



442G Multi-functional Access Box

Catalog Numbers 442G-MABH-*, 442G-MAB*-U**-C**, 442G-MABE1



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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Read this preface to become familiar with the rest of the manual. It provides information concerning:

- Who would use this manual
- The purpose of this manual
- Related documentation
- Conventions that are used in this manual

Who Should Use This Manual

Use this manual if you are responsible for designing, installing, programming, or troubleshooting systems that use the 442G Multi-functional Access Box.

You must have a basic understanding of electrical circuitry and familiarity with safety-related systems. If you do not, obtain the proper training before using this product.

Purpose of This Manual

This manual is a reference guide for the 442G Multi-functional Access Box. It describes the procedures to use to install, wire, and troubleshoot the device. This manual:

- Explains how to install and wire your 442G Multi-functional Access Box
- Provides an overview of the 442G Multi-functional Access Box

Conventions Used in This Manual

The following conventions are used throughout this manual:

- Bulleted lists such as this one provide information, not procedural steps.
- Numbered lists provide steps or hierarchical information.

Additional Resources

The following document offers more information about related Rockwell Automation products:

Resource	Description
Allen-Bradley™ Industrial Automation Glossary, publication AG-7.1	Glossary of industrial automation terms and abbreviations

You can view and download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documents, contact your local Rockwell Automation distributor or sales representative.

Terminology

OSSD	Output Signal Switching Device. Typically designates a pair of solid-state signals pulled up to the DC source supply. The signals are tested for short circuits to the DC power supply, short circuits to the DC common, and short circuits between the two signals.
Standard coding	Same as Low coding as defined in EN/ISO 14119:2013
Unique coding	Same as High coding as defined in EN/ISO 14119:2013

General Description

442G MAB Overview

The Guardmaster® 442G Multi-functional Access Box is an electromagnetic interlocking device with guard locking. The system consists of one locking module and one handle assembly. An escape release is available as an option.

The 442G-MAB functions by extending the locking bolt from the handle assembly into the lock module. When the locking bolt is fully extended into the lock module, the locking arm locks the bolt in this position, preventing the opening of the guard. Depending on the version, this is by spring force or solenoid force.

For power-to-release versions, the locking arm is kept in the locked position by spring force and unlocked by solenoid force when the solenoid is switched ON. For power-to-lock versions, the locking arm is kept in the locked position by solenoid force and unlocked by spring force when the solenoid is switched OFF.

Guard lock monitoring can be deactivated with DIP switches (see [Change Device Configuration \(using DIP switches\) on page 22](#)).



ATTENTION: For use as a guard locking device in accordance with EN ISO 14119, the guard lock monitoring must be ACTIVE.

With ACTIVE Guard Lock Monitoring:

In combination with a movable safety guard and the control system, this safety device can prevent opening of the safety guard while a dangerous machine movement is performed. The position of the guard locking is monitored during this process.

Safety outputs (FO1A, FO1B) are enabled only when the locking bolt is sensed in its extended position in the lock module AND the locking arm is in position (i.e., the guard is closed and the bolt is both extended and locked).

With INACTIVE Guard Lock Monitoring:

In combination with a movable separating safety guard and the control system, this safety device prevents dangerous machine movements from occurring while

the safety guard is open. A stop command is triggered if the safety guard is opened during the dangerous machine function. The position of the guard locking is not taken into account during this process.

Safety outputs (FO1A, FO1B) are enabled only when the locking bolt is sensed in its extended position in the lock module (i.e, the guard door is closed and the bolt is extended). In this mode, the status of the guard locking is not taken into account.

IMPORTANT The safety outputs (FO1A, FO1B) will not be enabled until a handle assembly has been configured (see [Handle Configuration on page 9](#)). After configuration is completed, the lock module will only recognize the unique code of the configured handle.

Assembly Overview

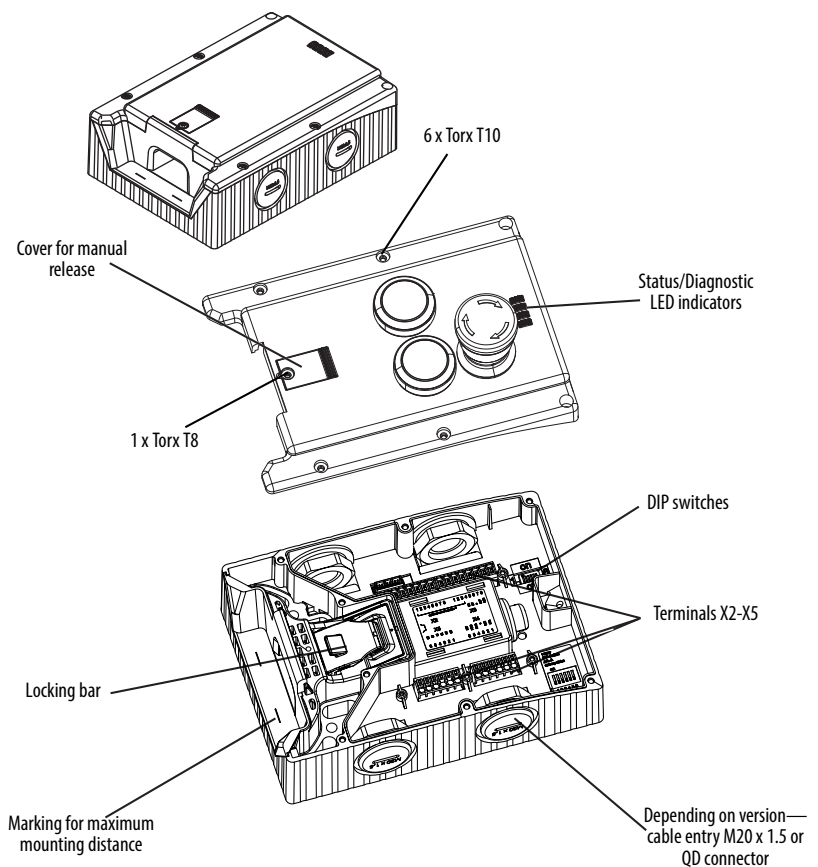


Figure 1 - Locking Module with Control Cover

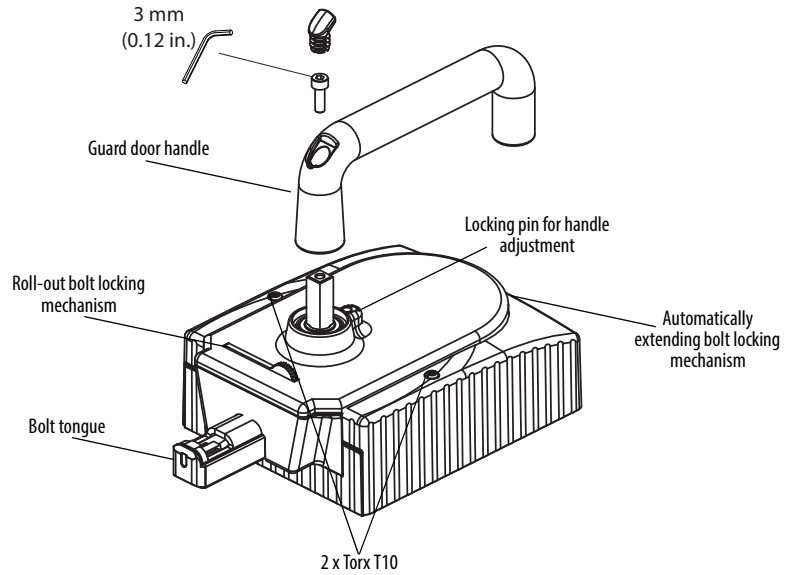


Figure 2 - Handle Assembly

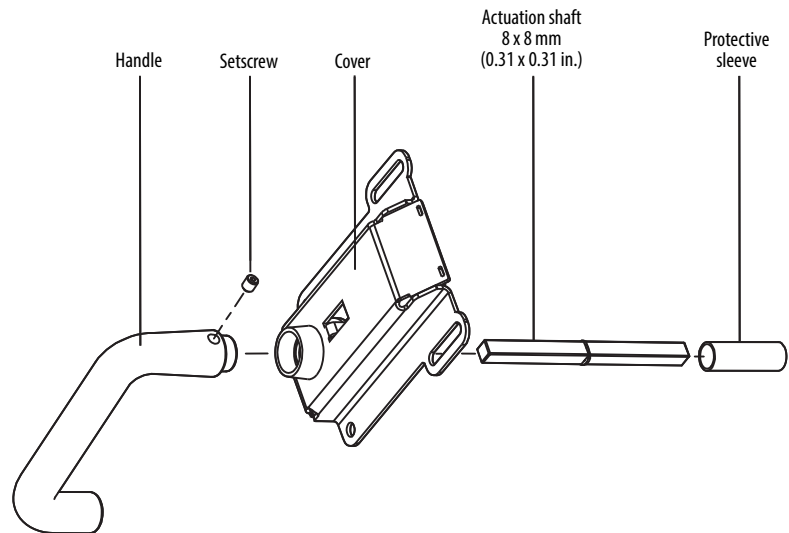


Figure 3 - Escape Release (optional)

IMPORTANT The length of the actuation shaft (115 mm (4.53 in.)) is optimized for mounting on a 45 mm (1.77 in.) profile. An extended shaft is available (442G-MABASHFT). See Chapter 3, [Installation and Wiring on page 8](#) for instructions regarding mounting on smaller or larger profiles.

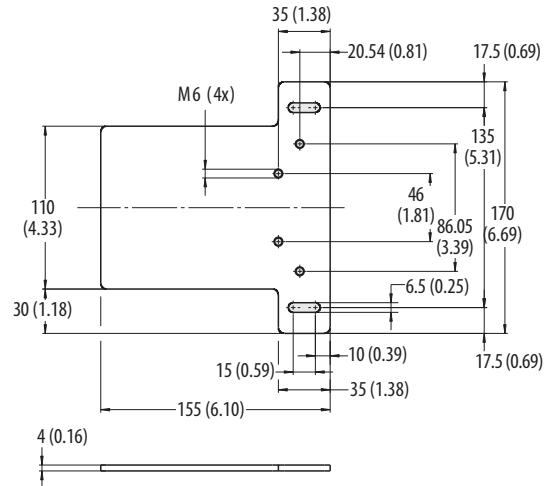


Figure 4 - Lock Module Mounting Plate [mm (in.)]

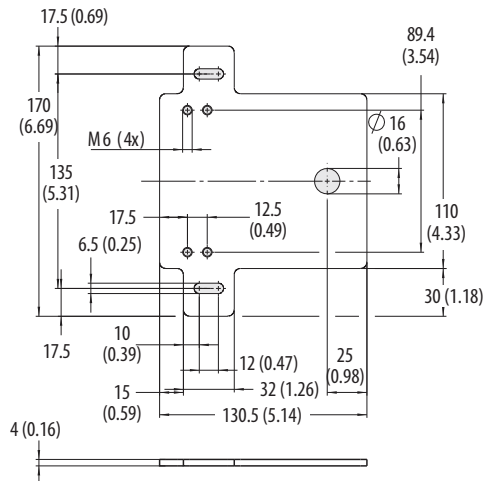


Figure 5 - Handle Assembly Mounting Plate [mm (in.)]

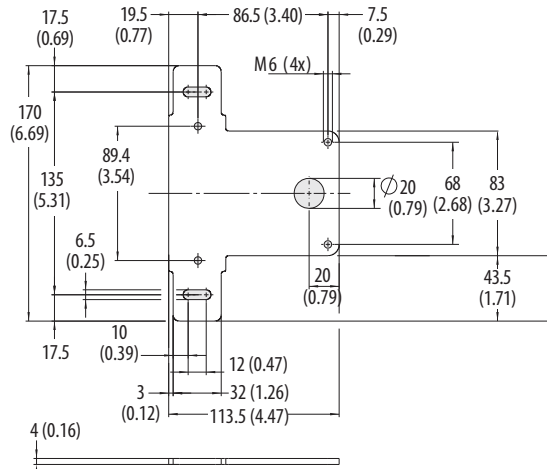


Figure 6 - Escape Release Mounting Plate [mm (in.)]

Mounting Hardware Reference

Handle Module Mounting Plate is supplied with the following hardware:

- 4X DIN 7984-M6X12 ZN (screw)
- 4X DIN 433-6 NI (washer)
- 4X DIN 6797-JZ-D6,4 (lock washer)

Locking Module Mounting Plate is supplied with the following hardware:

- 4X DIN 912-M6X25-8.8 ZN (screw)
- 4X DIN 433-6 NI (washer)
- 4X DIN 6797-JZ-D6,4 (lock washer)

Escape Release Mounting Plate is supplied with the following hardware:

- 4X DIN 7984-M6X8 (screw)
- 4X DIN 433-6 NI (washer)
- 4X DIN 6797-JZ-D6,4 (lock washer)

Safety Concept

Standards Applied to the Guardmaster 442G Multi-functional Access Box

The Guardmaster 442G-MAB satisfies applicable requirements in the following standards related to functional and machinery assembly:

- IEC 60947-5-3: 1999/A: 2005
- EN/ISO 13849-1:2008/AC: 2009 Performance Level e (PLe), Category 4
- EN/ISO 14119:2013
- UL 508 17th Edition dated 3/19/2013

Safety Certification

The Guardmaster 442G-MAB is certified for use in safety applications up to and including Performance Level PL e and Category 4 in compliance with ISO 13849-1.

-
- IMPORTANT**
- In the estimation of the PL for the overall system, a maximum value of 100 years can be assumed for the $MTTF_d$ according to the limit value in EN ISO 13849-1:2008, Chapter 4. This corresponds to a minimum value for the PFH_d of $2.47 \times 10^{-8}/h$.
 - When up to 10 devices are connected in series, these limit values can be assumed for the entire switch chain as a subsystem. As a subsystem, this switch chain achieves PL e.
-

The 442G-MAB must be installed in accordance with the applicable regulation and standards.

While the 442G-MAB can be used for PLe and Category 4 applications, the installer must comply with guard requirements (e.g. EN/ISO 13854 and EN/ISO 13857) and in some cases also minimum (safe) distance requirements (e.g. EN/ISO 13855).

The installed system, including the safety control system and the means by which the machine stops, must achieve the needed safety performance. The 442G-MAB is one element in the safety system.

Before safety components are used, a risk assessment must be performed on the machine in accordance with:

- EN ISO 13849-1, Safety of machinery. Safety related parts of control systems. General principles for design, Annex B
- EN ISO 12100, Safety of machinery – Basic concepts - General principles for design - Risk assessment and risk reduction.

Correct use includes compliance with the relevant requirements for installation and operation, in particular

- EN ISO 13849-1, Safety of machinery. Safety related parts of control systems. General principles for design
- EN ISO 14119, Safety of machinery. Interlocking devices that are associated with guards. Principles for design and selection
- EN 60204-1, Safety of machinery. Electrical equipment of machines. General requirements.

Additional guidance on guards, guard locking and guard interlocking may be found in:

- EN/ISO 12100 Safety of machinery—General principles for design—Risk assessment and risk reduction
- EN/ISO 13855 Safety of machinery—Positioning of safeguards with respect to the approach speeds of parts of the human body
- EN/ISO 13857 Safety of machinery—Safety distances to prevent hazard zones being reached by upper and lower limbs
- EN/ISO TR 24119 Technical report associated with EN ISO 14119 addressing the logical serial connection of interlocking devices
- EN/ISO 14120 General requirements for the design and construction of guards

Installation and Wiring

General Considerations

Installation must be in accordance with the present manual and must be performed by qualified personnel exclusively. The 442G-MAB guard locking switch system is intended to be part of the safety-related control system of a machine. Before installation, a thorough risk assessment must be performed to determine whether the specifications (see page 33) of this device are suitable for all foreseeable operational and environmental characteristics of the application.

Use appropriate screws, bolts, or nuts that are fitted by tools to mount the lock module and handle assembly to avoid tampering. Do not over-torque the mounting hardware.

Mounting



ATTENTION: With two-wing hinged guard doors, one of the two guard door wings must also be latched mechanically.

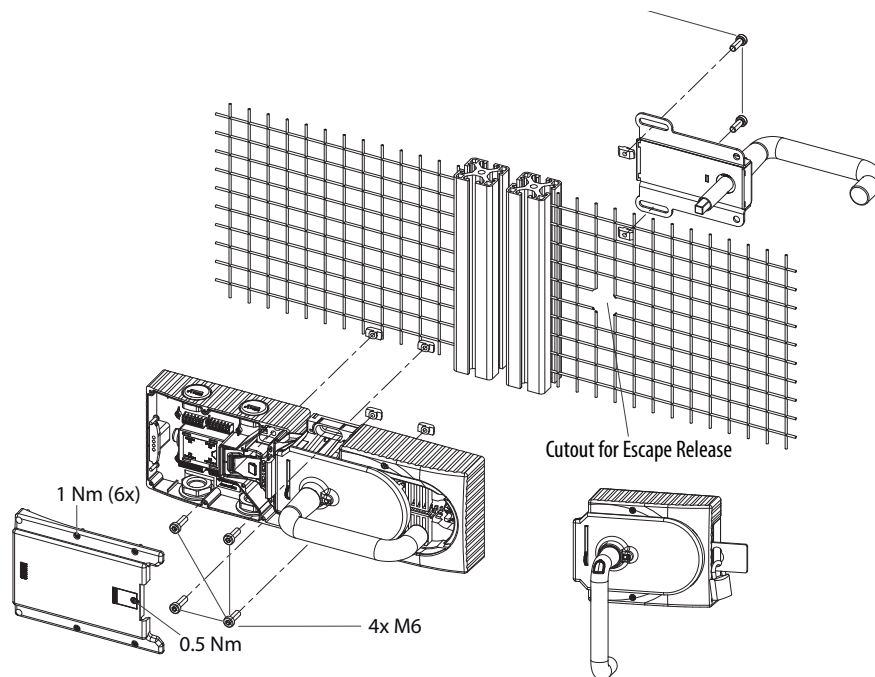


Figure 7 - Installation Example for Guard Door That Is Hinged on the Right

IMPORTANT Care should be taken when mounting the lock module cover to avoid pinching the ribbon cable.

TIP For easier installation, it is recommended that the handle assembly be mounted to the guard door before the silver handle is attached to the handle assembly.

Handle Configuration

The unique-coded handle assembly must be assigned to the locking module before the system is functional.

During configuration of the handle, the safety outputs are switched off.

- Insert bolt tongue in the locking module.
- Apply operating voltage (U_A and U_B).
- The State LED flashes (5 Hz) as the device performs a self-test (up to 8 seconds).
- Programming begins when the State LED flashes (1 Hz). After approximately 60 seconds, the State LED turns off.
- To complete the configuration, switch off the operating voltage (U_B) for a minimum of 3 seconds or apply 24V to the input RST for a minimum of three seconds.

IMPORTANT The locking module disables the code for the previous handle assembly if configuration is carried out for a new handle assembly. A disabled handle assembly can be configured again only after a third handle assembly has been configured.

Terminal Assignment and Wiring

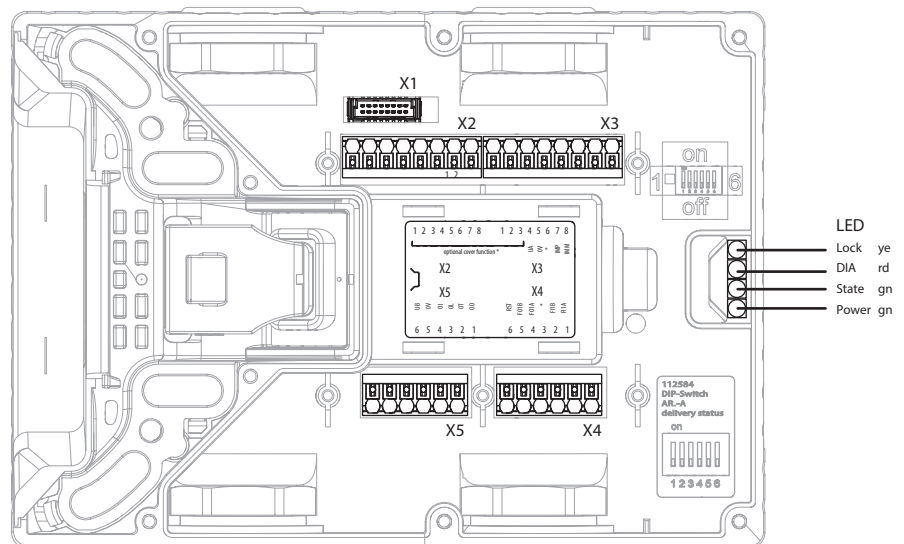
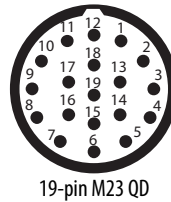
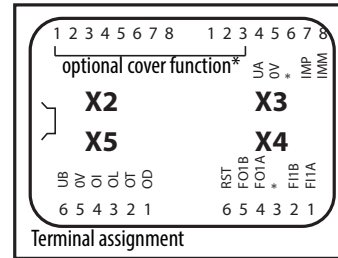


Figure 8 - Connections and LEDs



19-pin M23 QD



M23 19-Pin QD ¹	19-Conductor Cordset ¹	M20 Cable Entry	Function	Description
		Terminal		
1	Violet	X3.7	IMP	Lock command A
2	Red	X2.1	S1.A1	E-stop circuit A
3	Grey	X2.2	S1.B1	E-stop circuit B
n/a	n/a	X4.1	FI1A	Safety input channel A, connect FO1A from previous device when switch configured for series operation ²
n/a	n/a	X4.2	FI1B	Safety input channel B, connect FO1B from previous device when switch configured for series operation ²
4	Red/Blue	X4.4	FO1A	Safety output channel A, ON when guard is closed and locked
5	Green/Black	X4.5	FO1B	Safety output channel B, ON when guard is closed and locked
6	Blue	X5.5	OV	Connected internally to X3.5
7	Grey/Pink	X4.6	RST	Reset, device is reset if 24V DC is applied for at least 3 seconds
8	White/Green	X5.2	OT	Bolt monitoring output, ON when guard is closed and bolt is inserted in lock module
9	White/Yellow	X5.4	OI	Fault diagnostic, ON when the switch is in a fault state
10	White/Grey	X2.3	S1.A2	E-stop circuit A
11	Black	X2.4	S1.B2	E-stop circuit B
n/a	n/a	X2.6	S1 Auxiliary	E-stop monitoring contact (conduit models only)
12	Green/Yellow	N/A	⏏	Connector housing GND
13	Yellow/Brown	X2.7	S2	Push button switching element (S2)
14	Brown/Green	X3.1	H2	Push button LED (H2)
15	White	X3.2	S3	Push button switching element (S3)
16	Yellow	X3.3	H3	Push button LED (H3)
n/a	n/a	x5.1	OD	Door monitoring output, ON when the door is closed.
17	Pink	X5.3	OL	Lock monitoring output, ON when guard is closed and locked
18	Grey/Brown	X3.8	IMM	Reserved for future use.
19	Brown	X3.4	UA	Power Supply for solenoid and monitoring outputs
		X5.6	UB	Power supply for safety outputs ³

¹ 19-pin mating cordset Cat. No. 889M-F19RM-*

² The lock modules are factory preset for standalone operation. See the User Manual for setting up the device for series operation (cable entry models only).

³ On QD models, terminal X5.6 is connected internally to terminal X3.4.

Table 1 - Terminal Assignment

Connection of Cover Controls and Indicators

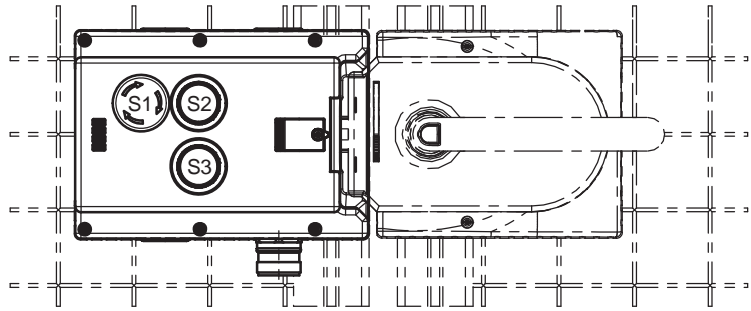


Figure 9 - As Mounted on a Right-hinged Guard

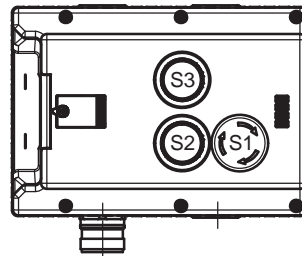


Figure 10 - As Mounted on a Left-hinged Guard

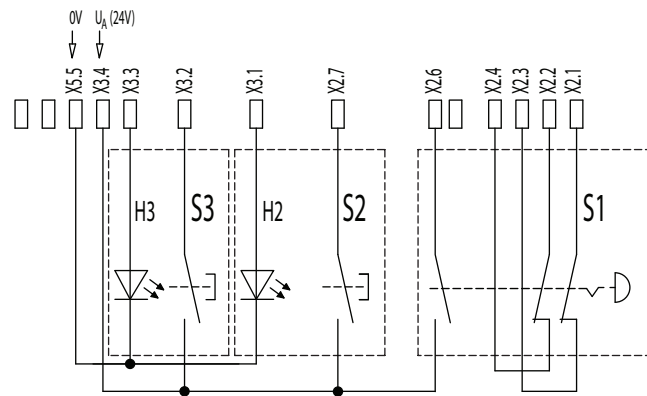


Figure 11 - Connection of Controls and Indicators

Indicator Lens Set Installation

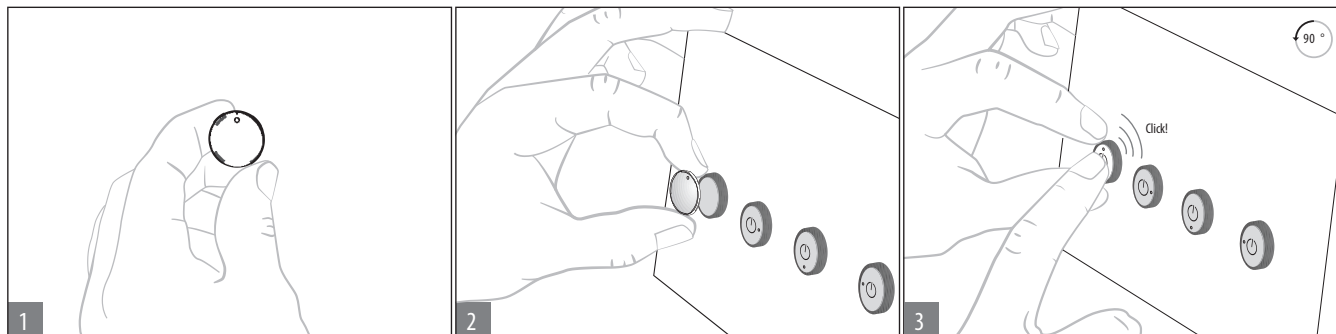


Figure 12 - Installing Lens Cover

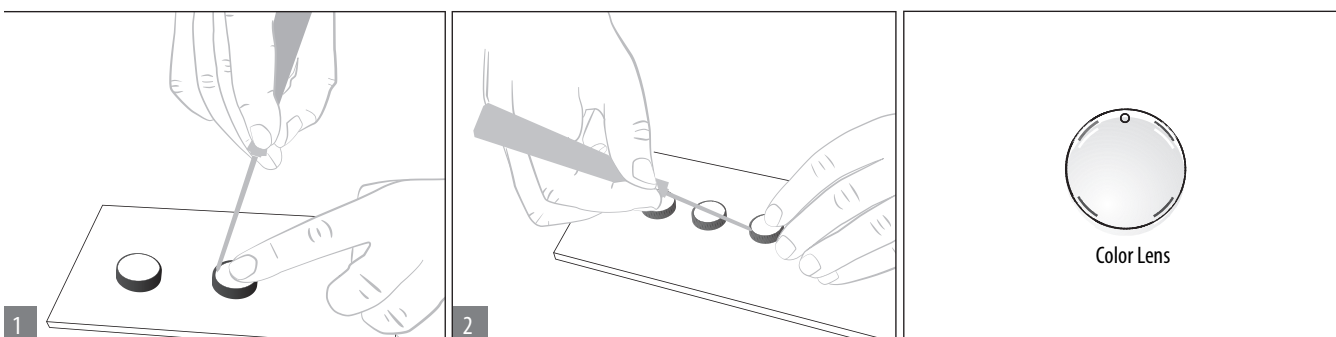


Figure 13 - Removing Lens Cover

Escape Release

The escape release is used to open a locked safety guard from inside the safeguarded area without tools.

With release monitoring active (default factory setting), the system enters into a latching fault when the escape release is actuated. To reset the device, turn the power off for at least three seconds or apply 24V to the input RST for a minimum of three seconds.

IMPORTANT	The guard door must be in the open position to clear a latching fault.
------------------	--

Note: A latching fault may not occur if the escape release is actuated slowly.

IMPORTANT	<p>The escape release is not a safety function.</p> <p>The machine manufacturer must select and use a suitable release according to the risk assessment.</p> <p>The correct operation must be checked at regular intervals.</p>
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IMPORTANT The length of the actuation shaft (115 mm (4.53 in.)) is optimized for mounting on 40 mm (1.57 in.) and 45 mm (1.77 in.) profiles. For mounting on profiles larger than 45 mm (or if using mounting plates on a 45 mm profile), an extended shaft is required (order separately, 442G-MABASHFT). Refer to the table below for instructions about sizing the extended shaft and mounting the escape release on smaller or larger profiles.

Use the following table to determine if the extended shaft is needed (442G-MABASHFT ordered separately) to prepare the escape release for smaller or larger profiles.

Profile Width	Length Required for Actuation Shaft		Shaft Required? ³	Necessary Work Steps
	Without Mounting Plates	With Mounting Plates (4 mm each)		
D	D+13.5	D + 17.5 ¹ D+21.5 ²		
30 mm	43 mm	51 mm	Standard shaft	Shorten to required length
40 mm	53 mm	61 mm	Standard shaft or extended shaft	<ul style="list-style-type: none"> Without mounting plates: shorten standard shaft to required length With two mounting plates: shorten extended shaft and protective sleeve to required length
45 mm	58 mm	66 mm	Standard shaft or extended shaft	<ul style="list-style-type: none"> Without mounting plate: none With mounting plates: shorten extended shaft and protective sleeve to required length
50 mm	63 mm	71 mm	Extended shaft	Shorten extended shaft and protective sleeve to required length

¹ Shaft length required when only one mounting plate is used.

² Shaft length required when two mounting plates are used for the escape release and the handle assembly.

³ The extended shaft (442G-MABASHFT) must be ordered separately.

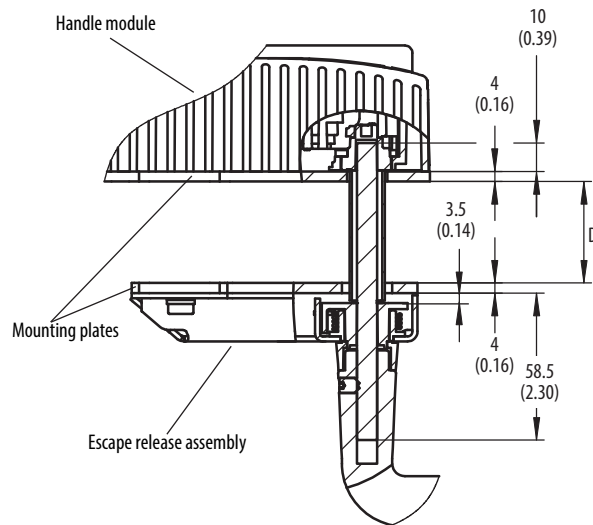


Figure 14 - Example with Mounting Plates [mm (in.)]

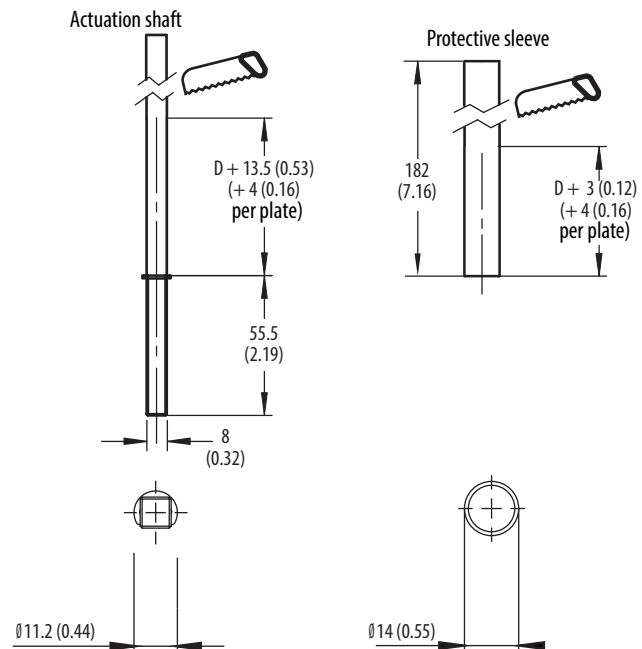
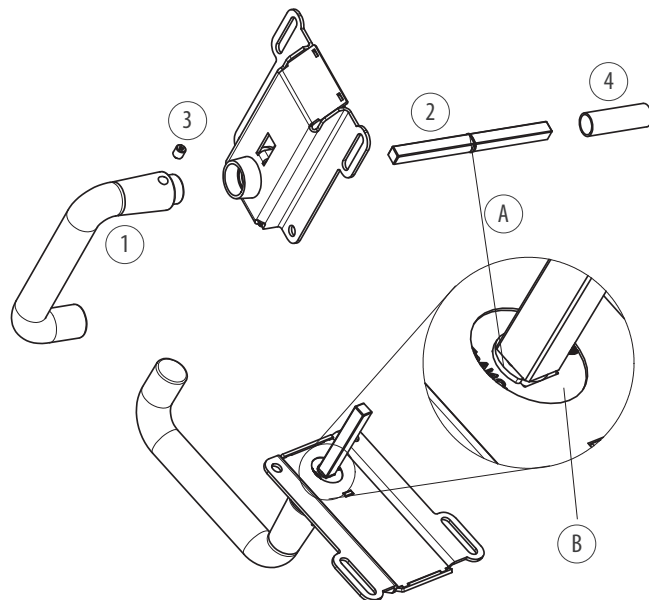


Figure 15 - Shortening the Extended Actuation Shaft [mm (in.)]

Prepare the Escape Release



1. Attach door handle
2. Insert actuation shaft. The locking ring A must be in contact with the escape release B.
3. Tighten setscrew to 2 Nm
4. Slide protective sleeve over actuation shaft

Figure 16 - Preparing the Escape Release

Electrical Connection



WARNING:

- To ensure safety, both safety outputs (F01A/F01B) must always be evaluated.
 - Diagnostic outputs OD, OT, OL, and OI must not be used as safety outputs.
 - Lay the connection cables with protection to prevent the risk of short circuits (see [Requirements for Connection Cables on page 16](#)).
-



ATTENTION:

Incorrect electrical connections can lead to damage or malfunction of the device. All electrical connections must either be isolated from the mains supply by a safety transformer according to IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.

A 24V DC Class 2 power supply is required. Alternative solutions must comply with the following requirements:

- a) Electrically isolated power supply with a maximum open-circuit voltage of 30V DC and a limited current of maximum 8 A.
- b) Electrically isolated power supply in combination with fuse as per UL248. This fuse should be designed for max. 3.3 A and should be integrated into the 30V DC voltage section.

The mounting of conduits directly on the 442G-MAB is not allowed. Cables are only allowed to be connected using a suitable cable gland. Cable glands can be used if they are UL-listed (QCRV) and are suitable for the related cable diameter (22...17 AWG).

All electrical outputs must have an adequate protective circuit for inductive loads. The outputs must be protected with a free-wheeling diode for this purpose. RC interference suppression units must not be used.

Power devices which are a powerful source of interference must be installed in a separate location away from the input and output circuits for signal processing. The cable routing for safety circuits should be as far away as possible from the cables of the power circuits.

To prevent EMC problems, it is imperative you follow the [Requirements for Connection Cables on page 16](#). Follow EMC guidelines on devices in the immediate vicinity of the 442G-MAB system and their cables.

In order to avoid EMC interference, the physical environmental and operating conditions at the installation site of the device must comply with the requirements according to the standard DIN EN/IEC 60204-1:2006, section 4.4.2/EMC).

IMPORTANT

- To ensure the stated degree of protection is achieved, the cover screws must be tightened to a tightening torque of 1 Nm.
 - Tighten screw for the cover for the mechanical release to 0.5 Nm.
-

Safety in Case of Faults

- The operating voltage UB is reverse polarity protected.
- The safety inputs (FI1A/FI1B) and safety outputs (FO1A/FO1B) are short circuit-protected.
- A short circuit between FI1A and FI1B or FO1A and FO1B is detected by the device.
- A short circuit in the cable can be excluded by laying the cable with protection.

Fuse Protection for Power Supply

The power supply must be provided with fuse protection depending on the number of devices and current required for the outputs. The following rules apply:

Maximum current consumption of an individual device

$$I_{\max} = I_{UB} + I_{UA} + I_{FO1A+FO1B}$$

$$I_{UB} = \text{Device operating current (80 mA)}$$

$$I_{UA} = \text{Load current of monitoring outputs OD,OT, OL and OI (4 x max. 50 mA) + solenoid + switches}$$

$$I_{FO1A+FO1B} = \text{Load current of safety outputs FO1A + FO1B (2 x max. 200 mA)}$$

Maximum current consumption of multiple devices connected in series

$$I_{\max} = I_{FO1A+FO1B} + n \times (I_{UB} + I_{UA})$$

$$n = \text{Number of connected devices}$$

Requirements for Connection Cables



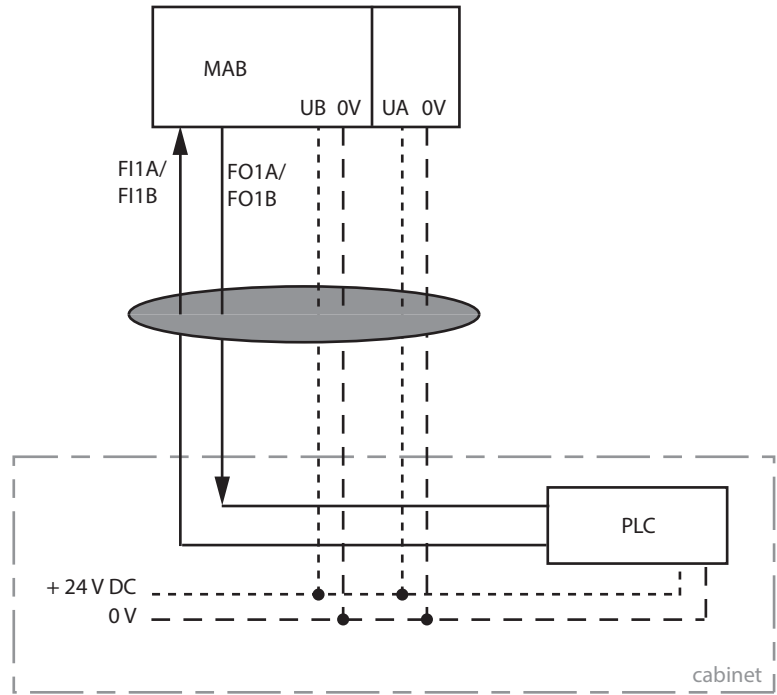
ATTENTION:

Incorrect connections can result in equipment damage or malfunction.

Observe the following requirements with respect to the connection cables:

Parameter	Value	Unit
Wire cross-section minimum	0.13 (26 AWG)	mm ²
R maximum	60	Ω/km
C maximum	120	nF/km
L maximum	0.65	mH/km

Lay all 442G-MAB connection cables in a common cable harness.



Important: lay cables in a common harness

Figure 17 - Mandatory Cable Laying

Description of Operation

Key to Symbols

○	LED not illuminated
●	LED illuminated
☼	LED flashes
X	Any state

Status/Diagnostic LED Indicators

Operating Mode	LED Indicator				State
	Power (Green)	State (Green)	Diagnostic (Red)	Lock (Yellow)	
Diagnostics	On	Green flash 1 x	On	Off	Error during handle configuration or invalid DIP switch setting
		Green flash 2 x		Off	Input fault (only applies when switch is configured for series operation)
		Green flash 3 x		Off	Handle module read error
		Green flash 4 x		Off	Output fault
		Off		Yellow flash 1 x	Signal sequence erroneous
		Off		Off	Internal fault
Setup		Off	Off	Off	Positive acknowledgement after completion of handle configuration. Power cycle or device RESET are required to resume normal operation.
Normal Operation		Flashes green approximately every three seconds	Off	Off	Normal operation, door open

Status/Diagnostic LEDs Table A (Standalone Operation)

Operating Mode	Door Position	Position of the Bolt Tongue	Guard Locking	Safety Outputs F01A and F01B	Door Mounting Output (OD)	Bolt Tongue Monitoring (OT)	Guard Locking Monitoring Output (OL)	Diagnostics Monitoring Output (OI)	Power (green)	State (green)	DIA (red)	Lock (yellow)	State
Normal Operation	Open	Not inserted	OFF	OFF	OFF	OFF	OFF	OFF	●	LED flashes Long OFF short ON	○	○	Normal operation, door open
	Closed	Not inserted	OFF	OFF	ON	OFF	OFF	OFF	●	LED flashes Long ON, short OFF	○	○	Normal operation, door closed
	Closed	Inserted	OFF	OFF	ON	ON	OFF	OFF	●	LED flashes Long ON, short OFF	○	LED flashes Long ON, short OFF	With active guard lock monitoring: Normal operation, door closed, bolt inserted. Safety outputs F01A and F01B are OFF.
				ON					●				With inactive guard lock monitoring: Normal operation, door closed, bolt inserted. Safety inputs F01A and F01B are ON.
	Closed	Inserted	ON	ON	ON	ON	ON	OFF	●	●	○	●	Normal operation, door closed and locked.
Handle configuration Standby	Open	Not inserted	OFF	OFF	OFF	OFF	OFF	OFF	●	LED flashes 3 x	○	○	Door open; unit is ready to configure another handle assembly (only 3 minutes after power-up).
Setup	Closed	Inserted	ON	ON	ON	ON	ON	OFF	●	LED flashes 2 Hz	○	○	Handle configuration, tip: to prevent the interruption of the hand, close door and switch on guard locking.
	X	X	X	OFF	OFF	OFF	OFF	OFF	○	○	○	○	Positive acknowledgement after completion of the handle configuration. Cycle power or apply 24V to RST for at least 3 seconds to resume normal operation.
Diagnostics	X	X	X	OFF	OFF	OFF	OFF	ON	●	LED flashes 1 x	○	○	Error during configuration or invalid DIP switch setting.
	X	X	X	OFF	X	X	X	OFF	●	LED flashes 3 x	○	○	Handle assembly read error (e.g., error in code)**
	X	X	X	OFF	OFF	OFF	OFF	ON	●	LED flashes 4 x	○	○	Output error (e.g., short circuits or loss of switching capability) or short circuit at the outputs*
	X	X	X	OFF	OFF	OFF	OFF	ON	○	○	○	○	Internal fault (e.g., component faulty, data fault)*
	X	X	X	OFF	OFF	OFF	OFF	ON	○	○	LED flashes 1 x	LED flashes 1 x	Signal sequence erroneous (e.g., broken bolt)*** With active release monitoring: escape release or manual release was actuated.
	X	X	X	X	X	X	X	X	●	LED flashes Power is ON for a long time with short interruption	○	○	○

* Latching fault; to reset, use the RST input or briefly disconnect the device from the power supply.

** Non-latching fault; open safety guard and close it again to reset.

*** See Troubleshooting and Assistance in Appendix A on page 37.

○ LED not illuminated

● LED illuminated

LED flashes

x Any state

Status Diagnostic LEDs Table B (Series Operation)

Operating Mode	Safety Inputs FIA and	Door Position	Position of the Bolt Tongue	Guard Locking	Safety Outputs F01A and F01B	Door Mounting Output (OD)	Monitoring Output Bolt Tongue (OT)	Guard Locking Monitoring Output (OL)	Diagnostics Monitoring Output (OI)	Power (green)	State (green)	DIA (red)	Lock (yellow)	State	
Self-test	X	X	X	X	OFF	OFF	OFF	OFF	OFF		5 Hz			Self-test after power-up	
Normal Operation	X	Open	Not inserted	OFF	OFF	OFF	OFF	OFF	OFF		Long OFF short ON		○	Normal operation, door open	
	X	Closed	Not inserted	OFF	OFF	OFF	OFF	OFF	OFF		Long ON, short OFF			Normal operation, door closed	
	OFF	Closed	Inserted	OFF	OFF	ON	ON	OFF	OFF	☀	Long ON, short OFF		☀	Normal operation, door closed, bolt inserted safety inputs F11A/F11B OFF	
	ON	Closed	Inserted	OFF	OFF	ON	ON	OFF	OFF	OFF	☀	Long ON, short OFF	☀	Long ON, Short OFF	With active guard lock monitoring: Normal operation, door closed, bolt inserted. Safety inputs F11A/F11B are ON. Safety outputs F01A and F01B are OFF.
					ON										With inactive guard lock monitoring: Normal operation, door closed, bolt inserted. Safety inputs F11A/F11B are ON. Safety outputs F01A and F01B are ON.
	OFF	Closed	Inserted	ON	OFF	ON	ON	ON	ON	OFF	☀	Long ON, short OFF		●	Series Operation: Normal operation, door closed and locked. Safety outputs on the previous device OFF.
	ON	Closed	Inserted	ON	ON	ON	ON	ON	ON	OFF	●			●	Operation as separate device: Normal operation, door closed and locked. Series Operation: Normal operation, door closed and locked. Safety outputs on the previous device ON.
Handle Config. Standby	X	Open	Not inserted	OFF	OFF	OFF	OFF	OFF	OFF	●	☀	3 x		○	Door open: unit is ready for configuration of another handle assembly (only 3 minutes after power-up).
	X	Closed	Inserted	ON	OFF	OFF	OFF	OFF	OFF		☀	2 Hz		○	Handle configuration tip: to prevent interruption during configuration, close door and switch on guard locking.
Handle Configuration Set-up	X	X	X	X	OFF	OFF	OFF	OFF	OFF		○			○	Position acknowledgement after completion of handle configuration. Cycle power or apply 24V to RST for at least 3 seconds to resume normal operation.
	X	X	X	X	OFF	X	X	X	OFF		☀	1 x		○	Error during configuration or invalid DIP switch setting.
Diagnostics	erroneous	X	X	X	OFF	OFF	OFF	OFF	ON		☀	2 x		○	Input error (e.g., missing test pulses, illogical switch state from previous switch)*
	X	X	X	X	OFF	X	X	X	OFF		☀	3 x		○	Handle assembly read error (e.g., error in code)**
	X	X	X	X	OFF	OFF	OFF	OFF	ON		☀	4 x		○	Output error (e.g., short circuits or loss of switching capability) or short circuit at the outputs*
	X	X	X	X	OFF	OFF	OFF	OFF	ON		○			○	Internal fault (e.g., component faulty, data fault)*
	X	X	X	X	OFF	OFF	OFF	OFF	ON		○		☀	1 x	Signal sequence erroneous (e.g., broken bolt)*** With active release monitoring: escape release or manual release was actuated.
	X	X	X	X	X	X	X	X	X	☀		Power is ON for a long time with short interruption			One million operating cycles exceeded.

* Latching fault; to reset, use the RST input or briefly disconnect the device from the power supply.

** Non-latching fault; open safety guard and close it again to reset.

***See Troubleshooting and Assistance in Appendix A on [page 37](#).

○ LED not illuminated

● LED illuminated

☀ LED flashes

x Any state

Operation with Control Systems

Do not use a control system with pulsing or switch off the pulsing function in your control system. The control system must tolerate these pulses, which may have a duration of up to 1 ms when the device is configured for series operation or 300 μ s when the device is configured for standalone operation.

Proving Basic Lock Function With Active Guard Lock Monitoring

1. Switch on operating voltage.

The State LED flashes (5 Hz) as the device performs a self-test (up to 8 seconds). When the self-test is complete, the State LED flashes at regular intervals.

2. Close all safety guards and insert the bolt tongue into the locking module. For power to lock versions, activate guard locking.
 - The safety outputs FO1A/FO1B are ON
 - The machine must not start automatically.
 - It must not be possible to open the safety guard.
 - The State LED and the Lock LED are illuminated continuously.
3. Use the control system to start the machine.
 - It must not be possible to open the guard door as long as the machine is running.
4. Use the control system to stop the machine and unlock the door.
 - The safety guard must remain locked until there is no longer any risk of injury.
 - It must not be possible to start the machine as long as the guard locking is deactivated.
 - It must be possible to open the safety guard.

Repeat steps two through four for each safety guard.

With Inactive Guard Lock Monitoring

1. Switch on operating voltage.

The State LED flashes (5 Hz) as the device performs a self-test (up to 8 seconds). When the self-test is complete, the State LED flashes at regular intervals.

2. Close all safety guards and insert the bolt tongue into the locking module. As soon as the bolt tongue is inserted in the locking module, the safety outputs FO1A/FO1B are ON (independent of whether the guard door is locked or unlocked).
 - The machine must not start automatically.

- The State LED is ON. The Lock LED is ON for a long time with a short interruption (guard door unlocked) or is ON continuously (guard door locked).
3. Use the control system to start the machine.
 4. Open the guard door (for power-to-release versions, use the control system to unlock the guard door).
 - The machine must switch off and it must not be possible to start it as long as the safety guard is open.

Repeat steps two through four for each safety guard.

Change Device Configuration (using DIP switches)

The 442G-MAB can be configured using DIP switches. The following settings are possible:

- Changing system operation (standalone or series operation)
- Deactivating guard lock monitoring
- Deactivating release monitoring

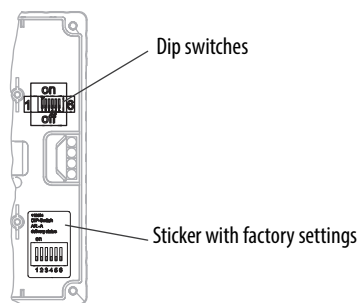
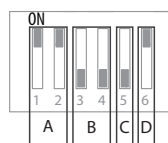


Figure 18 - Location of the Switches

Function of the Switches



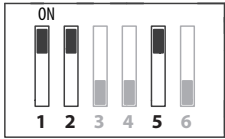
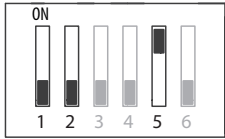
Factory settings are shown.

Detail	Switch	Function ¹
A	1+2	on: Device is configured for standalone operation (factory setting) off: Device is configured for series operation
B	3+4	on: Guard lock monitoring is deactivated off: Guard lock monitoring is activated (factory setting)
C	5	on: DIP switch configuration enabled off: DIP switch configuration inhibited (factory setting)
D	6	on: Release monitoring is activated (factory setting) off: Release monitoring is deactivated

Changing System Operation (configuring device for standalone or series operation)

IMPORTANT The terminal assignment also changes on changing the configuration (see Table 1 - Terminal assignment on page 10).

1. Switch off power supply.
2. Set DIP switches 1, 2 and 5 as shown.

Switching from series to standalone operation	Switching from standalone to series operation
 <p>A diagram of six DIP switches labeled 1 through 6. Switches 1, 2, and 5 are in the 'ON' position (indicated by a black bar at the top). Switches 3, 4, and 6 are in the 'OFF' position (indicated by a grey bar at the bottom). An 'ON' label is positioned above switch 1.</p>	 <p>A diagram of six DIP switches labeled 1 through 6. Switches 1, 2, 3, 4, and 5 are in the 'ON' position (indicated by a black bar at the top). Switch 6 is in the 'OFF' position (indicated by a grey bar at the bottom). An 'ON' label is positioned above switch 1.</p>

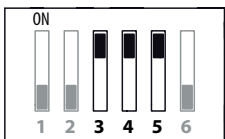
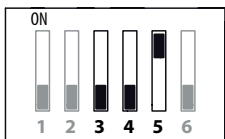
3. Switch on the power supply for at least five seconds.
 - The change is confirmed by the illumination of the Power LED. All other LEDs are off.
4. Switch off power supply.
5. Set DIP switch five to OFF.
 - The next time the device is started, the new setting will be activated.

Activating/Deactivating Guard Lock Monitoring



WARNING: If guard lock monitoring is inactive, the position of the guard locking does not influence the safety outputs. The safety guard can be opened immediately. This setting is not allowed to be used in applications in which, e.g., there is hazard due to overrunning machinery movement.

1. Switch off power supply.
2. Set DIP switches three, four, and five as shown.

Deactivating guard lock monitoring	Activating guard lock monitoring
 <p>A diagram of six DIP switches labeled 1 through 6. Switches 3, 4, and 5 are in the 'ON' position (indicated by a black bar at the top). Switches 1, 2, and 6 are in the 'OFF' position (indicated by a grey bar at the bottom). An 'ON' label is positioned above switch 1.</p>	 <p>A diagram of six DIP switches labeled 1 through 6. Switches 1, 2, 3, 4, and 5 are in the 'ON' position (indicated by a black bar at the top). Switch 6 is in the 'OFF' position (indicated by a grey bar at the bottom). An 'ON' label is positioned above switch 1.</p>

3. Switch on the power supply for at least five seconds.
 - The change is confirmed by the illumination of the Power LED. All other LEDs are off.
4. Switch off power supply and set DIP switch five to OFF.
5. Set DIP switch five to OFF.

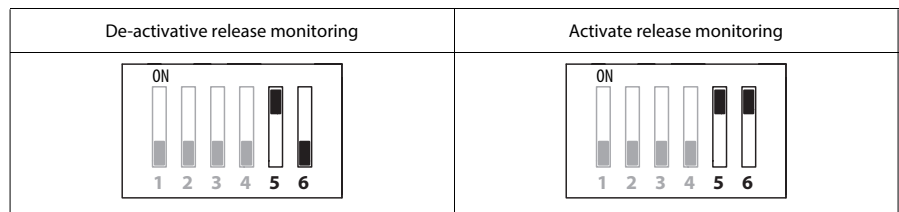
- The next time the device is started, the new setting will be activated.

Activating/Deactivating Release Monitoring

IMPORTANT Release monitoring can be activated only if guard lock monitoring is also active.

IMPORTANT When release monitoring is active, the system enters into a latching fault when the escape release or manual release is actuated. See *System status table, signal sequence incorrect* status (DIA red, Lock flashes one time).

1. Switch off power supply.
2. Set DIP switches five and six as shown.



3. Switch on the power supply for at least five seconds.
 - The change is confirmed by the illumination of the Power LED. All other LEDs are off.
4. Switch off the power supply.
5. Set DIP switch five to OFF.
 - The next time the device is started, the new setting will be activated.

Change Actuation Direction of Handle Assembly

IMPORTANT It is only possible to perform this change when the bolt is not extended and an escape release is not yet mounted.

If for some reason a right-hand assembly needs to be mounted on a left-hinged guard door or a left-hand assembly needs to be mounted on a right-hinged guard door, the actuating direction of the door handle must be changed. The example that is shown is for changing from right- to left-hand operation (see [Figure 19](#)).

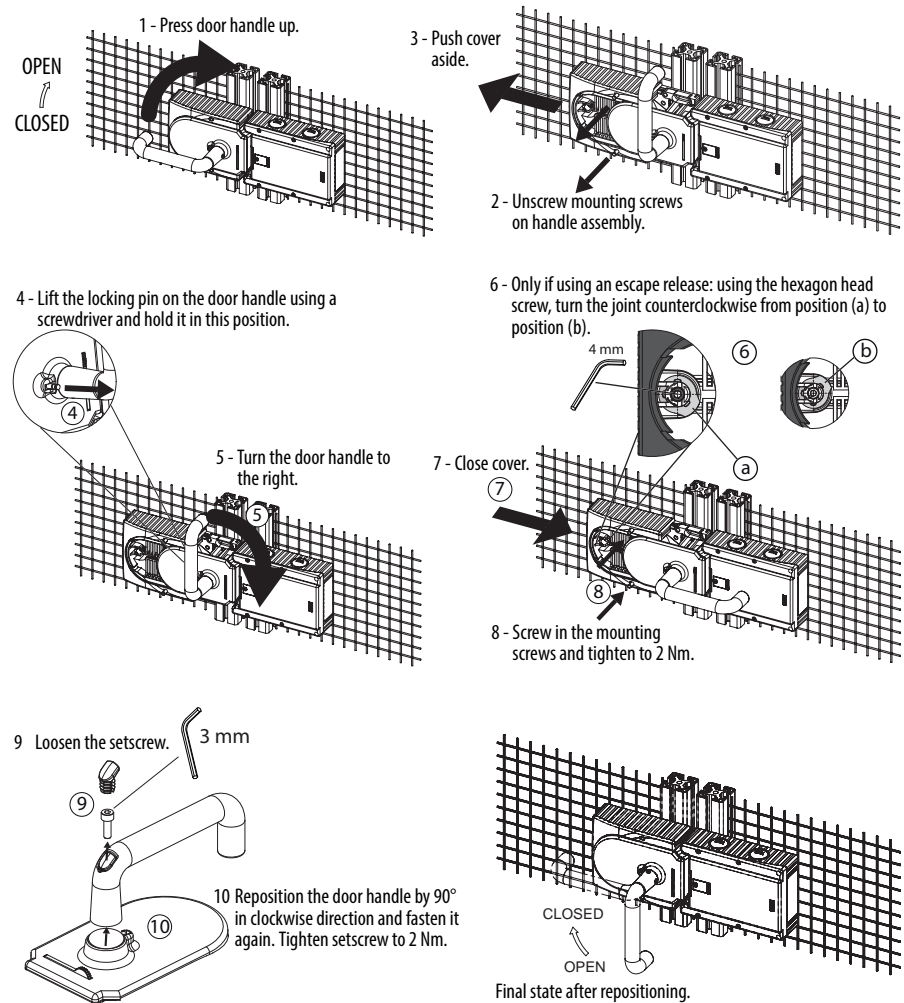


Figure 19 - Change Actuation Direction

Fault Reset

Switch off the operating voltage at the locking module for a minimum of three seconds or apply 24V to the input RST for a minimum of three seconds.

The State LED flashes quickly (approximately 5 Hz). A self-test is performed during this time (up to eight seconds). The LED then cyclically flashes three times.

Close safety guard and switch guard locking on. The system is in normal mode again.

Auxiliary/Manual Release

The manual release is provided to allow for unlocking the guard door in the event of unforeseen or uncommon circumstances.

With release monitoring active (default factory setting), the system enters into a latching fault when the escape release is actuated. To reset the device, turn the power off for at least three seconds or apply 24V to the input RST for a minimum of three seconds.

IMPORTANT	The guard door must be in the open position to clear a latching fault.
------------------	--

Note: The system might not enter into a latching fault if the mechanical release is actuated slowly.

IMPORTANT	The mechanical release is not a safety function. The machine manufacturer must select and use a suitable release according to the risk assessment. The correct function must be checked at regular intervals.
------------------	---



ATTENTION: The locking screw must be screwed back in and sealed after assembly and after use of the manual release (for example, with sealing lacquer). Tightening torque is 0.5 Nm.

1. Undo locking screw.
2. Lift locking arm using a screwdriver and actuate the guard door handle.

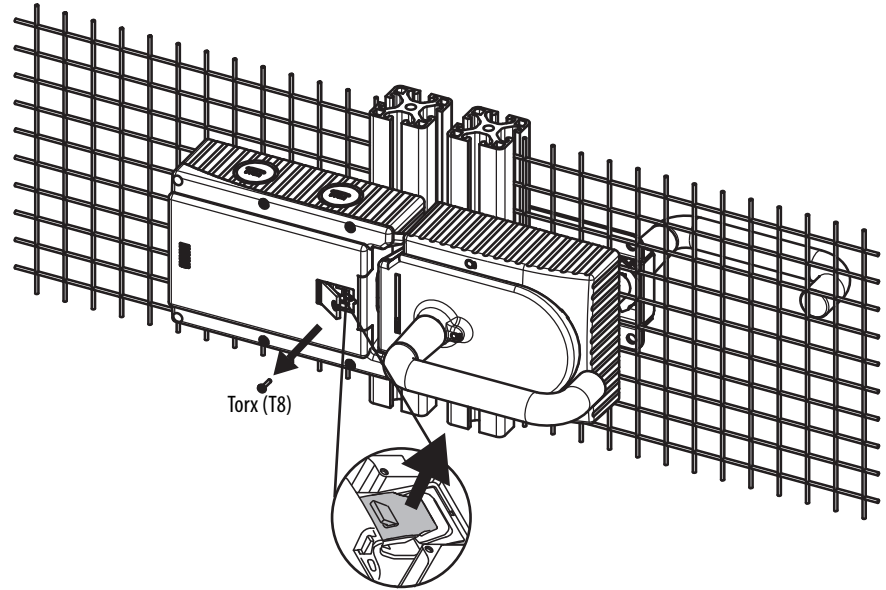


Figure 20 - Auxiliary/Manual Release

Bolt Locking Mechanism

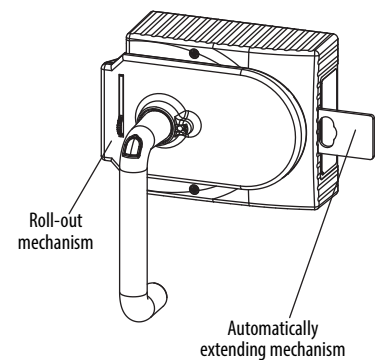
The 442G-MAB has two mechanisms for locking the bolt actuator to prevent locking the guard and restarting the machine while an operator is inside the safeguarded area.

One of the bolt locking mechanisms automatically extends when the handle is in the OPEN position. The other mechanism is manually extended (see Figure 18). To pivot out, press the grooved part (only possible with the handle in the OPEN position and the bolt retracted).

IMPORTANT With the manual bolt locking mechanism rolled out, the bolt cannot be extended.

Note: Minimum padlock diameter is 2 mm (0.08 in.) and the maximum diameter is 10 mm (0.39 in.) You can fit a maximum of three locks in an 8 mm (0.31 in.) diameter.

Figure 21 - Bolt Locking Mechanisms



Series Operation

A maximum of ten devices can be connected in series.

Resetting in Switch Chains

IMPORTANT If you use the reset input (RST) for resetting devices that are connected in series, all devices in the chain must be reset at the same time. Resetting individual switches will result in faults.

Inspection and Service

Periodically check the correct operation of the switching function. Also check for signs of abuse or tampering. Inspect the switch casing for damage. Check the safe function of the device particularly after any of the following:

- Set-up work
- The installation or replacement of a 442G-MAB module
- An extended period without any use
- A fault condition
- Any change to the DIP switch setting

If there is a malfunction or damage to the product, attempts at repair shall not be made. The unit should be replaced or alternative safeguarding shall be implemented before machine operation is allowed.

Wiring Examples

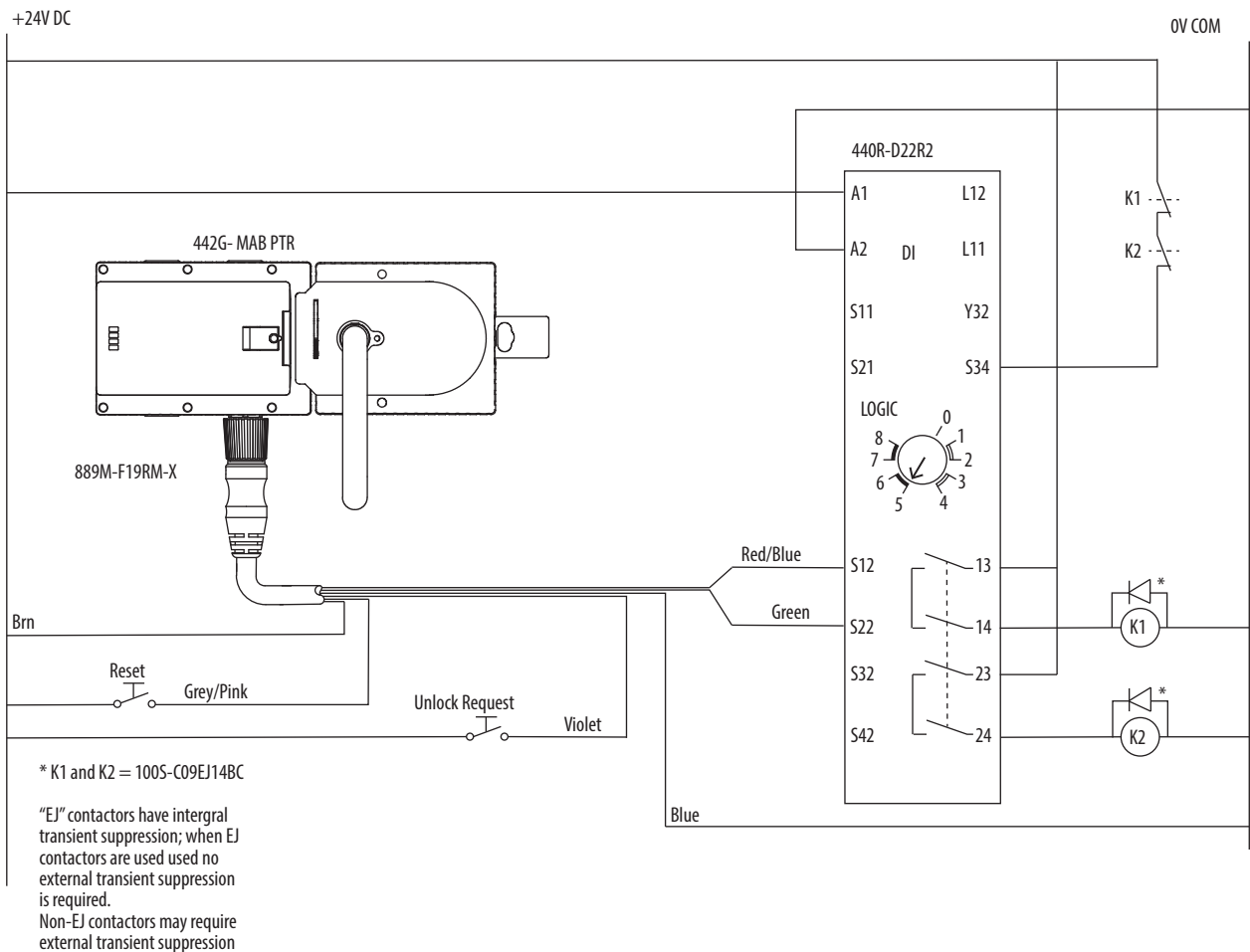


Figure 22 - Connection Example for Standalone Operation

The switch can be reset via the RST input. To do this, a voltage of 24V is applied to the RST input for at least three seconds.

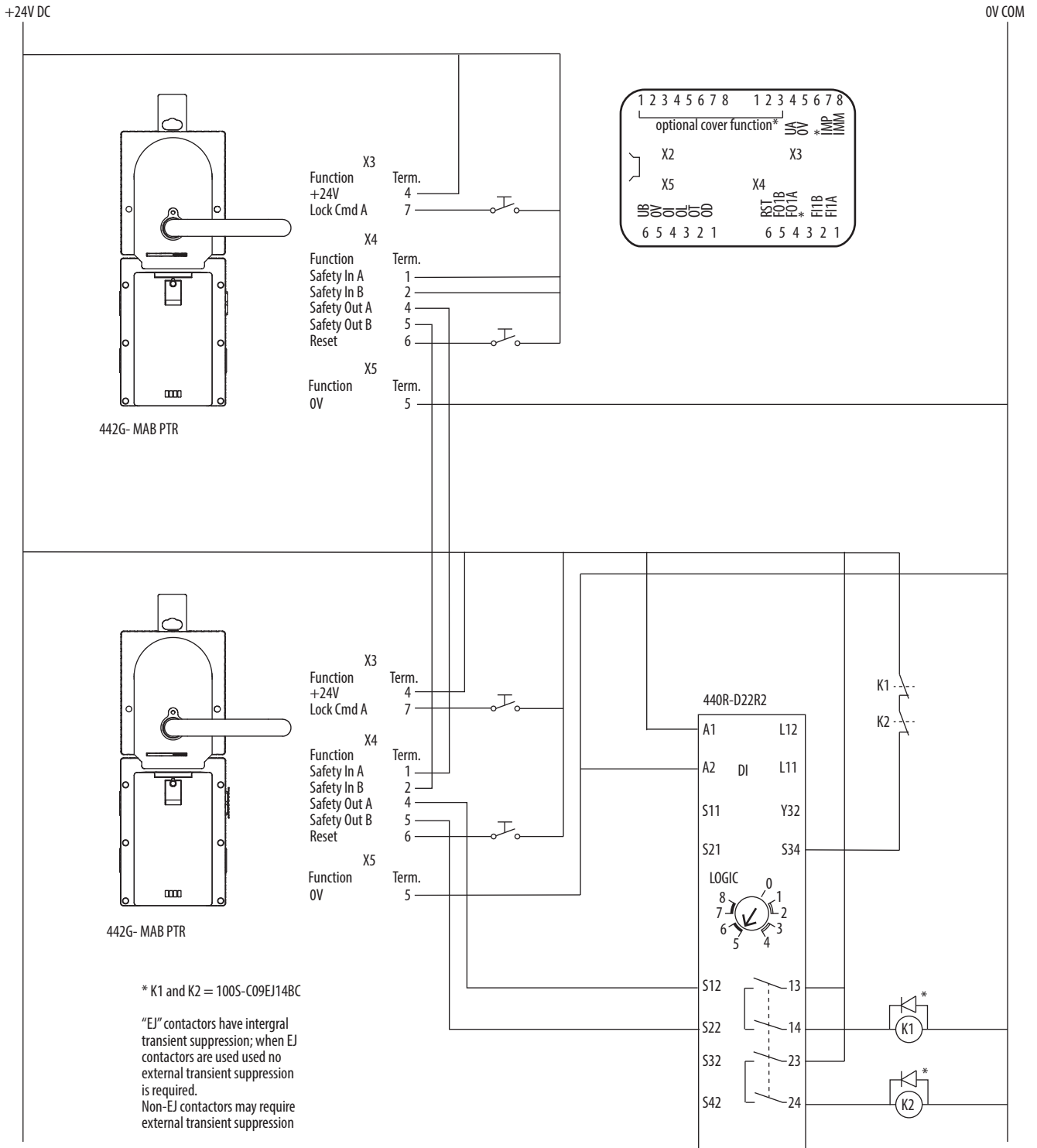


Figure 23 - Connection Example for Series Operation

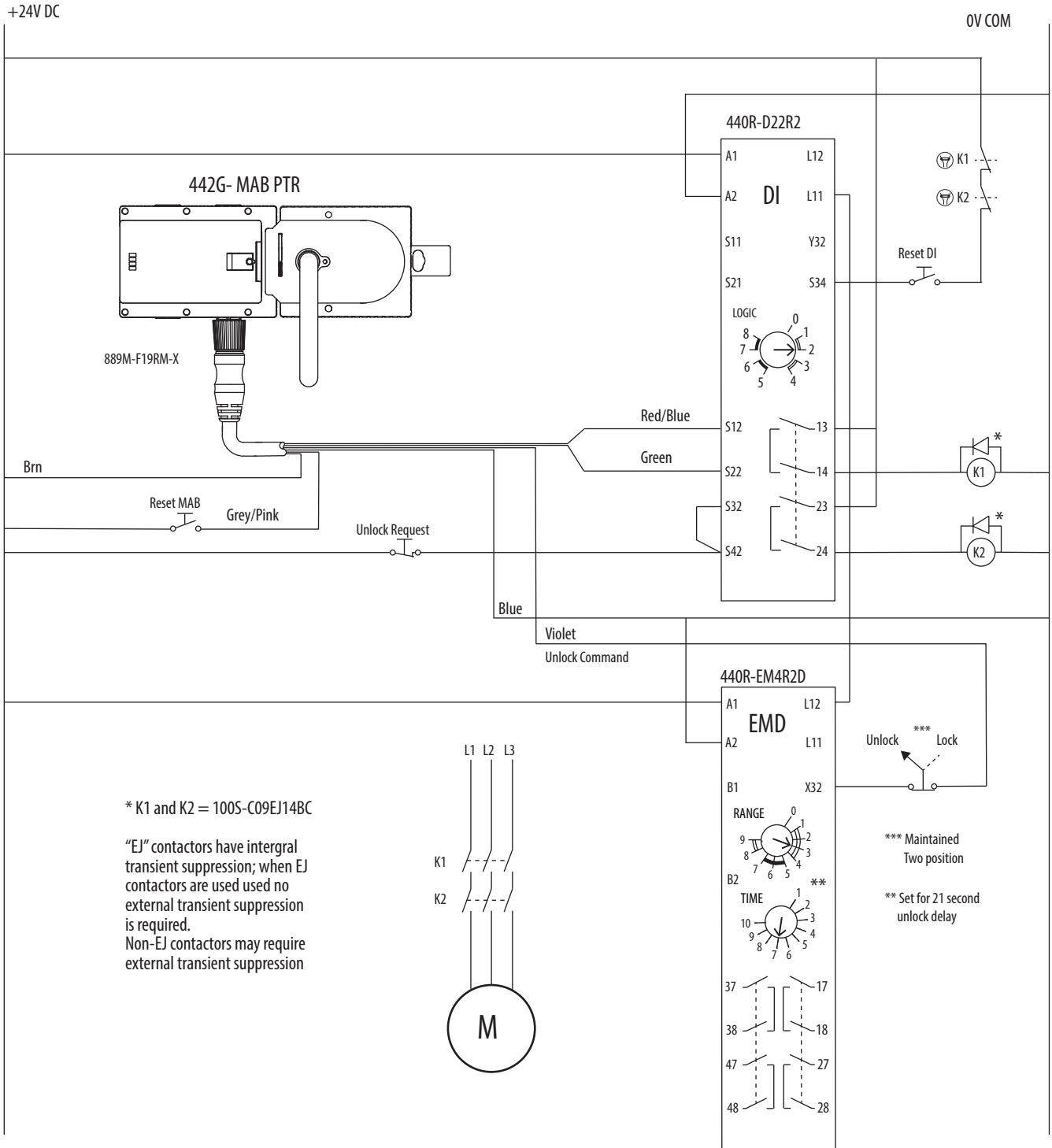


Figure 24 - Connection Example for GSR DI and EMD Expansion Module

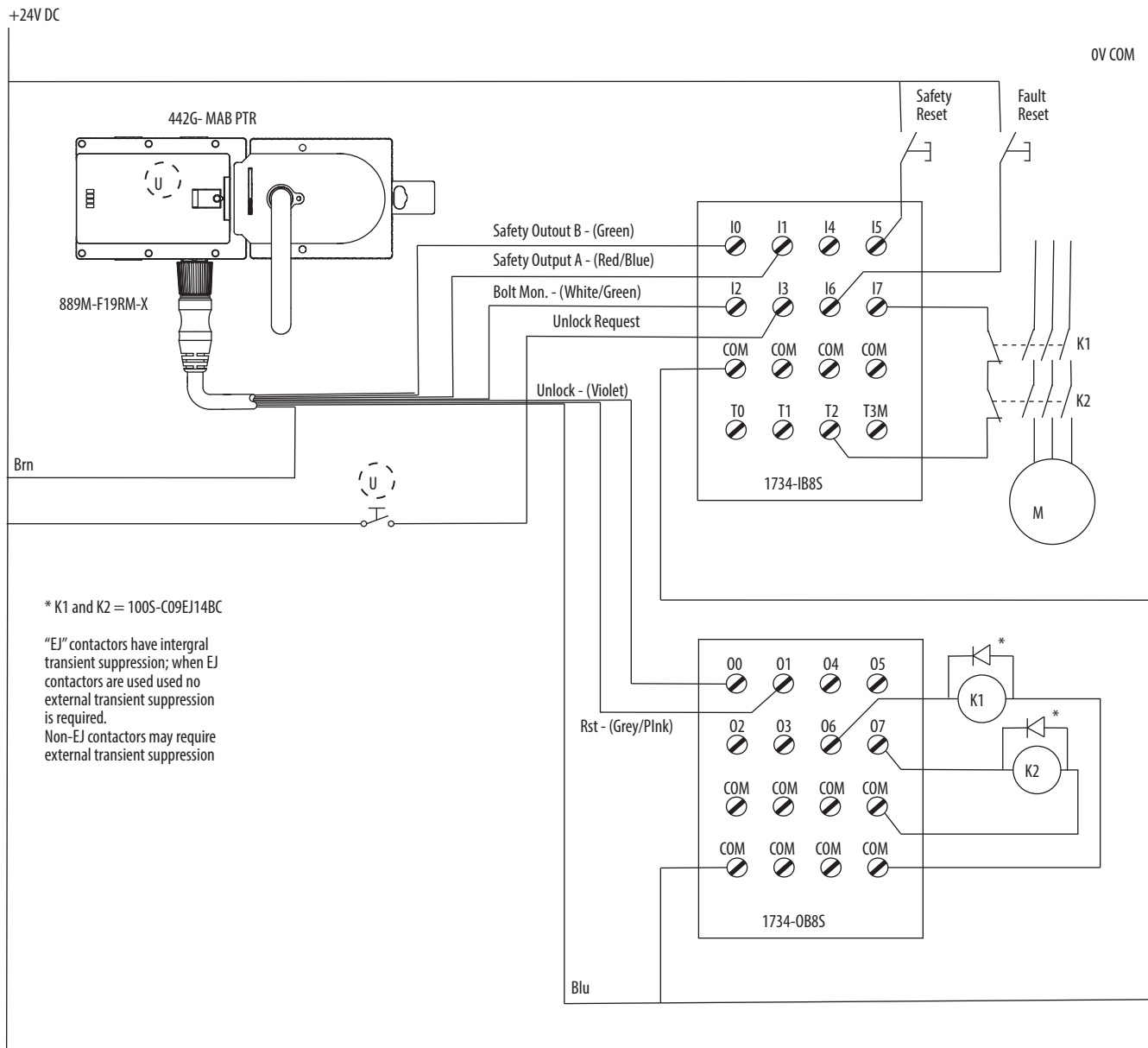


Figure 25 - Connection Example with Point I/O

Specifications

Safety Ratings		Operating Characteristics (continued)	
Standards	IEC 60947-5-3, EN ISO 13849-1, ISO 14119, UL 508 (evaluated for risks of electrical shock and fire; only suitable for NFPA 79 applications only)	Protection Type	Short circuit and reverse polarity protected, cross-fault detection
Safety Classification	Type 4 interlocking device with guard locking and high-coded RFID actuators according to ISO 14119	Current Consumption I_{UB} (no load on any outputs)	80 mA
Functional Safety Data	PFHD: 2.47×10^{-8} ; PLe, Cat. 4 (according to ISO 13849-1). Mission time: 20 years. B10d for E-stop: 1.0×10^5 cycles	With energized guard-locking solenoid and unloaded outputs OI, OL, OT and OD	350 mA
Certifications	cULus (UL 508) and CE Marked for all applicable EU directives	Push button (no load, per LED)	5 mA
Outputs		External Fuse	Refer to 442G-MAB Multi-functional Access Box User Manual
Safety Outputs (F01A/F01B)	Semiconductor outputs, PNP	Response Time (On)	570 ms
Output Current, maximum (each)	200 mA	Response Time (Off)	350 ms first switch, 5 ms each additional switch
Output voltage U_{F01A} / U_{F01B}^1 @ 50 mA switching current	ON: $U_B - 2V \dots U_B$, OFF: $0 \dots 1V$ DC	Risk Time (per IEC 60947-5-3)	350 mS
Monitoring Outputs		Discrepancy Time	10 ms (maximum)
Monitoring Outputs (OD, OT, OL, OI)	P-switching and short circuit-proof	Start-up Time (availability)	0.5 s configured for standalone operation 8 s configured for series operation
Output Voltage	$U_A - 2V \dots U_A$	Maximum Length of Switch Chain	10 MAB devices
Maximum Load (each)	50 mA, maximum	Utilization Category (IEC 60947-5-2)	DC-13 24V 200 mA
Push Button Controls and Indicators		Insulation Voltage U_i (IEC 60947-1)	30V
Operating Voltage	$5 \dots 24$ V DC	Impulse Withstand Voltage U_{imp}	1.5 kV
Operating Current	$1 \dots 100$ mA	Pollution Degree (IEC 60947-1)	3
Breaking Capacity, maximum	250 mW	Manual Release	Built in (ISO 14119)
Power Supply LED	24V DC	Mechanical Life	1,000,000 operations
Operating Characteristics		Environmental	
Torque Settings, maximum	1 Nm lock module cover screws (6x) 0.5 Nm manual release locking screw 2 Nm handle set screw (handle and escape release)	Ambient Temperature [C (F)] at $U_B = DC$ 24V	$-20 \dots +55^\circ (-4 \dots +131^\circ)$
Locking Force F_{max}	2600 N	Storage Temperature [C (F)]	$-20 \dots +65^\circ (-4 \dots +149^\circ)$
Holding Force F_{zh} (ISO 14119)	2000 N	Enclosure Rating	IP65
Maximum Impact Energy Withstand	300 J	Operating Humidity	$5 \dots 80\%$ relative
Locking Bolt Alignment Tolerance	Horizontal: ± 4 mm; Vertical: ± 5 mm	Vibration/Shock	IEC 60068-2-27 30 g, 11 ms/IEC 60068-2-6 10...55 Hz
Operating Voltage U_B	Class 2 PELV 24V DC +10/-15% required	Physical Characteristics	
Auxiliary Power U_A	Class 2 PELV 24V DC +10/-15% required	Weight	Lock module with cover 750 g, handle assembly 1000 g, escape release 500 g
		Materials	Glass fiber reinforced plastic, nickel-plated die-cast zinc, anodized aluminum handle, stainless steel hardware

Dimensions [mm (in.)]

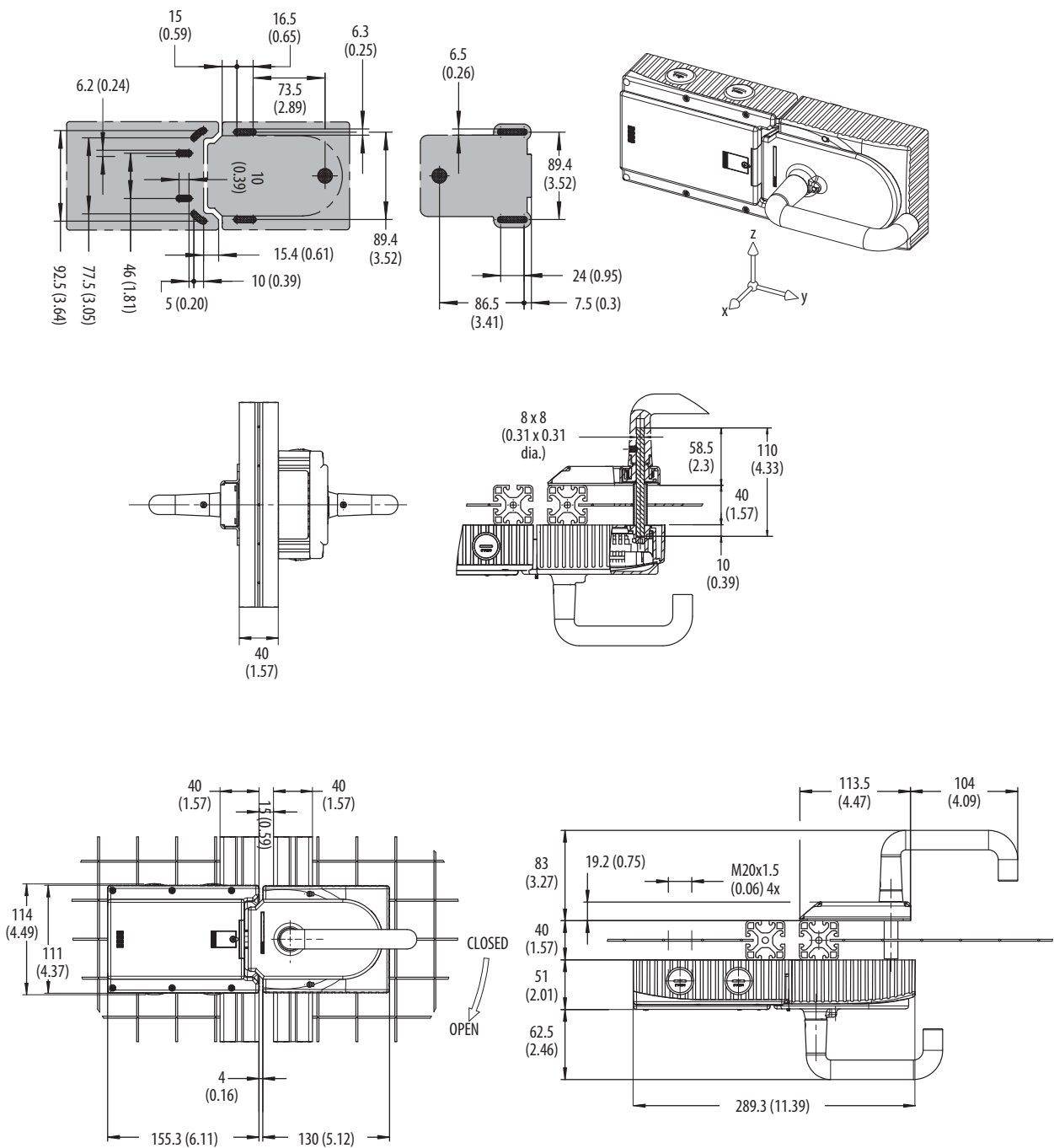


Figure 26 - Dimensions for MAB Mounted without Optional Mounting Plates

Environmental Protection

Lasting and correct safety function requires that the system must be protected against debris (filings, shavings, etc.), which can become lodged in the locking and handle modules. For this purpose, a suitable installation position should be selected. The device should be covered during paint work.

Catalog Numbers

Handle Assembly (one required per system)

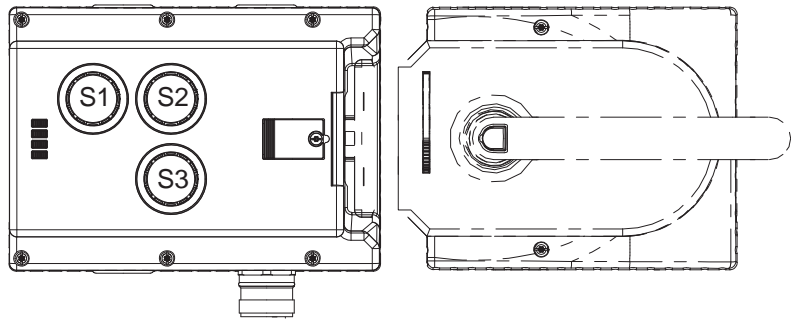


Figure 27 - Right Handle (for use on guard doors that are hinged on the right or slide from the right)

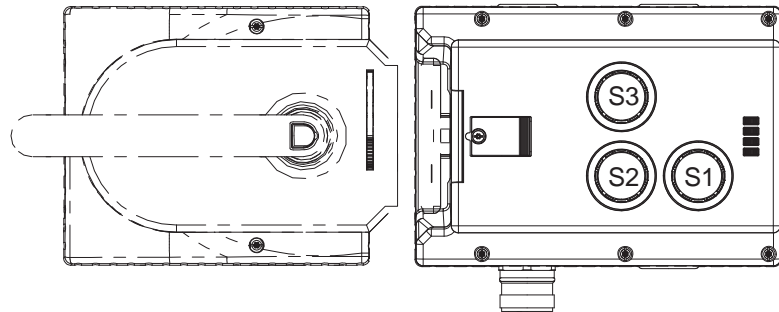


Figure 28 - Left handle (for use on guard doors that are hinged on the left or slide from the left)

Machine Layout	Cat. No.
Right-hand Guard Door (Figure 27)	442G-MABH-R
Left-hand Guard Door (Figure 28)	442G-MABH-L

Lock Module (one required per system)

Lock Type	Machine Layout	Cat. No.	
		Cable Entry (M20)	Connector (19-pin M23)
PTL	Right-hand Guard Door (Figure 27)	442G-MABL-UT-*	442G-MABL-URM-*
	Left-hand Guard Door (Figure 28)		442G-MABL-ULM-*
PTR	Right-hand Guard Door (Figure 27)	442G-MABR-UT-*	442G-MABR-URM-*
	Left-hand Guard Door (Figure 28)		442G-MABR-ULM-*

Replace * with Code:	Cover Controls and Indicators
C00	Blank Cover (No controls or indicators)
C01	One illuminated push button (S2)
C02	Two illuminated push buttons (S2,S3)
C03	E-stop (S1) and two illuminated push buttons (S2,S3)

IMPORTANT Refer to [Figure 27](#) (right-hand guard door assembly) and [Figure 28](#) (left-hand guard door assembly) for the positions of the controls. Covers with push buttons are supplied with a colored lens kit, including one blue, green, red and yellow, and two white.

Escape Release (optional)

Cat. No. 442G-MABE1

(The standard shaft (115 mm (4.53 in.)) is optimized for use on 40 mm and 45 mm profiles. An extended shaft (250 mm (9.85 in.)) is available (see Chapter 3, [Installation and Wiring on page 8](#) for instructions about mounting on smaller or larger profiles.

Accessories

Description	Cat. No.
Mounting Plate, Handle Assembly	442G-MABAMPH ¹
Mounting Plate, Lock Module	442G-MABAMPL ²
Mounting Plate, Escape Release	442G-MABAMPE
Extended Shaft (250 mm (9.58 in.)) for Escape Release	442G-MABASHFT

¹ Use only if the lock module is also mounted to a plate.

² Use only if the handle module is also mounted to a plate.

Mating Cordset

Description	Cat. No.
19-pin M23 cordset	889M-F19RM- ³

³ Add 2, 5, or 10 for cable length in meters.

Replacement Parts

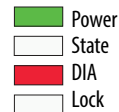
Description	Cat. No.
Replacement Handle for Handle Assembly	442G-MABADH
Replacement Indicator Lens Covers	442G-MABALENS ⁴
Lock Module Replacement Cover, no controls	442G-MAB-C00
Lock Module Replacement Cover, one push button	442G-MAB-C01
Lock Module Replacement Cover, two push buttons	442G-MAB-C02
Lock Module Replacement Cover, E-stop and two push buttons	442G-MAB-C03

⁴ Includes one blue, green, red and yellow, and two white.

Troubleshooting and Assistance

Status/Diagnostic LED Indicators During Troubleshooting

DIA LED Illuminated and State LED Not Illuminated



Fault: Internal fault.

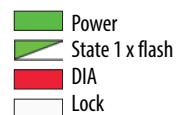
Possible causes:

- Data error
- Locking arm is blocked
- Internal component fault

Remedy:

1. Check whether the locking arm is blocked (possibly by the bolt of the handle assembly).
2. Switch off the voltage at all devices or press the reset button (if present) that controls ALL integrated reset inputs in the series connection.
3. Close the door.
4. Switch the voltage on again or release the reset button.
5. Wait until the State LED flashes at regular intervals.
The 442G-MAB is now ready for operation again.

DIA LED Illuminated and State LED Flashes One Time



Fault: Fault during handle configuration or invalid DIP switch position.

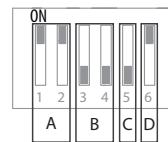
Possible causes:

- Invalid DIP switch position

Remedy:

1. Check the DIP switch setting. Configuration must be repeated if the setting is incorrect. Follow the instructions in “Changing Device Configuration” on [page 22](#).

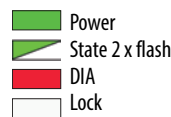
Function of the switches



Factory settings are shown.

Detail	Switch	Function ¹
A	1+2	on: Device is configured for standalone operation (factory setting) off: Device is configured for series operation
B	3+4	on: Guard lock monitoring is deactivated off: Guard lock monitoring is activated (factory setting)
C	5	on: DIP switch configuration enabled off: DIP switch configuration inhibited (factory setting)
D	6	on: Release monitoring is activated (factory setting) off: Release monitoring is deactivated

DIA LED Illuminated and State LED Flashes Two Times (standalone operation only)



Fault: Input error.

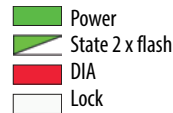
Possible causes:

- 24V DC missing at safety inputs FI1A and/or FI1B
- A safe control system with clocking outputs is connected to safety inputs FI1A and/or FI1B.

Remedy:

1. Check the wiring and correct it if necessary or switch to standalone mode.
2. Switch off the voltage or press the reset button (if present) that controls the integrated reset input.
3. Close the door(s).
4. Switch the voltage on again or release the reset button.
5. Wait until the State LED flashes at regular intervals. The 442G-MAB is now ready for operation again.

DIA LED Illuminated and State LED Flashes Two Times (series connection only)



Fault: Input error

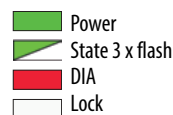
Possible causes:

- 24V DC missing at safety inputs FI1A and/or FI1B of the first 442G-MAB.
- FI1A is connected with FO1B or FI1B is connected with FO1A.
- Conventional safety components (switching contacts) are connected to FI1A and/or FI1B.
- A safe control system with clocking outputs is connected.
- All connections are correct, but there is no common potential for the series-connected devices (several power supply units for one chain).
- An upstream unit is set as a standalone device.

Remedy:

1. Check the wiring and correct it or switch off the clock pulses or check the upstream devices for incorrect DIP switch configuration.
2. Switch off the voltage at all devices
or
press the reset button (if present) that controls ALL integrated reset inputs in the series connection
3. Close the door(s).
4. Switch the voltage on again
or
release the reset button
5. Wait until the State LED flashes at regular intervals.
The 442G-MAB is now ready for operation again.

DIA LED Illuminated and State LED Flashes Three Times



Fault: Handle assembly read error (e.g. error in code/code not readable).

Possible causes:

- EMC interference, e.g. caused by clocked cables near the 442G-MAB.
- Hardware fault in the handle assembly

- Different potentials at the fence and door, which causes compensating currents that could lead to this error message.

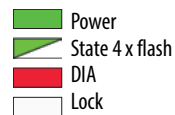
Remedy (in case of EMC interference or potential differences):

1. Check the area of use regarding increased EMC radiation or lack of grounding connections of the protective enclosure.
2. Switch off the voltage at all devices
or
press the reset button (if present) that controls ALL integrated reset inputs in the series connection.
3. Switch the voltage on again
or
release the reset button.
4. Wait until the State LED flashes at regular intervals.
The 442G-MABs are now ready for operation again.

Remedy (in case of hardware fault in the handle assembly):

Replace the handle assembly and repeat the instructions for the handle configuration (see [Handle Configuration on page 9](#)). Tip: Close the guard door and activate guard locking to avoid interruptions during the handle configuration.

DIA LED Illuminated and State LED Flashes Four Times



Fault: Output fault.

Possible causes:

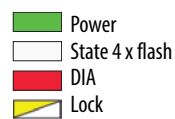
- The connected control system and the 442G-MAB do not have a common reference potential (common ground).
- A ground loop is produced by bridges having been installed both on the 442G-MAB and in the control cabinet.
- The internal output circuit is damaged.
- 24V DC or 0V is present at one of the two safety outputs during the switch-on process.
- A safe control system with clocking outputs is connected.

Remedy:

1. Check the wiring and correct it.

2. Switch off the voltage at all devices
or
press the reset button (if present) that controls ALL integrated reset inputs in the series connection.
3. Switch the voltage on again
or
release the reset button.
4. Wait until the State LED flashes at regular intervals.
5. The 442G-MABs are now ready for operation again if no fault occurred in the internal output connection.

DIA LED Illuminated and Lock LED Flashes One Time



Fault: Signal sequence incorrect

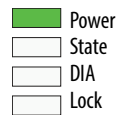
Possible causes:

- Bolt actuator broken.
- EMC interference.
- Hardware fault in the handle assembly
- Different potentials between fence and door.
- With active release monitoring, escape release or manual release was activated.

Remedy:

1. Open all safety doors on which the LED Lock is flashing (regardless of the number of flashing pulses) so that no passage is possible.
2. Switch off the voltage at all devices or press the reset button (if present) that controls the integrated reset inputs.
3. Switch the voltage on again or release the reset button.
4. Wait until the State LED flashes at regular intervals.
5. Close the safety doors. If there is no internal fault, the 442G-MABs are now ready for operation again.

DIA LED Not Illuminated and State LED Not Illuminated or Does Not Flash



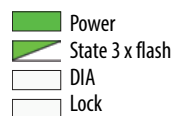
Possible causes:

- Handle configuration is complete.
- DIP switch five still set to “ON” (system configuration (series or standalone operation not fully completed)).

Remedy:

- When the handle configuration is complete, the operating voltage must then be switched off at the locking module for at least three seconds to activate the new code of the handle assembly in the locking module. As an alternative, 24V can be applied to the input RST for at least three seconds.
- Complete the device configuration (see [Change Device Configuration \(using DIP switches\) on page 22](#)) process (set DIP switch five to “OFF”). Restart the 442G-MAB.

DIA LED Not Illuminated and State LED Flashes Three Times



The device indicates that it is ready to learn a new handle assembly. This state will continue for three minutes after power-up with the door open.

DIA LED Not Illuminated and State LED Flashes Approximately Every Three Seconds



The device displays normal operation with the door open. If this display also occurs with the door close, the handle module has already been taught in and is being blocked on this 442G-MAB.

Remedy:

Repeat handle configuration with a new handle assembly (see [Handle Configuration on page 9](#)). Tip: Close the door and activate guard locking to avoid interruptions during configuration.

Individual Flickering Input LED on the Evaluation Unit

Even when the 442G-MAB is switched off, it emits a pulse sequence at output FO1A to ensure the functional capability of the output circuit always. So, a faintly flickering LED can be seen on an input of an evaluation unit even though the evaluation unit does not switch on or signal any fault.

This usually does not result in any problems during operation.

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At <http://www.rockwellautomation.com/support> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <https://rockwellautomation.custhelp.com/> for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://www.rockwellautomation.com/services/online-phone>.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page , or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication [RA-DU002](#), available at <http://www.rockwellautomation.com/literature/>

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