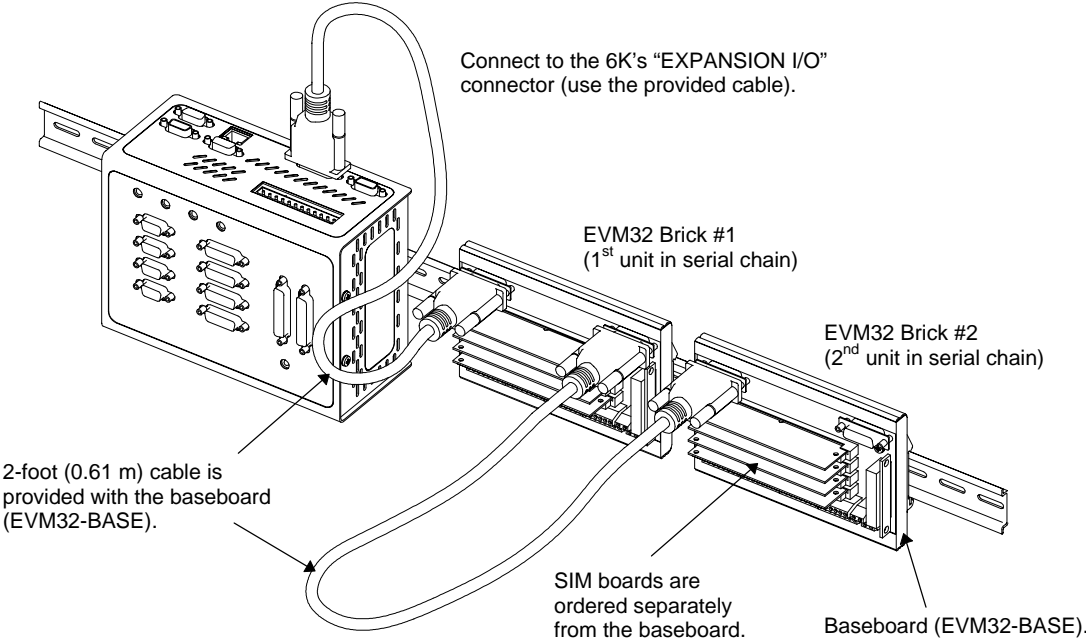


# Appendix B. EVM32 Installation



## EVM32 Description

The EVM32 is a family of I/O modules (or "bricks") that is sold as accessories to the 6K Controllers. The purpose of the EVM32 is to provide more I/O than the 6K offers onboard. Up to eight DIN-rail mountable EVM32 bricks can be connected in a serial chain to the 6K. Each EVM32 brick can hold from 1 to 4 of these I/O SIM boards in any combination (each SIM board provides 8 I/O points, for a total of 32 I/O points per I/O brick):

- Digital inputs
- Digital outputs
- Analog inputs

Order an EVM32 brick and up to four I/O SIM boards per brick (see table below).

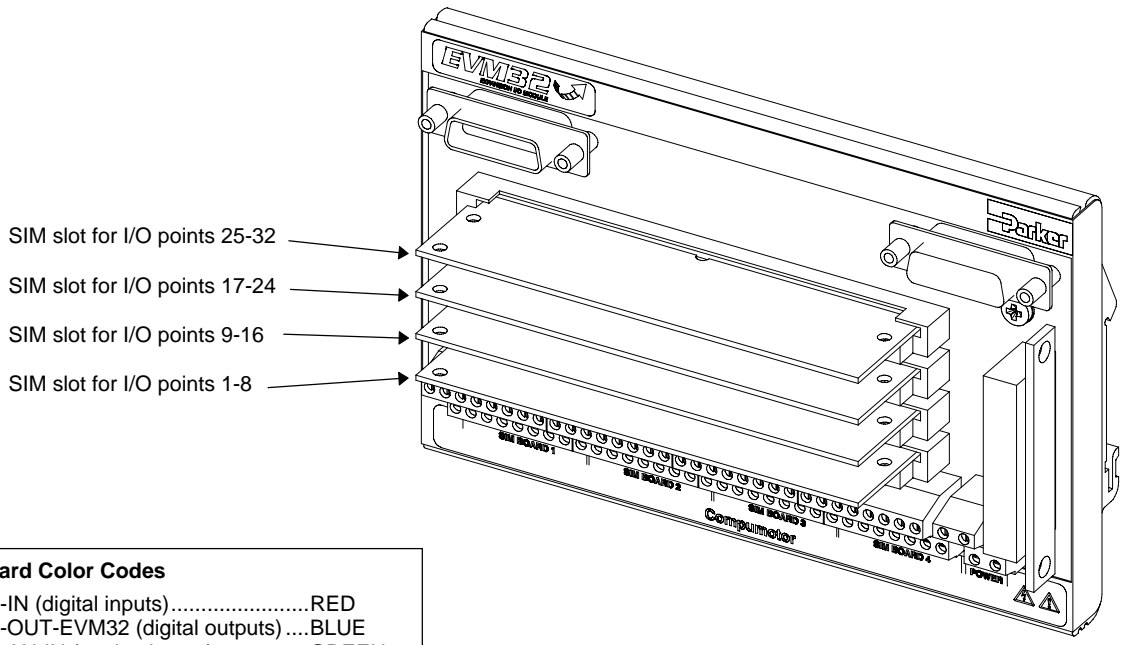
Product (p/n)	Description
EVM32-Base.....	EVM32 baseboard, extrusion with built-in DIN rail mount (includes 2-foot cable).
SIM8-IN.....	SIM board with 8 digital inputs. Color code: RED.
SIM8-OUT-EVM32 ...	SIM board with 8 digital outputs. Color code: BLUE.
SIM8-AN-IN.....	SIM board with 8 analog inputs (12-bit, ±10V inputs). Color code: GREEN.
71-016949-02.....	2-foot cable for connection to 6K or between I/O bricks (included with EVM32-BASE).
71-016949-100.....	100-foot cable for connection to 6K or between I/O bricks.

# EVM32 Specifications

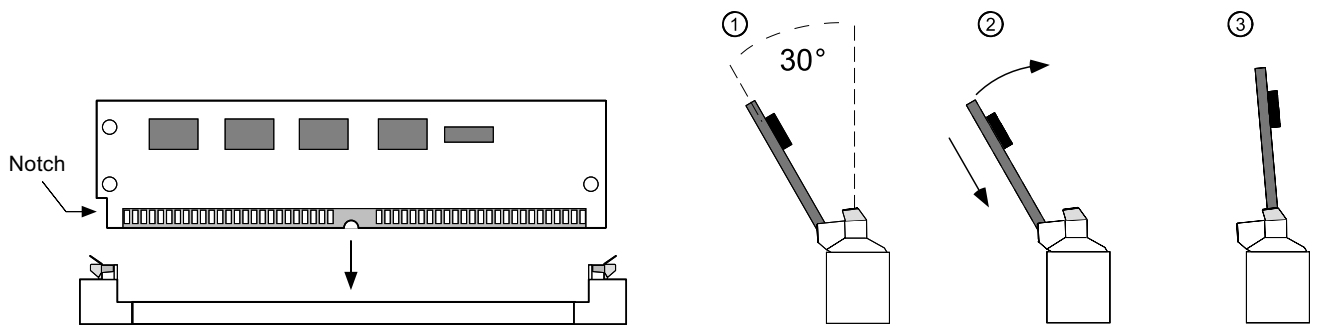
Parameter	Specification
<b>Power (DC input)</b>	
V+ .....	User-supplied voltage that drives output circuitry.
V+ range .....	12-24VDC.
V+ current .....	1.5A @ 12VDC or 0.75A @ 24VDC; plus the sum of the load current on outputs that are in sourcing mode.
<b>Environmental</b>	
Operating temperature .....	32 to 122°F (0 to 50°C)
Storage temperature .....	-22 to 185°F (-30 to 85°C)
Humidity .....	0 to 95% non-condensing
<b>Dimensions</b>	
EMV32 module .....	3.3 inches x 6.25 inches (83.82 mm x 158.75 mm)
<b>Digital Inputs</b>	
Switching levels .....	Low $\leq 1/3$ V+ voltage; High $\geq 2/3$ V+ voltage.
Voltage range .....	Voltage range = 0-24VDC. Voltage of input signals should not exceed voltage level of V+. (Input circuitry of EVM32 has diodes to protect against voltages that exceed V+, but performance may degrade.)
Sinking/Sourcing .....	Sinking: Connect jumper for selected SIM board to position 3 (factory default). Sourcing: Connect jumper for selected SIM board to position 1.
Impedance .....	6 K $\Omega$ , minimum. Requires input current (sinking or sourcing) of 0.111mA per volt of user-supplied voltage to V+ (e.g., 2.67mA if V+ = 24V).
Active level .....	Set by the 6K controller (INLVL command setting) — default is active low, but can be set to active high.
Input frequency .....	50 kHz (the maximum frequency is limited practically to 500 Hz by the 2 ms update rate of the 6K controller).
Status .....	Check with the TIO command.
<b>Digital Outputs</b>	
Sinking/Sourcing .....	Sinking: Connect jumper for selected SIM board to position 3 (factory default). Sourcing: Connect jumper for selected SIM board to position 1.
Voltage (sinking — jumper in position 3) .....	Output voltage level is less than or equal to 0.4VDC when sinking up to 50mA. ( $\leq 0.4$ VDC for 50 mA). Output voltage level is less than or equal to 2.5VDC when sinking up to 300mA. ( $\leq 2.5$ VDC for 300 mA).
Voltage (sourcing — jumper in position 1) .....	Output voltage level may be up to 2 volts less than the user-supplied voltage V+ when sourcing up to 50mA. Output voltage level may be up to 2.5 volts less than the user-supplied voltage V+ when sourcing up to 300mA.
Current .....	300mA maximum per output; continuous duty at 50°C ambient temperature.
Active level .....	Set with the OUTLVL command — default is active low.
Rise time, Fall time .....	Load dependent; typically 40ns per 1000 pF.
Under-voltage protection .....	The under-voltage lockout circuit is meant to prevent the output driver from sinking or sourcing when the user-supplied voltage at V+ drops below +5VDC.
Thermal shutdown .....	The thermal shutdown protection is intended to protect the device from marginal environmental factors. It must not be considered short circuit protection. The thermal resistance between the FET junction and the thermal protection circuit on the SIM cards is great enough that the rapid rise in junction temperature caused by a short circuit will not transfer fast enough to protect the device from damage.
Short-circuit protection .....	Digital outputs are NOT short-circuit protected.
Status .....	Check with the TIO command.
<b>Analog Inputs</b>	
Input voltage range .....	12-bit A/D converter, $\pm 10$ VDC; unipolar/bipolar range selectable ANIRNG command. Unipolar: 0V to 10VDC, or 0V to 5V; Bipolar: -10 to +10V (factory default), or -5V to +5V.
Input current (worst case load) .....	Unipolar: 720 $\mu$ A @ 0V to 10VDC range; 360 $\mu$ A @ 0V to 5V range. Bipolar: -1200 $\mu$ A @ -10V and 720 $\mu$ A @ +10V; -600 $\mu$ A @ -5V and 360 $\mu$ A @ +5V.
Input dynamic resistance .....	Unipolar: 21K $\Omega$ ; Bipolar: 16K $\Omega$
Fault tolerance .....	$\pm 16.5$ V
Sample rate .....	Each input requires 2ms (e.g., 4 ms for 2 inputs, 16ms for 8 inputs); therefore, to maximize performance, you should disable unused inputs with ANIEN command.
Status .....	Check with the TIO command.

# Installing the SIM Boards

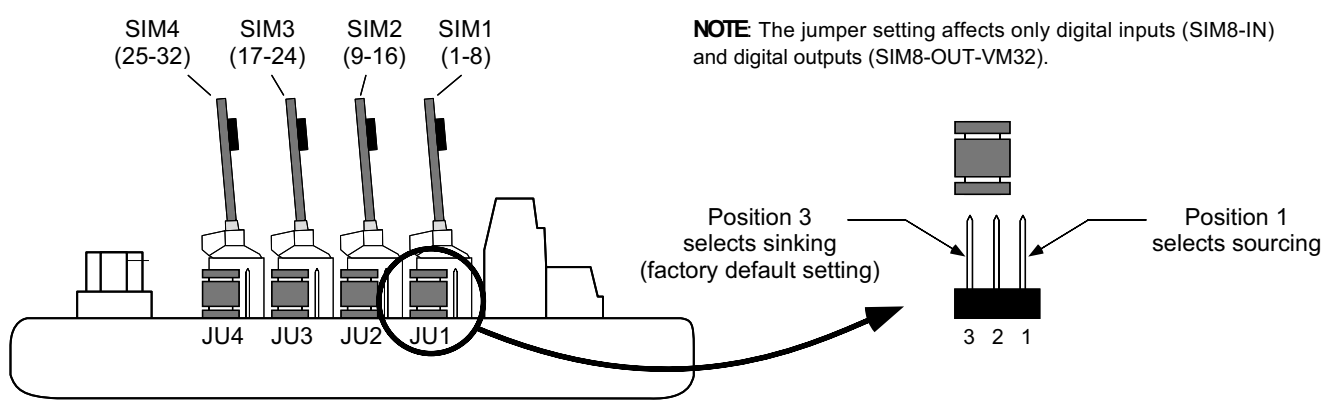
**CAUTION:** Remove power to the EVM32 baseboard before installing or removing SIM boards.



**SIM Board Color Codes**  
 SIM8-IN (digital inputs).....RED  
 SIM8-OUT-EVM32 (digital outputs)....BLUE  
 SIM8-AN-IN (analog inputs) .....GREEN



# Setting Jumpers (selecting sinking/sourcing)



**NOTE:** The jumper setting affects only digital inputs (SIM8-IN) and digital outputs (SIM8-OUT-VM32).

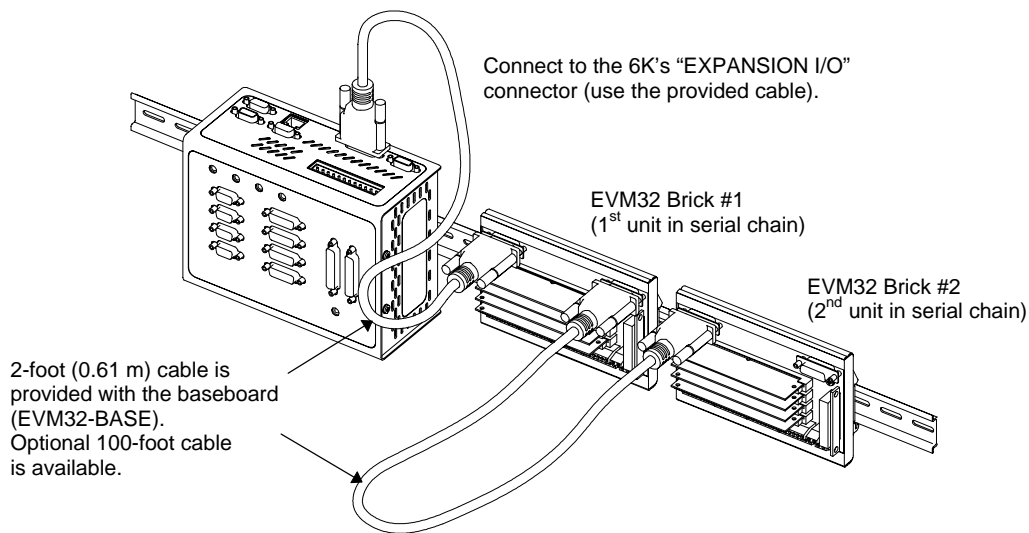
# Electrical Connections

## Connection to the 6K controller and between VM32 I/O bricks

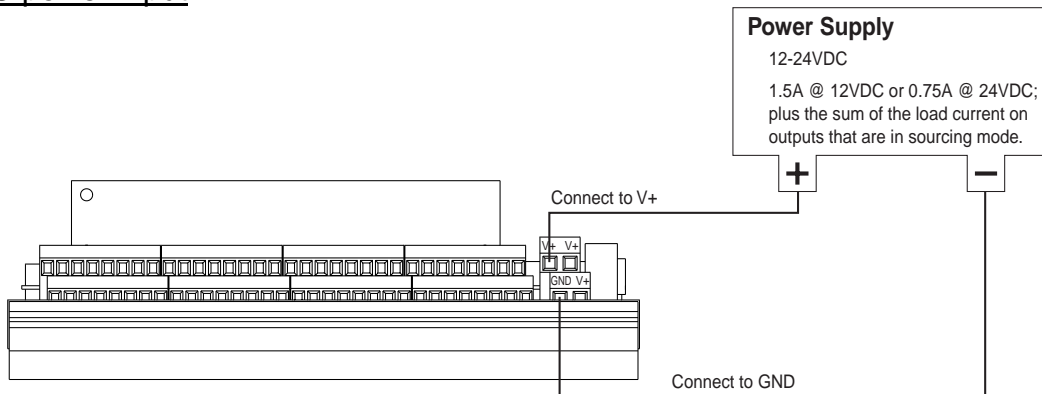
⚠ **CAUTION** ⚠

Remove power to the 6K controller and the EMV32 baseboard before connection or disconnecting the EVM32 baseboard to the 6K controller or to other EVM32 units.

If the VM32 I/O brick is disconnected (or if it loses power), the controller will perform a kill (all tasks) and set error bit #18. When the 6K controller powers up and detects an output SIM on a VM32, it will set the active level (OUTLVL command) according to the jumper setting selected. To check the status of one or more VM32 I/O bricks, use the TIO command.



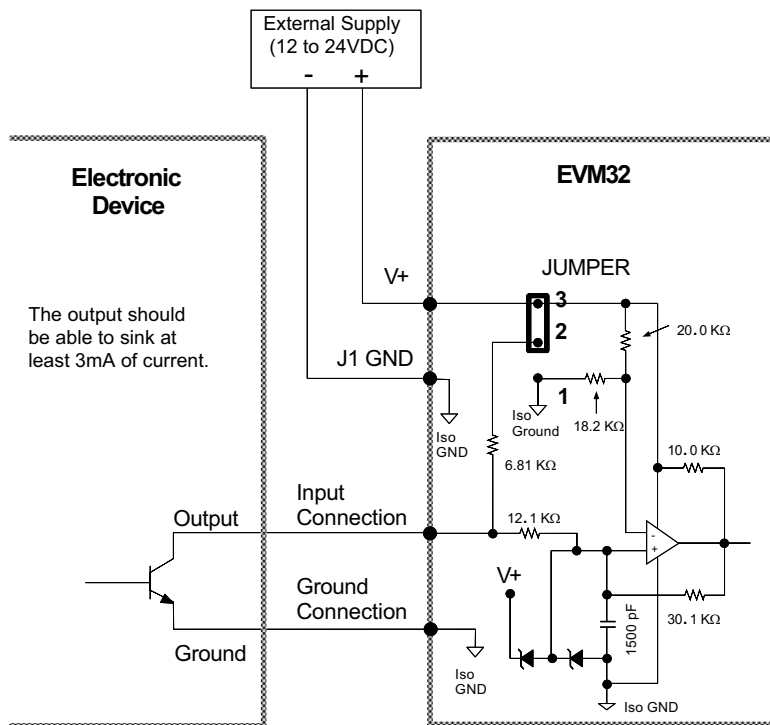
## 24VDC power input



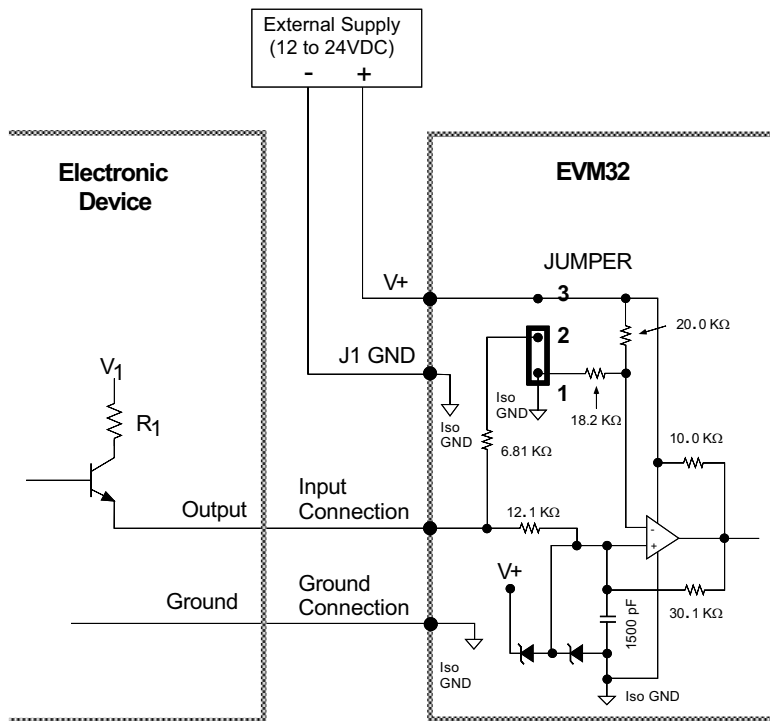
# Digital Inputs

**CAUTION:** Remove power to the EMV32 baseboard before connecting I/O.

## Sinking



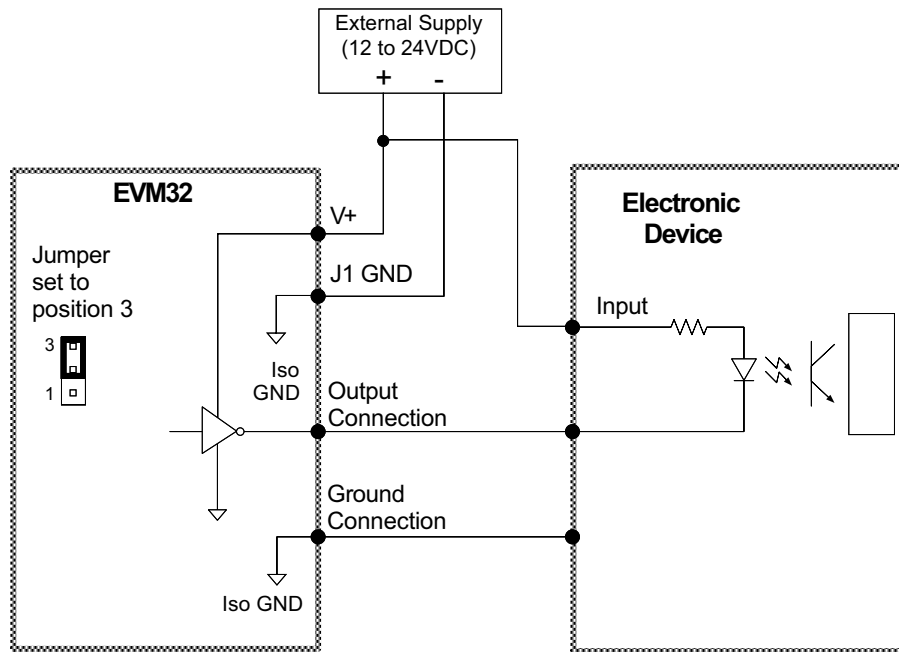
## Sourcing



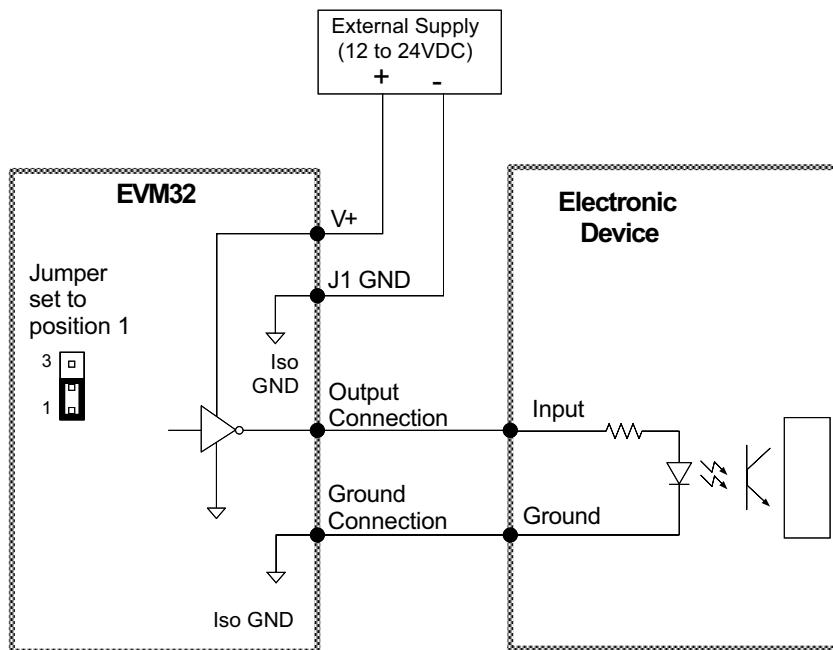
## Digital Outputs

**CAUTION:** Remove power to the EMV32 baseboard before connecting I/O.  
**NOTE:** Use an external diode when driving inductive loads. Connect the diode in parallel to the inductive load.

### Sinking



### Sourcing



## Analog Inputs

