



# Proposal for Primary Packaging of Bottles

Purpose, environment, configuration, devices and safety measures

by

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Final Report  
MFET0340 - Automation Control Systems

Directed to: Professor Michael Slifka

Report submitted in partial fulfillment of the  
requirements for the final project

at

Rochester Institute of Technology  
Department of Manufacturing and Mechanical Engineering Technology  
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# **1 Executive Summary**

The operation of filling bottles, from those of drinkable waters to containers of washing machine detergent, is highly automated. The high volume and low production cost requirements of these products make automation the only viable option. This report features a system capable of operating with different types of containers and varied liquid materials. The report also dives deep into a program that simulates the production line of bottled liquids. With some adaptations the program can be used to operate on the physical implementation of the system.

The system uses two feeders, one for bottles and one for liquids. When operating, the bottles are moved into a container and get rinsed, filled and capped. Finally the bottles of the same type and liquid, grouped together, are made available to packaging. To operate, the system uses a PLC program that verifies the count of bottles in the feeder to coordinate with moving of products to the conveyor and verifies volume of liquid available to coordinate with filling of bottles.

Other than the two feeders, the system requires a set of colored button devices, a bottle filling machine, a bottle conveyor and the PLC itself. The PLC used is Rockwell's model 5069-L306ER, with models 5069-IB6F and 5069-OB16 as input and output modules. The simulation is implemented in Ladder Logic using Studio 5000.

## **2 Full System Description**

The proposed bottle filling system (“System”) solves the problem of rinsing, filling and packaging bottles in high speed with low operation cost. When compared to manual processes the advantage is clear in terms of economy but the System also meets more complex business requirements. In a paint manufacturer, for example, several colors of paint are produced, bottled and packaged, but each paint cannot get mixed with the others.

Not only that, but typically black and white paint ship in larger bottles, while colored paint sells in smaller containers. The feeder of bottles of such machines must be able to accommodate containers of different sizes. The feeder of paint must also be able to be filled with different colors of paint. In the case of paint, the feeder must be cleaned so colors do not get mixed whenever the paint is changed. Other liquids have different requirements, such as toxicity removal or cleaning through chemical reactions.

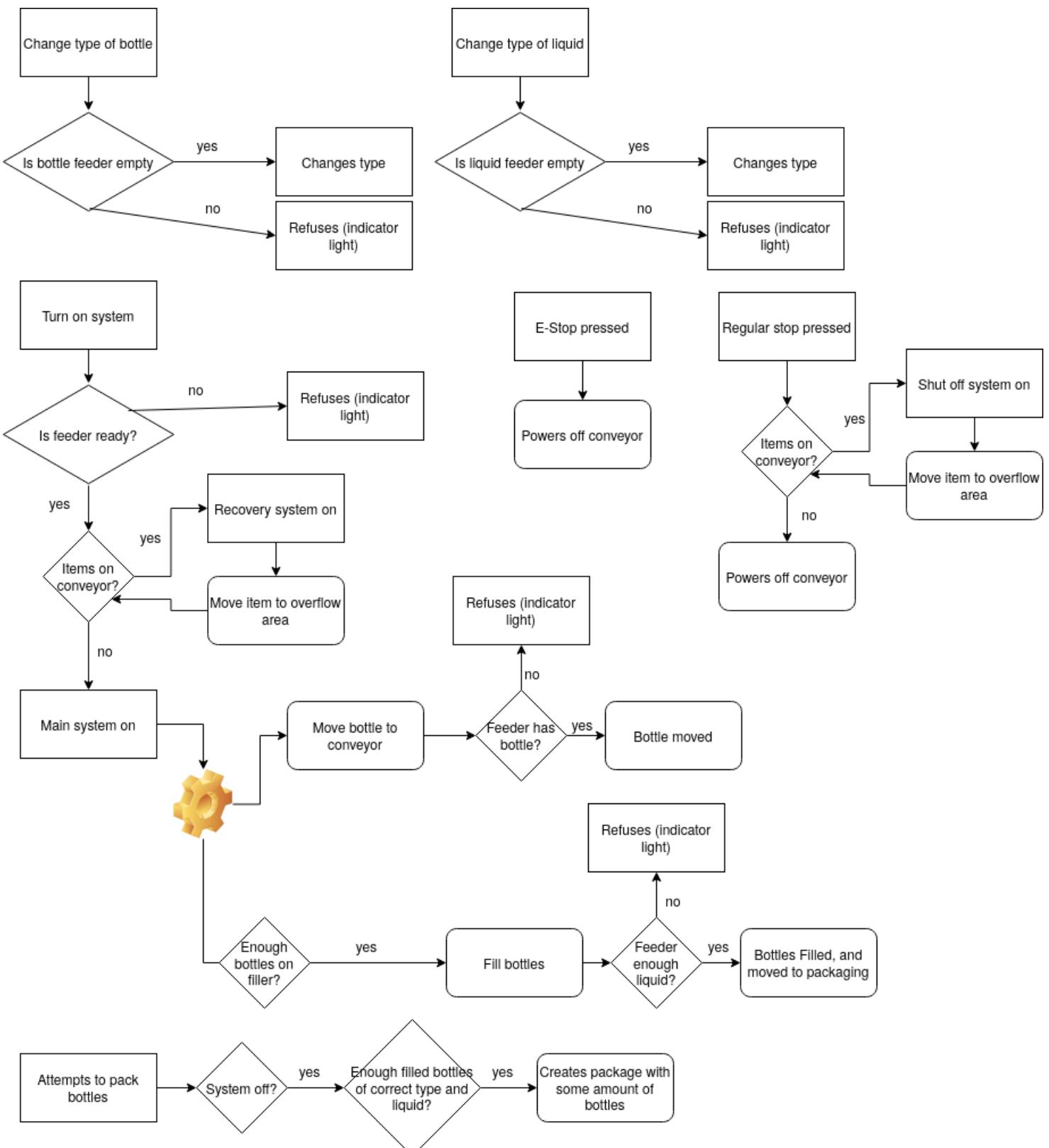
Bottles flow from the feeder onto the conveyor. Once on the conveyor, the bottles are rinsed and proceed to the liquid filler. Once a predetermined amount of bottles reach the liquid filler, the liquid flows from the liquid feeder to the bottles. After it is filled the bottle must be capped and moved to a predetermined area. The process of moving may involve sorting or could be directly connected to the startup configuration of the feeders. The conveyor part of the System features only fills the bottle.

Safety wise, the system meets some requirements by making sure the main system always starts up in a safe state. Starting up in a safe state means that it will not start until the conveyor is empty. After a power loss or emergency shutdown, bottles will stay in the conveyor and they could be from the earlier stages of cleaning to filled. When starting up again, through retentive counters, the system knows some bottles were left behind and proceeds to move them to a designated area.

The same process of moving objects to a designated area happens when shutting down the system normally. When instructed to shutdown, the main system immediately shuts down, but a shutdown system powers on if there are bottles in the conveyor. Of course, red indicator lights are on whenever any of recovery, shutdown and main system are on.

## **3 Logic Flow Chart**

The flow and logic of the System that is implemented in the form of a PLC program. This flow simulates the behavior of the proposed sorting conveyor.



## 4 Development Spreadsheet

Type	Logic Function	Name	I/O	DATATYPE	BaseTag
ALIAS	Indicates system is ready to turn on	B_GREEN	OUTPUT	DIGITAL	Local:5:Pt10.Data
ALIAS	Daily quote of (box-0, liquid-0) is reached	CONV_SOL_A	OUTPUT	DIGITAL	Local:6:Pt02.Data
ALIAS	Daily quote of (box-0, liquid-1) is reached	CONV_SOL_C	OUTPUT	DIGITAL	Local:6:Pt03.Data
ALIAS	Daily quote of (box-1, liquid-0) is reached	LINE_C_GREEN	OUTPUT	DIGITAL	Local:6:Pt07.Data
ALIAS	Daily quote of (box-1, liquid-1) is reached	LINE_C_RED	OUTPUT	DIGITAL	Local:6:Pt08.Data
ALIAS	Feeder of bottles is full	LINE_A_GREEN	OUTPUT	DIGITAL	Local:6:Pt05.Data
ALIAS	Feeder of liquids is full	LINE_A_RED	OUTPUT	DIGITAL	Local:6:Pt06.Data
ALIAS	Trying to fill with liquid of incorrect type or when feeder is full	FEEDER_GREEN	OUTPUT	DIGITAL	Local:6:Pt00.Data
ALIAS	Trying to fill with bottle of incorrect type or when feeder is full	FEEDER_RED	OUTPUT	DIGITAL	Local:6:Pt01.Data
ALIAS	Main system is running - note main system runs during startup prep as well	MOTOR_1	OUTPUT	DIGITAL	Local:4:I.Pt14.Data
ALIAS	Recovery system running - note recovery system runs during shutdown as well	MOTOR_2	OUTPUT	DIGITAL	Local:4:I.Pt15.Data
ALIAS	Indicates system is not running	tower_green	OUTPUT	DIGITAL	Local:6:Pt15.Data
ALIAS	Indicates there is not enough bottles or not enough liquid in the feeder to maintain operations normally	tower_yellow	OUTPUT	DIGITAL	Local:6:Pt14.Data
ALIAS	Indicates system is running - either recovery or main system	tower_red	OUTPUT	DIGITAL	Local:6:Pt13.Data
ALIAS	When system off, tries to change type of bottles in the feeder	SW1_NO	INPUT	DIGITAL	Local:2:I.Pt03.Data
ALIAS	When system off, tries to change type of liquid in the feeder	SW2_NO	INPUT	DIGITAL	Local:2:I.Pt05.Data
ALIAS	When system off, resets daily boxes count. When on, triggers shutdown system	SW3_LEFT_NO	INPUT	DIGITAL	Local:2:I.Pt07.Data
ALIAS	When off, tries to power on the system	SW3_RIGHT_NO	INPUT	DIGITAL	Local:2:I.Pt08.Data
ALIAS	Indicates bottle of type 0 is to be collected	SW4_NO_1	INPUT	DIGITAL	Local:3:I.Pt00.Data
ALIAS	Indicates bottle of type 1 is to be collected	SW4_NO_2	INPUT	DIGITAL	Local:3:I.Pt01.Data
ALIAS	Indicates liquid of type 0 is to be collected	SW5_NO_1	INPUT	DIGITAL	Local:3:I.Pt06.Data
ALIAS	Indicates liquid of type 1 is to be collected	SW5_NO_2	INPUT	DIGITAL	Local:3:I.Pt07.Data
ALIAS	When system off, attempts to collect bottles specified into a box, if there are enough boxes	PB1_NO	INPUT	DIGITAL	Local:1:I.Pt03.Data
ALIAS	When system off, tries to feed bottle to the feeder	PB2_NO	INPUT	DIGITAL	Local:1:I.Pt05.Data
ALIAS	When system off, tries to feed liquid to the feeder	PB3_NO	INPUT	DIGITAL	Local:1:I.Pt07.Data
ALIAS	When system off, empties the feeder of bottles	PB4_NO	INPUT	DIGITAL	Local:1:I.Pt09.Data
ALIAS	When system off, empties the feeder of liquid	PB5_NO	INPUT	DIGITAL	Local:1:I.Pt11.Data
ALIAS	Triggers immediate stop of the conveyor	ESTOP_1	INPUT	DIGITAL	Local:1:I.Pt01.Data
ALIAS	Triggers immediate stop of the conveyor	ESTOP_2	INPUT	DIGITAL	Local:2:I.Pt01.Data
TAG	MAIN   - indicates feeders are ready to system startup	can_turn_on		BOOL	
TAG	MAIN   - confirms given amount of bottles was filled	filled_bottles		BOOL	
TAG	MAIN   - confirms bottle moved to container	moved_bottle_success		BOOL	
TAG	MAIN   - conveyors wants to move bottle from feeder to conveyor	tried_moving_bottle		BOOL	
TAG	MAIN   - indicates recovery system is on	recovery_on		BOOL	
TAG	MAIN   - indicates main system is on	system_on		BOOL	
TAG	MAIN   - currently selected bottle type	sel_bottle_type		DINT	
TAG	MAIN   - currently selected liquid type	sel_liquid_type		DINT	
TAG	MAIN   - number of bottles conveyors wants to fill	num_bottles_to_fill		DINT	
TAG	FEEDER   - Unused variable but required by the SBR tag	required_placeholder_feeder		BOOL	
TAG	FEEDER   - Indicates bottles or liquid minimum threshold is reached	feeder_ready		BOOL	
TAG	FEEDER   - Confirms bottle can be moved	bottle_moved		BOOL	
TAG	FEEDER   - Confirms bottles were filled	filledSuccessfully		BOOL	
TAG	FEEDER   - Whethen system is running	system_running		BOOL	
TAG	FEEDER   - Number of bottles the conveyors is trying to fill	num_of_bottles		COUNTER	
TAG	FEEDER   - currently selected bottle type	bottle_type		DINT	
TAG	FEEDER   - currently selected liquid type	liquid_type		DINT	
TAG	FEEDER   - Signals the conveyor wants to get a bottle from the feeder	bottle_to_conveyor		DINT	
TAG	FEEDER   - Total liquid that goes in a bottle	bottle_volume		DINT	
TAG	FEEDER   - State of type selection for bottles	cur_bottle_type		DINT	
TAG	FEEDER   - State of type selection for liquid	cur_liquid_type		DINT	
TAG	FEEDER   - Number of recipients conveyors wants to fill	recipients_filled		DINT	
TAG	FEEDER   - Current volume of liquid in the container	volume_liquid		DINT	
TAG	FEEDER   - Total volume the conveyor needs to fill the bottles	total_volume		DINT	

TAG	CONVEYOR   - Whether the amount of bottles requested were filled	bottles_filled_successfully	BOOL
TAG	CONVEYOR   - Whether the feeder is ready for the system to startup	feeder_is_ready	BOOL
TAG	CONVEYOR   - Whether the bottle requested from the feeder is in the conveyor	moved_bottle	BOOL
TAG	CONVEYOR   - Unused variable but required by the SBR tag	required_placeholder_conveyor	BOOL
TAG	CONVEYOR   - Whether the shutdown system is running	shutdown_system_active	BOOL
TAG	CONVEYOR   - Whether the recovery system is running	recovery_system_active	BOOL
TAG	CONVEYOR   - Whether the conveyor is powered on	power_on	BOOL
TAG	CONVEYOR   - Number of bottles in the conveyor	bottles_on_conveyor	COUNTER
TAG	CONVEYOR   - Number of bottles trying to be filled	bottles_to_fill	DINT
TAG	CONVEYOR   - Timer used to simulate system shutdown and recovery	recovery_timer	TIMER
TAG	CONVEYOR   - Timer used to simulate sinsing and filling of bottles	fill_bottles	TIMER
TAG	CONVEYOR   - Timer used to simulate moving of bottles to conveyor	move_bottle_to_conveyor	TIMER
TAG	PACKAGING   - Whether the current number of bottles were filled	filled	BOOL
TAG	PACKAGING   - ONS used to simulate subsystem packing specific bottles	guard_0_0	BOOL
TAG	PACKAGING   - ONS used to simulate subsystem packing specific bottles	guard_0_1	BOOL
TAG	PACKAGING   - ONS used to simulate subsystem packing specific bottles	guard_1_0	BOOL
TAG	PACKAGING   - ONS used to simulate subsystem packing specific bottles	guard_1_1	BOOL
TAG	PACKAGING   - Whether the main system is running	main_system_active	BOOL
TAG	PACKAGING   - Unused variable but required by the SBR tag	required_placeholder_packaging	BOOL
TAG	PACKAGING   - Number of packed boxes of type 0 with liquid 0	boxes_of_0_0	COUNTER
TAG	PACKAGING   - Number of packed boxes of type 0 with liquid 1	boxes_of_0_1	COUNTER
TAG	PACKAGING   - Number of packed boxes of type 1 with liquid 0	boxes_of_1_0	COUNTER
TAG	PACKAGING   - Number of packed boxes of type 1 with liquid 1	boxes_of_1_1	COUNTER
TAG	PACKAGING   - Number of bottles trying to be filled	bottle_filled	DINT
TAG	PACKAGING   - Number of bottles of type 0 with liquid 0 ready to be packed	total_0_0	DINT
TAG	PACKAGING   - Number of bottles of type 0 with liquid 1 ready to be packed	total_0_1	DINT
TAG	PACKAGING   - Number of bottles of type 1 with liquid 0 ready to be packed	total_1_0	DINT
TAG	PACKAGING   - Number of bottles of type 1 with liquid 1 ready to be packed	total_1_1	DINT

## 5 PLC definition and specification

### Components

#### Controller selected:

- 5069-L306ER
- 8 I/Os
- <https://configurator.rockwellautomation.com/#/configurator/E6650EFBABB645899D338ED>  
D0D78A095/summary



#### Input Module selected:

- 5069-IB16F
- 16 points
- <https://configurator.rockwellautomation.com/#/configurator/5069-IB16F/summary>



#### Output Module selected:

- 5069-OB16
- 16 points
- <https://configurator.rockwellautomation.com/#/configurator/5069-OB16/summary>



## 6 Specification of input and output devices

### E-stop Rope:

- Qty: 1
- PN: RP-RM83F
- <https://www.bannerengineering.com/sg/en/products/part.82128.html>



### E-stop button:

- Qty: 1
- PN: SSA-EB1PLXR-12ECQ8
- <https://www.bannerengineering.com/us/en/products/part.25305.html>



### Illuminated push buttons:

- Qty: 2
- PN: K50LYXXPPB2Q
- <https://www.bannerengineering.com/us/en/products/part.32021.html>



Multi-color Indicator light:

- Qty: 4
- PN: K50LGRY2NQ
- <https://www.bannerengineering.com/br/pt/products/part.75668.html>



Indicator Tower Light:

- Qty: 3
- PN: TL70GYRQ
- <https://www.bannerengineering.com/us/en/products/part.92336.html>



## **7 Logic of the system**

Find the code for the simulation system in the next few pages.

## conveyor - Ladder Diagram

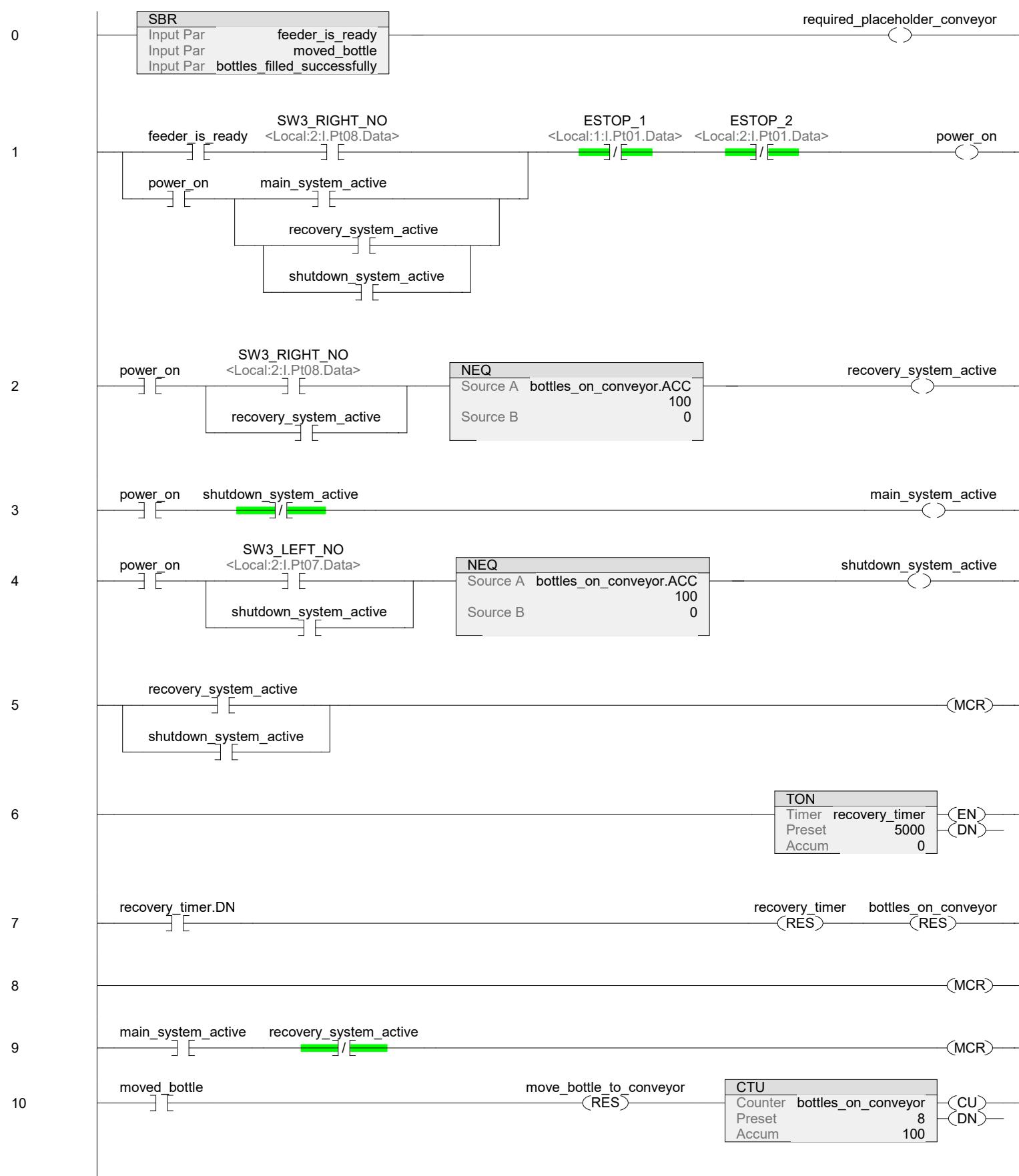
Template:MainTask:MainProgram

Total number of rungs in routine: 18

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**conveyor - Ladder Diagram**

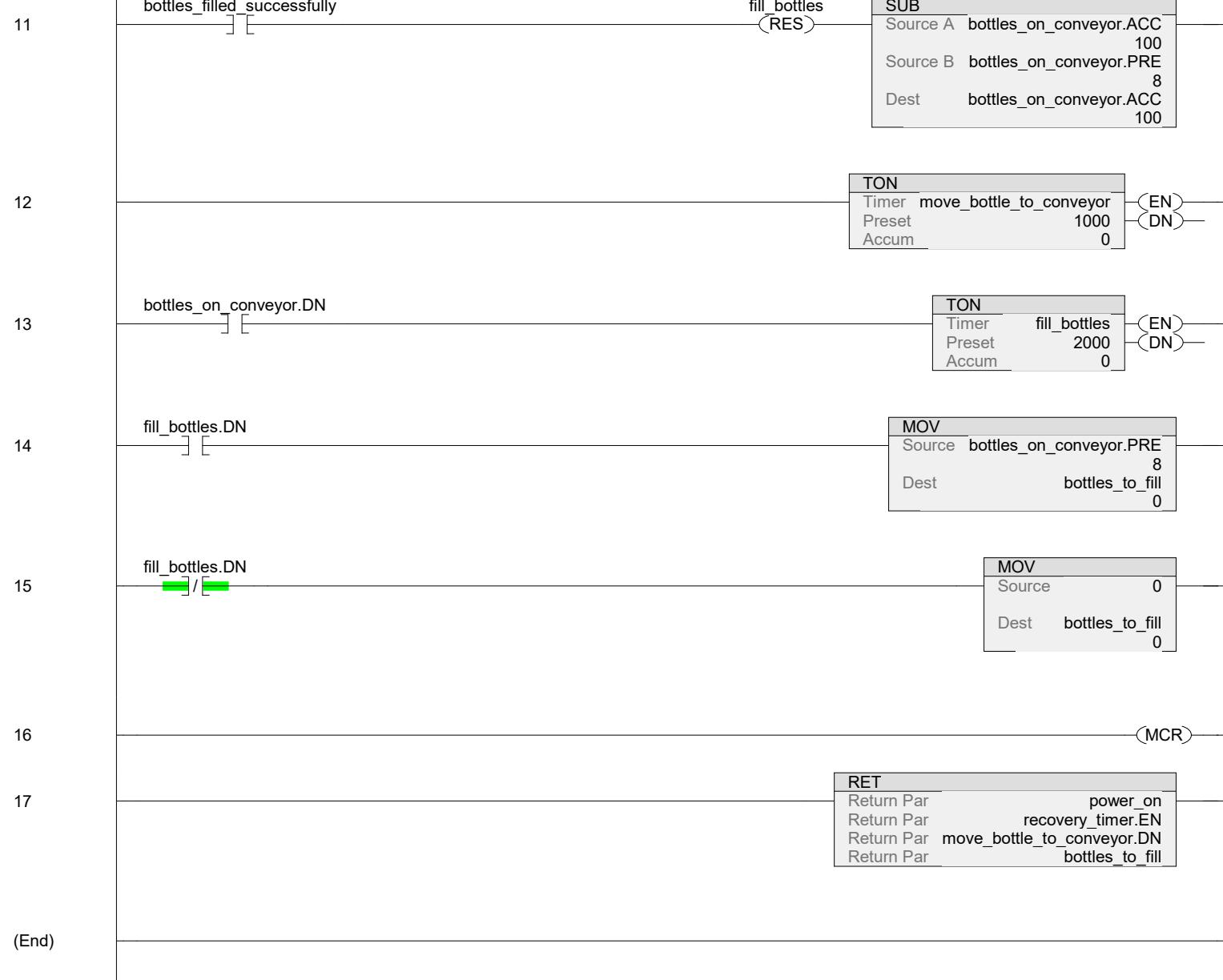
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Total number of rungs in routine: 18

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**feeder\_routine - Ladder Diagram**

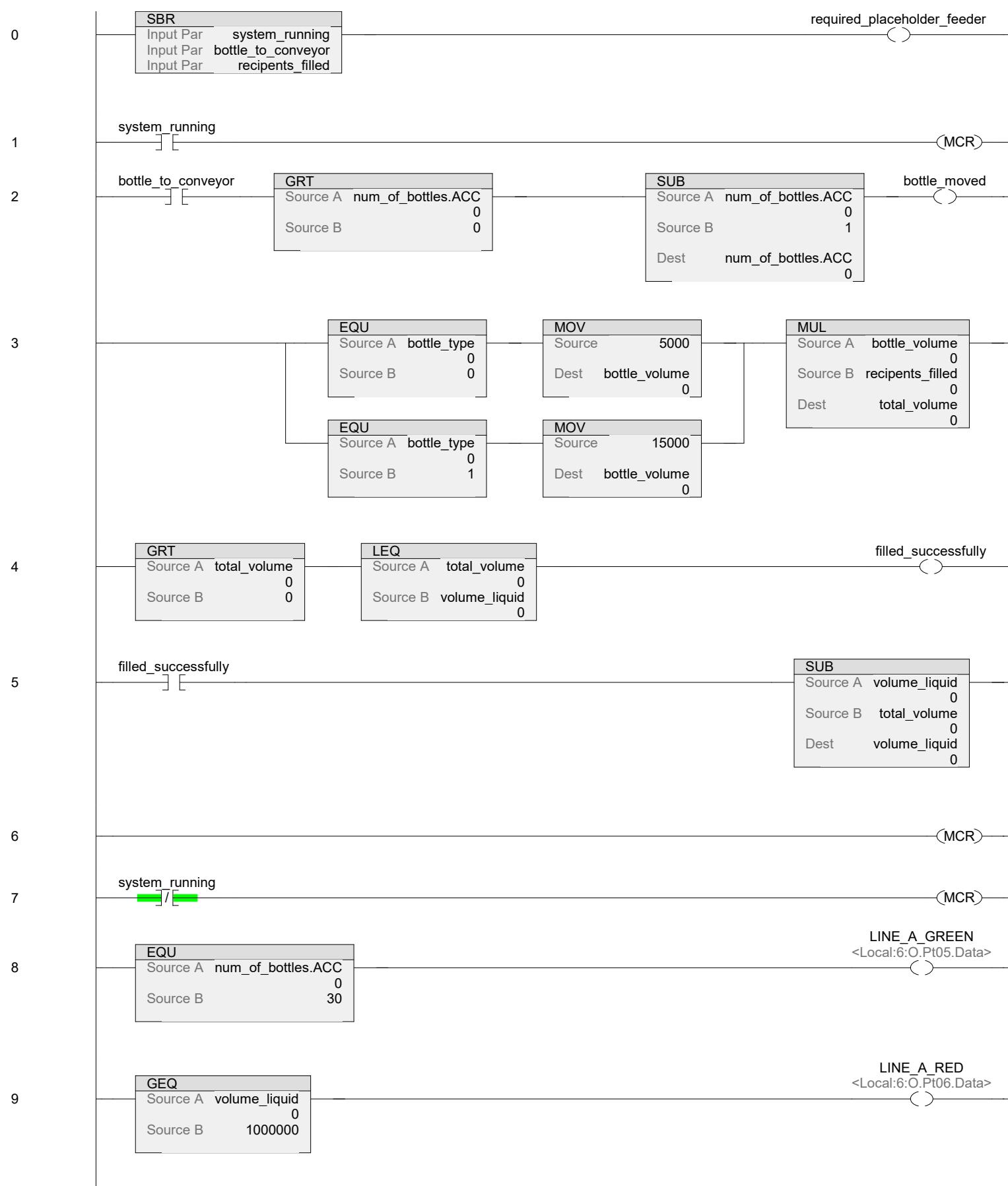
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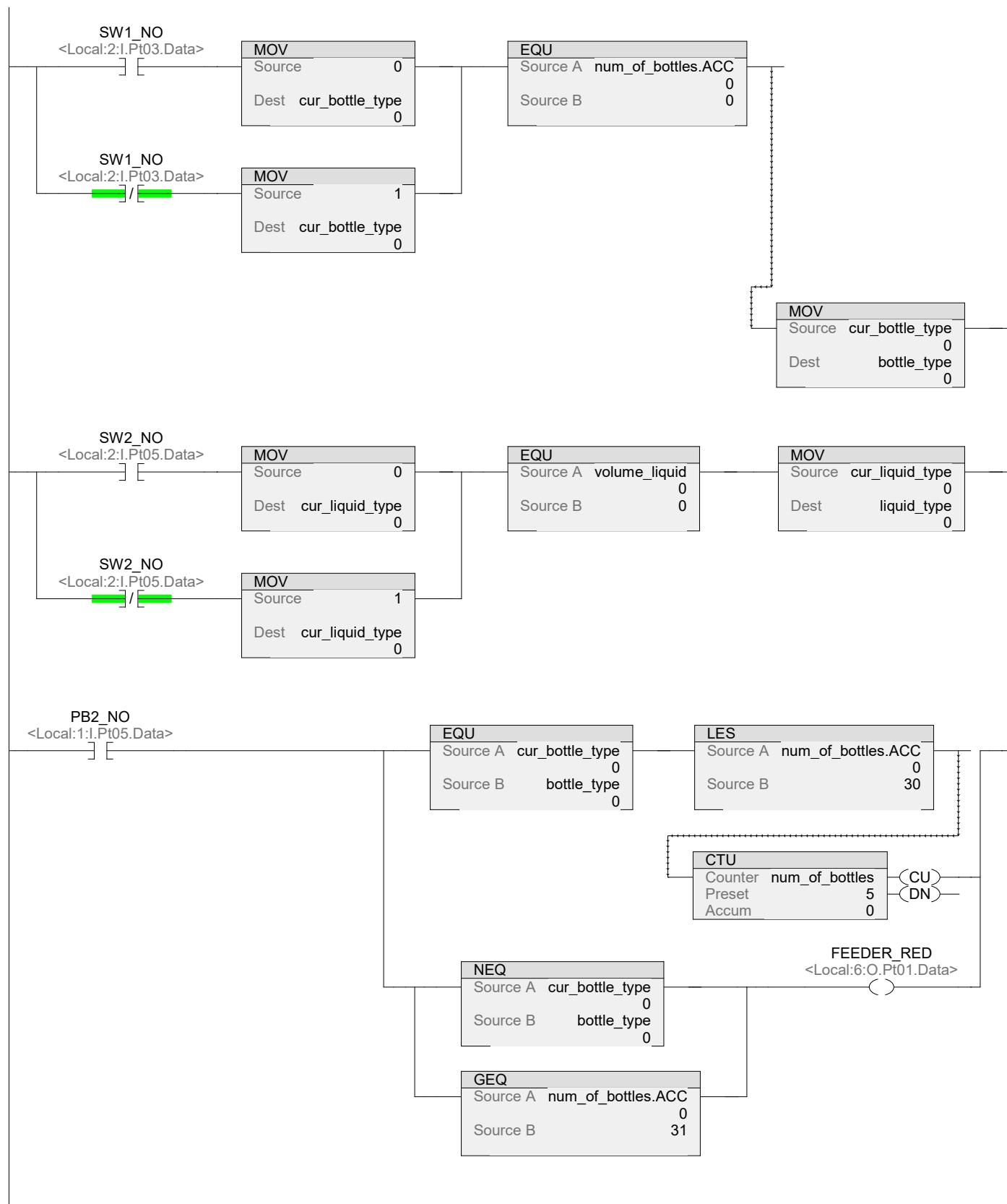
Total number of rungs in routine: 19

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**feeder\_routine - Ladder Diagram**

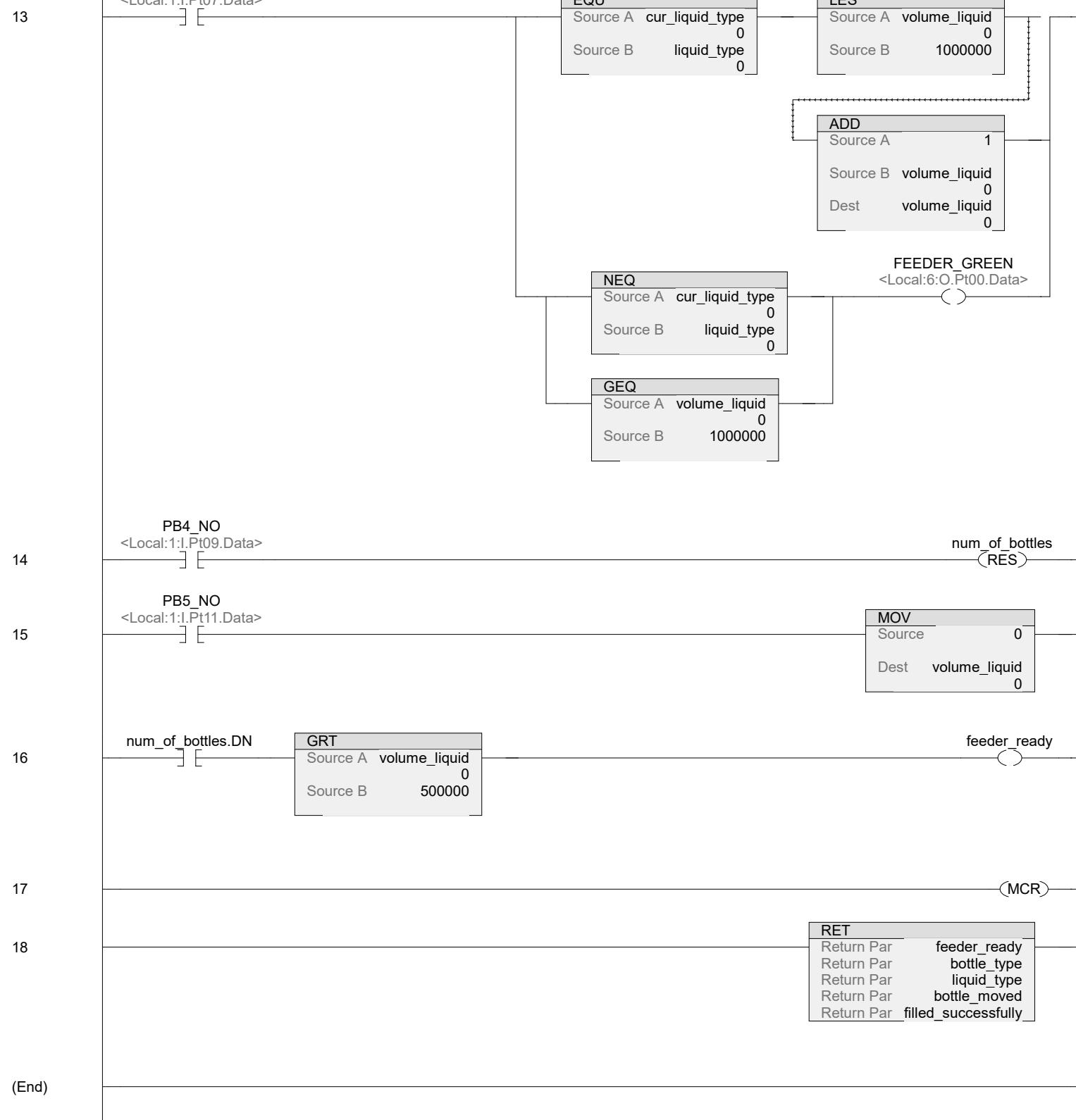
Template:MainTask:MainProgram

Total number of rungs in routine: 19

**Page 5**

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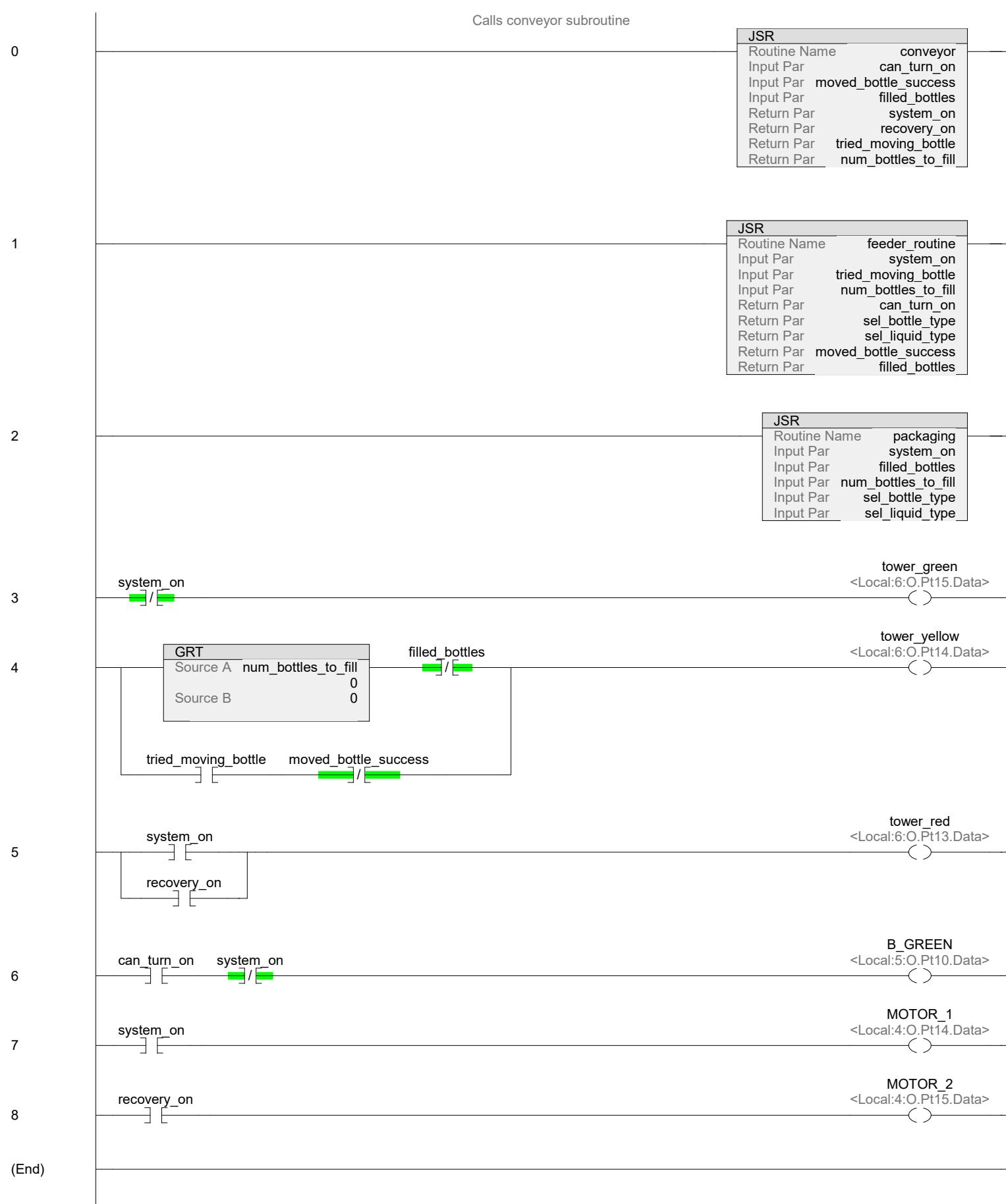
## MainRoutine - Ladder Diagram

Template:MainTask:MainProgram  
Total number of rungs in routine: 9

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## packaging - Ladder Diagram

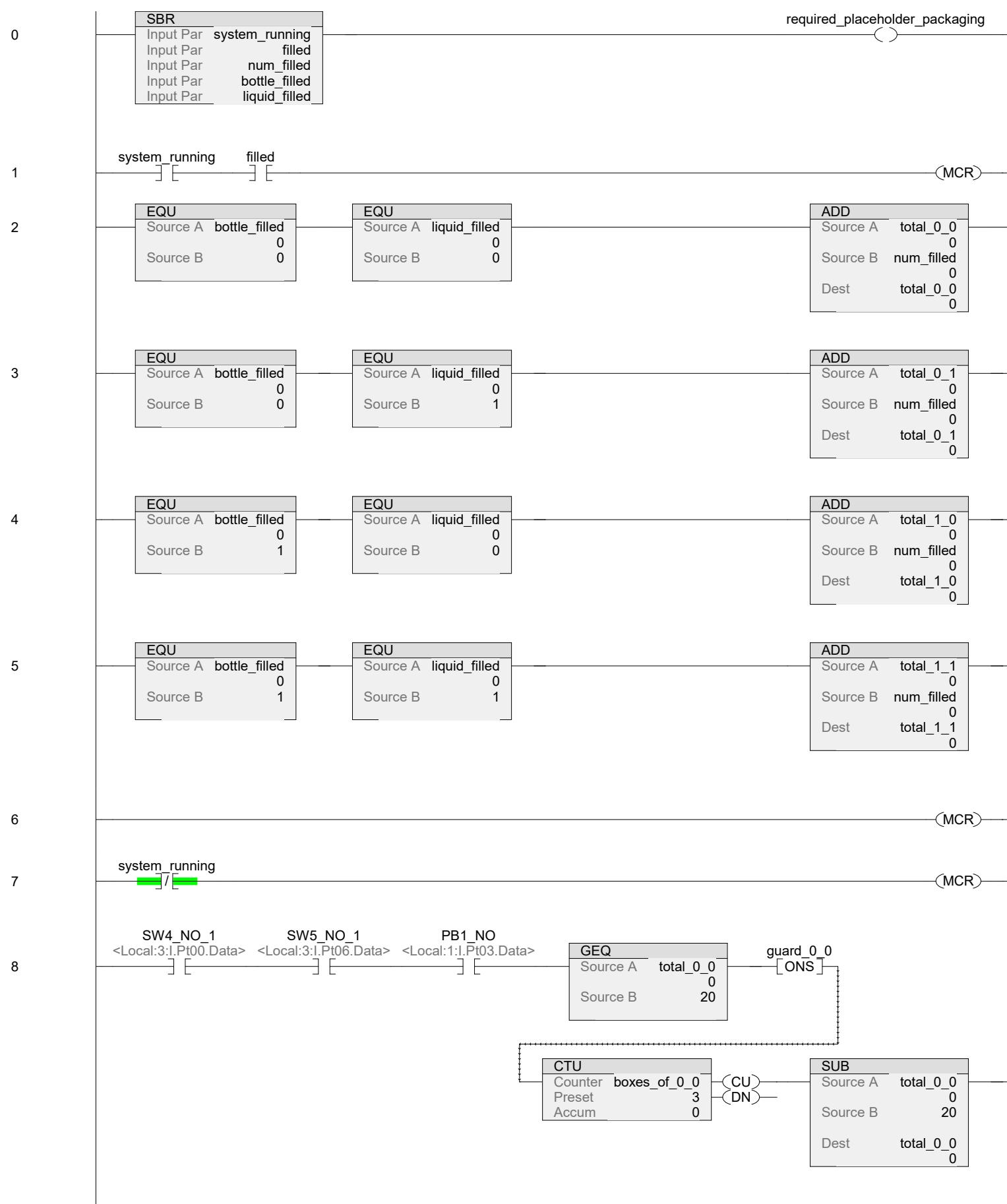
Template:MainTask:MainProgram

Total number of rungs in routine: 18

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## packaging - Ladder Diagram

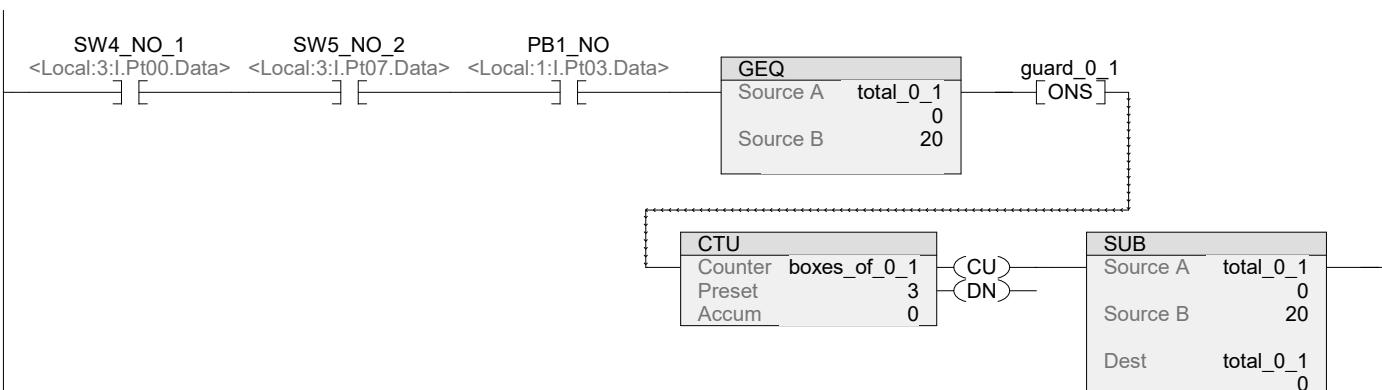
Template:MainTask:MainProgram  
Total number of rungs in routine: 18

Page 8

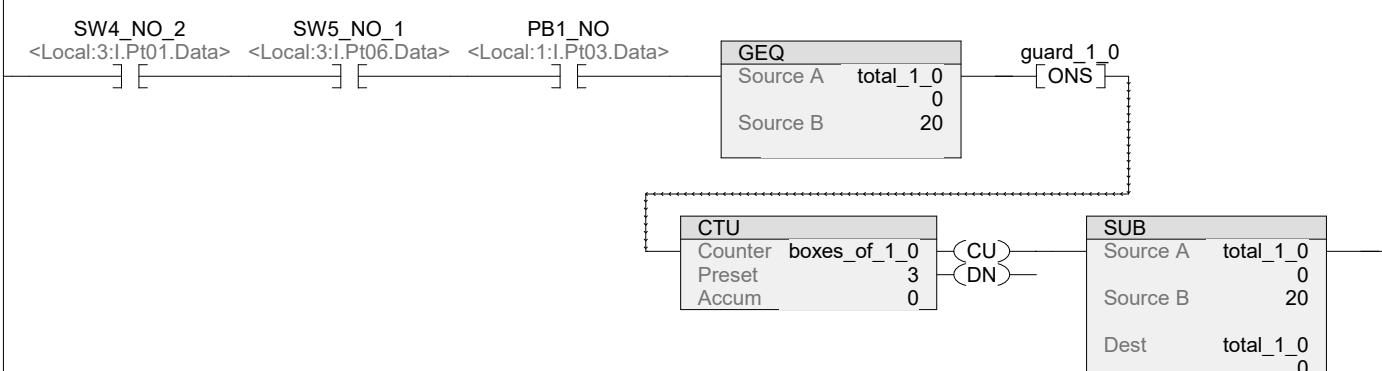
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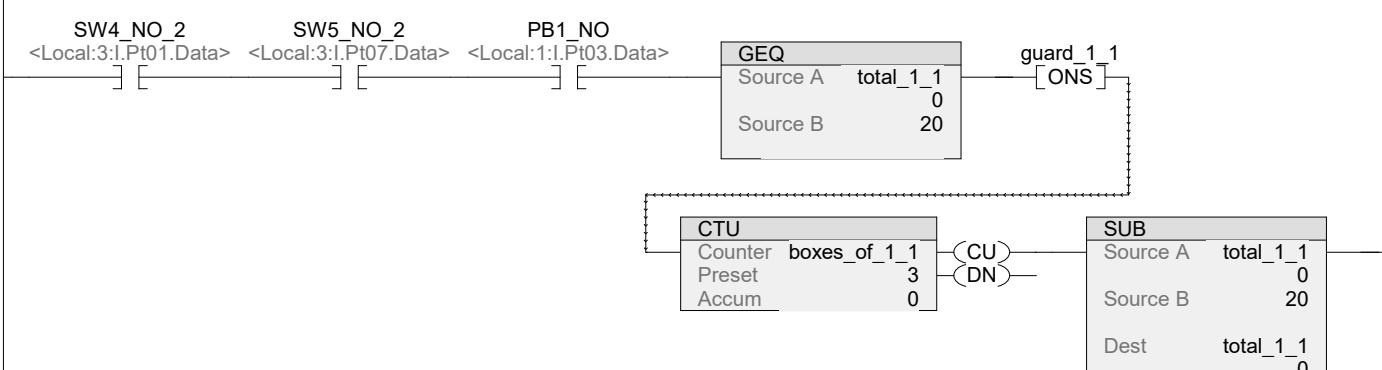
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10



11



12



13



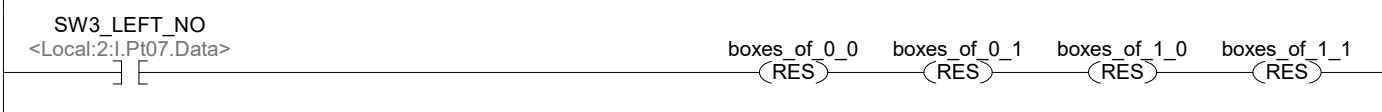
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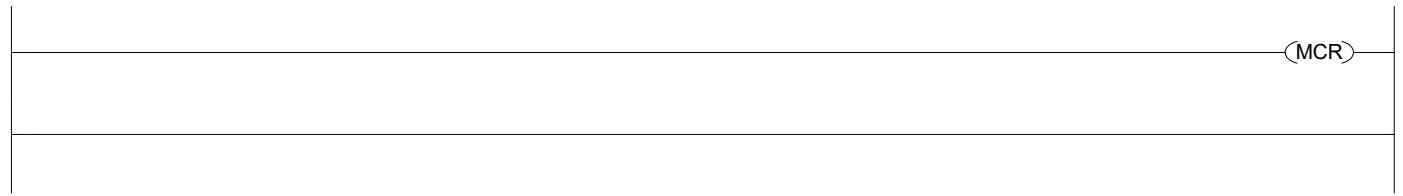


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16





## 8 Startup Configuration

The first requirement for system startup is that emergency stops are reset to their original position. This is a common and necessary procedure. Another requirement to power on the system is having both the bottles and the liquid feeders with some amount of product. They do not have to be full, but need to be fed to a predefined capacity.

The last requirement is the conveyor to be full. This is a necessity because system supports different types of bottles. If the feeder is fed with a different type of bottle than those in the bottle conveyor, then there would be a big problem, possibly big, with the output of the system. Once there is a reset, like with a power loss, the system will recover to a safe state by moving everything from the conveyor to a designated overflow area. The same happens when the system is shut off normally: moves shutting off power to the conveyor, objects are, once again, moved to an overflow area.

## 9 Potential System Issues

The System as implemented in the simulation and described section 2 will resist some errors resulting from emergency stops and power loss. The current state of the system, however, is not safe for all scenarios, including resistance to personnel mistakes and parts failure. This section brings some of them into light.

Due to the high speed, the bottle conveyor should be kept in a restricted area when operating. Although there is an E-Stop rope around the conveyor, since there are no proximity sensors the speed might be high enough to cause damage to personnel in the restricted area before the E-Stop is actuated. However, this injuries are not major nor fatal, and by making the zone where the System is installed restricted, the accidents will be rare.

If it is impossible to restrict the area where the feeders and fillers are installed, then physical barriers should be added to all reachable parts. In this case, using proximity sensors is a good addition to system safety. For example, if the part holding the bottles fails, a bottle will fall in a very high speed. If it is in an accessible area and there are no barriers, it might hurt personnel.

Additionally, the system does not take into account misuse of the equipment. As from the PLC program, the packaging points cannot be accessed when the machine is on. Packaging is only allowed when conveyor power is off because there is a risk of having other products coming down from the conveyor in high speed. However, since there are no physical blocks that becomes a risk in the physical implementation.

The last featured problem is with material handling and monitoring parts failure. If the liquid feeder fails and does not detect it is out of liquid, the system will continue running normally. While not a risk to personnel, the result would be packaged empty bottles, which is a big problem. The problem is there are no feedback sensors. The system only uses timers and trusts every subsystem works all the time. This is not realistic but is a decision taken to avoid unnecessary complication in the earlier stages of development. If moving to a physical scenario, feedback sensors would be necessary to monitor the system.

# **Appendix A**

## **Specifications Sheet**

Find specifications sheet starting on the next page.

# RP-RM83F Heavy-Duty Rope Pull Emergency Stop Switch



## Datasheet

Rope pull switch with an emergency stop button for indoor or outdoor use



- Both safety contacts latch open when rope is pulled, broken, or if tension is reduced; requires manual reset (IEC 60947-5-5)
- Aluminum die-cast housing, rated IP67 and NEMA 4, suitable for demanding indoor and outdoor industrial environments
- Innovative RP-RM83F...LT.. design provides quick, easy rope adjustment
- Rope spans up to 75 m (245 ft), depending on model
- Both safety contacts are closed with normal rope tension, and open when rope is pulled or if rope breaks (or if tension is reduced from normal amount)
- Both Monitoring contacts operate opposite the safety contacts for monitoring by another device
- Additional Aux. 24V solid-state PNP output on some models provides remote rope tension monitoring
- Tension indicator window indicates proper rope tension for operation or safety contacts latched open (the rope pull or the E-stop button is actuated)

## Models

Model	Max. Rope Length	Rope Connection	Aux. Status Output	Run Position	Cable Pulled/Cable Break	Switching Diagram	
RP-RM83F-75LTE	75 m (245 ft)	Built-in Turnbuckle	Yes	<b>Cable Run Position (All Models)</b>		No PNP Aux. Output Models	
RP-RM83F-75LRE		Ring		S1	S2		
RP-RM83F-75LT		Built-in Turnbuckle	No				
RP-RM83F-75LR		Ring					
RP-RM83F-38LTE	37.5 m (123 ft)	Built-in Turnbuckle	Yes	<b>Cable Pulled / Cable Break Position (All Models)</b>		PNP Aux. Output Models	
RP-RM83F-38LRE		Ring		S1	S2		
RP-RM83F-38LT		Built-in Turnbuckle	No				
RP-RM83F-38LR		Ring					

Contacts:  Open  Closed



**Note:** This symbol for a positive-opening safety contact (IEC 60947-5-1) is used in the switching diagram to identify the point in actuator travel where the normally-closed safety contact is fully open.



## Important... Read This First

**Regarding the Use of Rope Pull Switches.** In the United States, the functions that Banner rope pull switches are intended to perform are regulated by the Occupational Safety and Health Administration (OSHA). Whether or not any particular rope pull switch installation meets all applicable OSHA requirements depends upon factors that are beyond the control of Banner Engineering Corp. These factors include the details of how the switches are applied, installed, wired, operated, and maintained.

Banner Engineering Corp. has attempted to provide complete application, installation, operation, and maintenance instructions in this document. Direct any questions regarding the use or installation of rope pull switches to the factory applications department.

Banner Engineering Corp. recommends that rope pull switches be applied according to the guidelines set forth in the standards listed below. In addition, the user is responsible for ensuring all local, state, and national laws, rules, codes, and regulations relating to the use of Banner rope pull switches in each application are satisfied. Extreme care is urged that all legal requirements are met and that all installation and maintenance instructions are followed.

### Applicable U.S. and International Standards (not all inclusive):

ANSI B11.0 Safety of Machinery, General Requirements, and Risk Assessment

Contact: Safety Director, AMT – The Association for Manufacturing Technology, 7901 Westpark Drive, McLean, VA 22102, Tel.: 703-893-2900

ANSI B11.19 Performance Criteria for Safeguarding

Contact: Safety Director, AMT – The Association for Manufacturing Technology, 7901 Westpark Drive, McLean, VA 22102, Tel.: 703-893-2900

ANSI NFPA 79 Electrical Standard for Industrial Machinery

Contact: National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, Tel.: 800-344-3555

ANSI/RIA R15.06 Safety Requirements for Industrial Robots and Robot Systems

Contact: Robotic Industries Association, 900 Victors Way, P.O. Box 3724, Ann Arbor, MI 48106, Tel.: 734-994-6088

EN ISO 12100 Safety of Machinery – General Principles for Design — Risk Assessment and Risk Reduction

EN 60204-1 Electrical Equipment of Machines Part 1: General Requirements

ISO 13850 (EN 418) Emergency Stop Devices, Functional Aspects – Principles for Design

IEC 60947-5-5 Low Voltage Switchgear – Electrical Emergency Stop Device with Mechanical Latching Function

These and other standards are available from:

**NSSN National Resource for Global Standards:** [www.nssn.org](http://www.nssn.org) (Tel: 212-642-4980)

**IHS Standards Store:** [www.global.ihs.com](http://www.global.ihs.com) (Tel: 303-397-7956, 800-854-7179)

**Document Center:** [www.document-center.com/home.cfm](http://www.document-center.com/home.cfm) (Tel: 650-591-7600)

## EU Declaration of Conformity (DoC)

Banner Engineering Corp. herewith declares that these products are in conformity with the provisions of the listed directives and all essential health and safety requirements have been met.

Product	Directive
RP-RM83F Heavy-Duty Rope Pull Emergency Stop Switch	Machinery Directive

Representative in EU: Peter Mertens, Managing Director Banner Engineering Europe. Address: Park Lane, Culliganlaan 2F, bus 3,1831 Diegem, Belgium.

## Overview

Models RP-RM83F-.. are rope pull emergency stop switches in compact, heavy-duty die-cast aluminum housings, for indoor or outdoor use. When used with steel wire rope, they can provide emergency stop actuation along conveyors and similar machinery. Red PVC-covered 2, 3, 4, or 5 mm diameter wire rope is recommended, depending on model (force) and rope distance.

The switches have redundant contacts; terminals 11/12 are positive opening when there is a cable-pull or cable-brake situation. When used separately, these contacts provide inputs to a dual-channel safety module. Terminals 11/12 can also be used individually to provide single-channel switching or as a single-channel input to a safety module. Terminals 23/24 are for monitoring purposes only (closed in a cable-break/cable-pull situation).

When the rope is properly tensioned (228 or 133N, depending on model), the red arrows are centered under the hash mark on the tension indicator window, the contacts at terminals 11/12 are closed, and the contacts at terminals 23/24 are open. All models feature a “latching” operation. When the rope is pulled, the switch contacts 11/12 open and remain open until the built-in E-stop/reset button is manually reset.

These rope pull emergency stop switches are not generally considered safeguarding devices, in that they do not prevent or reduce exposure of individuals to a hazard. They provide the same function as other types of emergency stop switches.



**WARNING:**

- **Not a safeguarding device**
- Failure to follow these instructions could result in serious injury or death.
- This device is not considered a safeguarding device because it requires an overt action by an individual to stop machine motion or hazards. A safeguarding device limits or eliminates an individual's exposure to a hazard without action by the individual or others. This device cannot be substituted for required safeguarding. Refer to the applicable standards to determine those requirements.



**WARNING:**

- **Do not mute or bypass any emergency stop device**
- Muting or bypassing the safety outputs renders the emergency stop function ineffective.
- ANSI B11.19, ANSI NFPA79 and IEC/EN 60204-1 require that the emergency stop function remain active at all times.

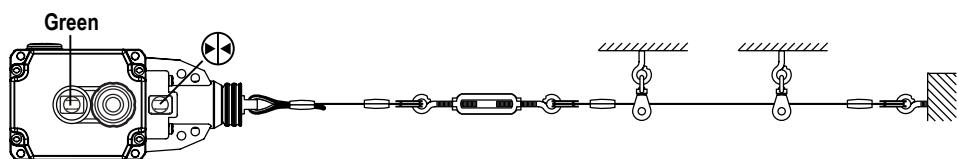


Figure 1. Run Condition (Proper Rope Tension) - Contacts 11/12 Closed

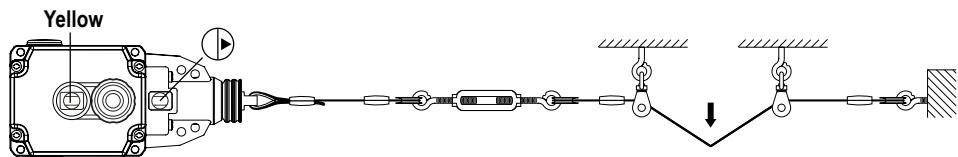


Figure 2. Rope Pulled Condition - Contacts 11/12 Open

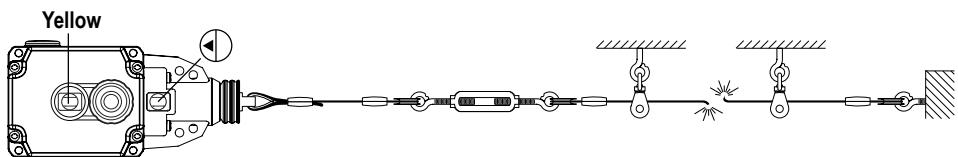


Figure 3. Rope Break Condition - Contacts 11/12 Open

## Mechanical Installation

- The rope should be easily accessible and visible along its entire length. Markers or flags may be fixed on the rope to increase its visibility
- Switch body, anchor mounts and wire rope supports (pulleys or eye bolts) must be rigid and secure
- Although pulleys are preferred, a combination of pulleys and/or eye bolts are required to support the wire rope along its length. When pulled, the wire rope, should move freely through the pulleys or eye bolts to actuate the switch
- Use only pulleys (not eye bolts) when routing the rope around a corner or whenever direction changes, even slightly
- Never run rope through conduit or other tubing
- Never attach weights to the rope
- Temperature affects rope tension. The rope expands (lengthens) when temperature increases, and contracts (shrinks) when temperature decreases. Significant temperature variations require frequent checks of the tension adjustment
- Do not exceed the maximum specified total rope length. Banner offers models for other spans; contact Banner Engineering or visit [www.bannerengineering.com](http://www.bannerengineering.com) for model selection



**WARNING:** Failure to use pulleys or eye bolts to support the wire rope can result in damage to the switch and may create a dangerous situation that could lead to serious injury or death.

## Installation Procedure

1. Mount the switch securely on a solid stationary surface.
2. Fasten an eye bolt at the opposite end of the rope span from the switch. Verify that the anchor for the eye bolt is solid and stationary to withstand the constant tension and possible pull of the rope.

3. Assemble the rope as shown. Keep the rope's PVC cover intact along its complete length.
4. Use pulleys (recommended) or eye bolts at each support point. Always use a pulley when routing the rope around a corner, regardless of the angle.

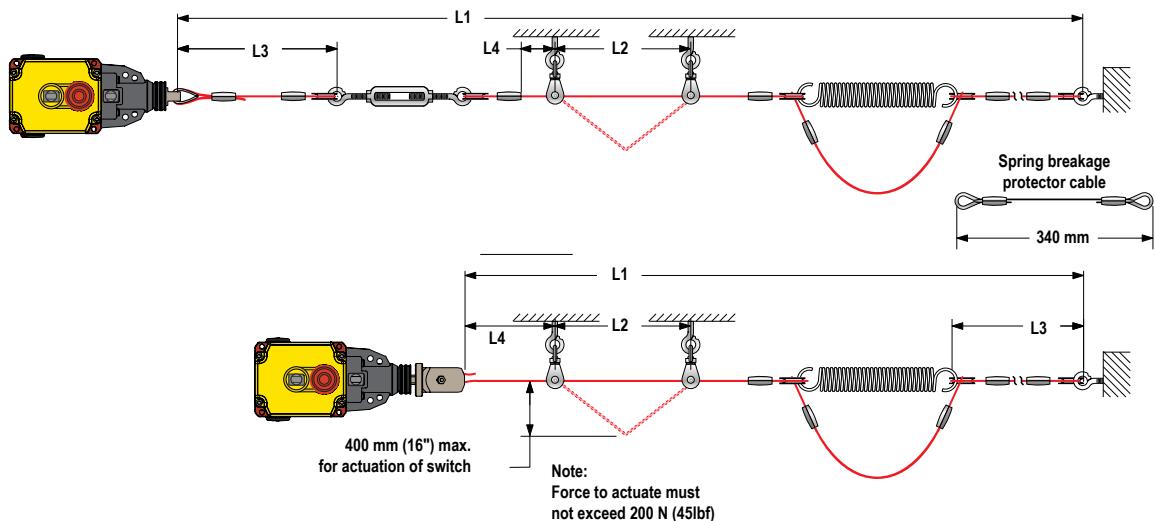


Figure 4. Assembly of Rope and Hardware

Switch Model	Max. Total Length L1	Max. Distance Between Pulleys L2	Max. Distance to Spring/Turnbuckle L3 <sup>1</sup>	Min. Distance Fitting to Pulley L4 <sup>2</sup>
75 m	75 m (245 ft)	3-5 m (10-15 ft)	150 mm (6 in)	150 mm (6 in)
38 m	37.5 m (123 ft)			

All hardware is supplied by the user. See *Dimensions* (p. 8) for switch mounting hole mounting pattern and size.

### Installing Models RP-RM83F-..75 and RP-LS42F-xxLF (with Integral Turnbuckle)

These models have their own integral turnbuckle and clamp to tension the rope and to hold it in place. This innovative design provides for quick and easy rope fixing and tensioning. These models require no external turnbuckle or any additional clamp at the switch end of the rope.

To install the rope at the switch end:

1. Strip away several inches of the cable covering.
2. Loosen the set screw on the switch fitting using a 4 mm hex wrench.
3. Insert the cable into the center hole, and pull the cut end out from the side hole.
4. When the tension is correct, tighten the set screw to hold the rope firmly in place.



Figure 5. Tightening the rope into the internal turnbuckle (models RP-RM83F-..LT and ..LTE)

### Tensioning the Rope

After the rope span components are installed, apply tension to the rope until the arrows in the tensioning indicator are centered on the line in the tension indicator window. This indicates sufficient rope tension. (Contacts 11/12 will close.)

1. For models RP-RM83F-..LT and RP-RM83F-..LTE: Turn the external turnbuckle until the arrows are centered. For models RP-RM83F-..LR and RP-RM83F-..LRE: Turn the shaft of the switch using a 17 mm wrench as shown, until the arrows are centered.
2. Pull hard on the rope and reset the latch several times. If the arrows in the tensioning indicator window do not return to the correct position (centered on the line in the window), further tighten or loosen the rope tension as needed, then reset, until proper tension is shown.
3. Check the tension adjustment periodically to ensure proper operation.

<sup>1</sup> Closer, if possible

<sup>2</sup> Distance must allow necessary clearance to all mounting hardware.



Figure 6. Tension Indicator Window: too little tension shown

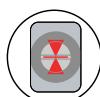


Figure 7. Tension Indicator Window: proper tension shown



Figure 8. Adjusting rope tension (models RP-RM83F-..LT and..LTE)

## Electrical Installation

### Accessing the Wiring Chamber

Access the wiring chamber by loosening the four corner screws to remove the front cover. Select the best wiring entrance and thread in the  $\frac{1}{2}$ " x 14 NPSM conduit adapter (supplied), or the optional M20 x 1.5 cable gland (see Accessories). Wire the two switch contacts in series or independently.

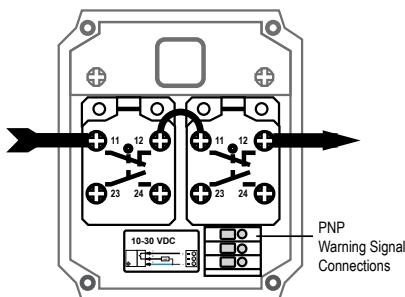


Figure 9. Single-Channel Connection

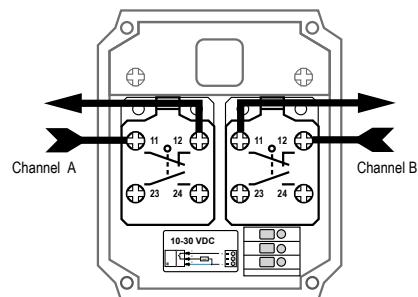


Figure 10. Dual-Channel Connection



#### WARNING:

- **Risk of electric shock**
- Use extreme caution to avoid electrical shock. Serious injury or death could result.
- Always disconnect power from the safety system (for example, device, module, interfacing, etc.), guarded machine, and/or the machine being controlled before making any connections or replacing any component. Lockout/tagout procedures might be required. Refer to OSHA 29CFR1910.147, ANSI Z244-1, or the applicable standard for controlling hazardous energy.
- Make no more connections to the device or system than are described in this manual. Electrical installation and wiring must be made by a Qualified Person<sup>3</sup> and must comply with the applicable electrical standards and wiring codes, such as the NEC (National Electrical Code), ANSI NFPA79, or IEC 60204-1, and all applicable local standards and codes.

## Wiring

These switch models have redundant pairs of safety contacts, so they may be wired for either single-channel or dual-channel output to a safety module or E-stop circuit. Monitor contacts may be wired as desired to an external alarm device.



**CAUTION:** Proper Wiring. Maximum tightening torque of contact screws is specified at 0.8 Nm; do not over-tighten. Before closing the front cover, verify no wires are trapped. Do not operate the rope pull without properly closing the cover.

**Single-Channel Output:** Wire contacts 11/12 together in series to the input of a safety module or E-stop circuit.

**Dual-Channel Output:** Wire contacts 11/12 independently to the two safety module inputs.

<sup>3</sup> A person who, by possession of a recognized degree or certificate of professional training, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work.

**Warning Signal.** Switch models RP-RM83F-...E provide a 24 V dc solid-state “warning signal” output, which signals when the rope tension is either too high or too low, before the safety contacts open and the switch latches OFF. This solid-state switch is located inside the wiring chamber next to the safety output contacts.

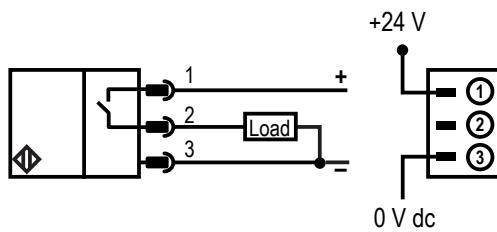


Figure 11. Warning Signal Electrical Connections

## Manual/Latch Reset

**E-Stop and Latch Reset.** Following the rope pulling/breaking or the E-stop button being pressed, the latch must be manually reset. The E-stop can be reset only when proper tension is indicated. Pull the red E-stop button until the switch Status indicator changes from Yellow to Green and the latch makes an audible “click,” indicating that the latch has been reset.



**Note:** Proper rope tension must be displayed before the latch can be reset.



Figure 12. Resetting the Latch

## Maintenance/Checkout

At switch installation or replacement and at machine set up, a Designated Person<sup>4</sup> must test each switch for proper machine shutdown response and check the switch(es) and installation for proper operation, physical damage, mounting (looseness), and excessive environmental contamination. This must also take place on a periodic schedule determined by the user, based on the severity of the operating environment and the frequency of switch actuations. Adjust, repair, or replace components as needed. If inspection reveals contamination on the switch, thoroughly clean the switch and eliminate the cause of the contamination. Replace the switch and/or appropriate components when any parts or assemblies are damaged, broken, deformed, or badly worn; or if the electrical/mechanical specifications (for the environment and operating conditions) have been exceeded. Always test the control system for proper functioning under machine control conditions after performing maintenance, replacing the switch, or replacing any component of the switch.

Additional items that should be included in the checkout and/or regularly scheduled maintenance of a rope pull system:

- Check for proper rope tension and adjust as needed
- Verify free operation (no binding) of the rope and proper tripping when the rope is pulled
- Periodically lubricate the pulleys and other moving parts associated with the rope
- Repair any loose or damaged hardware, worn/frayed rope (cable), missing red rope sheathing or flags/markers (if used)
- Remove or clean off any contamination and eliminate its cause

## Repairs

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



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

<sup>4</sup> A Designated Person is identified in writing by the employer as being appropriately trained to perform a specified checkout procedure.

## Specifications

---

### Contact Rating

10 A at 24 V ac  
10 A at 110 V ac  
6 A at 230 V ac  
6 A at 24 V dc  
2.5 kV max, transient tolerance  
NEMA A300 P300

### Monitoring Solid-State Output Rating

Rated operational voltage:  $U_e = 10$  to  $30$  V dc  
Rated operational current:  $= 50$  mA  
Utilization category: DC13  
Protected against reverse polarity and short circuit

### European Rating

Utilization categories: AC15 and DC13  
 $U_i = 500$  V ac;  $I_{th} = 10$  A  
Rated surge capacity: 2.5 kV

40-60 Hz		
$U_e$ (V)	$I_e/AC-15$ (A)	$I_e/DC-13$ (A)
120	6	0.55
240	3	0.27

### Contact Material

Silver-nickel alloy

### Maximum Switching Speed

20 operations per minute

### Recommended Rope Size

Accommodates rope sizes 2 to 5 mm diameter steel rope (see Accessories); select rope diameter based on switch model and rope length  
75 m models: recommended 2 to 5 mm diameters  
38 m models: recommended 2 to 5 mm diameters

### Short Circuit Protection

10 amp Slow Blow, 15 amp Fast Blow. Recommended external fusing or overload protection.

### Wire Connections

Screw terminals with pressure plates accept the following wire sizes:  
Stranded and solid: 20 AWG ( $0.5$  mm $^2$ ) to 16 AWG ( $1.5$  mm $^2$ ) for one wire  
Stranded: 20 AWG ( $0.5$  mm $^2$ ) to 18 AWG ( $1.0$  mm $^2$ ) for two wires

### Mechanical Life

100,000 operations

### Cable Entry

M20 x 1.5 threaded entrance. Adapter supplied to convert M20 x 1.5 to  $\frac{1}{2}$ "-14 NPT threaded entrance

### Construction

Die-cast aluminum housing; zinc die-cast actuator

### Maximum Rope Pull Length

75 m (245 ft) or 37.5 m (123 ft), depending on model

### Environmental Rating

NEMA 4, IEC IP67, per IEC/EN 60529

### Operating Conditions

Temperature:  $-30$  °C to  $80$  °C ( $-34$  °F to  $176$  °F)

### Weight

RP-RM83F-..LT and ..LTE: 1Kg (2.1 lbs.)  
RP-RM83F-..LR and ..LRE: 0.77 Kg (1.6 lbs.)

### Product Performance Standards

DIN EN 60947-1, DIN EN 60947-5-1, DIN EN 60947-5-5, IEC 60947-1, IEC 60947-5-1, IEC 60947-5-5, ISO 13850

### Certifications



## Dimensions

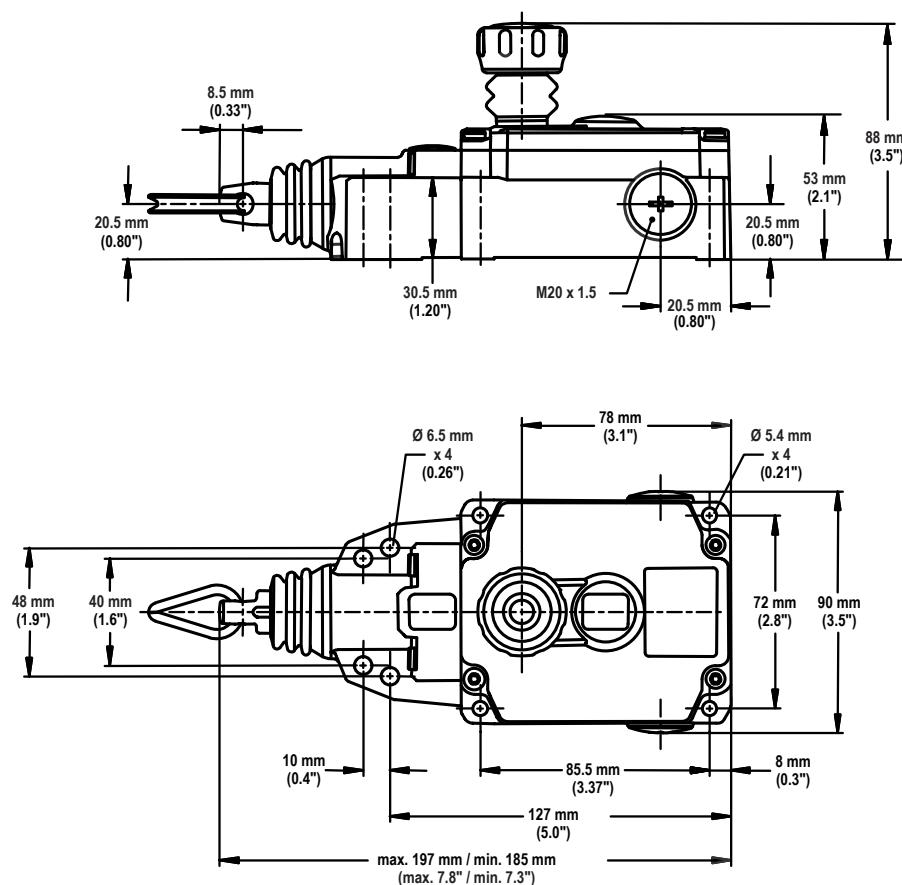


Figure 13. RP-RM83F-..LR..

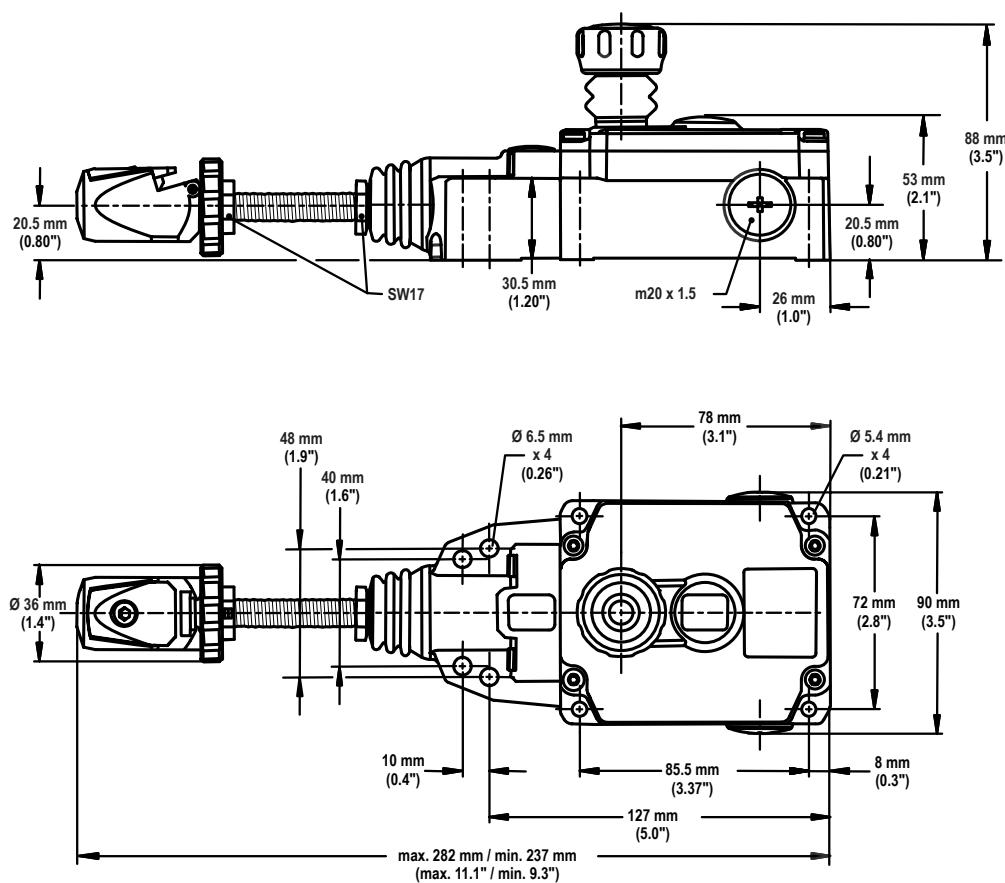


Figure 14. RP-RM83F--LT..

## Accessories

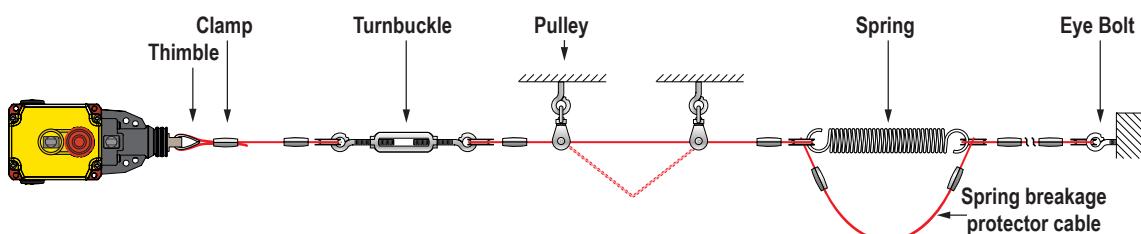


Figure 15. Wire Rope Assembly Components

Model	Length	Description	Wire Rope
RPA-C1-10	10 m (33 ft)		
RPA-C1-20	20 m (66 ft)	2 mm steel wire rope with 0.5 mm red PVC jacket (unterminated)	
RPA-C1-100	100 m (330 ft)		

Model	Length	Description	Wire Rope
RPA-C2-10	10 m (33 ft)		
RPA-C2-20	20 m (66 ft)	3 mm steel wire rope with 0.5 mm red PVC jacket (unterminated)	
RPA-C2-50	50 m (264 ft)		
RPA-C2-80	80 m (264 ft)		

Model	Length	Description	Wire Rope
RPA-C3-20	20 m (66 ft)		
RPA-C3-100	100 m (330 ft)	4 mm steel wire rope with 0.5 mm red PVC jacket (unterminated)	

Model	Quantity	Description	Thimble
RPA-T1-4	4	Thimble for 2 mm wire rope	
RPA-T2-4	4	Thimble for 3 mm wire rope	
RPA-T3-4	4	Thimble for 4 mm wire rope	

Model	Quantity	Description	Clamp
RPA-CC1-4	4	Clamp for 2 mm wire rope	
RPA-CC2-4	4	Clamp for 3 mm wire rope	
RPA-CC3-4	4	Clamp for 4 mm wire rope	

Model	Quantity	Description	Turnbuckle
RPA-TA1-1	1	#4 Turnbuckle	

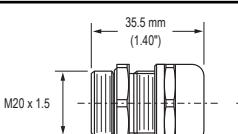
Model	Quantity	Description	Eye Bolt
RPA-EB1-1	1	1/4"-20 Eye bolt (3" bolt shaft)	

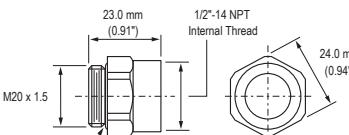
Model	Quantity	Description	Eye Bolt
RPA-EB2-1	1	5/16"-18 Eye bolt (3" bolt shaft)	

Model	Quantity	Description	Pulley
RPA-P1-1	1	Hanging pulley for in-line use	
RPA-DP1-1	1	Right-angle mount deflection pulley for corner turns (90 to 180 degrees)	

Model	Quantity	Description	Tensioning Spring	Used With
RPA-S3-1	1	Tensioning spring #3		RP-LM40D-6 RP-LM40D-6L RP-RM83F-.75..
RPA-S5-1	1	Tensioning spring #5		RP-RM83F-.38..

Model	Quantity	Description	Tensioning Spring	Used With
RPA-S4-1	1	Tensioning spring #4 with built-in eye bolt, cable thimble, clamping, tensioning, and overload protection.		RP-LM40D-6 RP-LM40D-6L RP-RM83F-..75..
RPA-S6-1	1	Tensioning spring #6 with built-in eye bolt, cable thimble, clamping, tensioning, and overload protection.		RP-RM83F-..38..

Model	Size	For Cable Diameter	Dimensions	Used With
SI-QM-CGM20	M20 × 1.5 Metal	5.0 to 12.0 mm (0.20 to 0.47 inches)		SI-LM40 Safety Interlock Switches SI-QM100 Safety Interlock Switches RP-RM83 Rope Pull Switches RP-LM40 Rope Pull Switches RP-QM72/QMT72 Rope Pull Switches RP-QM90 Rope Pull Switches

Model	Size	Thread Conversion	Dimensions	Used With
SI-QM-M20	1/2 in-14 NPT Metal	M20 × 1.5 to 1/2 in-14 NPT		SI-LM40 Safety Interlock Switches SI-QM100 Safety Interlock Switches RP-RM83 Rope Pull Switches RP-LM40 Rope Pull Switches RP-QM72/QMT72 Rope Pull Switches RP-QM90 Rope Pull Switches

## Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

**THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.**

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

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For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).



more sensors, more solutions

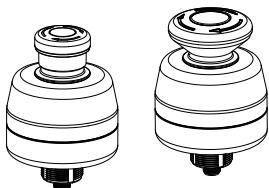
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# SSA-EB Series Lighted Emergency Stop Push Button



## Datasheet

### Illuminated 30 mm Mount Electro-mechanical Push Buttons



- Rugged design; easy installation with no assembly or individual wiring required
- Push-to-stop, twist-to-release, or pull-to-release operation per EN 60947-5-5
- Models with the washdown cover are push-to-stop and pull-to-release operation per EN 60947-5-5
- Latching design complies with ISO 13850; direct (positive) opening operation per EN 60947-5-1
- Compliant with ANSI B11.19, NFPA 79, and IEC/EN 60204-1 Emergency Stop requirements
- "Safe Break Action" ensures normally closed (NC) contacts will open if the contact block is separated from the actuator
- 8-pin M12 quick disconnect
- Models with yellow and red indication of actuation (armed or depressed/latched button)
- "Emergency Stop" legend included
- U.S. Patent No. Des. 700,149
- FDA-grade silicone cover withstands high pressure, high temperature washdown, and increases the product rating to IP69; the cover is ECOLAB® certified to withstand aggressive cleaning procedures with chemicals used in the food processing industry

Models SSA-EB... series are "mushroom-style" electro-mechanical emergency stop push buttons. When the button is armed, the switch's safety contacts (normally closed/NC) are closed and its monitoring contacts (normally open/NO), if present, are open. When the button is pushed, the switch's safety contacts open, and the monitoring contacts close. The contacts remain in this condition until the push button is manually rearmed by pulling or twisting clockwise the red push button actuator.

The SSA-EB1PL and -EB2PL...-ECQ.. series has a 30 mm mounting base similar to Banner's OTB, VTB, and STB Optical Touch Buttons for ease of mounting without requiring an additional enclosure. The EZ-LIGHT® illumination logic allows for easy identification of a pushed/actuated button. An armed button will light a steady yellow or green illumination or off (depending on model), a pushed/actuated button is indicated by a red illumination (flashing or solid depending on model). An optional input allows an armed button to illuminate a steady red to indicate a machine stop or emergency stop condition.

## Models

Model	Push Button	EZ-LIGHT® Illumination Logic	Connection
SSA-EB1PL-12ECQ8	Standard 40 mm	OFF (armed), RED (solid, PUSH)	8-pin M12/Euro-style quick disconnect
SSA-EB1PLXR-12ECQ8		OFF (armed), RED (flash, PUSH)	
SSA-EB1PLYR-12ECQ8		YELLOW (armed), RED (flash, PUSH)	
SSA-EB1PLGR-12ECQ8		GREEN (armed), RED (flash, PUSH)	
SSA-EB2PLXR-12ECQ8	Large 60 mm	OFF (armed), RED (flash, PUSH)	

## Important... Read this before proceeding!

**The user is responsible for satisfying all local, state, and national laws**, rules, codes, and regulations relating to the use of this product and its application. Banner Engineering Corp. has made every effort to provide complete application, installation, operation, and maintenance instructions. Please contact a Banner Applications Engineer with any questions regarding this product.

**The user is responsible** for making sure that all machine operators, maintenance personnel, electricians, and supervisors are thoroughly familiar with and understand all instructions regarding the installation, maintenance, and use of this product, and with the machinery it controls. The user and any personnel involved with the installation and use of this product must be thoroughly familiar with all applicable standards, some of which are listed within the specifications. Banner Engineering Corp. makes no claim regarding a specific recommendation of any organization, the accuracy or effectiveness of any information provided, or the appropriateness of the provided information for a specific application.



**WARNING:**

- **Not a safeguarding device**
- Failure to follow these instructions could result in serious injury or death.
- This device is not considered a safeguarding device because it requires an overt action by an individual to stop machine motion or hazards. A safeguarding device limits or eliminates an individual's exposure to a hazard without action by the individual or others. This device cannot be substituted for required safeguarding. Refer to the applicable standards to determine those requirements.

**U.S. Application Standards**

ANSI B11.0 Safety of Machinery; General Requirements and Risk Assessment

ANSI B11.19 Performance Criteria for Safeguarding

NFPA 79 Electrical Standard for Industrial Machinery

**International/European Standards**

EN ISO 12100 Safety of Machinery – General Principles for Design — Risk Assessment and Risk Reduction

ISO 13850 (EN 418) Emergency Stop Devices, Functional Aspects – Principles for Design

IEC 62061 Functional Safety of Safety-Related Electrical, Electronic and Programmable Control Systems

EN ISO 13849-1 Safety-Related Parts of Control Systems

IEC/EN 60204-1 Electrical Equipment of Machines Part 1: General Requirements

EN 60947-1 Low Voltage Switchgear – General Rules

EN 60947-5-1 Low Voltage Switchgear – Electromechanical Control Circuit Devices

EN 60947-5-5 Low Voltage Switchgear – Electrical Emergency Stop Device with Mechanical Latching Function

**Emergency Stop Considerations**

NFPA 79, ANSI B11.19, IEC/EN 60204-1, and ISO 13850 specify emergency stop requirements, including the following:

- Emergency-stop push buttons shall be located at each operator control station and at other operating stations where emergency shutdown is required.
- Stop and emergency-stop push buttons shall be continuously operable and readily accessible from all control and operating stations where located. Do not mute or bypass E-stop buttons.
- Actuators of emergency-stop devices shall be colored red. The background immediately around the device actuator shall be colored yellow (where possible). The actuator of a push-button-operated device shall be of the palm or mushroom-head type.
- The emergency-stop actuator shall be a self-latching type.

**WARNING:**

- **Do not mute or bypass any emergency stop device**
- Muting or bypassing the safety outputs renders the emergency stop function ineffective.
- ANSI B11.19, NFPA 79 and IEC/EN 60204-1 require that the emergency stop function remains active at all times.

**WARNING:**

- **Connect two or more devices to the same safety module (controller) in series**
- Connecting devices in parallel defeats the switch contact monitoring ability of the module and creates an unsafe condition that could result in serious injury or death.
- Failure to test each device individually in this manner could result in undetected faults and create an unsafe condition that could result in serious injury or death.
- Connect the contacts of the corresponding pole of each switch in series. Never connect the contacts of multiple switches in parallel. Individually actuate (engage) each device, then release (or re-arm) and reset the safety module. This allows the module to check each switch and its wiring to detect faults. Perform this check during the prescribed checkouts.

**EU Declaration of Conformity (DoC)**

Banner Engineering Corp. herewith declares that these products are in conformity with the provisions of the listed directives and all essential health and safety requirements have been met. For the complete DoC, please go to [www.bannerengineering.com](http://www.bannerengineering.com).

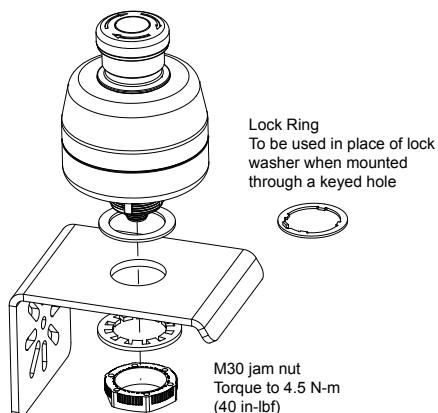
<b>Product</b>	<b>Directive</b>
SSA-EB1PL and -EB2PL.. Emergency Stop Push Button	Machinery Directive (2006/42/EC), Low Voltage Directive (2014/35/EU)

Representative in EU: Peter Mertens, Managing Director, Banner Engineering BV. Address: Park Lane, Culliganlaan 2F, bus 3, 1831 Diegem, Belgium.

## Installation and Maintenance

The device must not be affected by environmental conditions. **Install the device so that operation is not impeded, but should be protected against inadvertent operation** (for example, accidental actuation by being bumped or leaned against). Do not operate the switch using a tool. Do not expose the switch to excessive shocks and vibrations, otherwise the switch may be deformed or damaged, causing malfunction or operation failure. Hardware includes jam nut, lock washer, lock ring, and seal washer. The lock ring may be used to prevent switch rotation if a 5mm hole keyway is provided in the 30 mm mounting hole. The threaded base contains external M30 threads for the supplied jam nut, as well as internal 1/2-14 NPSM threads for an alternate mounting option.

Figure 1. Mounting the E-stop



Electrical installation must be made by qualified personnel<sup>1</sup> and must comply with NEC (National Electrical Code), NFPA 79 or IEC/EN 60204-1, and all applicable local standards. It is not possible to give exact wiring instructions for a device that interfaces to a multitude of machine control configurations. The following is general in nature; it is recommended to perform a risk assessment to ensure appropriate application, interfacing/hookup, and risk reduction (see ISO 12100 or ANSI B11.0).



### WARNING:

- **Risk of electric shock**
- Use extreme caution to avoid electrical shock. Serious injury or death could result.
- Always disconnect power from the safety system (for example, device, module, interfacing, etc.), guarded machine, and/or the machine being controlled before making any connections or replacing any component. Lockout/tagout procedures might be required. Refer to OSHA 29CFR1910.147, ANSI Z244-1, or the applicable standard for controlling hazardous energy.
- Make no more connections to the device or system than are described in this manual. Electrical installation and wiring must be made by a Qualified Person<sup>2</sup> and must comply with the applicable electrical standards and wiring codes, such as the NEC (National Electrical Code), NFPA 79, or IEC 60204-1, and all applicable local standards and codes.

<sup>1</sup> A Qualified Person possesses a recognized degree or certificate or has extensive knowledge, training, and experience to solve problems relating to the emergency stop installation.

<sup>2</sup> A person who, by possession of a recognized degree or certificate of professional training, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work.

Table 1: Wiring

Pin	Color	Function	Connection and Pinout
1	White	AUX N.O. Output (Switched pin 2)	
2	Brown	+24 V DC (12–30 V DC)	
3	Green	Stop Signal input from safety module or machine +24 V DC (12–30 V DC)	
4	Yellow	CH2a	
5	Gray	CH2b	
6	Pink	CH1a	
7	Blue	0 V DC	
8	Red	CH1b	

Table 2: SSA-EB1xxLYR-xx or SSA-EB1xxLGR-xx

See Figure 2 on p. 5.

Situation	Indication	Illumination Logic
Button Armed Pin 3 open	YELLOW / SOLID or GREEN / SOLID	<ul style="list-style-type: none"> <li>Indicates button is armed</li> <li>If used, ES-FA-11AA Module status is in a reset/run condition (31/32 open)</li> </ul>
Button Pushed Pin 3 open or +V DC	RED / FLASH	<ul style="list-style-type: none"> <li>Indicates the button is pushed (actuated)</li> <li>Signal on Pin 3 has no effect on a button that has been pushed (actuated)</li> </ul>
Button Armed Pin 3 = +V DC	RED / SOLID	<ul style="list-style-type: none"> <li>Indicates the machine is in an Emergency Stop or other stop condition, but that specific button has not been pushed (actuated)</li> <li>This optional signal (12 to 30 V DC) allows the user to indicate a stop condition by turning the armed indication to red (steady) indication</li> </ul>

Table 3: SSA-EB1(2)xxLXR-xx

See Figure 2 on p. 5.

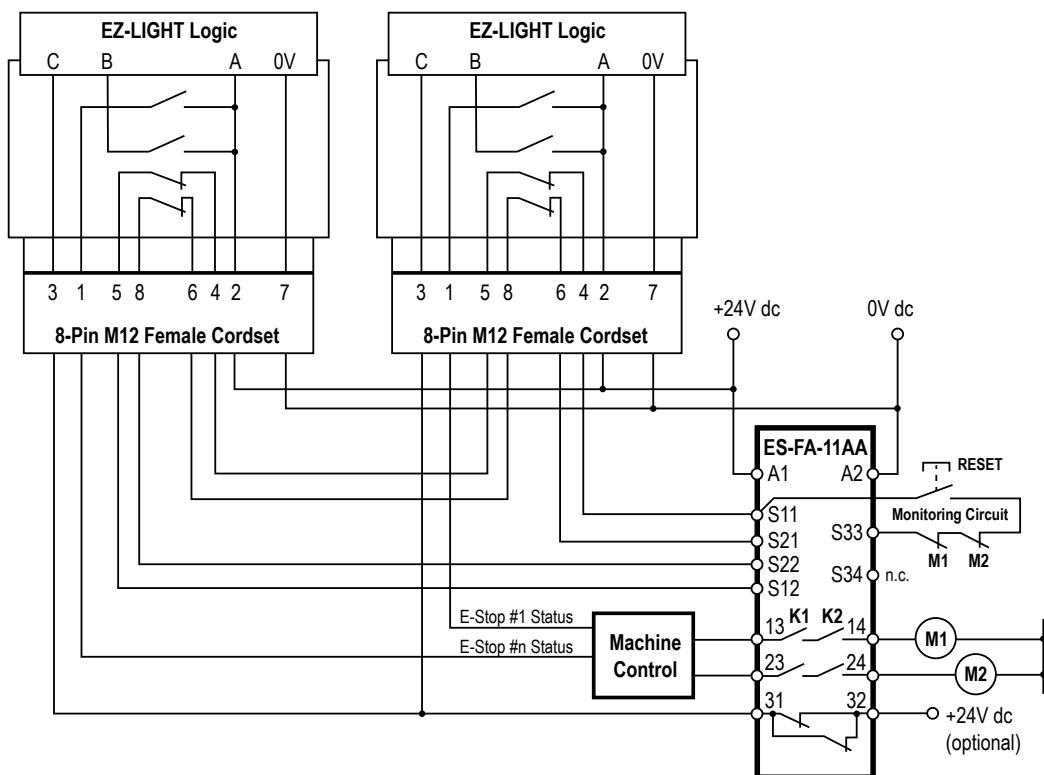
Situation	Indication	Illumination Logic
Button Armed Pin 3 open	OFF	<ul style="list-style-type: none"> <li>Indicates button is armed</li> <li>If used, ES-FA-11AA Module status is in a reset/run condition (31/32 open)</li> </ul>
Button Pushed Pin 3 open or +V DC	RED / FLASH	<ul style="list-style-type: none"> <li>Indicates the button is pushed (actuated)</li> <li>Signal on Pin 3 has no effect on a button that has been pushed (actuated)</li> </ul>
Button Armed Pin 3 = +V DC	RED / SOLID	<ul style="list-style-type: none"> <li>Indicates the machine is in an Emergency Stop or other stop condition, but that specific button has not been pushed (actuated)</li> <li>This optional signal (12 to 30 V DC) allows the user to indicate a stop condition by turning the armed indication to red (steady) indication</li> </ul>

Table 4: SSA-EB1xxL-xx

See Figure 2 on p. 5.

Situation	Indication	Illumination Logic
Button Armed Pin 3 open	OFF	<ul style="list-style-type: none"> <li>Indicates button is armed</li> <li>If used, ES-FA-11AA Module status is in a reset/run condition (31/32 open)</li> </ul>
Button Pushed Pin 3 open or +V DC	RED / SOLID	<ul style="list-style-type: none"> <li>Indicates the button is pushed (actuated)</li> <li>Signal on Pin 3 has no effect on a button that has been pushed (actuated)</li> </ul>
Button Armed Pin 3 = +V DC	RED / SOLID	<ul style="list-style-type: none"> <li>Indicates the machine is in an Emergency Stop or other stop condition, but that specific button has not been pushed (actuated)</li> <li>This optional signal (12 to 30 V DC) allows the user to indicate a stop condition by turning the armed indication to red (steady) indication</li> </ul>

Figure 2. Illuminated models - example hookup



**Note:** Refer to the ES-FA-11AA E-Stop Safety Module datasheet (p/n 60606) for complete safety module installation information.

## Checkout

At machine set up, a *Designated Person*<sup>3</sup> should test each safety point for proper machine shutdown response. A *Designated Person* should check the safety point for proper operation, physical damage, button looseness, and excessive environmental contamination. This should take place on a periodic schedule determined by the user, based on the severity of the operating environment and the frequency of switch actuations.

Adjust, repair, or replace components as needed. If inspection reveals contamination on the switch, thoroughly clean the switch and eliminate the cause of the contamination. Replace the switch and/or appropriate components when any parts or assemblies are damaged, broken, deformed, or badly worn; or if the electrical/mechanical specifications (for the environment and operating conditions) have been exceeded.

**Always test the control system for proper functioning** under machine control conditions after performing maintenance, replacing the safety point, or replacing any component of the device.

<sup>3</sup> A *Designated Person* is identified in writing by the employer as being appropriately trained to perform a specified checkout procedure. A *Qualified Person* possesses a recognized degree or certificate or has extensive knowledge, training, and experience to solve problems relating to the emergency stop installation.

## Installing the Silicone Cover

To properly install the FDA-grade silicone cover and achieve an IP69 rating, follow these instructions.

1. Turn the cover inside-out, except for the top portion the button fits into.
2. Place the cover on top of the emergency stop unit.
3. Roll the cover onto the e-stop unit.
4. Continue rolling the cover down, around the base of the e-stop unit, until the entire unit is covered.
5. Mount the e-stop and cover assembly to a bracket wide enough to cover the base of the assembly. The cover should be clamped firmly between the e-stop button and the bracket.



**Note:** This cover is suitable for applications with pull-to-release resetting methods.



**Note:** The FDA-grade silicone cover withstands high pressure, high temperature washdown, and increases the product rating to IEC IP69. The cover is ECOLAB® certified to withstand aggressive cleaning procedures with chemicals used in the food processing industry.

## Specifications

### Housing / Button

Polycarbonate / Polyamide  
Threaded base has M30 by 1.5 external threads; Maximum Tightening Torque: 4.5 N·m (40 in-lbf)

### Operating Conditions

-25 °C to +55 °C (-13 °F to +131 °F)  
45% to 85% relative humidity (no condensation)

### Environmental Rating

For Indoor Use Only  
IP65 (IEC 60529), UL Type 4X and UL Type 13  
IP67, IP69 (IEC 60529), and UL Type 4X and UL Type 13 (with SSA-EB1P-ECWC cover installed)

### Insulation Resistance

100 MΩ minimum (500 V DC megger)

### Impulse Withstand Voltage

2.5 kV

### Pollution Degree

3

### Output Configuration

See [Installation and Maintenance](#) on p. 3

### Overvoltage Category

II

### Contact Material/Bounce<sup>4</sup>

Gold plated silver / 20 ms

### Electrical Life

100,000 operations minimum, 250,000 operations minimum at 24 V AC/DC, 100 mA

### Mechanical Life

250,000 operations

### Rated Current (I<sub>th</sub>)

2A

### Vibration Resistance

Operating extremes: 10 Hz to 500 Hz, amplitude 0.35 mm acceleration 50 m/s<sup>2</sup>

### LED Color

Yellow - 590 nm, Red - 618 nm, Green - 525 nm

### LED Flash Rate

1.6 Hz at 50% duty cycle

### LED Voltage/Current

**SSA-EB1.LYR-.., SSA-EB1(2).LXR-.., and SSA-EB1.. L-..:** 12 V DC to 30 V DC; 120 mA at 12 V DC, 65 mA at 24 V DC, 60 mA at 30 V DC  
**SSA-EB1.LGR-..:** 12 V DC to 30 V DC; 135 mA at 12 V DC, 75 mA at 24 V DC, 70 mA at 30 V DC

### Electrical Rating

Minimum load: 1 mA at 5 V AC/DC

**SSA-EB1(2)xx-xxECQ8:** 2A at 60 V AC / 75 V DC maximum

UL Applications: 1.5 A at 250 V AC, 1 A at 30 V DC (pilot duty)

CE Applications: AC-15: 1.5 A at 250 V AC, DC-13: 1 A at 30 V DC

### Shock Resistance

Operating extremes: 150 m/s<sup>2</sup> (15G)

### Rated Insulation Voltage (Ui)

60 V AC / 75 V DC

### B10d

100,000 (based on ISO13849-1(2006))

### Date code format (U.S. Standard Format)

YYWWX: 2-digit year, 2-digit week, "X" internal code

### Design and Application Standards

Compliant with EN 60497-1 / -5-1, ISO 13850, ANSI B11.19, ANSI NFPA79, IEC/EN 60204-1

### Certifications



<sup>4</sup> When the button is reset, the normally closed contacts will chatter. When pressing the button, the normally open contacts will chatter. When designing a control circuit, take the contact chatter time into consideration. Do not expose the switch to external shocks, otherwise the contacts will bounce.

**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](http://www.bannerengineering.com).

Supply Wiring (AWG)	Required Overcurrent Protection (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

**Rated Operating Current and Voltage (Ue)**

Safety Contact (N.C.)	30 V	60 V AC/75 V DC
AC 50/60 Hz	Resistive Load (AC-12)	-
	Inductive Load (AC-15)	2 A
DC	Resistive Load (DC-12)	2 A
	Inductive Load (DC-13)	0.4 A

Auxiliary Output (N.O.)	30 V	60 V AC/75 V DC
12 to 30 V DC (from supply pin 2)	Resistive Load (DC-12)	0.25 A
	Inductive Load (DC-13)	0.25 A

The operating current is classified according to EN 60947-5-1 making and breaking capacities and are measured at resistive/inductive load types specified in EN 60947-5-1. See "Electrical Rating" above for specific model and UL/CE maximum ratings.

**Dimensions**

All measurements are listed in millimeters [inches], unless noted otherwise.

Figure 3. Standard 40 mm Pushbutton

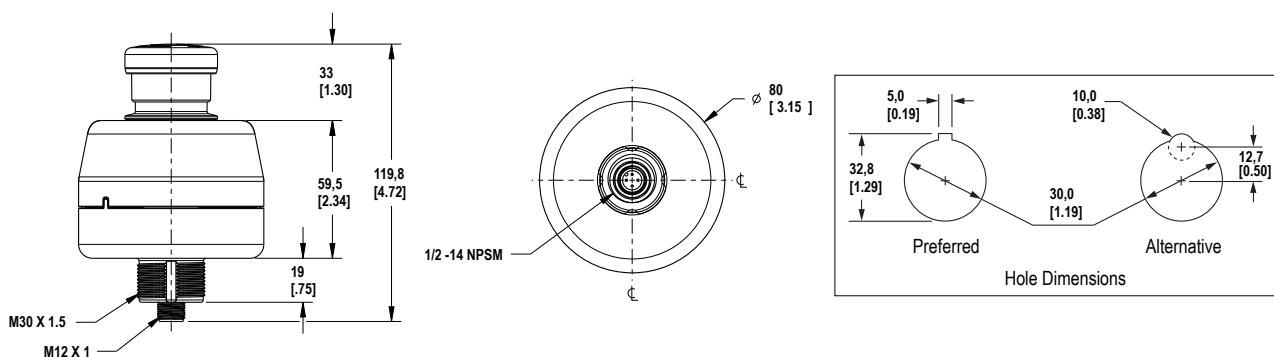
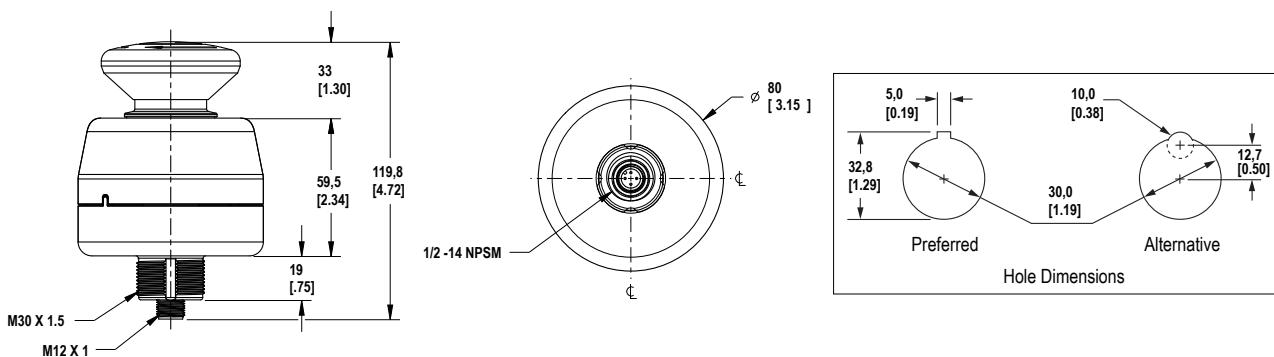


Figure 4. Large 60 mm Pushbutton



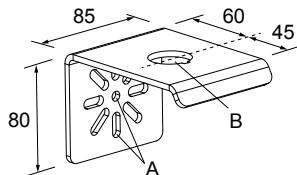
## Accessories

### Mounting Brackets

#### SSA-MBK-EEC1

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

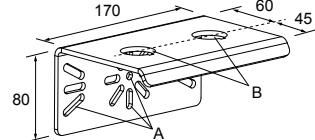
Hole size: A =  $\varnothing$  7 , B =  $\varnothing$  30



#### SSA-MBK-EEC2

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

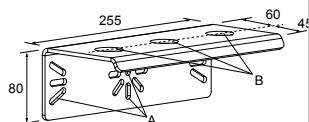
Hole size: A =  $\varnothing$  7 , B =  $\varnothing$  30



#### SSA-MBK-EEC3

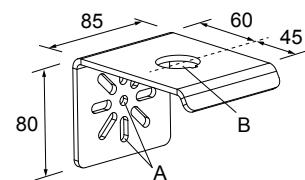
- Three 30 mm holes
- 8 gauge steel, black finish (powder coat)
- Front surface for customer applied labels

Hole size: A =  $\varnothing$  7 , B =  $\varnothing$  30



#### SSA-MBK-EEC1-SS

- Single 30 mm hole
- 8 gauge 316 stainless steel
- Front surface for customer applied labels



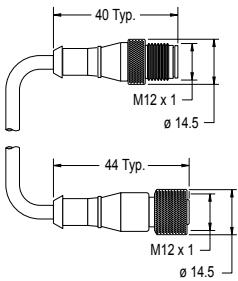
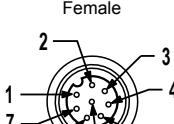
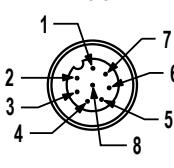
Hole size: A =  $\varnothing$  7 , B =  $\varnothing$  30

The SSA-MBK-EECx brackets offer:

- Horizontal and vertical (post) mounting
- Interchangeable positions of mounted devices (e.g. OTB/STB/VTB, E-Stop, K50s)

## Cordsets

8-Pin Threaded M12 Cordsets—Flying Leads				
Model	Length	Style	Dimensions	Pinout (Female)
SXA-815D	4.57 m (15 ft)			
SXA-825D	7.62 m (25 ft)			
SXA-850D	15.24 m (50 ft)	Straight	 M12 x 1 ø 14.5	 1 = White      5 = Gray 2 = Brown     6 = Pink 3 = Green     7 = Blue 4 = Yellow    8 = Red
SXA-8100D	30.48 m (100 ft)			

8-Pin Threaded M12 Cordsets—Double Ended				
Model (8-pin/8-pin) <sup>5</sup>	Length	Style	Dimensions	Pinout
DEE2R-81D	0.3 m (1 ft)			
DEE2R-83D	0.91 m (3 ft)			
DEE2R-88D	2.44 m (8 ft)			
DEE2R-815D	4.57 m (15 ft)			
DEE2R-825D	7.62 m (25 ft)			
DEE2R-850D	15.24 m (50 ft)			
DEE2R-875D	22.86 m (75 ft)	Female Straight/ Male Straight		 
DEE2R-8100D	30.48 m (100 ft)			1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red

See Banner Engineering catalog or go to [www.bannerengineering.com](http://www.bannerengineering.com) for additional models and complete information.

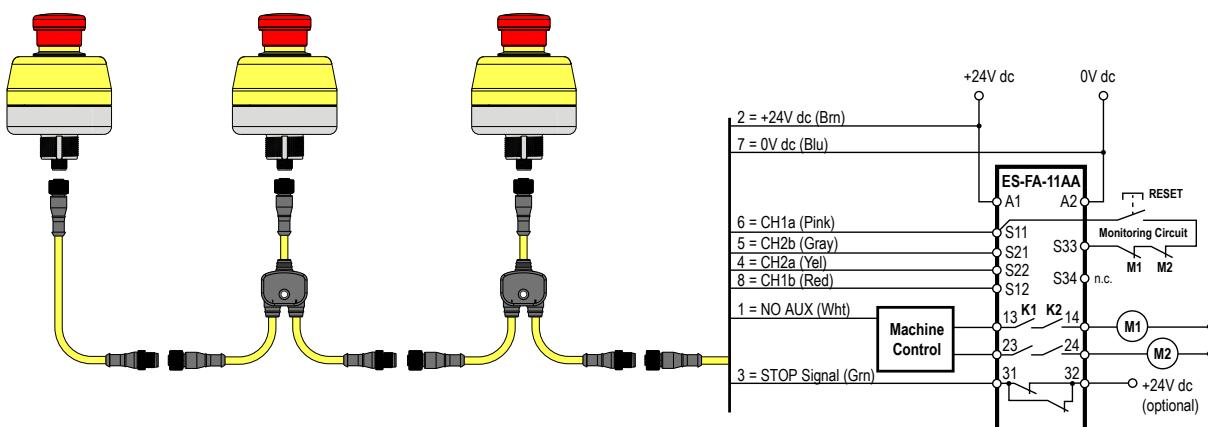
### Series Connection Cordset Solution

This interconnection solution allows for quick wiring of a series of string emergency stop buttons. For the models listed below, Branch #1 and Branch #2 are 300 mm (12 in) in length and the length of the trunk is listed below.



#### WARNING:

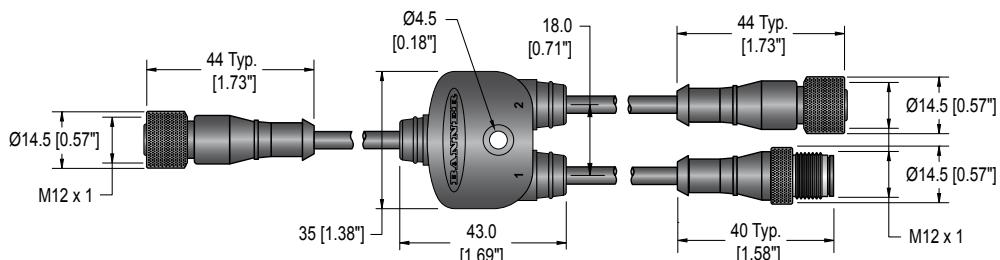
- **Do not defeat the cordset installation**
- Defeating the series connection cordset solution could result in serious injury or death.
- Install the CSS series connection cordset solution so they cannot be easily defeated. Ensure that mounting and routing of the cordsets that are connected to the Trunk, Branch #1, Branch #2, and the E-Stop QD connector does not allow access to the QD connectors or allow improper connection bypassing the function of the Emergency Stop.



Model	Length	Description
CSS-M12F81M12M81M12F81	1 ft	
CSS-M12F83M12M81M12F81	3 ft	8-pin M12/Euro-style QD splitter cordset for use with SSA-EB1PLxR-12ECQ8
CSS-M12F88M12M81M12F81	8 ft	

<sup>5</sup> Standard cordsets are yellow PVC with black overmold. For black PVC and overmold, add the suffix "B" to the model number (example, DEE2R-81DB)

Model	Length	Description																								
<p><b>SSA-EB1PLxR-12ECQ8</b> E-Stop # 2</p> <p><b>EZ-LIGHT Logic</b></p> <table border="1"> <tr> <td>C</td> <td>B</td> <td>A</td> <td>0V</td> </tr> </table> <p>3 1 5 8 6 4 2 7</p> <p>8-Pin M12 Female DEE2R-8xxD</p> <p>8-Pin M12 Male</p> <table border="1"> <tr> <td>4</td> <td>6</td> <td>2</td> <td>7</td> <td>8</td> <td>5</td> <td>1</td> <td>3</td> </tr> </table> <p><b>SSA-EB1PLxR-12ECQ8</b> E-Stop # 1</p> <p><b>EZ-LIGHT Logic</b></p> <table border="1"> <tr> <td>C</td> <td>B</td> <td>A</td> <td>0V</td> </tr> </table> <p>3 1 5 8 6 4 2 7</p> <p>8-Pin M12 Female TRUNK CSS-M12F81M12M81M12F81 CSS-M12F83M12M81M12F81 CSS-M12F88M12M81M12F81</p> <p>8-Pin M12 Male BRANCH #1</p> <table border="1"> <tr> <td>4</td> <td>6</td> <td>2</td> <td>7</td> <td>8</td> <td>5</td> <td>1</td> <td>3</td> </tr> </table> <p>8-Pin M12 Female/Flying Leads MQDC2S-8xx</p> <ul style="list-style-type: none"> <li>4 = CH1a (Yel)</li> <li>6 = CH1a (Pink)</li> <li>2 = +24V (Brn)</li> <li>7 = 0V (Blu)</li> <li>8 = CH1b (Red)</li> <li>5 = CH2b (Gray)</li> <li>1 = NO AUX (Wht)</li> <li>3 = STOP Signal (Grn)</li> </ul>	C	B	A	0V	4	6	2	7	8	5	1	3	C	B	A	0V	4	6	2	7	8	5	1	3	Length	Description
C	B	A	0V																							
4	6	2	7	8	5	1	3																			
C	B	A	0V																							
4	6	2	7	8	5	1	3																			

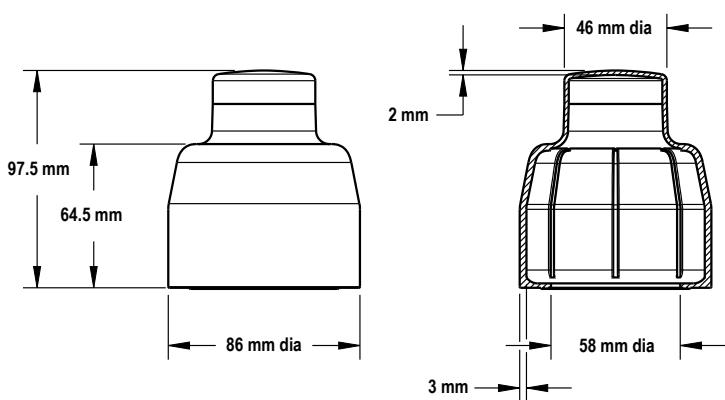


### Washdown Silicone Cover SSA-EB1P-ECWC

To order a model with the washdown cover installed, add "-WC" to the model number. For example, **SSA-EB1PLYR-12ECQ8-WC**.

Washdown Cover Model	For Push Button Models	Description
<b>SSA-EB1P-ECWC</b>	Standard 40 mm	FDA-grade silicone cover

SSA-EB Series Lighted Emergency Stop Push Button

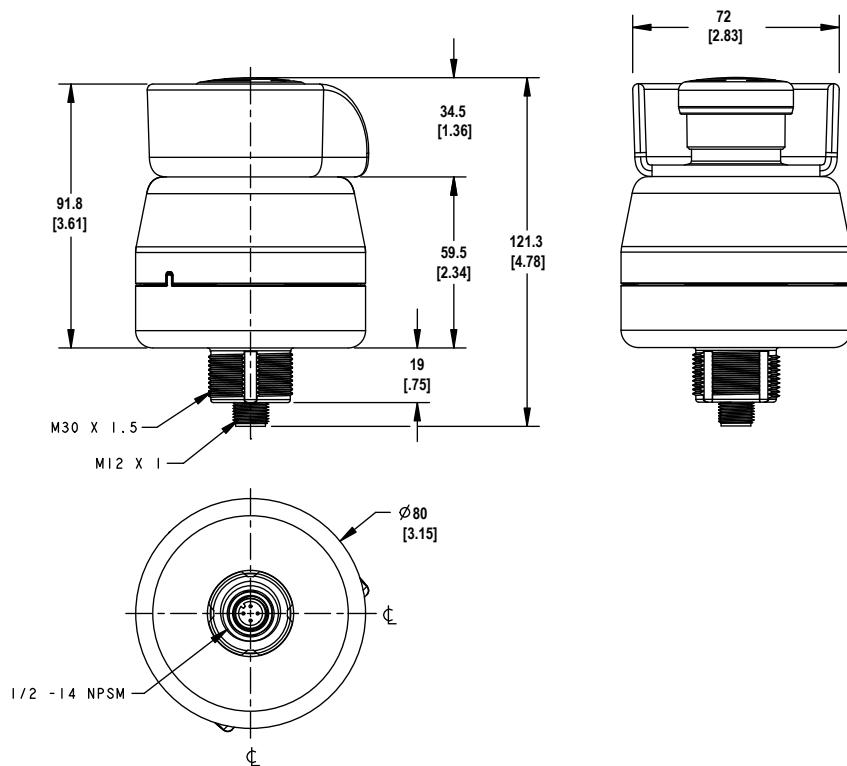


Pre-Installed Shroud

To order a unit with a shroud (model **ESC-1-YW**) pre-installed, the model number has an S1 inserted after the LED color characters (for example **SSA-1EB1PLYR-12ECQ8** becomes **SSA-EB1PLYRS1-12ECQ8**). Contact Banner Engineering for availability.

Figure 5. SSA-EB1PLxx-12ECQ8 E-Stop with a Shroud

Figure 6. Dimensions for the SSA-EB1PLxx-12ECQ8 E-stop button with shroud



## Banner Engineering Corp. Limited Warranty

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Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).



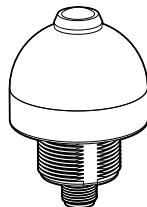
more sensors, more solutions

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## Datasheet

*Compact Indicator with One, Two, or Three Colors and a Momentary Push Button Output*

To view or download the latest technical information about this product, including specifications, dimensions, accessories, and wiring, see [www.bannerengineering.com](http://www.bannerengineering.com).



- Rugged, cost-effective and easy-to-install multicolor indicator light with pushbutton
- Waterproof IEC IP65 construction for washdown environments
- Excellent for panel mounting or as a stand-alone device
- Immune to EMI and RFI interference
- 12 V dc to 30 V dc operation
- Cabled and quick disconnect models available
- Up to 3 independent colors in one unit



### WARNING: Not To Be Used for Personnel Protection

Never use this device as a sensing device for personnel **protection**. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

## Models

Family	Color 1	Color 2	Color 3	Input	Output	Connector
K50L	G	R	Y	P	PB2	Q
	G = Green			P = PNP	PB2 = Momentary Push Button	Q = Euro Integral QD
	R = Red					Blank = 2 m Integral Cable
	Y = Yellow					QP = Euro Pigtail QD
	B = Blue					
	W = White					
	T = Turquoise					
	O = Orange					
	V = Violet					
	M = Magenta					
	X = No color in this position					

Example Model	# of LED Colors	LED Indicators	Connection <sup>1</sup>
K50LGXXPPB2Q	1	Green	4-pin M12/Euro-style integral QD Connector
K50LRXXPPB2Q		Red	
K50LGRXPPB2Q	2	Green, Red	5-pin M12/Euro-style QD Connector
K50LGYXPPB2Q		Green, Yellow	
K50LGRYPPB2Q	3	Green, Red, Yellow	8-pin M12/Euro-style QD Connector

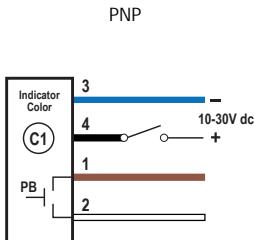
<sup>1</sup> Integral quick disconnect models are listed.

- To order the 2 m (6.5 ft) PVC cable model, omit the suffix "Q" in the model number. For example, K50LGXXPPB2.
- To order the 150 mm (6 in) PVC cable model, replace the suffix "Q" with "QP" in the model number. For example, K50LGXXPPB2QP.
- Models with a quick disconnect require a mating cordset.



## Wiring Diagrams

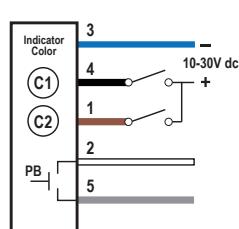
### 4-Pin Models



#### PNP

Key  
1 = Brown  
2 = White  
3 = Blue  
4 = Black  
C1 = Color 1  
PB = Push Button

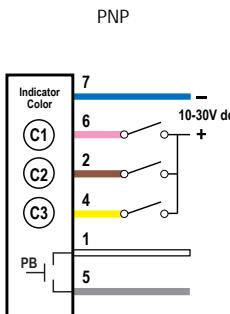
### 5-Pin Models



#### PNP

Key  
1 = Brown  
2 = White  
3 = Blue  
4 = Black  
5 = Gray  
C1 = Color 1  
C2 = Color 2  
PB = Push Button

### 8-Pin Models



#### PNP

Key  
1 = White  
2 = Brown  
3 = Green (not used)  
4 = Yellow  
5 = Gray  
6 = Pink  
7 = Blue  
8 = Red (not used)  
C1 = Color 1  
C2 = Color 2  
C3 = Color 3  
PB = Push Button

## Installation

Install the K50 sensor at such a height and in a location that will be easy for the user and/or supervisor to see the indicator and comfortable for the user to press the push-button.

## Specifications

### Supply Voltage and Current

12 V dc to 30 V dc  
65 mA at 12 V dc; 35 mA at 30 V dc maximum, current per LED color

### Supply Protection Circuitry

Protected against transient voltages and reverse polarity

### Switch Contact Rating

150 mA at 30 V dc

### Contact Bounce

10 ms maximum

### Environmental Rating

IEC IP65  
NEMA/UL Type 4X, 13

### Construction

Base: polycarbonate  
Translucent dome: polycarbonate  
Push button: thermoplastic

### Mounting Torque

2.25 Nm (20 in-lbf) maximum

### Connections

Integral M12/Euro-style quick disconnect, 2 m (6.5 ft) PVC jacketed cable or 150 mm (6 in) PVC cable with quick disconnect, depending on model

### Operating Temperature

-40 °C to +50 °C (-40 °F to +122 °F)

### Max. Relative Humidity

90% at +50 °C maximum relative humidity (non-condensing)

### Storage Temperature

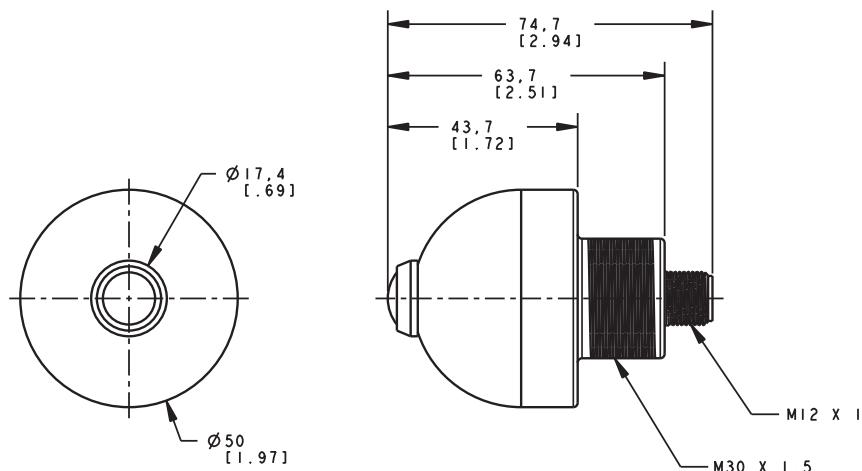
-40 °C to +70 °C (-40 °F to +158 °F)

### Certifications



## Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise.

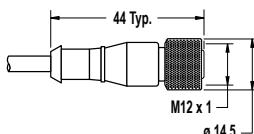
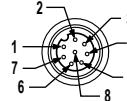


## Accessories

### Quick-Disconnect (QD) Cordsets

4-Pin Threaded M12/Euro-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	1.83 m (6 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black
MQDC-415	4.57 m (15 ft)			
MQDC-430	9.14 m (30 ft)			
MQDC-450	15.2 m (50 ft)			

5-Pin Threaded M12/Euro-Style Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC1-501.5	0.50 m (1.5 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray
MQDC1-506	1.83 m (6 ft)			
MQDC1-515	4.57 m (15 ft)			
MQDC1-530	9.14 m (30 ft)			
MQDC1-506RA	1.83 m (6 ft)	Right-Angle		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray
MQDC1-515RA	4.57 m (15 ft)			
MQDC1-530RA	9.14 m (30 ft)			

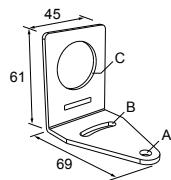
8-Pin Threaded M12/Euro-Style Cordsets with Shield				Pinout (Female)
Model	Length	Style	Dimensions	
MQDC-806	1.83 m (6 ft)	Straight		 1 = White      5 = Gray 2 = Brown     6 = Pink 3 = Green     7 = Blue 4 = Yellow    8 = Shield
MQDC-815	4.57 m (15 ft)			
MQDC-830	9.14 m (30 ft)			

## Brackets

All measurements are in mm

SMB30A

- Right-angle bracket with curved slot for versatile orientation
- Clearance for M6 ( $\frac{1}{4}$  in) hardware
- Mounting hole for 30 mm sensor
- 12-ga. stainless steel

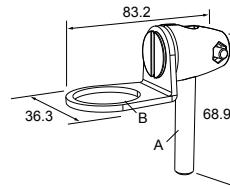


Hole center spacing: A to B=40

Hole size: A=Ø 6.3, B= 27.1 x 6.3, C=Ø 30.5

SMB30FA

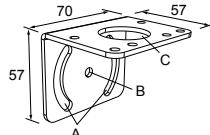
- Swivel bracket with tilt and pan movement for precise adjustment
- Mounting hole for 30 mm sensor
- 12-ga. 304 stainless steel
- Easy sensor mounting to extrude rail T-slot
- Metric and inch size bolt available



Bolt thread: SMB30FA, A= 3/8 - 16 x 2 in; SMB30FAM10, A= M10 - 1.5 x 50  
Hole size: B= Ø 30.1

SMB30MM

- 12-ga. stainless steel bracket with curved mounting slots for versatile orientation
- Clearance for M6 ( $\frac{1}{4}$  in) hardware
- Mounting hole for 30 mm sensor

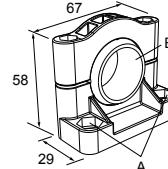


Hole center spacing: A = 51, A to B = 25.4

Hole size: A = 42.6 x 7, B = Ø 6.4, C = Ø 30.1

SMB30SC

- Swivel bracket with 30 mm mounting hole for sensor
- Black reinforced thermoplastic polyester
- Stainless steel mounting and swivel locking hardware included



Hole center spacing: A=Ø 50.8

Hole size: A=Ø 7.0, B=Ø 30.0

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# EZ-LIGHT Indicators for 3-Color, 7-Function



## Datasheet

DC-operated LED indicators with solid ON or flashing capability and a Euro-style integral QD<sup>1</sup>. Choose from red, yellow, or green ON, flashing, or rotating (depending on wiring).<sup>2</sup>

Models	Construction	Inputs
	M18GRY2PQ	PNP
	M18GRY2NQ	NPN
	T30GRY2PQ	PNP
	T30GRY2NQ	NPN
	K50LGRY2PQ	PNP
	K50LGRY2NQ	NPN
	K50FLGRY2PQ	PNP
	K50FLGRY2NQ	NPN
	K80LGRY2PQ <sup>3</sup>	PNP
	K80LGRY2NQ	NPN

**Other Models:** Standard integral QD models only are listed (mating cordset required). To order 2 m (6.5 ft) cable models, omit suffix **Q** from model number (example, M18GRY2P). To order models with 150 mm (6 inch) PVC pigtail with 5-pin Euro QD connector, replace suffix **Q** with **QP** (example, M18GRY2PQP).

## Specifications

### Supply Voltage and Current

M18 Models: 10 to 30 V dc at 40 mA max.  
 T30 Models: 10 to 30 V dc at 50 mA max.  
 K50L, K50FL and K80L Models: 18 to 30 V dc at 50 mA max.

### Indicators

Entire translucent diffuser or dome provides indication.  
 LEDs are independently selected: Green, Red, Yellow, ON steady or flashing.  
 For other colors/combinations, contact Factory for availability

### Input Response Time

Indicator ON: 250 ms (max.)  
 Indicator OFF: 10 ms (max.)

### Indicator Flash Rate

Single Color: 1 second flash rate (500 ms ON)  
 Three Color: 1.5 second rotation rate (500 ms per color)

### Connections

K80L Models: 5-pin Euro-style integral QD (Q) standard. Terminal-wired models available for use with bulk cable; compression fitting optional. Contact Factory for cable information.

Other Models: 5-pin Euro-style integral QD (Q); 6" pigtail QD (QP), (do not use center pin 5); or 5-wire, 2 m (6.5') integral cable

### Operating Conditions

Temperature: -40 °C to 50 °C (-40 °F to 122 °F)

### Environmental Rating

Rated IEC IP67. K80L has encapsulated electronics only; other models fully encapsulated.  
 K50L, and K50FL quick-disconnect models meet IP69K per DIN 40050-9  
 Cabled models also meet IP69K if the cable and cable entrance are protected from high-pressure spray.

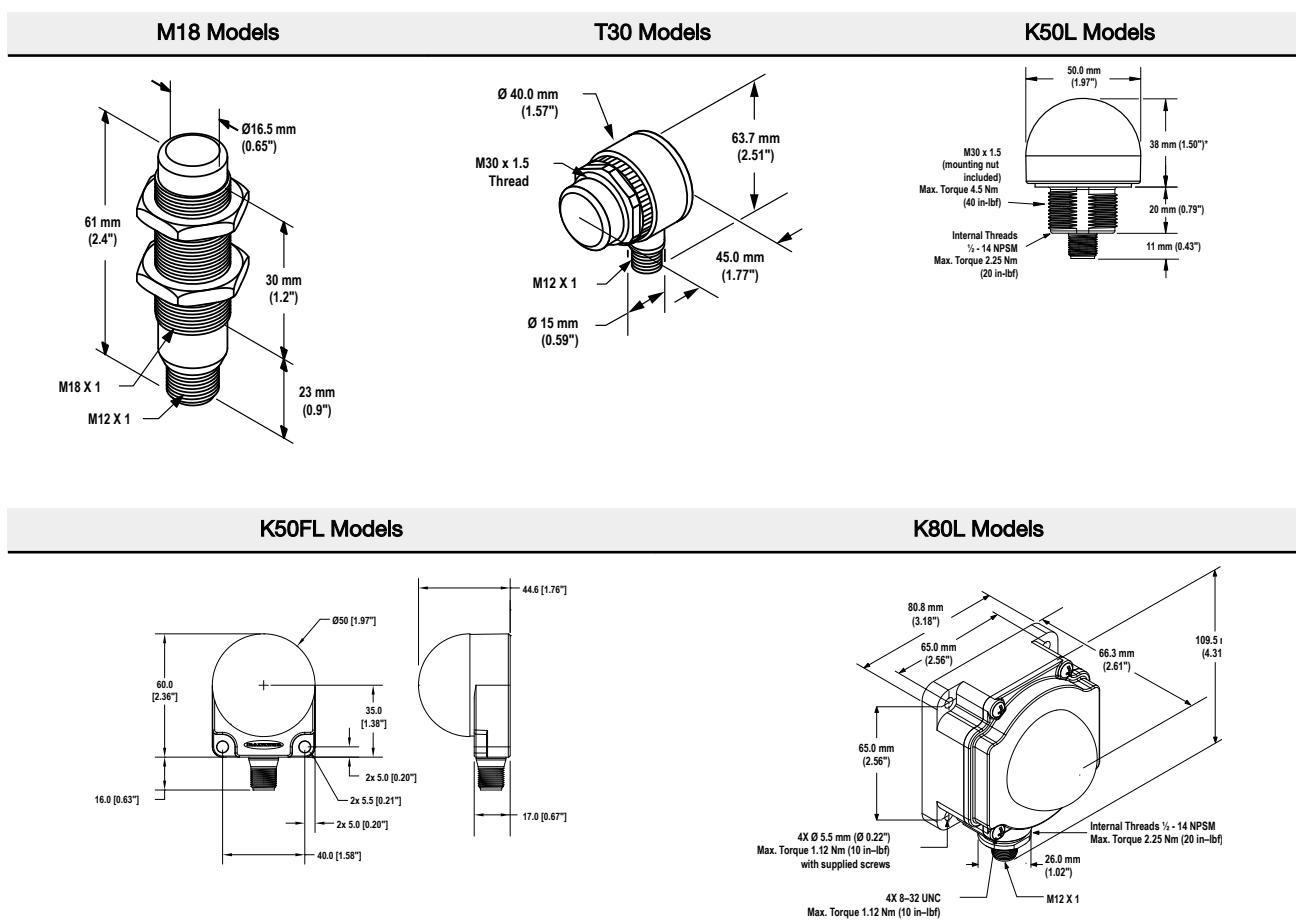
<sup>1</sup> Pin 5 is not used; connects to 4-wire QD cordset. If a cordset other than those specified in this document is used, use a 5-pin mating cordset.

<sup>2</sup> Contact Factory for other colors/color combinations, including: blue, white, orange.

<sup>3</sup> K80L Models: Standard 5-pin Euro integral QD connector models only are listed (mating cordset required). For terminal-wired model, omit suffix Q (example, K80LGRY2P).



## Dimensions



## Wiring

Table 1: Select from 7 operating schemes, depending on wiring

LED Function	PNP Models				NPN Models			
	Brown Wire	White Wire	Black Wire	Blue Wire	Blue Wire	White Wire	Black Wire	Brown Wire
Red ON	+V dc			0 V dc	0 V dc			+V dc
Red Flashing	+V dc		+V dc	0 V dc	0 V dc		0 V dc	+V dc
Yellow ON		+V dc		0 V dc		0 V dc		+V dc
Yellow Flashing	+V dc	+V dc		0 V dc	0 V dc	0 V dc		+V dc
Green ON			+V dc	0 V dc			0 V dc	+V dc
Green Flashing		+V dc	+V dc	0 V dc		0 V dc	0 V dc	+V dc
Rotating Red-Green-Yellow	+V dc	+V dc	+V dc	0 V dc	0 V dc	0 V dc	0 V dc	+V dc

Table 2: Only QD wiring is shown; cabled wiring is functionally identical.

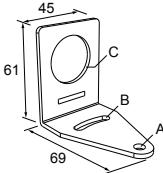
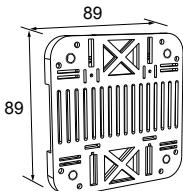
PNP Models	NPN Models
G = Green R = Red Y = Yellow X = Not Used	

## Accessories

4-Pin Threaded M12/Euro-Style Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	1.83 m (6 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black
MQDC-415	4.57 m (15 ft)			
MQDC-430	9.14 m (30 ft)			
MQDC-450	15.2 m (50 ft)			
MQDC-406RA	1.83 m (6 ft)	Right-Angle		 1 = Brown 2 = White 3 = Blue 4 = Black
MQDC-415RA	4.57 m (15 ft)			
MQDC-430RA	9.14 m (30 ft)			
MQDC-450RA	15.2 m (50 ft)			

To order bulk cable for terminal-wired K80L models, contact the factory. If cables other than those listed are used, use a 5-pin mating cable.

Brackets		
<b>SMB18A</b> <ul style="list-style-type: none"> <li>Right-angle mounting bracket with a curved slot for versatile orientation</li> <li>12-ga. stainless steel</li> <li>18 mm sensor mounting hole</li> <li>Clearance for M4 (#8) hardware</li> </ul> <p>Hole center spacing: A to B = 24.2  Hole size: A = Ø 4.6, B = 17.0 × 4.6, C = Ø 18.5</p>		For use with M18 and T18 models or base-mount T30 models. Other available 18 mm dia. brackets: SMB1815SF SMB18Q SMB18SF SMB312PD SMBAMS18RA SMBAMS18P

Brackets	
<b>SMB30A</b> <ul style="list-style-type: none"> <li>Right-angle bracket with curved slot for versatile orientation</li> <li>Clearance for M6 (1/4 in) hardware</li> <li>Mounting hole for 30 mm sensor</li> <li>12-ga. stainless steel</li> </ul> <p><b>Hole center spacing:</b> A to B=40  <b>Hole size:</b> A=Ø 6.3, B= 27.1 x 6.3, C=Ø 30.5</p>	 <p>For use with T30 models or base-mount K50L models. Other available 30 mm diameter brackets are:</p> <p>SMBAMS30RA  SMBAMS30P  SMB30SC  SMB30SC  SMB30MM  SMB3018SC</p>
<b>SMBDX80DIN</b> <ul style="list-style-type: none"> <li>Black reinforced thermoplastic</li> <li>Bracket for mounting on a 35 mm DIN rail</li> </ul>	 <p>K50FL models include a 48 mm (1.9 inch) circular velcro mounting kit for easy mounting with no additional hardware</p>

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# TL70 Modular Tower Light



## Instruction Manual

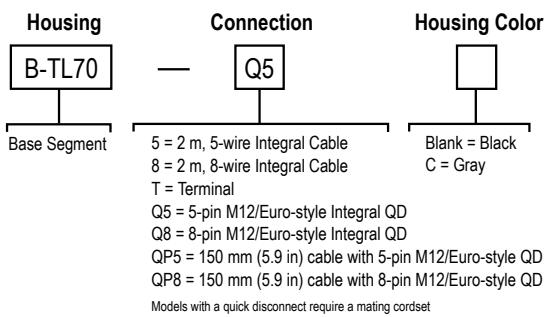


Banner's TL70 Tower Light is a 70 mm, modular LED indicator with extremely bright and uniform light. The modularity gives the user flexibility to customize tower lights as needed and change positions in the field. The TL70 is also available preassembled for easy installation.

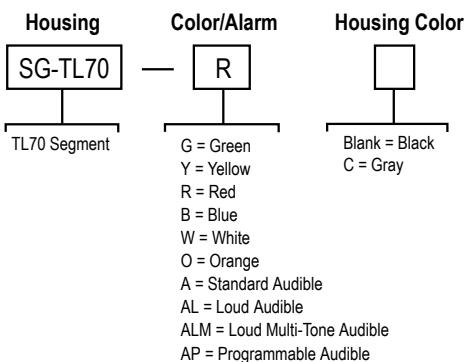
- Light segments have user-selectable solid ON or flashing
- Up to six colors, or five colors plus audible, in one device
- Rugged, water-resistant IP65 housing with UV-stabilized material
- Bright, uniform indicator segments appear gray when off to eliminate false indication from ambient light
- Several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

## Models

### TL70 Base



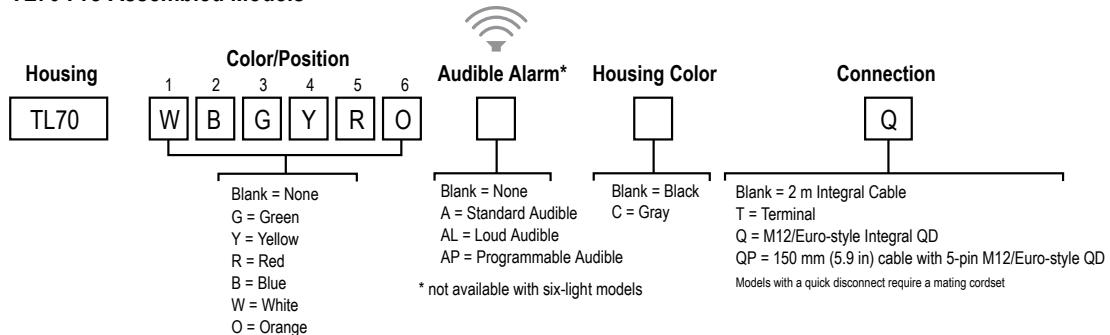
### TL70 Segments



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

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

### TL70 Pre-Assembled Models



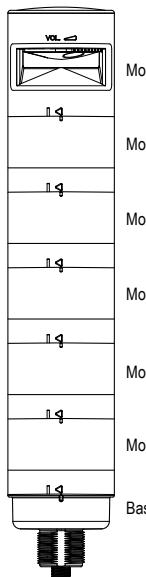
- Example pre-assembled model number: TL70GYRAQ.



## Configuring the Modules



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

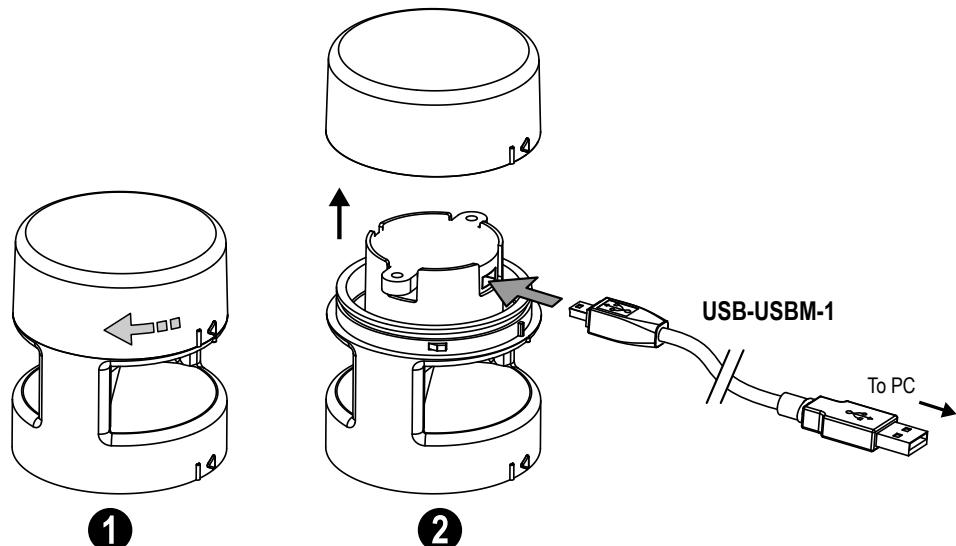


Assembly Options		DIP Switches							
		1	2	3	4	5	6	7	8
Light and Standard Audible Components	Module 1	ON							
	Module 2		ON						
	Module 3			ON					
	Module 4				ON				
	Module 5					ON			
	Module 6						ON		
Light Module Flash Rate	3 Hz						ON	OFF	
	1.5 Hz						ON	ON	
	Solid On*						OFF	OFF	
Standard 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

## Programming the Audible Tower Module



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

The SG-TL70-AP has 4MB of on-board flash memory and can playback any WAV or MP3 audio file that is 4MB or smaller. If the file is too large, a program such as Audacity can be used to compress or shorten the file to decrease the size.

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



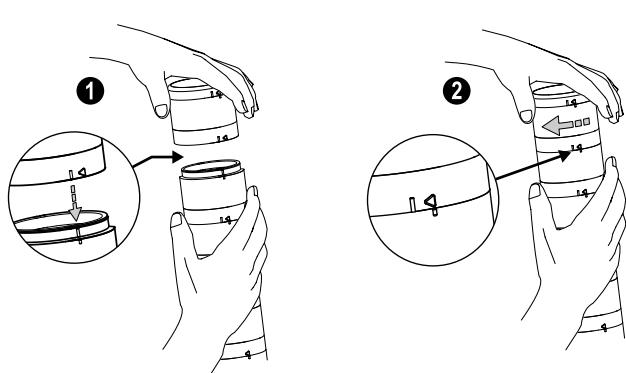
**Note:** Add a number to the beginning of the file name to create the order in which the files run. Files play consecutively without any pause.

To program the module:

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

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

## Assembling the Modules

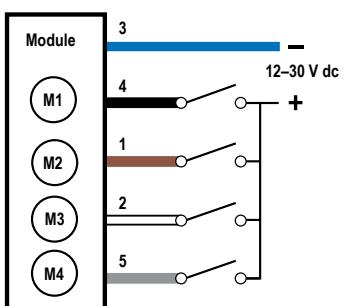


To assemble the modules:

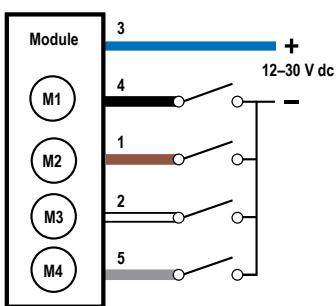
1. Align the notches on each module and press together.
2. Rotate the top module clockwise to lock into place (notches shown in the locked position).

## Wiring Diagrams

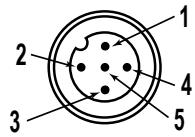
PNP Input



NPN Input



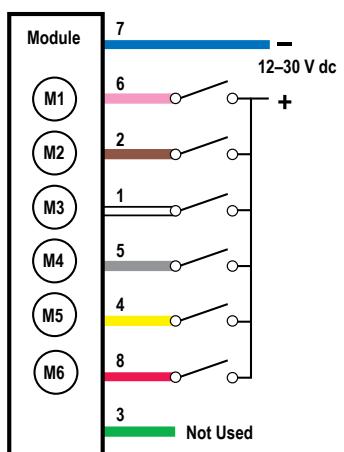
Euro-style Male Pinouts



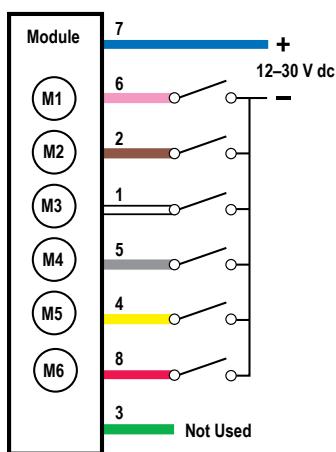
Key

- 1 = brown
- 2 = white
- 3 = blue
- 4 = black
- 5 = gray
- M1 = Module 1
- M2 = Module 2
- M3 = Module 3
- M4 = Module 4

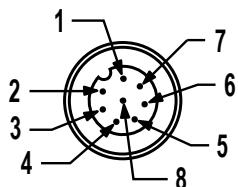
PNP Input



NPN Input



Euro-style Male Pinouts



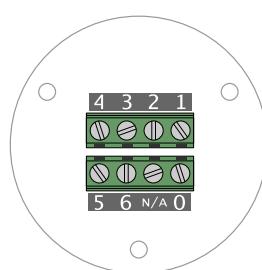
Key

- 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



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

Wiring Terminal Block



Terminal Block Key

- 0 = dc common
- 1 = Module 1
- 2 = Module 2
- 3 = Module 3
- 4 = Module 4
- 5 = Module 5
- 6 = Module 6

## Specifications

### Supply Voltage and Current

12 V DC to 30 V DC

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

### Supply Protection Circuitry

Protected against transient voltages

### Indicators

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

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

### Indicator Response Time

**Off Response:** 150 µs (maximum) at 12 V DC to 30 V DC  
**On Response:** 180 ms (maximum) at 12 V DC; 50 ms (maximum) at 30 V DC

### Indicator Characteristics

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	Color Coordinates <sup>1</sup>		Lumen Output (Typical at 25 °C)
		x	y	
Green	525 nm	—	—	92
Red	625 nm	—	—	40
Yellow	590 nm	—	—	22
Blue	470 nm	—	—	32
White	5000 K	—	—	125
Orange	—	0.66	0.33	33

### Connections

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

### Terminal Block Models

14 to 28 AWG wire

### Operating Conditions

–40 °C to +50 °C (–40 °F to +122 °F)  
95% at +50 °C maximum relative humidity (non-condensing)

### Environmental Rating

IEC IP65

### Certifications



### 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) (see table)

DIP Switches		Max Intensity (Loud Audible)
9	10	
ON	ON	Intensity 4: 101 dB
OFF	ON	Intensity 3: 99 dB
ON	OFF	Intensity 2: 92 dB
OFF	OFF	Intensity 1: 85 dB

### Audible Adjustment

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

**Loud Audible:** 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

### Construction

**Bases, Segments, Covers:** polycarbonate

### Vibration and Mechanical Shock

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

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

### 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.

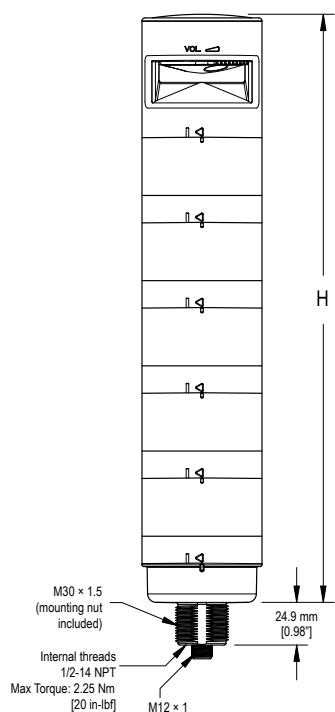
Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to [www.bannerengineering.com](http://www.bannerengineering.com).

Supply Wiring (AWG)	Required Overcurrent Protection (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

<sup>1</sup> Refer to CIE 1931 chromaticity diagram or color chart, to show equivalent color with indicated color coordinates.

## Dimensions

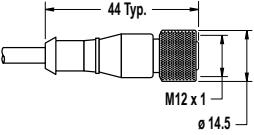
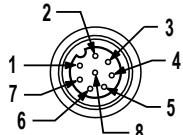
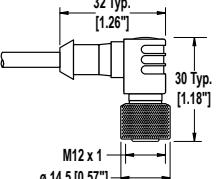
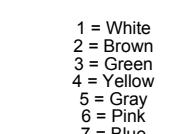


Model	Height (H)
1 light module	87.6 mm (3.45 in)
1 light module, 1 audible module	144.3 mm (5.68 in)
2 light modules	137.3 mm (5.41 in)
2 light modules, 1 audible module	194 mm (7.64 in)
3 light modules	187 mm (7.36 in)
3 light modules, 1 audible module	243.7 mm (9.59 in)
4 light modules	236.7 mm (9.32 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 Threaded M12 Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC1-501.5	0.5 m (1.5 ft)	Straight	<p>44 Typ. M12 x 1 ø 14.5</p>	<p>1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray</p>
MQDC1-506	2 m (6.5 ft)			
MQDC1-515	5 m (16.4 ft)			
MQDC1-530	9 m (29.5 ft)			
MQDC1-506RA	2 m (6.5 ft)			
MQDC1-515RA	5 m (16.4 ft)			
MQDC1-530RA	9 m (29.5 ft)	Right-Angle	<p>32 Typ. 30 Typ. M12 x 1 ø 14.5 [0.57"]</p>	

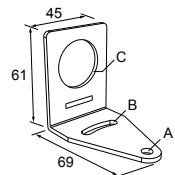
8-Pin Threaded M12 Cordsets with Open-Shield—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC2S-806	2.04 m (6.7 ft)	Straight		 1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red
MQDC2S-815	5.04 m (16.54 ft)			
MQDC2S-830	10.04 m (32.95 ft)			
MQDC2S-850	16 m (52.49 ft)			
MQDC2S-806RA	2 m (6.56 ft)	Right-Angle		 1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red
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.

### SMB30A

- Right-angle bracket with curved slot for versatile orientation
- Clearance for M6 ( $\frac{1}{4}$  in) hardware
- Mounting hole for 30 mm sensor
- 12-ga. stainless steel

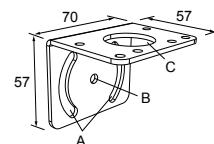


Hole center spacing: A to B=40

Hole size: A=Ø 6.3, B=27.1 x 6.3, C=Ø 30.5

### SMB30MM

- 12-ga. stainless steel bracket with curved mounting slots for versatile orientation
- Clearance for M6 ( $\frac{1}{4}$  in) hardware
- Mounting hole for 30 mm sensor

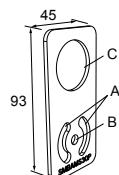


Hole center spacing: A = 51, A to B = 25.4

Hole size: A = 42.6 x 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-ga. 300 series stainless steel

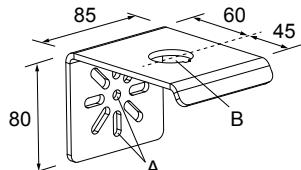


Hole center spacing: A=26.0, A to B=13.0

Hole size: A=26.8 x 7.0, B=Ø 6.5, C=Ø 31.0

### SSA-MBK-EEC1

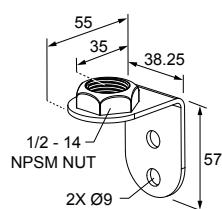
- Single 30 mm hole
- 8 gauge steel, black finish (powder coat)
- Front surface for customer applied labels



Hole size: A = Ø 7 , B = Ø 30

### LMBE12RA35

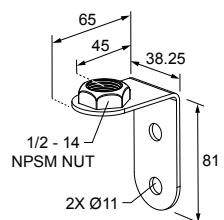
- Direct mounting of stand-off pipe, with common bracket type
- Zinc-plated steel
- 1/2-14 NPSM nut
- Mounting distance from the wall to the center of the 1/2-14 NPSM nut is 35 mm



Hole center spacing: 20.0

### 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



Hole center spacing: 35.0

## Elevated Mount System

Model			Features	Components	
<b>SA-M30</b> - Black Polycarbonate			<ul style="list-style-type: none"> <li>Streamlined black PC or Gray PC thread cover</li> <li>Covers M30 thread on the light base</li> <li>Mounting hardware included</li> </ul>		
<b>SA-M30C</b> - Gray Polycarbonate					
<b>Polished 304 Stainless Steel</b>	<b>Black Anodized Aluminum</b>	<b>Clear Anodized Aluminum</b>			
<b>SOP-E12-150SS</b> 150 mm (6 in) long	<b>SOP-E12-150A</b> 150 mm (6 in) long	<b>SOP-E12-150AC</b> 150 mm (6 in) long			
<b>SOP-E12-300SS</b> 300 mm (12 in) long	<b>SOP-E12-300A</b> 300 mm (12 in) long	<b>SOP-E12-300AC</b> 300 mm (12 in) long	<ul style="list-style-type: none"> <li>Elevated-use stand-off pipe (½ in. NPSM/DN15)</li> <li>Polished 304 stainless steel, black anodized aluminum, or clear anodized aluminum surface</li> <li>½ in. NPT thread at both ends</li> <li>Compatible with most industrial environments</li> </ul>		
<b>SOP-E12-900SS</b> 900 mm (36 in) long	<b>SOP-E12-900A</b> 900 mm (36 in) long	<b>SOP-E12-900AC</b> 900 mm (36 in) long			
<b>SA-E12M30</b> - Black Acetal					
<b>SA-E12M30C</b> - White UHMW			<ul style="list-style-type: none"> <li>Streamlined black acetal or white UHMW mounting base adapter/cover</li> <li>Connects between ½ in. NPSM/DN15 pipe and 30 mm (1-3/16 in) drilled hole</li> <li>Mounting hardware included</li> </ul>		

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

Foldable Mounting Brackets			
Model	Features	Construction	
<b>SA-FFB12</b>	<ul style="list-style-type: none"> <li>For use with 1/2 inch stand-off pipes</li> <li>Stainless steel hardware</li> </ul>	Black polycarbonate	
<b>SA-FFB12C</b>		Gray polycarbonate	

## LMB Sealed Right-Angle Bracket

Model	Description	Construction	
<b>LMB30RA</b>		Black polycarbonate	
<b>LMB30RAC</b>	<b>Direct-Mount Models:</b> Bracket kit with base, 30 mm adapter, set screw, fasteners, O-rings, and gaskets.	Gray polycarbonate	
<b>LMBE12RA</b>		Black polycarbonate	
<b>LMBE12RAC</b>	<b>Pipe-Mount Models:</b> 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).	Gray polycarbonate	

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(http://www.rockwellautomation.com/)

## 5069-L306ER

**Description:** 5069 CompactLogix/Compact GuardLogix System

### PRODUCT SELECTION

#### CATEGORY

Controllers

### CONTROLLER

#### CONTROLLER CAPACITY

0.6 MB

#### I/O MODULES (MAX)

8

#### ETHERNET/IP NODES SUPPORTED (MAX)

16

#### INTEGRATED MOTION

None

#### SAFETY RATING SELECTION

None

### CATALOG NUMBER

#### CATALOG NUMBER

Controller, CompactLogix 5380, 600 KB User Memory, 8 I/Os, 16 EtherNet/IP Devices

### NOTE

#### NOTE

The 5380 controllers did not come with the removable terminals. It is necessary to purchase the 5069-RTB64-SCREW or 5069-RTB64-SPRING terminal kits separately to use the 5380 controllers

### NOTE

**NOTE**

High Capacity SD cards (1784-SDHC8 and 1784-SDHC32) are supported only for CompactLogix 5069-L3 & 5069-L4 controllers not for the CompactLogix 1769 controllers



(http://www.rockwellautomation.com/)

## 5069-IB16F

**Description:** 5069 CompactLogix/Compact GuardLogix System

### PRODUCT SELECTION

**CATEGORY**

IO Modules

**I/O MODULES****CATEGORY**

Digital

**TYPE**

Input

**VOLTAGE**

12/24V DC

**NO OF INPUTS/OUTPUTS**

16

**CATALOG NUMBER****CATALOG NUMBER**

5069 Compact I/O 16 Channel Fast 24V DC Sink Input Module

**NOTE****NOTE**

The selected IO Product needs the Terminal kits 5069-RTB18-SCREW or 5069-RTB18-SPRING. Terminal kits are pre-packed in a pack of 1pcs

**NOTE**

**NOTE**

High Capacity SD cards (1784-SDHC8 and 1784-SDHC32) are supported only for CompactLogix 5069-L3 & 5069-L4 controllers not for the CompactLogix 1769 controllers



(http://www.rockwellautomation.com/)

## 5069-OB16

**Description:** 5069 CompactLogix/Compact GuardLogix System

### PRODUCT SELECTION

**CATEGORY**

IO Modules

**I/O MODULES****CATEGORY**

Digital

**TYPE**

Output

**VOLTAGE**

12/24V DC

**NO OF INPUTS/OUTPUTS**

16

**CATALOG NUMBER****CATALOG NUMBER**

5069 Compact I/O 16 Channel 24V DC Source Output Module

**NOTE****NOTE**

The selected IO Product needs the Terminal kits 5069-RTB18-SCREW or 5069-RTB18-SPRING. Terminal kits are pre-packed in a pack of 1pcs

**NOTE**

**NOTE**

High Capacity SD cards (1784-SDHC8 and 1784-SDHC32) are supported only for CompactLogix 5069-L3 & 5069-L4 controllers not for the CompactLogix 1769 controllers