# SB-293 Satellite Board

This quick start guide is made up of a specification sheet, basic installation drawings and information, and short descriptions of key terms and concepts. For comprehensive information regarding the SB-293 Satellite Board, please refer to the Technical Reference (p/n 01838-002).

## The SB-293 Satellite Board

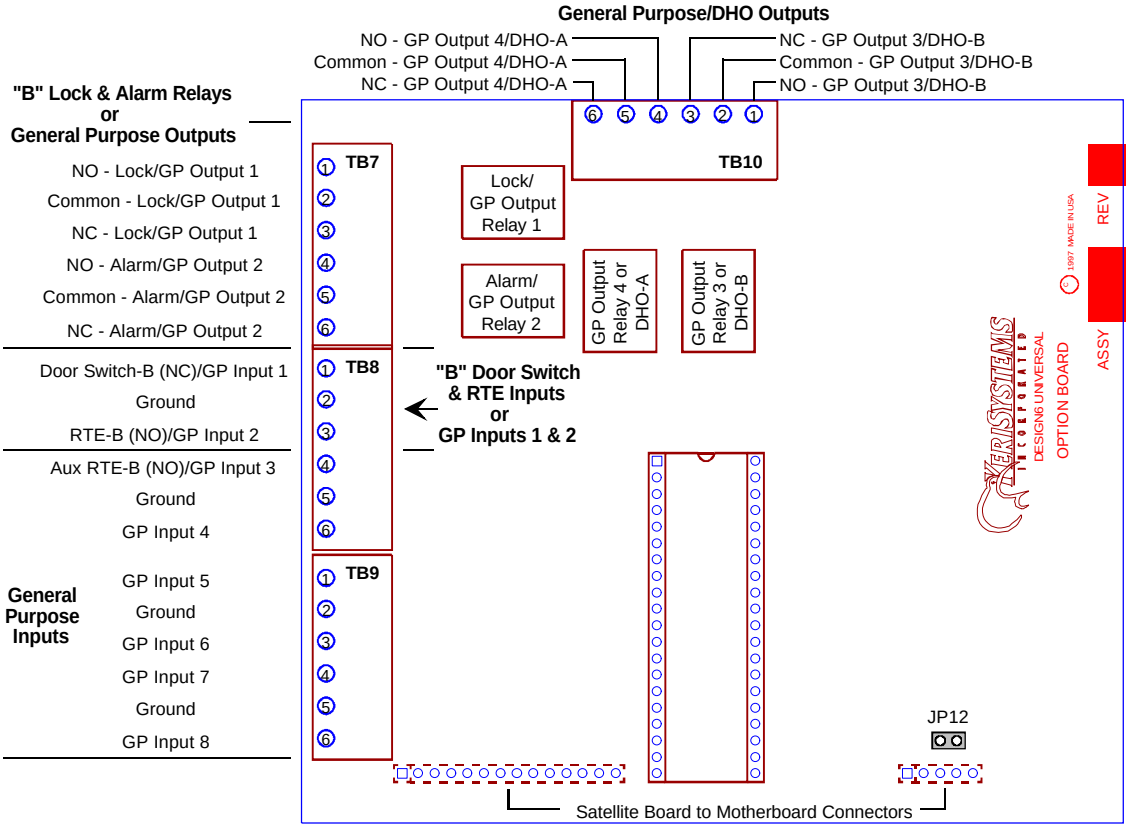
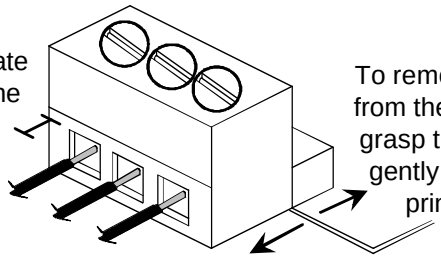



Figure 1 – The SB-293 Satellite Board

## Connecting Wires – Removing a Terminal Block

Strip away 1/4 inch of insulation and place the wire in the appropriate slot. Firmly tighten the screw on the top of the terminal block but do not overtighten.



To remove the terminal block from the printed circuit board, grasp the terminal block and gently pull it away from the printed circuit board.

Quick Start Guide

SB-293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# SB-293 Satellite Board

## Specifications

Unit Dimensions

- PXL-250 controller PCB with an SB-293 Satellite Board
  - 7.25 inches high by 6.00 inches wide by 1.75 inches deep, including wiring connectors
  - (18.45 cm by 15.25 cm by 4.45 cm)
- PXL-250 controller PCB with an SB-293 Satellite Board and an LCD-1 Alpha/Numeric Display
  - 8.10 inches high by 6.00 inches wide by 1.75 inches deep, including wiring connectors
  - (20.60 cm by 15.25 cm by 4.45 cm)
- Enclosure
  - 9.70 inches high by 8.20 inches wide by 2.60 inches deep
  - (24.65 cm by 20.85 cm by 6.60 cm)

Operating Temperature/Humidity Range

- 0°F to 140°F (-18°C to 60°C)
- 0% to 90% Relative Humidity, non-condensing

Controller Power Requirements

- 12 VDC @ 1.5 Amp

Current Draw

- maximum current draw 500 mA for a controller with all options installed
- 120 mA max for a PXL-250 Controller
- 150 mA max for an SB-293 Satellite Board
- refer to Table 1 for Reader current draw

| | Reader Type | | | | |
|---|---|---|---|---|---|
| | MS-3000 | MS-4000 | MS-5000 | MS-7000 | MS-9000 |
| **Current Draw** | 50 mA | 50 mA | 100 mA | 200 mA | 200 mA |

Table 1 – Reader Current Draw

Output Relay Contact Rating

- 1 Amp @ 24 VDC

Input Device Configuration

- Door Sense — normally closed
- Request to Exit — normally open
- Auxiliary Request to Exit — normally open
- General Purpose — normally open or closed as needed by the application

## Cable Requirements

Input and Output Connections

- two conductor, stranded, AWG 22 or a larger gauge

*NOTE: The Lock Output relay may require a heavier gauge of wire depending upon the current demands of the lock and the length of the lock wiring run.*

## Jumper Settings

JP12 - Configures the Satellite Board (see Figure 2)

- Jumper across JP12, pins 1 and 2, configures the Satellite board for general purpose inputs and outputs.
- NO jumper across JP12 configures the Satellite board for second door control with additional inputs and outputs. When the Satellite board is configured for second door control, the primary door must be connected to the "A" reader (TB-5 on the PXL-250 controller board) and the secondary door must be connected to the "B" reader (TB-6 on the Receiver board attached to the controller board).

## Board Installation

Perform the following steps to install an SB-293 Satellite board on a PXL-250 controller (see Figure 3).

1) Turn the controller's power off.
2) Line up the upper left-hand corner of the Satellite PCB with the controller PCB.
3) Line up the stand-offs in all four corners of the Satellite PCB with corresponding mounting holes in the controller PCB (see the Satellite/Controller Installation drawing below).
4) Align the Satellite Board to Motherboard connector pins.
5) Gently press the two boards together with each stand-off into its mounting hole and with the connector pins meshing together.

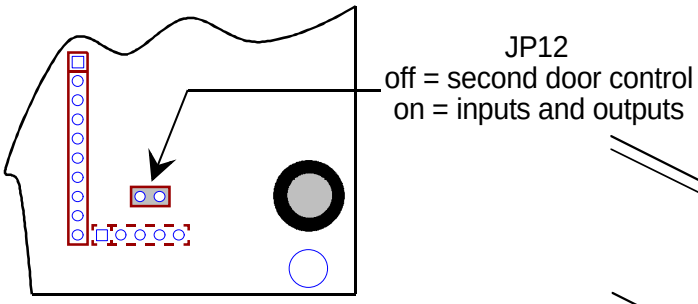



Figure 2 – Setting JP12

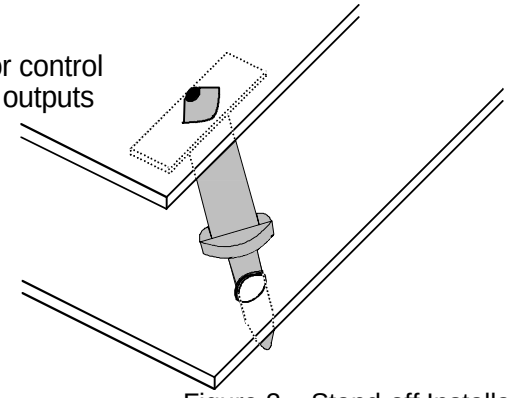


Figure 3 – Stand-off Installation

## When Installing Satellite Boards

DO

- route cables in accessible areas for ease of maintenance
- add transient suppression across electric devices attached to a satellite board output
- use an isolation relay (Keri Systems p/n IRP-1) if attaching to a parking gate, a turnstile, or any application using a large electric motor
- for a single door application, install the door's reader to the TB-5, "A" reader connection on the controller
- for a two door application, install the primary door's reader to the TB-5, "A" reader connection on the controller and install the secondary door's reader to the TB-6, "B" reader connection on the receiver board

DO NOT

- stretch or over-tension cables
- route cables over sharp objects
- let cables or wires get tangled

## Two Door Configuration Connections

This configuration assumes JP12 is OFF configuring the Satellite board for second door control.

Relay Outputs Table

| TB-7 / TB-10 Relay Outputs | Description |
|---|---|
| TB-7 – Pin 1 | lock output – normally open line |
| TB-7 – Pin 2 | common/ground |
| TB-7 – Pin 3 | lock output – normally closed line |
| TB-7 – Pin 4 | alarm output – normally open line |
| TB-7 – Pin 5 | common/ground |
| TB-7 – Pin 6 | alarm output – normally closed line |
| TB-10 – Pin 1 | GPO 3/DHO-B – normally open line |
| TB-10 – Pin 2 | common/ground |
| TB-10 – Pin 3 | GPO 3/DHO-B – normally closed line |
| TB-10 – Pin 4 | GPO 4/DHO-A – normally open line |
| TB-10 – Pin 5 | common/ground |
| TB-10 – Pin 6 | GPO 4/DHO-A – normally closed line |

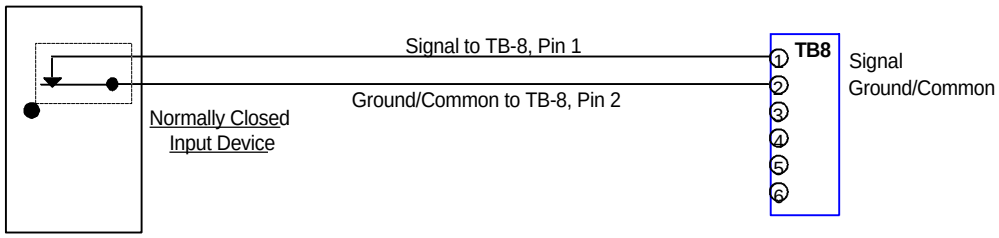
Inputs Table

| TB-8 / TB-9 Inputs | Description |
|---|---|
| TB-8 – Pin 1 | door status switch input – normally closed |
| TB-8 – Pin 2 | common/ground |
| TB-8 – Pin 3 | RTE input – normally open |
| TB-8 – Pin 4 | GPI 3 input (1)/AUX RTE-B input – normally open |
| TB-8 – Pin 5 | common/ground |
| TB-8 – Pin 6 | GPI 4 input (1) |
| TB-9 – Pin 1 | GPI 5 input (1) |
| TB-9 – Pin 2 | common/ground |
| TB-9 – Pin 3 | GPI 6 input (1) |
| TB-9 – Pin 4 | GPI 7 input (1) |
| TB-9 – Pin 5 | common/ground |
| TB-9 – Pin 6 | GPI 8 input (1) |

(1) General Purpose inputs can accept either a normally closed or normally open signal. The type of signal is dependent upon the type of input device. The Doors32™ software is then programmed to accept that input.

Door Status Switch Input

A door status switch opens and closes as the door is opened and closed.

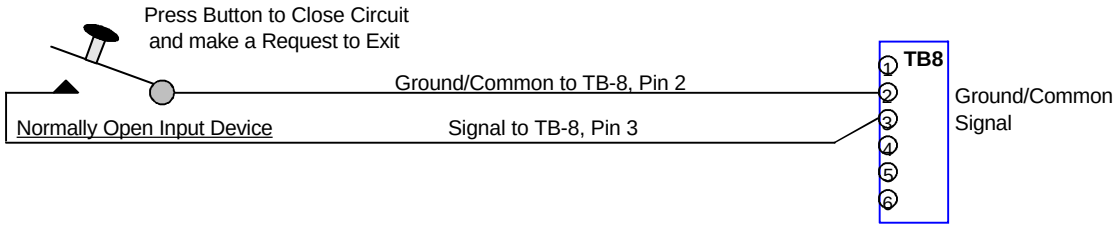



*NOTE: If a door switch is not installed, a jumper must be installed across pins 1 and 2 of TB8 to prevent a continuous door open alarm from being reported by the controller.*

## Two-Door Configuration Connections (continued)

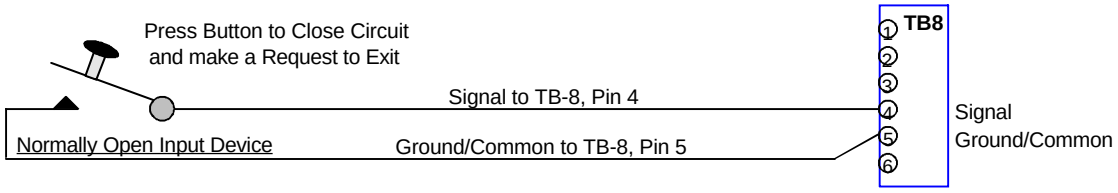
Request to Exit (RTE) Input

In an RTE circuit a user presses a switch (completing the circuit) to inform the controller that the user wishes to exit through the door associated with that controller.



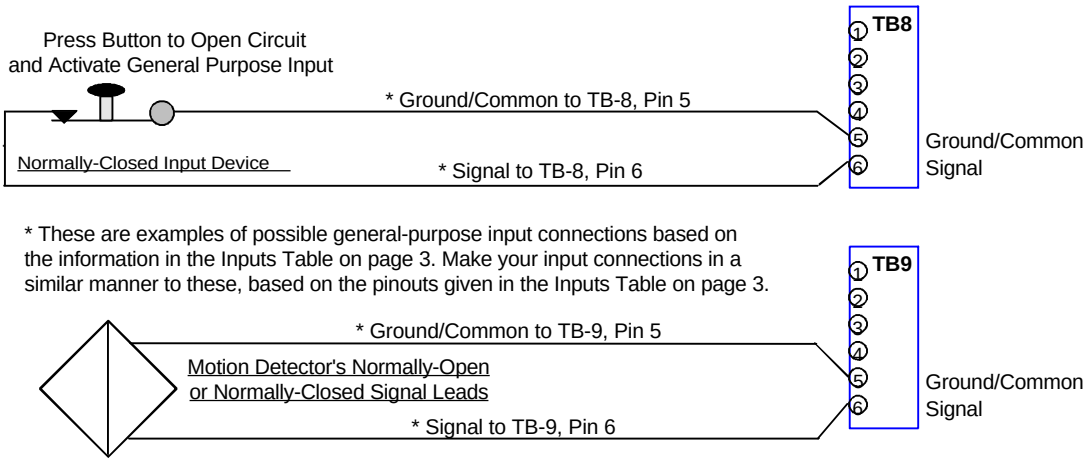

Auxiliary Request to Exit (RTE) Input

In an auxiliary RTE circuit a user presses a switch (completing the circuit) to inform the controller that the user wishes to exit through the door associated with that controller.




General Purpose Inputs

For the top application in the figure below, a circuit is opened to create an input event at the controller.

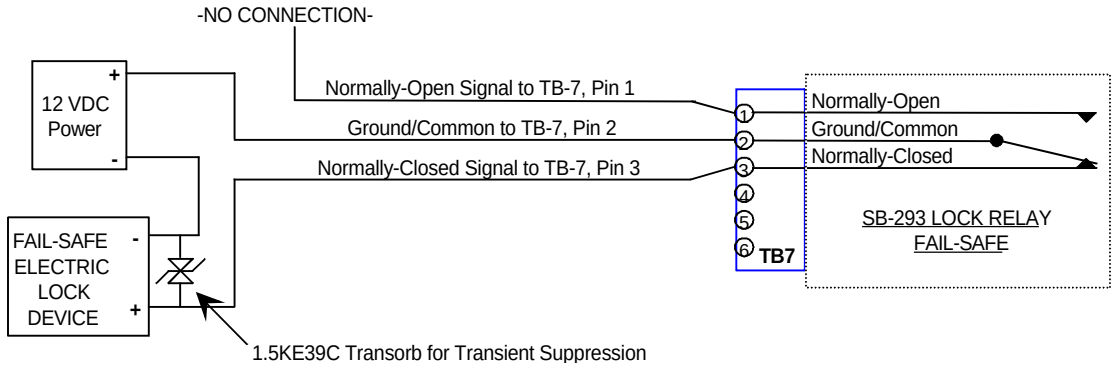



For the bottom application in the figure above, the motion detector senses motion and closes a circuit to create an input event at the controller.

## Two-Door Configuration Connections (continued)

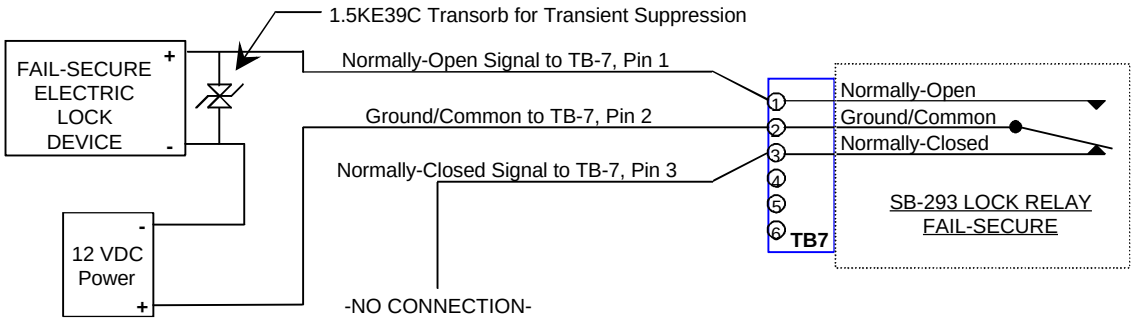
Fail-Safe Door Lock Output Relay

In a fail-safe application, if the power fails, the door is unlocked (see page 12 for more information).



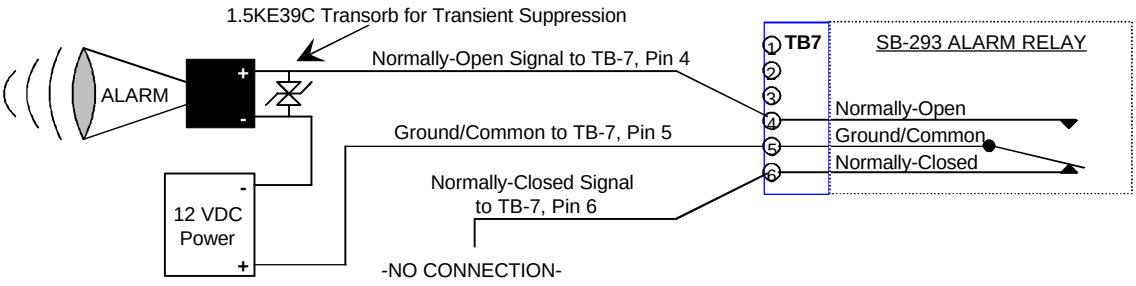

Fail-Secure Door Lock Output Relay

In a fail-secure application, if the power fails, the door is locked (see page 12 for more information).




Alarm Output Relay

An alarm condition on the controller closes the normally open line, sounding an alarm.

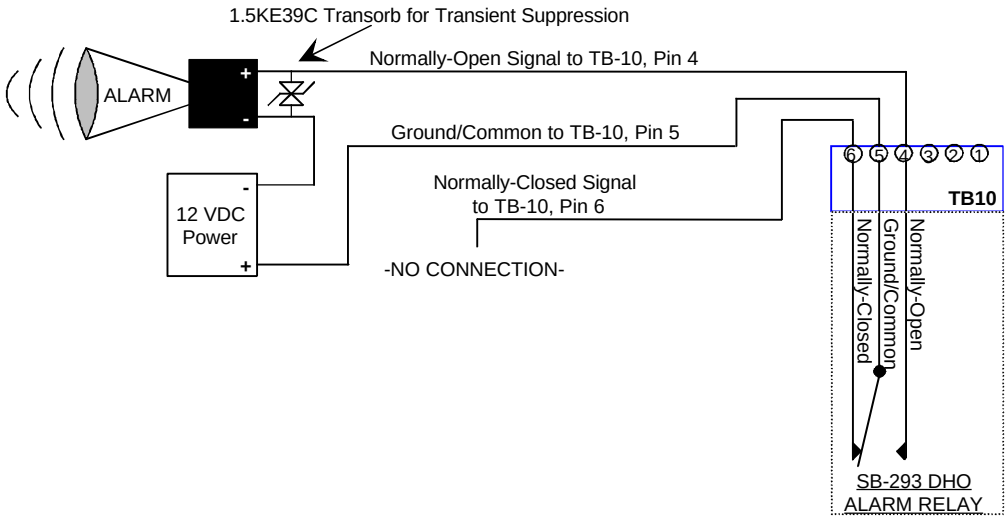


## Two-Door Configuration Connections (continued)

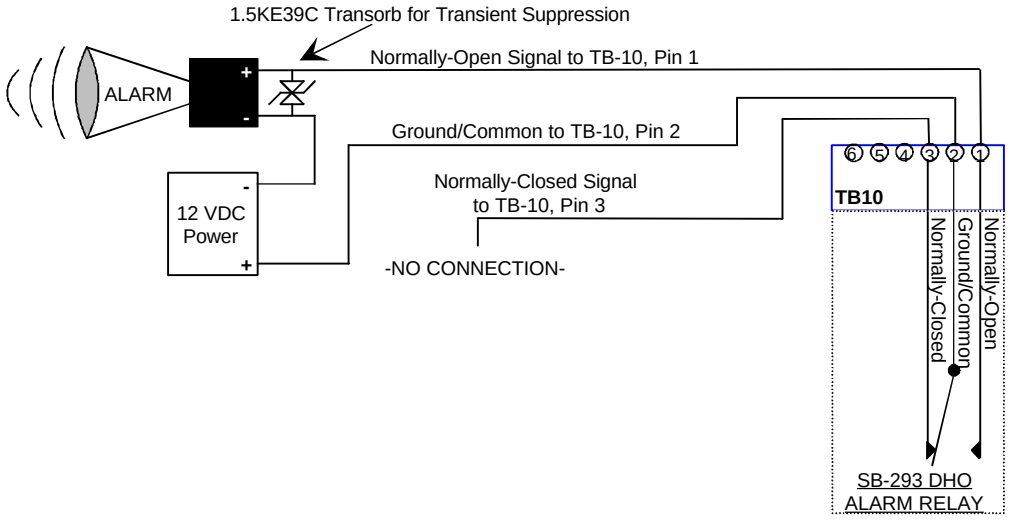
Door Held Open Alarm Output Relays

These instructions apply if the enhanced alarm out annunciation feature in the *Doors32*™ software has configured these outputs for door held open annunciation. Otherwise skip to the General-Purpose Outputs sections (normally open and normally closed) on page 8.

An alarm condition on the controller closes the normally open line, sounding an alarm. The following figure is for the A-door.



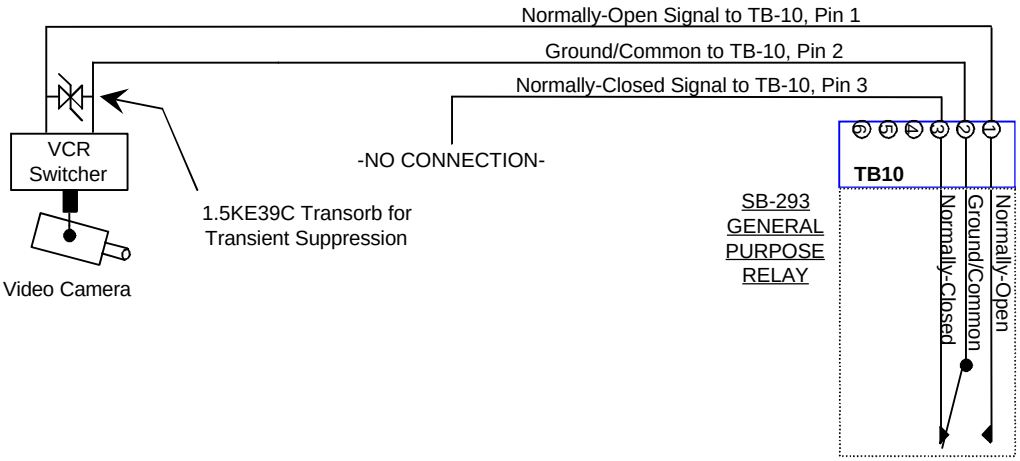

The following figure is for the B-door.



## Two-Door Configuration Connections (continued)

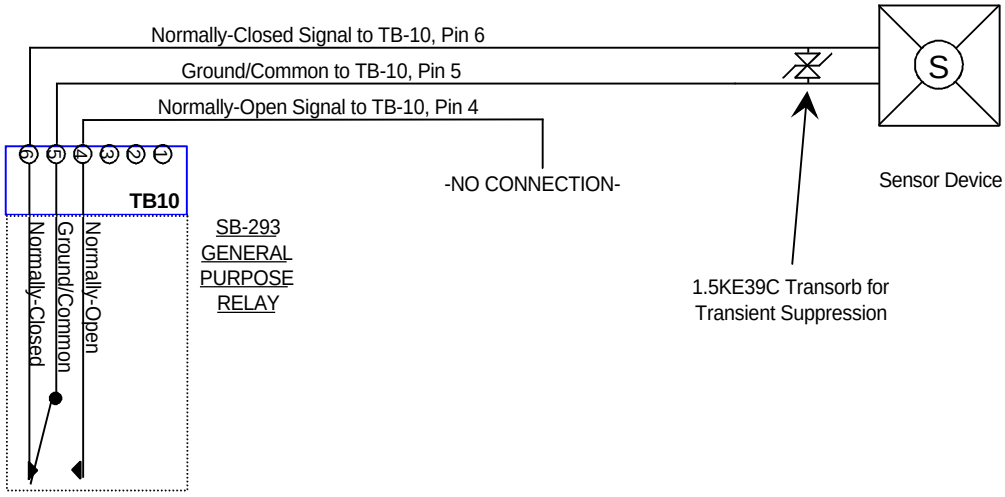
General Purpose Outputs - Normally Open Relay Connection

In the following application, an event causes programming in the controller to close the normally-open line, temporarily turning on a video camera.




General Purpose Outputs - Normally Closed Relay Connection

In the following application, an event causes programming in the controller to open the normally-closed line, temporarily turning off a sensor device.



## General Purpose Inputs and Outputs Configuration Connections

This configuration assumes JP12 is ON configuring the Satellite board for general purpose inputs and outputs.

Relay Outputs Table

| TB-7 / TB-10 Relay Outputs | Description |
|---|---|
| TB-7 – Pin 1 | GPO 1 – normally open line |
| TB-7 – Pin 2 | common/ground |
| TB-7 – Pin 3 | GPO 1 – normally closed line |
| TB-7 – Pin 4 | GPO 2 – normally open line |
| TB-7 – Pin 5 | common/ground |
| TB-7 – Pin 6 | GPO 2 – normally closed line |
| TB-10 – Pin 1 | GPO 3 – normally open line |
| TB-10 – Pin 2 | common/ground |
| TB-10 – Pin 3 | GPO 3 – normally closed line |
| TB-10 – Pin 4 | GPO 4 – normally open line |
| TB-10 – Pin 5 | common/ground |
| TB-10 – Pin 6 | GPO 4 – normally closed line |

Inputs Table

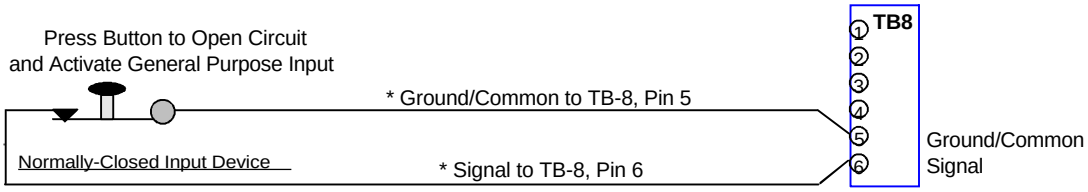
| TB-8 / TB-9 Inputs | Description |
|---|---|
| TB-8 – Pin 1 | GPI 1 (1) |
| TB-8 – Pin 2 | common/ground |
| TB-8 – Pin 3 | GPI 2 (1) |
| TB-8 – Pin 4 | GPI 3 (1) |
| TB-8 – Pin 5 | common/ground |
| TB-8 – Pin 6 | GPI 4 (1) |
| TB-9 – Pin 1 | GPI 5 (1) |
| TB-9 – Pin 2 | common/ground |
| TB-9 – Pin 3 | GPI 6 (1) |
| TB-9 – Pin 4 | GPI 7 (1) |
| TB-9 – Pin 5 | common/ground |
| TB-9 – Pin 6 | GPI 8 (1) |

(1) General Purpose inputs can accept either a normally closed or normally open signal. The type of signal is dependent upon the type of input device. The Doors32™ software is then programmed to accept that input.

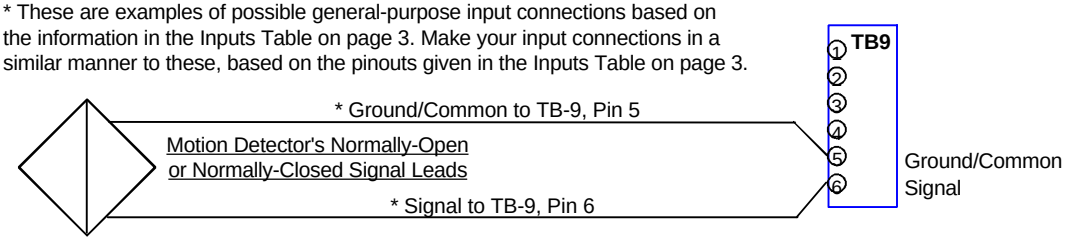
## General Purpose Inputs and Outputs Configuration Connections (continued)

General Purpose Inputs

For the top application in the figure below, a circuit is opened to create an input event at the controller.



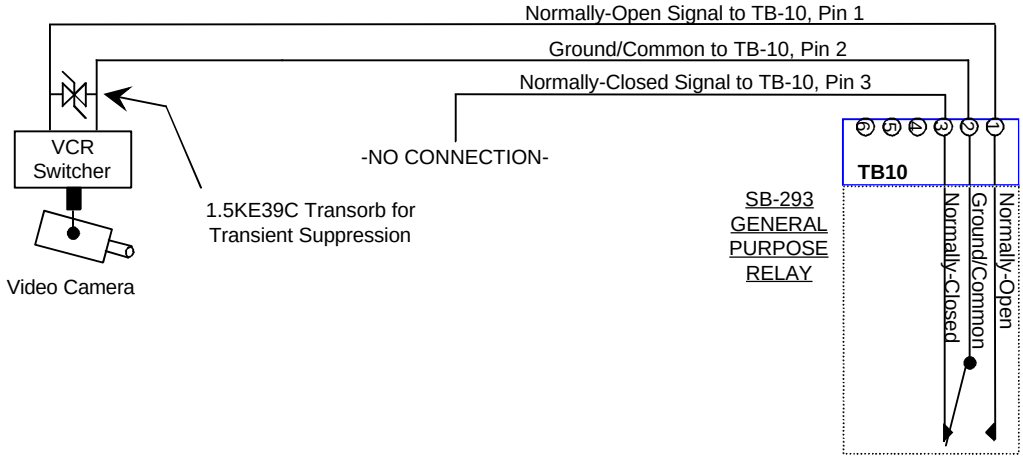

* These are examples of possible general-purpose input connections based on the information in the Inputs Table on page 3. Make your input connections in a similar manner to these, based on the pinouts given in the Inputs Table on page 3.




For the bottom application in the figure above, the motion detector senses motion and closes a circuit to create an input event at the controller.

General Purpose Outputs - Normally Open Relay Connection

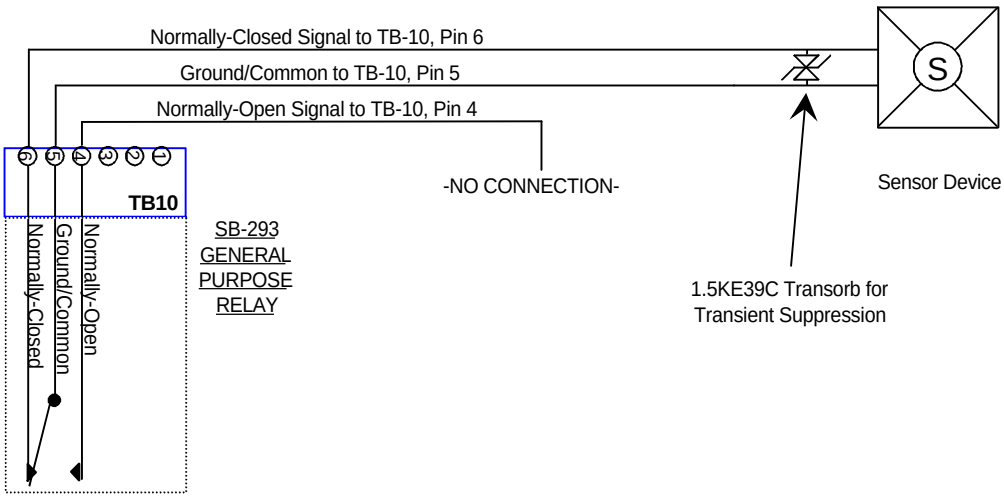
In the following application, an event causes programming in the controller to close the normally-open line, temporarily turning on a video camera.



## General Purpose Inputs and Outputs Configuration Connections (continued)

General Purpose Outputs - Normally Closed Relay Connection

In the following application, an event causes programming in the controller to open the normally-closed line, temporarily turning off a sensor device.



## General Information on Inputs

A controller input detects a state change generated by a device outside the controller that may prompt a response from the controller. Input devices that generate a state change may be normally-closed or normally-open. This section provides a brief description of normally-closed versus normally-open inputs.

Normally-Closed

A normally-closed input device continually keeps a circuit active or complete. A state change is generated when the normally-closed input device is forced open, breaking the circuit. In an access control system, a door switch is a typical example of a normally-closed device. While the door remains closed, the switch remains closed. When someone opens the door, the door switch is opened, breaking the circuit and generating a state change. The controller then responds to the state change and generates an output (such as sounding an alarm if the door is a secure door).

Normally-Open

A normally-open input device continually leaves a circuit open, or incomplete. A state change is generated when the normally-open input device is forced closed, completing the circuit. In an access control system, a request-to-exit (RTE) button is a typical example of a normally open device. In an access control installation, an RTE button is located on the secure side of a door. While there is no one there pressing the button, the switch remains open. When someone desires to exit through a secure door, they press the RTE button, closing the circuit and generating a state change. The controller then responds to this state change and generates an output (such as unlocking the door to allow egress).

## General Information on Safety versus Security with Door Locks

When installing a door lock there are two things to consider: safety versus security, or should the door be “fail-safe” or “fail-secure.”

Fail-Safe Door Lock

Fail-safe means that if the power should fail at a door (perhaps due to a power outage or equipment failure), the door will automatically unlock allowing entrance or egress. Power is required to keep the door locked. A fail-safe door ensures people will be able to enter and exit a secured area through that door in the case of an emergency. A typical fail-safe application may use a magnetic lock. In this application, the controller energizes the lock relay, causing the lock relay to change its state. In its new state the normally-closed circuit is opened breaking the power to the magnetic lock and allowing the door to be opened.

Fail-Secure Door Lock

Fail-secure means that if the power should fail at a door (perhaps due to a power outage or equipment failure), the door will automatically lock and not allow entrance, but will continue to allow egress. Power is required to unlock the door. A fail-secure door ensures a secured area remains secure regardless of the situation. A typical fail-secure application may use a door strike. In this application, the controller energizes the lock relay, causing the lock relay to change its state. In its new state the normally-open circuit is closed activating the release mechanism for the door strike on the door to be opened.