Description
Specifically designed for 12 Volt DC applications, the RB-8R-12V is a relay board equipped with eight relays each one capable of switching up to 10 Amp current. Inputs are opto-insulated therefore there is complete separation between inputs, outputs and the circuitry driving the relays.

Main parameters
- \( V_{cc} = +12 \) volt
- Input Voltage = - 24 to + 24 Volt
- Relay Output Current = 10 Amp/each

Benefits
- Wide input voltage range
- Separate input circuits
- Switching of up to 80 Amp current all relays combined
- Mix and match of floating and common reference inputs
- Compact size
- Battery inversion protected

Typical applications
- Automotive
- Lamp, alarm, sound drive
- Emergency switch
- Battery power main switch
- Motor direction control
- Electric brake

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min Limit</th>
<th>Max Limit</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>+ 10</td>
<td>+ 15</td>
<td>Volt</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>- 24</td>
<td>+ 24</td>
<td>Volt</td>
</tr>
<tr>
<td>Relay Current each relay</td>
<td></td>
<td>10</td>
<td>Amp</td>
</tr>
<tr>
<td>Relay Voltage across relay contacts DC</td>
<td></td>
<td>24</td>
<td>Volt</td>
</tr>
<tr>
<td>Relay Voltage across relay contacts AC</td>
<td></td>
<td>240</td>
<td>Volt</td>
</tr>
</tbody>
</table>
Operating Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vcc Supply Voltage</td>
<td>9.5</td>
<td>12</td>
<td>15</td>
<td>Volt</td>
</tr>
<tr>
<td>Icc Supply Current All Relays ON</td>
<td>0.3</td>
<td>0.45</td>
<td>0.6</td>
<td>Amp</td>
</tr>
<tr>
<td>Icc Supply Current All Relays OFF</td>
<td></td>
<td>10</td>
<td></td>
<td>milliAmp</td>
</tr>
<tr>
<td>$V_{in\text{-}high}$ Input Voltage High Level</td>
<td>3.5</td>
<td>12</td>
<td>24</td>
<td>Volt</td>
</tr>
<tr>
<td>$V_{in\text{-}low}$ Input Voltage Low Level</td>
<td>-24</td>
<td>0</td>
<td>1.0</td>
<td>Volt</td>
</tr>
<tr>
<td>$I_{in\text{-}high}$ Input High Current (NOTE1)</td>
<td>0.5</td>
<td>1</td>
<td>5</td>
<td>mAmp</td>
</tr>
<tr>
<td>$I_{output}$ Relay current at 12 DC Volt and 125 AC Volt</td>
<td></td>
<td>10</td>
<td></td>
<td>Amp</td>
</tr>
</tbody>
</table>

NOTE 1: Input high current increases with the high input voltage applied.

Application Information

The RB-8R-12V relay board has opto-insulated inputs so it can be used:

- With all inputs loops separate and independent from each other.
- With all inputs sharing connection – 1 as an independent common reference.
- With all inputs sharing a common ground reference.
- With any mix of separate loops and common reference loops.

Some or all input returns can be joined together by setting jumpers, which will short selected return inputs to the return of input 1, sharing return –1 as a common reference.

Jumpers allow connecting terminals from –2 to –9 to terminal –1.

Terminal –1 therefore acts as a common reference return path.

Fig-1 Jumpers
Fig-2 Eight independent input loops.

Fig-3 Eight inputs sharing a common reference (return input -1)

Fig-4 Eight inputs sharing a common ground
Fig-5 Four common reference inputs (1 to 4) and four independent (5 to 8)

**Logic levels**
The input voltage is considered logic High if higher than 3.5 Volt and logic Low if lower than 1.0 Volt.
Negative input voltages are acceptable up to –24 Volt and considered logic Low.
Positive input voltages between 1.0 and 3.5 Volt need to be avoided, since they cannot be interpreted neither high nor Low.
In order to enhance noise immunity, each input loop has a resistance of 4.7 k Ohm, so the input drive needs to be able to supply the relevant input current (0.5 to 5 milliAmp according to the value of the input voltage).
A High input will energize the relevant relay; a green LED will visually indicate it.
Each relay is has a SPDT (Single Pole Double Through) configuration and it is connected to a three terminals screw-in connector, which poles are indicated NC (Normally closed), CT (Center Tap) and NO (Normally Open).
Due to the double insulation (opto and magnetic) the power output loops are separate from the controlling input loops and the relay control circuitry.

**Power connector**
The Vcc input (marked +12V on the board) is protected by a diode against wrong battery connection (inverted battery connection).
The positions marked +5V and +48V are unconnected.

**Mechanical**
Dimensions: 5 x 4.3 inches / 127 x 110 millimeters
Weight: 0.5 lbs / 220 grams
### Fig-6 Relay board RB-8R-12V

<table>
<thead>
<tr>
<th>Input connector</th>
<th>Input connector</th>
<th>Power connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 4</td>
<td>5 to 8</td>
<td>+12V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GND</td>
</tr>
</tbody>
</table>

**Ordering instructions**

Part number: **RB-8R-12V** 12Volt board

Shipping: boards are shipped with all eight jumpers installed so with all return paths are connected together as common return path –1. Remove jumpers as needed to implement other input configurations.