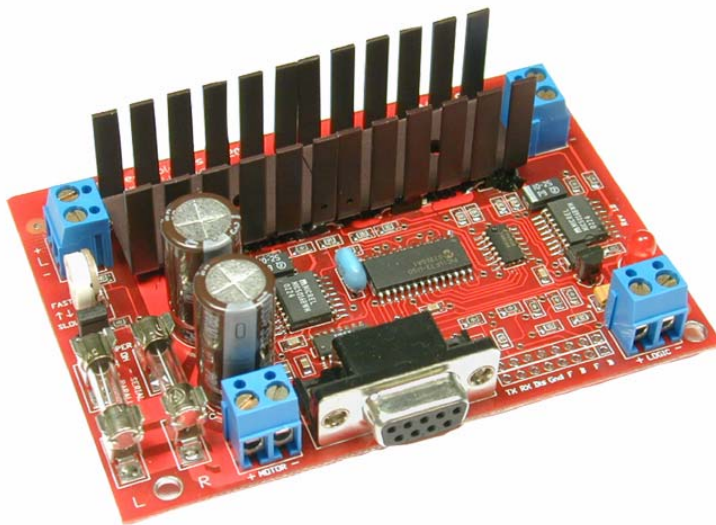




## DMC-8 (SKU#ROB-01-007)



**Dual Bi-Directional 8-Amp Motor Controller**

- Selectable serial or parallel interface
- Use with Microcontroller or PC
- Controls 2 DC motors
- For 5–24 Volt Motors
- 8 Amps per channel
- Windows software included
- Fuse protection



The DMC-8 allows the user to control the direction and speed of two DC motors from a microcontroller or a PC. Each channel is capable of delivering up to 8 amps.

**CAUTION:** The DMC-8 is designed for DC motors with a nominal voltage of 5 to 24 VDC. It is capable of controlling 96 Watts of power per channel. At a motor voltage of 12 Volts, this means 8 amps of current (per channel). At 24 Volts, this drops to 4 amps/channel. Figure 1 shows the relationship between motor voltage and current..

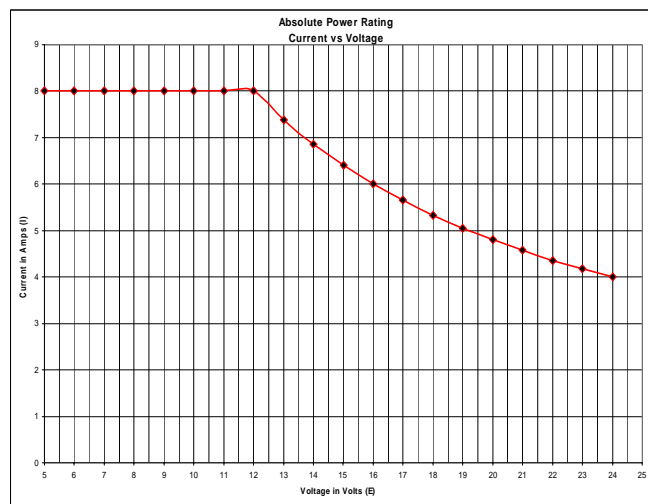


Figure 1 - Voltage vs Current

### Motors

Motors are inductive devices; they draw much more current at startup than when they are running at a steady speed. Before connecting a motor to the DMC-8 ensure that you know:

- What voltage it is designed to work at
- How much current it draws when running (unloaded) at that voltage
- How much current it draws at stall.

**CAUTION:** The DMC-8 is a DC motor controller. Never connect an AC motor or AC power to the DMC-8.

## User Interfaces

There are 3 ways to control the DMC-8. Which one you choose will depend on your application (PC, microcontroller or manual control).

**RS-232 Serial:** This interface uses the DB-9 connector of the DMC-8. Use it to connect to a PC running the Windows software or other program of your choice (HyperTerminal etc.). It may also be used to connect to a microcontroller or another device with an RS-232 interface (9600, 8N1). You may also use the DMC-8's Windows software ( 9x/ME/2000/XP) which is available for download from [www.hvwtech.com](http://www.hvwtech.com) to control the DMC-8 from a PC. To select the RS232 interface, the jumper (marked "Jumper", between the fuses and the speed control potentiometer) must be installed (default).

**TTL Serial:** This interface uses the TX connection on the PCB, located next to the DB-9 connector (RX & Dis are not used). This interface is intended for direct connection to a microcontroller pin (9600, 8N1). To select this interface, the jumper (marked "Jumper", between the fuses and the speed control potentiometer) must be installed (default).

**CAUTION:** TTL (0 to +5 VDC) signals ONLY.

**TTL Parallel:** This interface is ideal for manual control of the motors via switches or other form of contact closure. It may also be used with a microcontroller if desired. Grounding an input pin will cause the corresponding motor function to be active. Example. Grounding the "F" input of the left motor will make the left motor move forward To select the parallel interface, the jumper (marked "Jumper", between the fuses and the speed control potentiometer) must be removed.

**CAUTION:** TTL (0 to +5 VDC) signals ONLY.

## Connecting Power

The DMC-8 has both a motor and logic power terminal block. The motor power terminal block can be supplied with 5 - 24 volts DC to power the motors. The logic power terminal block can be supplied with 6 - 12 volts DC (this voltage is used to provide a regulated 5 Volts to the microprocessor and PWM drive circuitry). (see figure 2).

## Connecting Motors

Located on either side of the DMC-8 are terminal blocks that are used to connect the motors. The terminals are labeled with an "L" & "R" for Left and Right motor channels (see figure 2).

When connecting the motors to the terminal blocks, use the heaviest

wire that is practical. The thicker the wire, the less the voltage drop and the more power is delivered to the motor. A minimum of 18 gauge stranded wire is recommended.

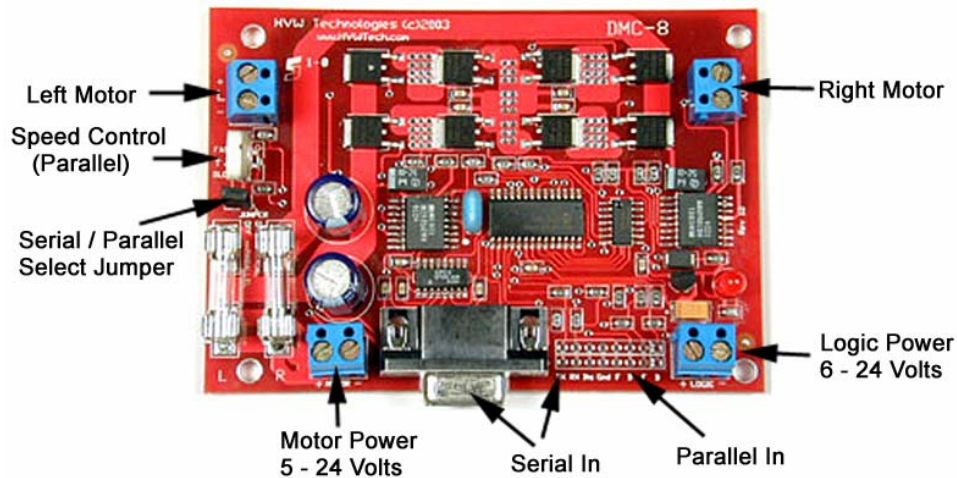


Figure 2 - The DMC Circuit Board Layout

### Controlling Motor Speed

The DMC-8 uses Pulse Width Modulation (PWM) to vary the speed of the motors. The greater the duty cycle, the greater the DC voltage that will be sent to the motors. There are 10 speed settings available.

The serial interfaces control the duty cycle by sending commands to the on-board processor. In serial modes, the speed potentiometer has no effect.

The parallel TTL interface uses the potentiometer located in between the left motor connector and jumper terminal (see figure 2). Turning the potentiometer will vary the duty cycle. To set the motor speed for parallel interface applications, engage one of the motors by grounding its "F" or "B" control line. With the motor(s) running, adjust the Parallel Speed Control potentiometer until the desired speed is achieved.

### Serial Interface Command Set

Serial communication with the DMC-8 is done at 9600 baud, 8 data bits, no parity, and 1 stop bit (9600-8N1) for both the RS-232 and TTL serial interfaces..

Command	Parameter	#
FF#	Both Motors Forward	0-9 (0=Stop; 9 = Full Speed)
BB#	Both Motors Reverse	
LF#	Left Motor Forward	
LB#	Left Motor Reverse	
RF#	Right Motor Forward	
RB#	Right Motor Reverse	
STP	Stop Both Motors	N/A
SLT	Stop Left Motor	
SRT	Stop Right Motor	
ABT	Abort Current Command and Reset Motor Controller (all motors stopped)	

Table 1- Serial Command Set

Parallel Interface Commands

The parallel TTL interface can be used to control the DMC-8 with a microcontroller, switches or other form of low-current contact closure.

To control a motor, ground that motor's "F" (Forward) or "B" (Backward) line. To stop, drive the line high, or let it float (the control lines are pulled-up internally).

Condition	F	B
Motor off	1	1
Motor forward	0	1
Motor reverse	1	0

Table 2 - Parallel Interface Truth Table

### Advanced Features

#### Ramping Delay

When you command the DMC-8 to change the speed of a motor, the on-board processor increases or decreases the pulse width. Between each change, there is a small 'ramping delay' to allow the motor to react to the new voltage. The default ramping delay is 100 ms. In some applications –particularly where heavy loads are involved– the motors need more time to speed up or slow down.

The ramping delay can be adjusted between 50 and 900 ms to suit the application. To alter the ramping delay, use the command TR# (where # is a number between 0-9). Eg. TR5 would set the delay to 500 ms. Table 3 shows the numbers and the corresponding delay.

#	0	1	2	3	4	5	6	7	8	9
Ramping Delay (ms)	50	100	200	300	400	500	600	700	800	900

Table 3 - Ramping Delays

Specifications (@25°C)

Parameter	Min	Typical	Max	Unit
Motor Supply Voltage	3	12	24	V
Logic Supply Voltage	4.5	6	12	V
Logic Supply Current	23	30	30	mA
Parallel Interface Signal Voltage	0	5	5.5	V
Parallel Interface Source Current	0.45	0.5	0.55	mA
Motor Current (continuous)	-	-	8	A
Motor Current (peak) max. 100 ms, non-repeating	-	-	10	A
Power Dissipation (per channel)	-	-	96	W
PWM Switching Frequency	-	20	-	KHz
Fuse (Fast Acting 5x20mm)	8			A

Technical Support

Technical support is available via email and phone. If you need help, please provide as much detailed information as possible.

E-mail: [Support@HVWTech.com](mailto:Support@HVWTech.com)

Phone: (403) 730-8603 (Monday - Friday 9am – 5pm Mountain time)

**\*\* Please contact us *before* sending a DMC-8 for repair ! \*\***

## Motor Control Made Easy !



Control 2 DC motors (up to 8 A each) with a microcontroller or PC  
Controls speed and direction

Windows software included

### Other Motor Control Products from HVW Technologies

**L298 Kit:** A simple, inexpensive, 2 A per channel H-Bridge

**Mini SSC:** Control up to 8 servo motors via a serial link

**Little Step U:** A unipolar stepper motor with many advanced features

Also: Motor Driver Kits • IR Sensors • Compilers • PIC Programmers  
and Proto Boards • FPGA Programmers • Robotics Kits/Parts...

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