Multifunctional Access Box and Guard Locking with Time Delay Safety Relay

442G-MABR-URM-C03

Purpose

This demo is designed to demonstrate the features of a Multifunctional Access Box and the Guard Locking with Time Delay (GLT relay) Safety Relay.

Product Overview

The multifunctional access box is a guard locking interlock with integrated controls that helps facilitate access to a safeguarded area. The customer determines the functions of the integrated push buttons and the functions can vary depending on the application. For this demo, a push button has been assigned as an “Unlock Request” and the other one as a “Reset and Lock Request.”

You press the Unlock Request button to request access to the safeguarded area. The control system (GLT relay) shuts down the hazard and unlocks the guard door after a time delay. Then you are allowed to open the guard door and enter the safeguarded area. Upon exiting the safeguarded area, you close the door and press the Reset and Lock Request button to lock the guard door and reset the safety system.

Guard Locking with Time-delay (GLT relay) Safety Relay

The GLT relay safety relay is designed to use time-delay outputs for use in Stop Category 1 applications and to unlock a guard door when the time expires. The relay also provides a lock command to lock a guard door before the starting of the hazard. In this demo, there is a three-second delay between the time that the GLT relay receives the Unlock Request and the time that the relay issues the Unlock command to the access box.
System Setup

Front View

- Turn Power ON by plugging in to 120V AC.
- Be sure that the circuit breaker is switched to the on position.
- Check that the guard door is closed and locked.
- When the door is closed and locked, both push buttons are illuminated.

Rear View

Description of Operation

1. Turn Power ON by plugging in to 120V AC.
   Be sure that the circuit breaker is switched to the on position.
2. Check that the guard door is closed and locked.
   When the door is closed and locked, both push buttons are illuminated.

Wiring Diagram
Note: If the PWR/Fault status indicator on the relay blinks red, push the blue button on the access box to reset the relay.

Note: If the DIA status indicator on the access box is red, clear the fault by pressing the green power reset button (found next to the circuit breaker) for at least three seconds.

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

3. To request access to the hazardous area, press the yellow push button.
   
   The GLT relay immediately turns its outputs OFF to shut down the hazard and after three seconds, unlocks the guard door. The yellow push button on the access box turns OFF.

4. Open the guard door.
   
   The blue push button on the access box turns OFF.

Note: The yellow push button is illuminated when the door is “closed and locked (diagnostic signal OL is on).” The blue push button is illuminated when the door is “closed and the bolt actuator is inserted in the lock module” (and therefore, ready to be locked (diagnostic signal OT is on)). See Diagnostics for more information about the access box diagnostic signals.

5. Close the guard door.
   
   The blue push button does not turn on again until you rotate the handle to insert the bolt into the lock module.

6. To reset the safety system, press the blue push button.
   
   The yellow push button turns on again, which indicates the device is closed and locked.

**E-stop**

The GLT relay can be operated with other safety relays in the Guardmaster Safety Relay (GSR) family, by use of the single-wire safety (SWS) connection. When the GLT relay receives a single-wire safety signal from another GSR relay, the GLT relay issues an Unlock command.

In this demo, the E-stop of the access box is connected to the GSR single input (SI) safety relay. The single-wire safety (SWS) output of the SI is connected to the SWS input of the GLT relay. When the E-stop is pressed, the GLT relay immediately turns its outputs OFF to shut down the hazard and after three seconds, unlocks the guard door.

7. With the door closed and locked and the outputs ON, press the E-stop.
   
   This action turns the outputs of the SI OFF. The single wire safety of the SI turns OFF, which turns the outputs of the GLT relay off. The GLT relay cannot be reset until the E-stop is released.

8. Release the E-stop. To reset the GLT relay, press the blue push button.
Using the Escape Release

The access box is optimized for use in full body access applications where entrance into the safeguarded area could be required. In full body access applications, it is important to consider what would happen if someone were locked inside the safeguarded area. The optional escape release allows a person who is locked inside the safeguarded area to exit quickly and easily.

9. Turn the red escape release handle to demonstrate that the escape release mechanically overrides the solenoid locking mechanism.

The DIA status indicator on the access box turns solid red to indicate a latching fault. The PWR/Fault status indicator on the GLT relay flashes green and red (5x) to indicate that the gate is open when it is expected to be closed and locked.

Note: When release monitoring is active (default factory setting), the system enters into a latching fault when the escape release is actuated. If the escape release is actuated too slowly, the system will not enter into a latching fault.

10. To reset the access box, turn the power off for at least three seconds or apply 24V to the Reset (RST) input for a minimum of three seconds.

In this demo, use the green power reset button next to the circuit breaker to the power supply.

11. To clear the fault on the GLT relay and to turn on the outputs, press the blue push button.

Diagnostics

The access box has four diagnostic signals that the control system can use to monitor device status.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD</td>
<td>ON when the guard door is in the closed position</td>
</tr>
<tr>
<td>OT</td>
<td>ON when the guard door is closed and the bolt actuator is inserted in the lock module</td>
</tr>
<tr>
<td>OL</td>
<td>ON when the guard door is closed and locked</td>
</tr>
<tr>
<td>OI</td>
<td>ON when the switch is in a fault state</td>
</tr>
</tbody>
</table>

For this demo, OL and OT are being used to illuminate the push buttons.
Four status indicators on the access box provide visual information about system status:

### Status/Diagnostic Indicators

<table>
<thead>
<tr>
<th>Operating Mode</th>
<th>Power (Green)</th>
<th>State (Green)</th>
<th>Diagnostic (Red)</th>
<th>Lock (Yellow)</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostics</td>
<td>On</td>
<td>Green flash 1 time</td>
<td>Off</td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green flash 2 times</td>
<td>Off</td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green flash 3 times</td>
<td>Off</td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green flash 4 times</td>
<td>Off</td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>Yellow flash 1x</td>
<td></td>
<td>Signal sequence erroneous or release has been actuated</td>
</tr>
<tr>
<td>Setup</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td></td>
<td>Positive acknowledgement after completion of handle configuration. Power cycle or device RESET are required to resume normal operation.</td>
</tr>
<tr>
<td>Normal Operation</td>
<td>Flashes green approximately every three seconds</td>
<td>Off</td>
<td>Off</td>
<td></td>
<td>Normal operation, door is open</td>
</tr>
</tbody>
</table>

### Additional Features

**Auxiliary/Manual Release**

The auxiliary release lets you manually unlock the guard door in the event of unforeseen or uncommon circumstances.

**Note:** When release monitoring is active (default factory setting), the system enters into a latching fault when the manual release is actuated. If the manual release is actuated too slowly, the system will not enter into a latching fault.

To reset the access box, turn the power off for at least three seconds or apply 24V to the input RST for a minimum of three seconds. (In this demo, use the reset button next to the circuit breaker to the power supply.)

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

**Note:** You can reconfigure the access box DIP switches to deactivate Release Monitoring (refer to Chapter 4 – Change Device Configuration (use of DIP switches) in 442G-UM001A-EN-P).
Bolt Locking Mechanisms

The access box has two mechanisms for locking the bolt actuator to prevent locking the guard and restart of 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 1). 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.

![Bolt Locking Mechanisms](image)

**Figure 1 - Bolt Locking Mechanisms**

**Note**: The 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 with an 8 mm (0.31 in.) diameter.
Notes: