OPERATION GUIDE: MC200/MC201
Current Limiting/Reversing Actuator Controller

The MC200 (12VDC) and MC201 (24VDC) current limiting controllers are used to limit force output of DC actuators and motors. Current is range selectable by dip switch, and fine-tuned via potentiometers independently in each direction. The controller can be used in place of, or in combination with, external limit switches.

- 12VDC (MC200) or 24VDC (MC201) versions
- Adjustable current limit or limit switch input for versatility in stop signal
- Single-button or two-button (dedicated direction) start button selectable
- Automatic motor reversing (1 button mode)
- Momentary or maintained input selectable
- Limit indicator and low voltage LED's
- Robust power and motor lugs for high-current connections
- Multi-pin connector with screw terminals for start/stop and limit switch inputs

DIP Switch Selection:

<table>
<thead>
<tr>
<th>SW1</th>
<th>SW2</th>
<th>1 BUTTON</th>
<th>2 BUTTON</th>
<th>1 BUTTON</th>
<th>OFF</th>
<th>2 BUTTON</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>MOMENTARY</td>
<td>MOMENTARY</td>
<td>TOGGLE</td>
<td>OFF</td>
<td>TOGGLE</td>
</tr>
</tbody>
</table>

Current Range Settings: Note: When SW6 is set to the Off position, SW4 and SW5 positions are ignored.

<table>
<thead>
<tr>
<th>SW4</th>
<th>SW5</th>
<th>SW6</th>
<th>MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>OFF</td>
<td>0 TO 5A</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>0 TO 10A</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>ON</td>
<td>5 TO 15A</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>ON</td>
<td>10 TO 20A</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>15 TO 25A</td>
</tr>
</tbody>
</table>

PWR/AUX Connector:

<table>
<thead>
<tr>
<th>AUX1</th>
<th>AUX2</th>
<th>12/24VDC INPUT</th>
<th>GND</th>
<th>AUX3</th>
</tr>
</thead>
</table>

SIGNAL Connector:

<table>
<thead>
<tr>
<th>PIN 1</th>
<th>PIN 2</th>
<th>PIN 3</th>
<th>PIN 4</th>
<th>PIN 5</th>
<th>PIN 6</th>
<th>PIN 7</th>
<th>PIN 8</th>
<th>PIN 9</th>
<th>PIN 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;IN&quot; SWITCH</td>
<td>&quot;OUT&quot; SWITCH</td>
<td>IGNITION</td>
<td>&quot;IN&quot; LIMIT SWITCH</td>
<td>&quot;IN&quot; LIMIT SWITCH RETURN</td>
<td>&quot;OUT&quot; LIMIT SWITCH</td>
<td>&quot;OUT&quot; LIMIT SWITCH RETURN</td>
<td>AUX 1</td>
<td>AUX 2</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: AUX inputs are non-functional as of 2/1/2013

Current Sample Settings:

(175 ms base):

<table>
<thead>
<tr>
<th>SW</th>
<th>MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>6</td>
</tr>
<tr>
<td>ON</td>
<td>8</td>
</tr>
<tr>
<td>ON</td>
<td></td>
</tr>
</tbody>
</table>

MTR+ = Drive 0 | UP | IN
MTR- = Drive 1 | DWN | OUT
Operation:

Button Modes:

1. **1 button momentary** –
   A single button or switch is used for actuator/motor control. Holding the button will drive the motor. Releasing the button will stop the and change the direction of movement on the next button press. The direction of the drive on button press is determined by the last direction of movement, limit switch activation, and i

2. **2 button momentary** –
   Two buttons or switches are used for actuator/motor control. Holding the button that is set up for an outward movement will cause the drive to move in the OUT direction. Holding the button that is set up for an inward movement will cause the drive to move in the IN direction.

3. **1 button toggle** -
   A single button or switch is used for actuator/motor control. Pressing the button will drive the motor even if released. A second button press, current limit, or limit switch input will stop the motor. The next button press will change the direction of movement. The direction of the drive is determined by the last direction of movement, limit switch activation, and ignition.

4. **2 button toggle** -
   Two buttons or switches are used for actuator/motor control. Pressing the button that is set up for an outward movement will cause the drive to move in the OUT direction until a second button press, current limit, or limit switch are reached. Pressing the button that is set up for an inward movement will drive the slide-out motor in the IN direction until a second button press, current limit, or limit switch are reached.

Limit Switches:

1. **Limit enable/disable** –
   When enabled, if the switch is triggered and the MCU pin connected to the limit switch is pulled high, movement in the direction toward the limit switch is stopped and disabled. You can still move in the opposite direction away from the triggered limit switch.

Current Modes:

1. **0 to 5A Range** –
   When this mode is set, the potentiometers will allow tuning for current limits on each direction between 0 and 5A, in .5 amp increments.

2. **0 to 10A Range** -
   When this mode is set, the potentiometers will allow tuning for current limits on each direction between 0 and 10A, in 1 amp increments.

3. **5 to 15A Range** -
   When this mode is set, the potentiometers will allow tuning for current limits on each direction between 5 and 15A, in 1 amp increments.

4. **10 to 20A Range**-
   When this mode is set, the potentiometers will allow tuning for current limits on each direction between 10 and 20A, in 1 amp increments.

5. **15 to 25A Range**-
   When this mode is set, the potentiometers will allow tuning for current limits on each direction between 15 and 25A, in 1 amp increments.
1. **Under Voltage** –

An under voltage state occurs when supply voltage drops below 8.5 VDC (MC200) or below 18 VDC (MC201) for more than 175ms. When this fault is triggered, motor drives will be stopped and disabled, and the LED in position 1 will turn on red. This fault is cleared when the voltage returns to over 9.0 VDC or 18.5 VDC.

2. **Over current** – (adjustable current limit)
   a. **Over Limit for MTR IN:**

   An over current limit fault will occur if the current is over the set limit after 175ms (MC200) or 240ms (MC201) of the motor being driven in the IN direction. The MTR IN limit can be tuned by using the DIP switches to select a general range and then using the potentiometer to fine adjust within that range. When the fault is triggered, the motor in the IN direction will be stopped and disabled and if in 1 button mode, the direction will be changed for the next button press. When tripped, the LED in position 2 will turn on red. This fault is cleared on next button press. Note: Current sample time may be increased, see settings above.
   
   b. **Limit Switch IN:**

   The motor moving in the IN direction will engage Limit Switch IN. When engaged, movement is disabled for the IN direction and the LED in position 3 will turn on red.

   b. **Limit Switch OUT:**

   The motor moving in the OUT direction will engage Limit Switch OUT. When engaged, movement is disabled for the OUT direction and the LED in position 3 will turn on green.

3. **Limit Switch** –
   a. **Limit Switch IN:**

   The motor moving in the IN direction will engage Limit Switch IN. When engaged, movement is disabled for the IN direction and the LED in position 3 will turn on red.
   
   b. **Limit Switch OUT:**

   The motor moving in the OUT direction will engage Limit Switch OUT. When engaged, movement is disabled for the OUT direction and the LED in position 3 will turn on green.

**NOTES:**

- Controller is designed to be used with a single motor or actuator.
- Ignition input may be used to disable "OUT" when energized.
- Limit switches and start/stop inputs need not be powered. Contact closure is all that is required, completing the circuit from the board back to the input.
- Version 1.4 & later- In the event of a current limit being reached, the motor/actuator must be reversed before the original direction can be activated again.