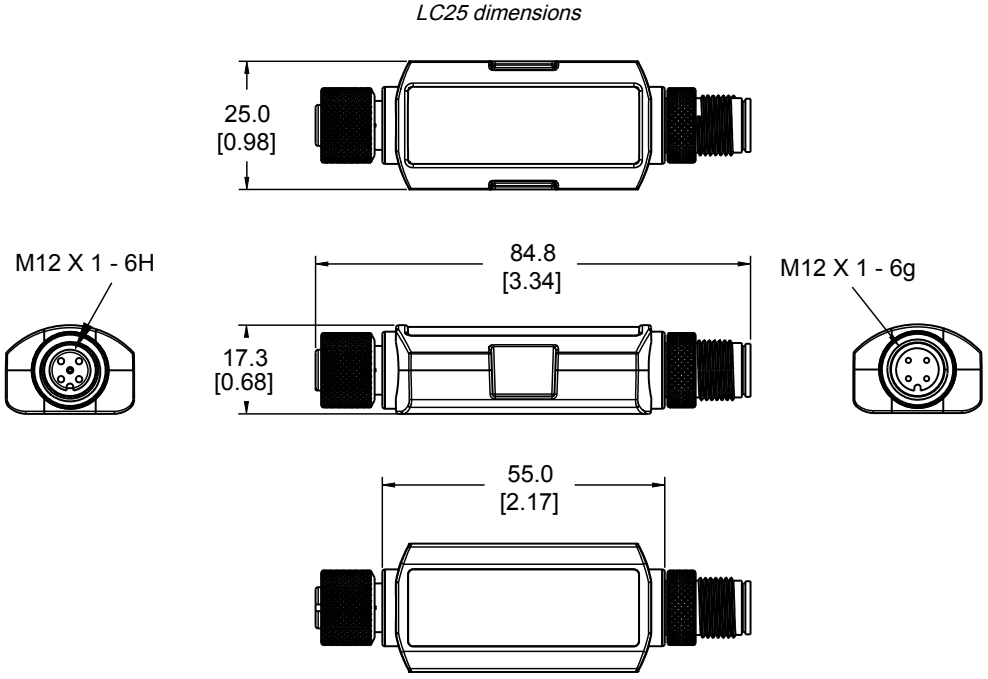
Industry Canada ICES-003(A)

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.

LC25 LED Controller Dimensions

LC25 dimensions



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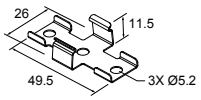
Chapter Contents

Chapter 4 LC25 LED Controller Accessories

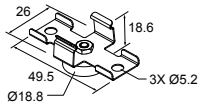
LMBLC25T

- Stainless steel clip bracket
- Includes 1 clip bracket and 2 plastic spacers
- Clearance hole for M5 hardware

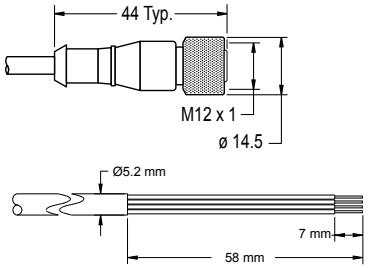
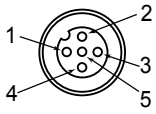
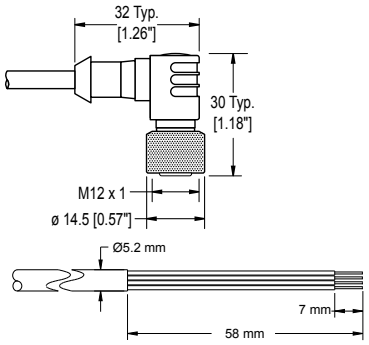
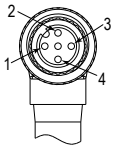


LMBLC25TMAG

- Magnetic mounting bracket for attachment to steel and iron surfaces



4-Pin Threaded M12 Cordsets—Single Ended

Model	Length	Style	Dimensions	Pinout (Female)	
MQDC-406	2 m (6.56 ft)	Straight			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Unused
MQDC-415	5 m (16.4 ft)				
MQDC-430	9 m (29.5 ft)				
MQDC-450	15 m (49.2 ft)				
MQDC-406RA	2 m (6.56 ft)	Right-Angle			
MQDC-415RA	5 m (16.4 ft)				
MQDC-430RA	9 m (29.5 ft)				
MQDC-450RA	15 m (49.2 ft)				

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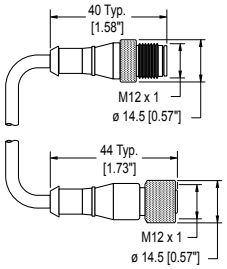
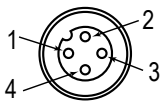
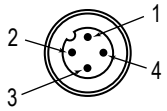
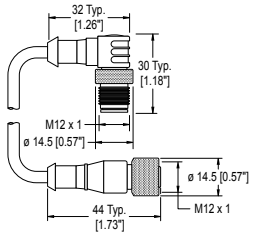
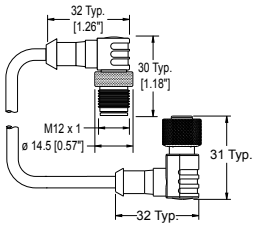
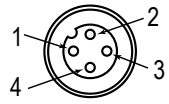
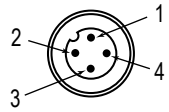
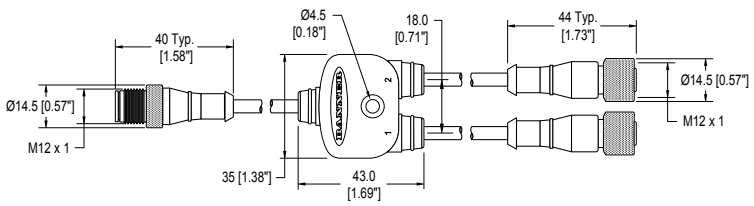
4-Pin Threaded M12 Cordsets—Double Ended				
Model	**Length**	**Style**	**Dimensions**	**Pinout**
MQDEC-401SS	0.31 m (1 ft)	Male Straight / Female Straight		Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
MQDEC-403SS	0.91 m (2.99 ft)			
MQDEC-406SS	1.83 m (6 ft)			
MQDEC-412SS	3.66 m (12 ft)			
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)			
MQDEC-403RS	0.91 m (2.99 ft)	Male Right-Angle / Female Straight		
MQDEC-406RS	1.83 m (6 ft)			
MQDEC-412RS	3.66 m (12 ft)			
MQDEC-420RS	6.10 m (20 ft)			
MQDEC-430RS	9.14 m (30.2 ft)			
MQDEC-450RS	15.2 m (49.9 ft)			
MQDEC-403RR	0.9 m (2.9 ft)	Male Right-Angle / Female Right-Angle		
MQDEC-406RR	1.8 m (5.9 ft)			
MQDEC-412RR	3.6 m (11.8 ft)			
MQDEC-420RR	6.1 m (20 ft)			

4-Pin Threaded M12 Splitter Cordsets—Flat Junction			
Model	**Branches (Female)**	**Trunk (Male)**	**Pinout**
CSB-M1240M1240	No branch	No trunk	Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
CSB-M1240M1241	2 × 0.3 m (1 ft)	No trunk	
CSB-M1241M1241		0.31 m (1 ft)	
CSB-M1248M1241		2.44 m (8 ft)	
CSB-M12415M1241		4.57 m (15 ft)	
CSB-M12425M1241		7.60 m (25 ft)	
CSB-UNT425M1241		7.60 m (25 ft) Unterminated	
CSB-M1243M1243	2 × 1 m (3.28 ft)	1 m (3.28 ft)	
			

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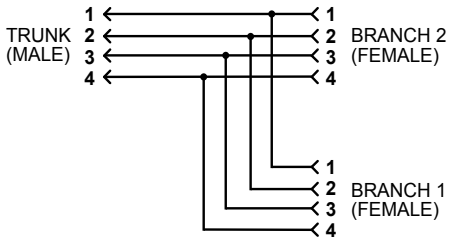
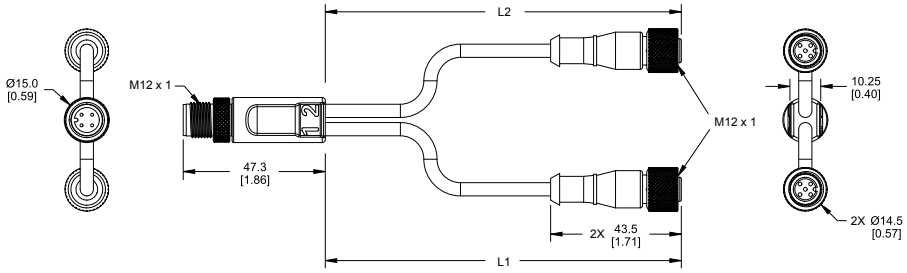
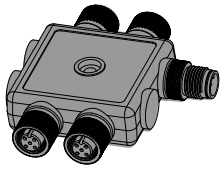
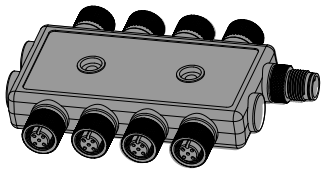
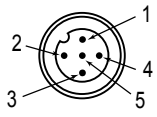
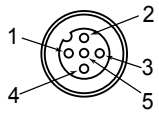
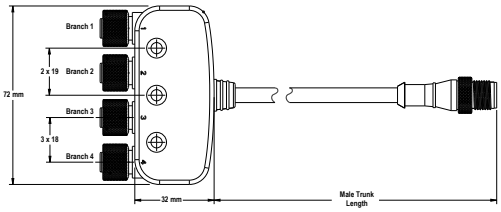
4-Pin Threaded M12 Male to 5-Pin Threaded M12 Female Splitter Cordset		
Model	**Branches (Female)**	**Wiring**
S15YB-M124-M124-0.2M	**L1, L2** 2 × 0.2 m (7.9 in)	
		

R50-4M125-M125Q-P Molded Junction Block
- Four integral 5-pin M12 female quick-disconnect connectors
- One integral 5-pin M12 male quick-disconnect connector
- Parallel wiring



R95-8M125-M125Q-P Molded Junction Block
- Eight integral 5-pin M12 female quick-disconnect connectors
- One integral 5-pin M12 male quick-disconnect connector
- Parallel wiring



5-Pin Threaded M12 Splitter Cordset with Flat Junction—Double Ended				
Model	**Trunk (Male)**	**Branches (Female)**	**Pinout (Male)**	**Pinout (Female)**
CSB4-M1251M1250	0.3 m (0.98 ft)	Four (no cable)		
			1 = Brown 2 = White 3 = Blue	4 = Black 5 = Gray

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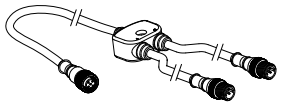
CSB-M1251FM1251M

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



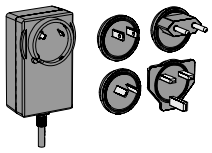
PSD-24-4

- 90 to 264 V AC 50/60 Hz input
- Includes a 1.8 m (6 ft) US style 5-15P input plug
- 24 V DC UL Listed Class 2 M12 connector output
- 4 A total current



PSW-24-2

- 24 V DC, 2 A Class 2 UL Listed power supply
- 100 V AC to 240 V AC 50/60 Hz input
- 3.5 m (11.5 ft) PVC cable with M12 quick disconnect
- Includes Type A (US, Canada, Japan, Puerto Rico, Taiwan), Type C (Germany, France, South Korea, Netherlands, Poland, Spain, Turkey), Type G (United Kingdom, Ireland, Singapore, Vietnam), and Type I (China, Australia, New Zealand) AC detachable input plugs



PSW-24-1

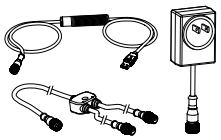
- 24 V DC, 1 A Class 2 UL Listed power supply
- 100 V AC to 240 V AC 50/60 Hz input
- 2 m (6.5 ft) PVC cable with M12 quick disconnect
- Includes Type A (US, Canada, Japan, Puerto Rico, Taiwan), Type C (Germany, France, South Korea, Netherlands, Poland, Spain, Turkey), Type G (United Kingdom, Ireland, Singapore, Vietnam), and Type I (China, Australia, New Zealand) AC detachable input plugs



PRO-KIT

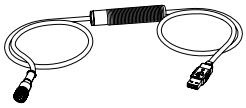
Includes:

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



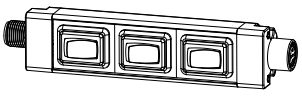
MQDC-506-USB

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



LC28PB2-3Q

- In-line switch with M12 connectors
- Rugged metal housing
- Perfect for DC-powered task lights, indicators, and tower lights
- Rated for up to 30 V DC



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Chapter Contents

Document Information 14

Chapter 5 Banner Engineering Corp Limited Warranty

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Document Information

Document title: LC25 LED Controller Instruction Manual
Part number: 234628
Revision: B
Original Instructions
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