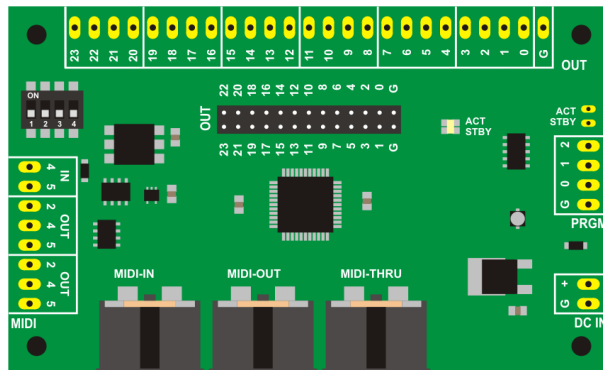




MD24
Hardware Revision G
User Manual



Updated 2011-04-28

Additional documentation available at:

<http://highlyliquid.com/support/>

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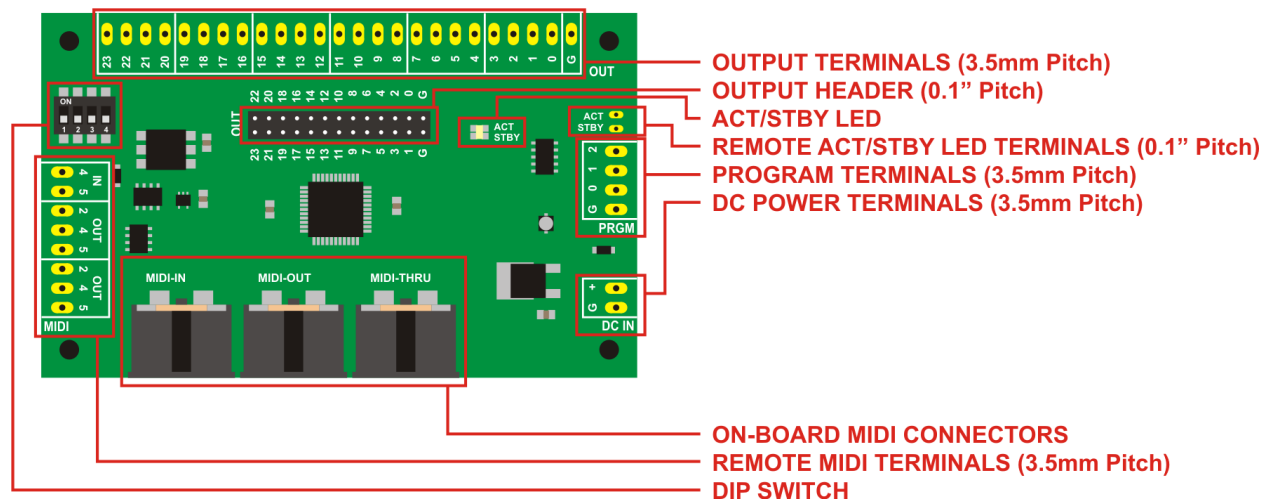
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1.0 Important Safety Information

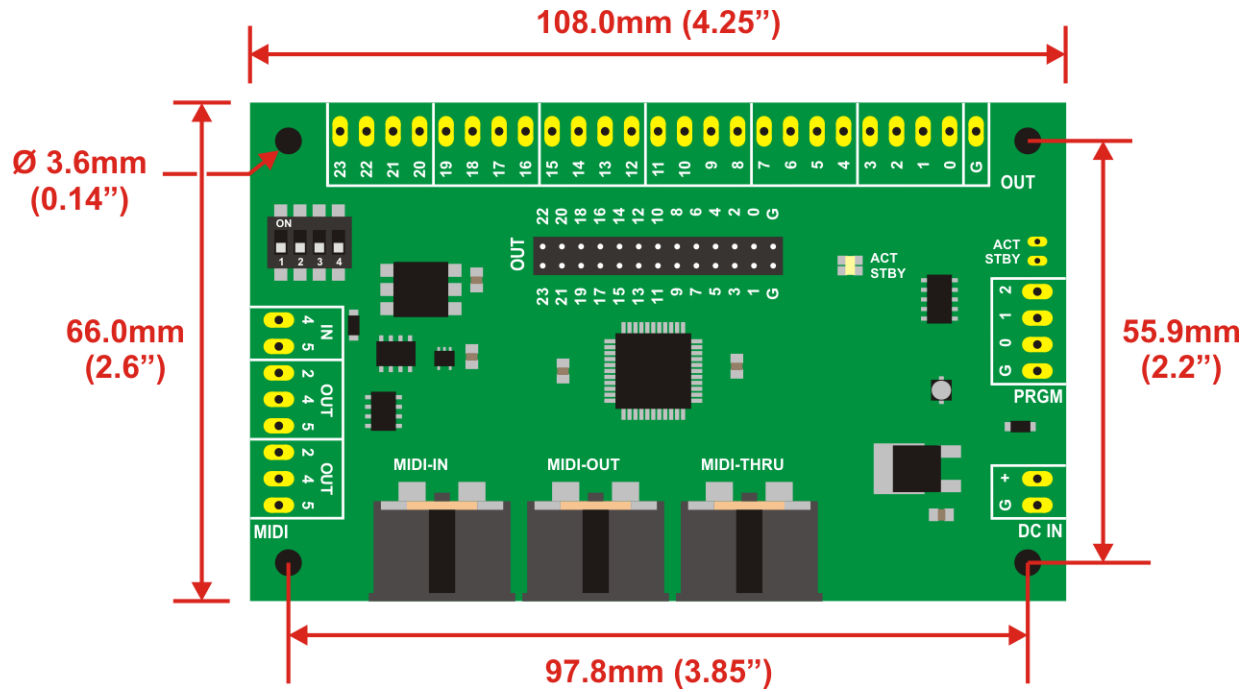
To prevent damage to the MD24 and connected devices, and to prevent personal injury:

- Take reasonable static-control precautions when handling the MD24. This product includes ESD-sensitive parts.
- Use an [appropriate power source](#).
- Do not exceed the [electrical maximum ratings](#).
- Do not apply an external voltage to any of the MD24 outputs.

2.0 Feature Diagram



3.0 Mechanical Drawing



4.0 Power Supply

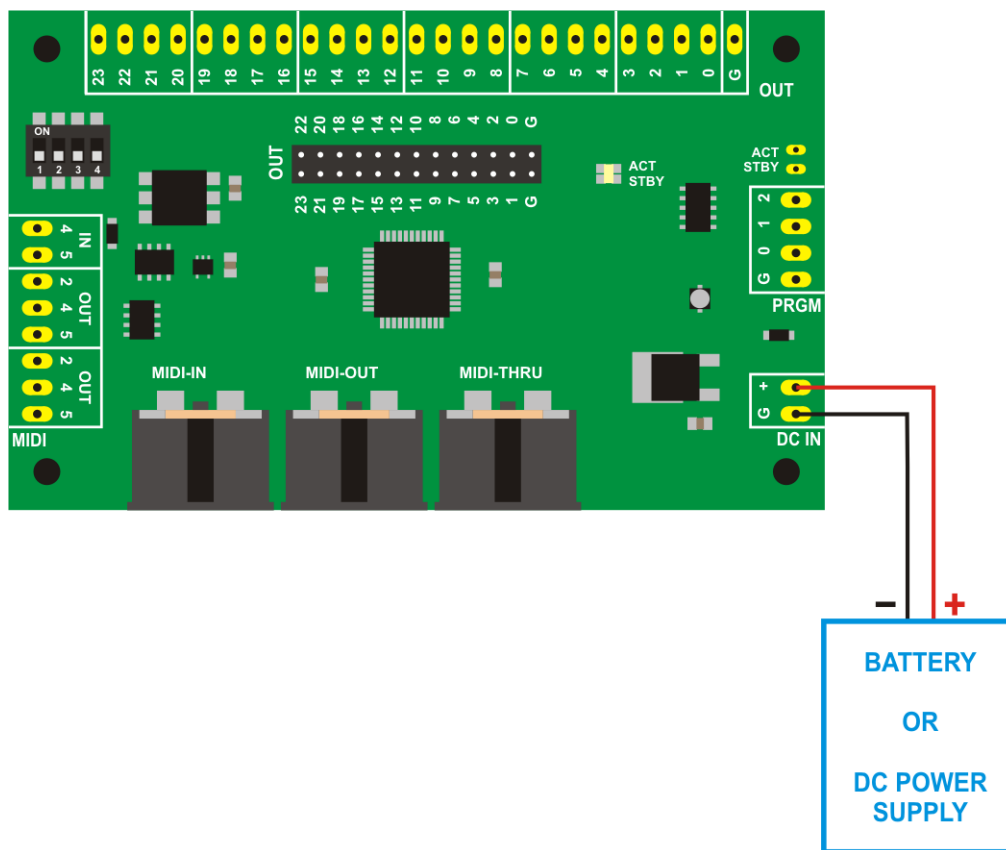
To operate, the MD24 must be connected to a battery or other DC power supply. A “wall adapter” supply with appropriate specifications may be used.

Power supply requirements:

- Minimum output voltage: 6VDC
- Maximum output voltage: 12VDC
- Current capacity: 300mA or greater

Wire the battery or power supply to the MD24 “DC IN” terminals as shown in **Figure 4.1**.

Figure 4.1: Power Supply Wiring



5.0 MIDI Wiring

The MD24 features MIDI IN, OUT and THRU ports.

Use the MIDI IN and MIDI THRU ports as shown in **Figure 5.1**. The MIDI THRU port sends an unprocessed replica of the signal received at the MIDI IN port.

The MIDI OUT port can be used to retrieve the MD24 configuration via MIDI SysEx message. See *MD24 Firmware User Manual*.

Remote MIDI connectors can be used instead of the on-board MIDI connectors. Wire MIDI receptacles as shown in **Figure 5.2**. Pin 2 is wired only at the OUT or THRU side of the MIDI link. Pins 1 & 3 are unused. Remote MIDI connectors can not be used simultaneously with the on-board MIDI connectors. See **Figure 5.3**.

Figure 5.1: MIDI IN and MIDI THRU

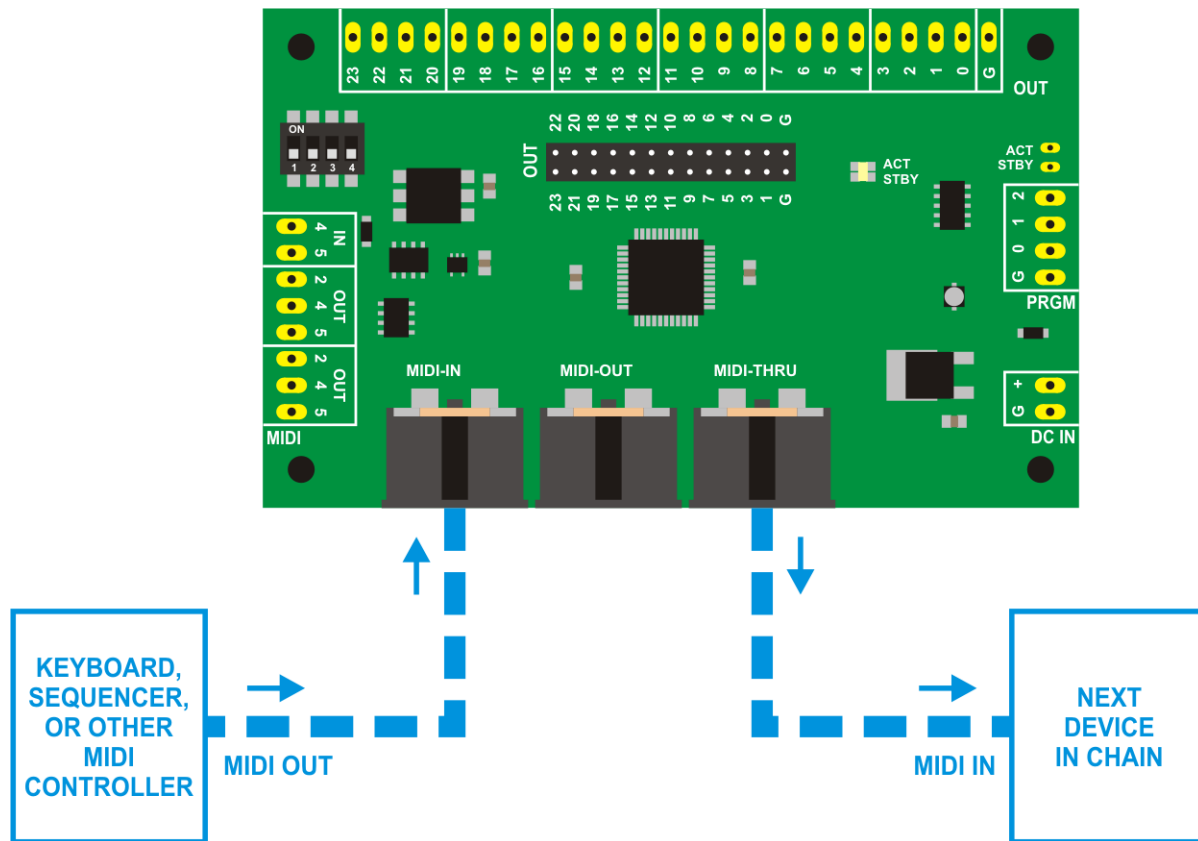
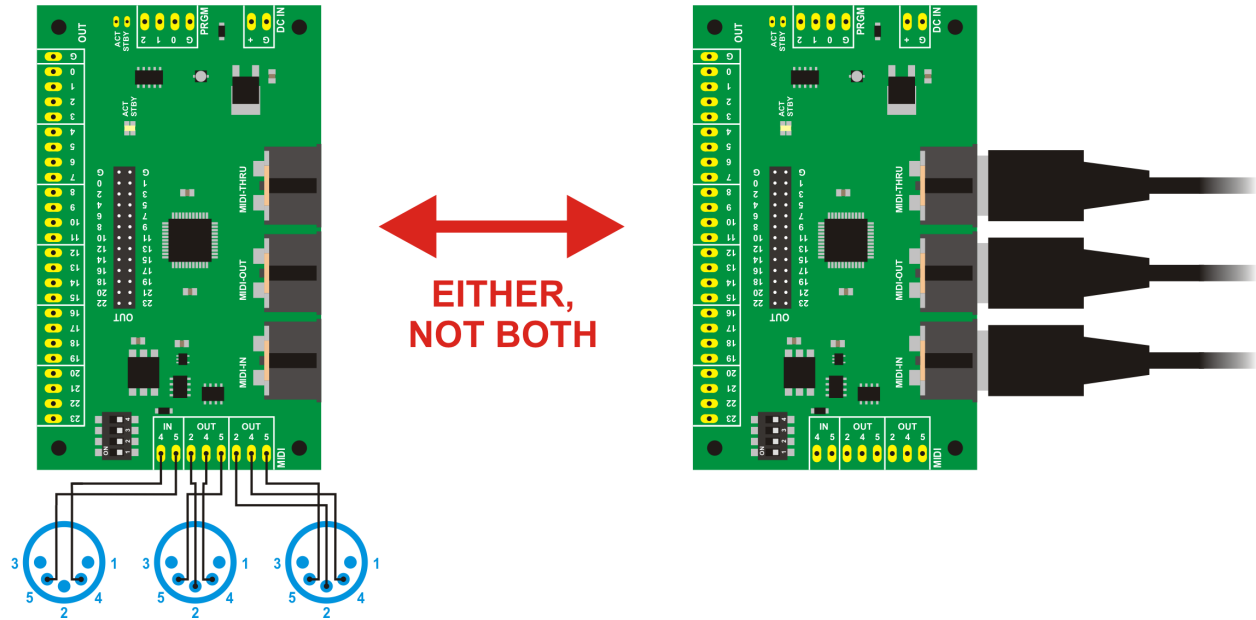


Figure 5.3: On-Board vs. Remote MIDI Connectors

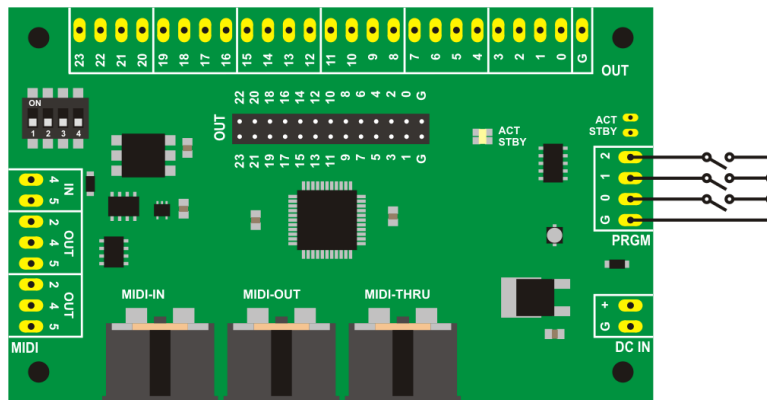


6.0 Program Switches

User-supplied “program” switches can be attached as shown in **Figure 6.1**.

If supported by firmware, a program switch can activate “learn mode” and other programming features of the MD24. Use normally-open momentary switches. See *MD24 Firmware User Manual* for additional details.

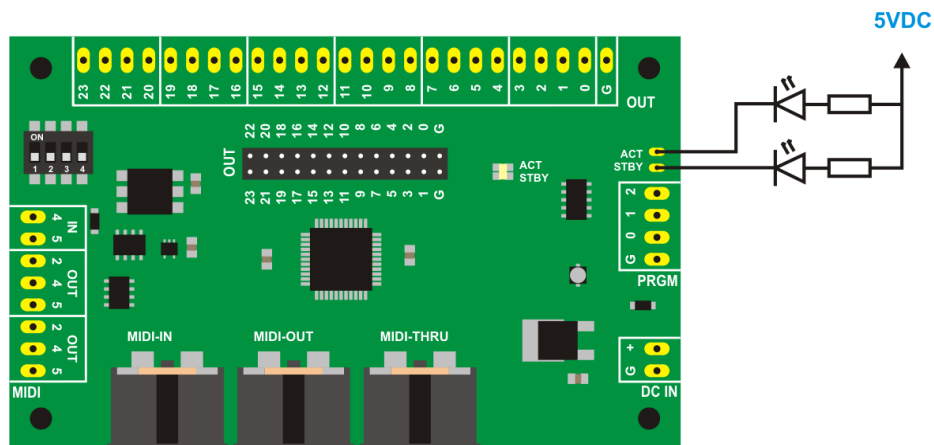
Figure 6.1: Program Switch Wiring



7.0 Remote ACT/STBY LEDs

The MD24 features on-board ACT/STBY LEDs. User-supplied remote ACT/STBY LEDs can be attached as shown in **Figure 7.1**. Limit the current thru each LED to 10mA.

Figure 7.1: Remote ACT/STBY LED Wiring



8.0 Outputs

8.1 Electrical Specifications

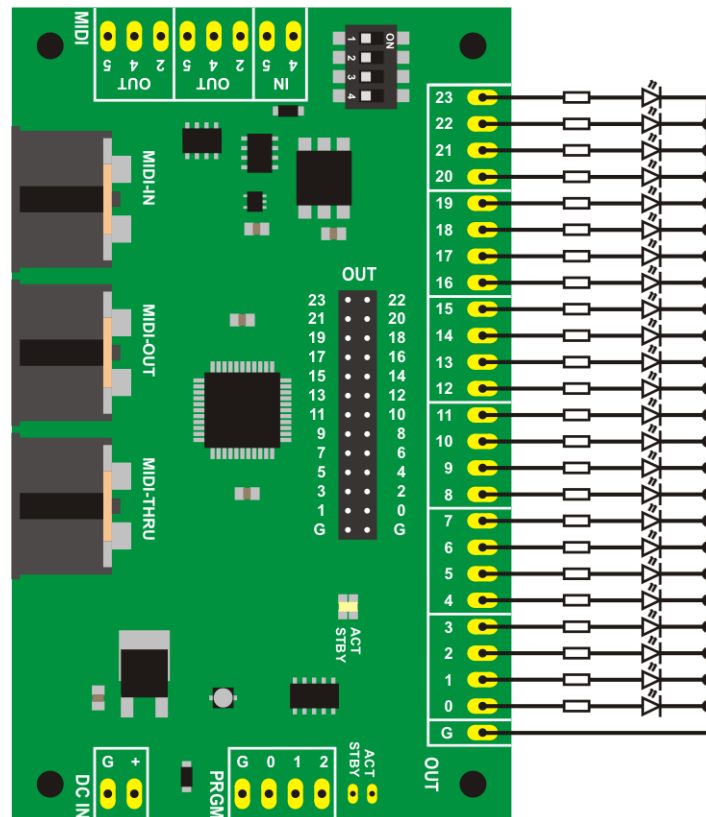
- 5V DC output, CMOS & TTL compatible
- Maximum aggregate output current source/sink per MD24: 200mA
- Maximum source/sink current per output: 25mA

8.2 Logic Wiring

Each MD24 output can be configured as a 5V “logic mode” output. See *MD24 Firmware User Manual* for details. A logic mode output can be connected to CMOS or TTL logic inputs, can be used to power LEDs, or can trigger other devices requiring a 5V signal.

Figure 8.1 shows a circuit which uses an LED to indicate the state of each MD24 logic mode output. The value for current-limiting resistors will depend on choice of LED (1.0kΩ is typical).

Figure 8.1: LED Output Wiring



8.3 Servo Wiring

Each MD24 output can be configured as a “servo mode” output. A servo mode output generates a 5V pulse width modulation (PWM) servo control signal. See *MD24 Firmware User Manual* for more details.

A servo has three leads: ground, power input, and control input (“signal”). Each lead is identified by color: ground is usually black, blue or brown; power input is usually red; and signal is usually white, yellow, or orange. Exact colors vary by servo brand and model.

MD24-to-servo wiring is shown in Figure 8.2. Output #18 is used as an example, but the circuit can be connected to any servo mode output. Repeat as needed for each servo/MD24 output pair.

The MD24 provides only the control signal. The power supply for the servo must be provided separately. See the documentation provided by the servo manufacturer for power supply requirements. Most RC servos will operate using a 5VDC or 6VDC power source.

Figure 8.2: Servo Output Wiring

