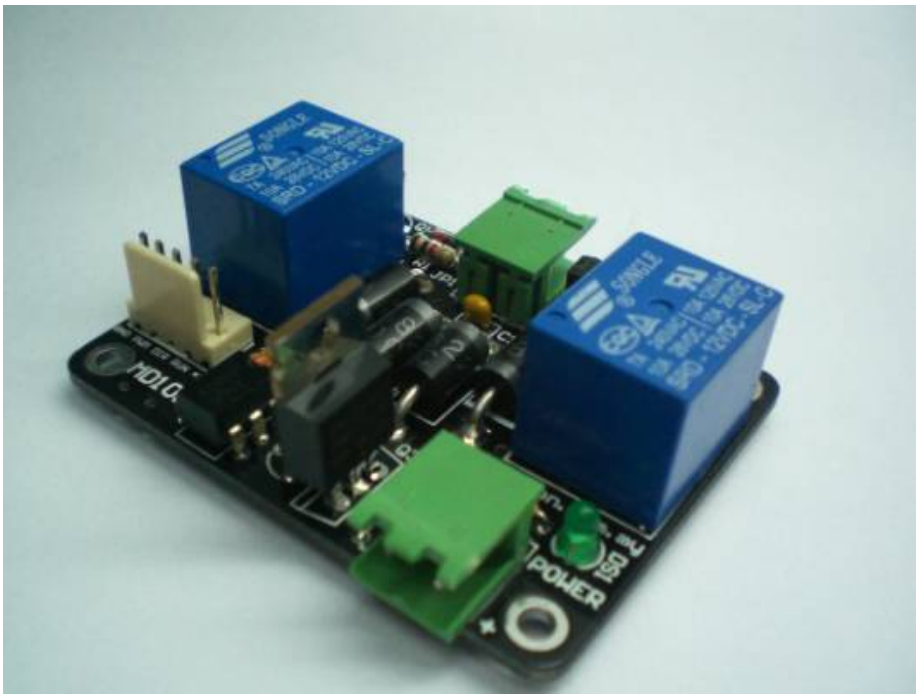
MD10B

Enhanced 10A Motor Driver



User's Manual

V1.0

August 2008

Information contained in this publication regarding device applications and the like is intended through suggestion only and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. No representation or warranty is given and no liability is assumed by Cytron Technologies Incorporated with respect to the accuracy or use of such information or infringement of patents or other intellectual property rights arising from such use or otherwise. Use of Cytron Technologies's products as critical components in life support systems is not authorized except with express written approval by Cytron Technologies. No licenses are conveyed, implicitly or otherwise, under any intellectual property rights.

Index

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

1. INTRODUCTION AND OVERVIEW

MD10B is an enhanced version of MD10A. It is designed to drive high current brush motor or application. It is designed for wide range of robotics and automotive applications. The board incorporates most of the components of the typical applications. With minimum interface, the board is ready for plug and play. Simply add in power, this driver is ready to drive high current motor.

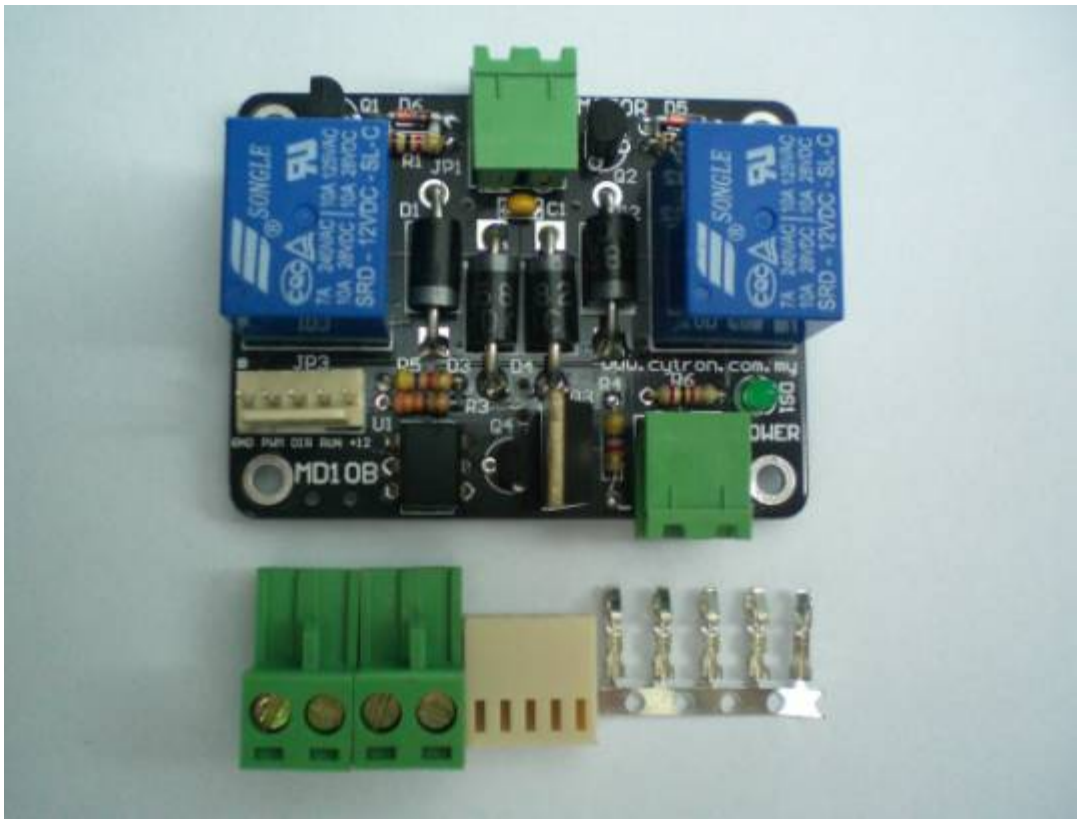
It has been designed with capabilities and features of:

- Industrial grade PCB with heavy copper material for **high current applications**
- Each component is soldered properly and tested
- Support up to **10A maximum**
- 5V logic level compatible inputs
- 12V as V_{cc}
- PWM speed control up to **10KHz**
- Bi-directional control for 1 motor
- Very low standby power consumption
- System ground is isolated from motor's power source using opto-isolator
- 4 Schottky diode as clamping diode

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

2. PACKAGING LIST

Please check the parts and components according to the packing list. If there are any parts missing, please contact us at sales@cytron.com.my immediately.



1. 1 x MD10B
2. 1 x 2510 5 ways female connector pin.
3. 5 x 2510 iron pins.
4. 2 x terminal block

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

3. PRODUCT SPECIFICATION AND LIMITATIONS

Pin Function Description

Label	Definition	Function
Power	Battery Input	Power source for motor. It can be as low as 5V and as high as **19V**. The driver does not have protection against wrong polarity on power input, thus user must be careful during providing power source to this driver. Please follow (+) and (-) marker on the PCB for the correct polarity.
Motor	Motor Terminal	Terminal for motor connection.
12V	Operating supply	Input for driver logic operation. User should provide 12V
CW	Clock Wise	Voltage controller input pin. These two pins control the state of the relay in normal operation according to the truth table 4.1 (brake, clockwise and counterclockwise).
CCW	Counter Clock Wise	
PWM	Pulse Width Modulation	Voltage controlled input pin. This pin is isolated using opto-isolator. It will control the onboard MOSFET to ON and OFF further control the speed the motor.
Gnd	Ground	Logic ground signal. Internally separated from Power's ground

Absolute Maximum Rating

Symbol	Parameter	Value	Unit
V_{in}	Motor supply voltage	19	V
V_{cc}	Operating voltage	12	V
I_{max}	Maximum Output Current (continuos)	10	A
I_R	Reserve Output Current (continuos)	10	A
I_{in}	Logic Input current (CW/CCW)	20	mA
I_{pw}	PWM Input Current	20	mA
T_c	Case Operating Temperature	-0 to 80	°C
T_{STG}	Storage Temperature	-40 to 100	°C

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

Electrical Characteristics

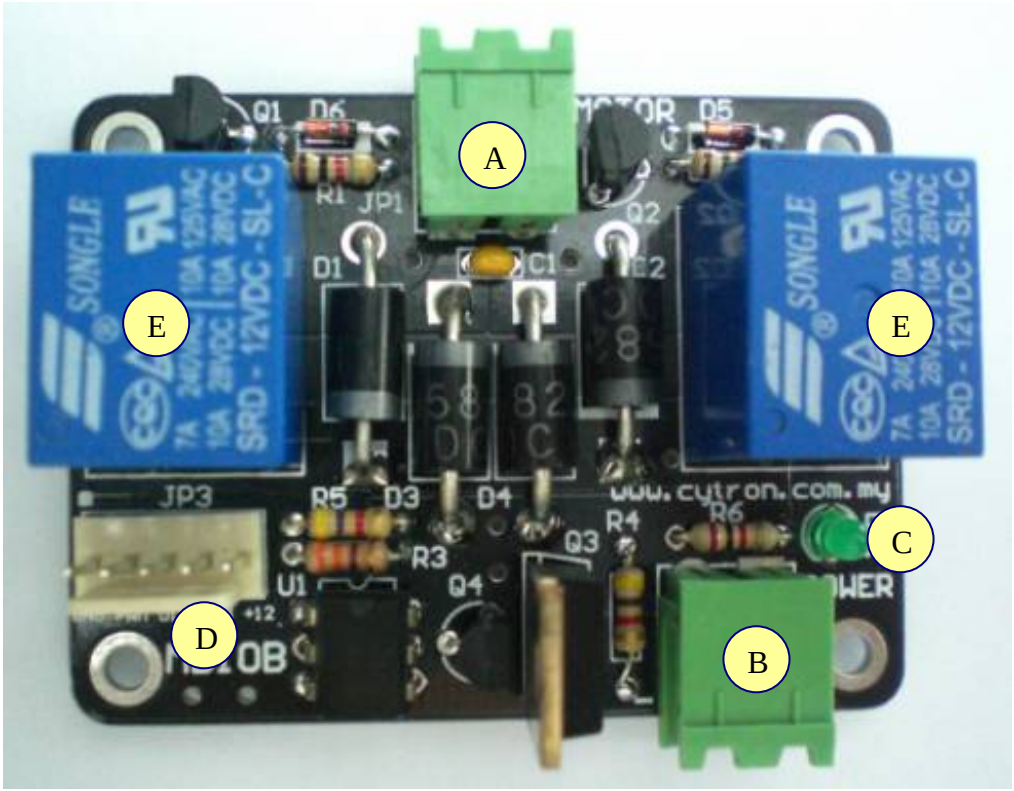
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Power	Motor supply voltage		5	12	19	V
12V	Operating supply voltage		10	12	14	V
f	PWM frequency		0		10	KHz
V_{pwl}	PWM low level voltage				1.0	V
V_{pwh}	PWM high level voltage		4.0			V
$V_{CW/CCWL}$	CW input low level voltage				1.0	V
$V_{CW/CCWH}$	CW input high level voltage		4.0			V

Truth Table in Normal Operating Condition

CW	CCW	Motor(+)	Motor(-)	Comment
1	1	H	H	Brake to Power (+)
1	0	H	L	Clockwise
0	1	L	H	Counter Clockwise
0	0	L	L	Brake to Power (-)

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

4. BOARD LAYOUT



Label	Function
A	Connector for motor.
B	Connector for power supply.
C	On board power supply indicator LED. It is green color.
D	5 ways header pin for external connection.
E	Relay

A – Connecter for motor.

B – Connector for power supply.

C – Power supply indicator LED. It is green in color. Once power is inserted to the board, this LED will turn ON.

D – 5 ways header pin for external connections. If this kit is connected to microcontroller board, it should be powered with 12V. Please refer to hardware installation for detail connection.

E – Relays are used as switch to change the direction of motor (clockwise or anticlockwise).

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

5. INSTALLATION (HARDWARE)

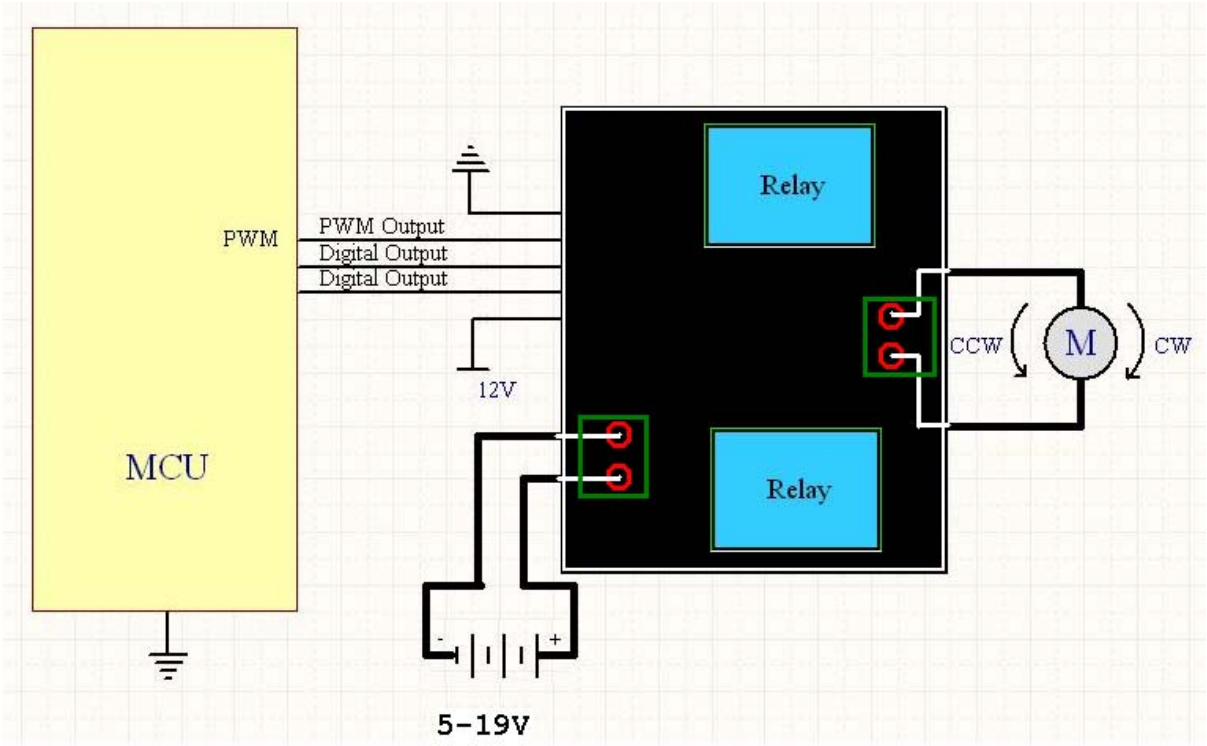
5.1 Connecting Battery and Motor

In a typical application, the motor power supply (battery) should be soldered to connector provided. The control pin come with connector and is ready for user to interface with wire.

12V should be supplied (to12V pin) for this driver for logic operation. CW and CCW control the activation and direction of the motor, while the PWM pin turns the motor on or off for speed control. CW and CCW will activate the on board relay. Thus providing 5V using a switch or relay to these 2 pin can turn on the relays further drive the motor. As for PWM pin, user may provide a constant 5V to it if no speed control is required.

5.2 Connecting to Microcontroller

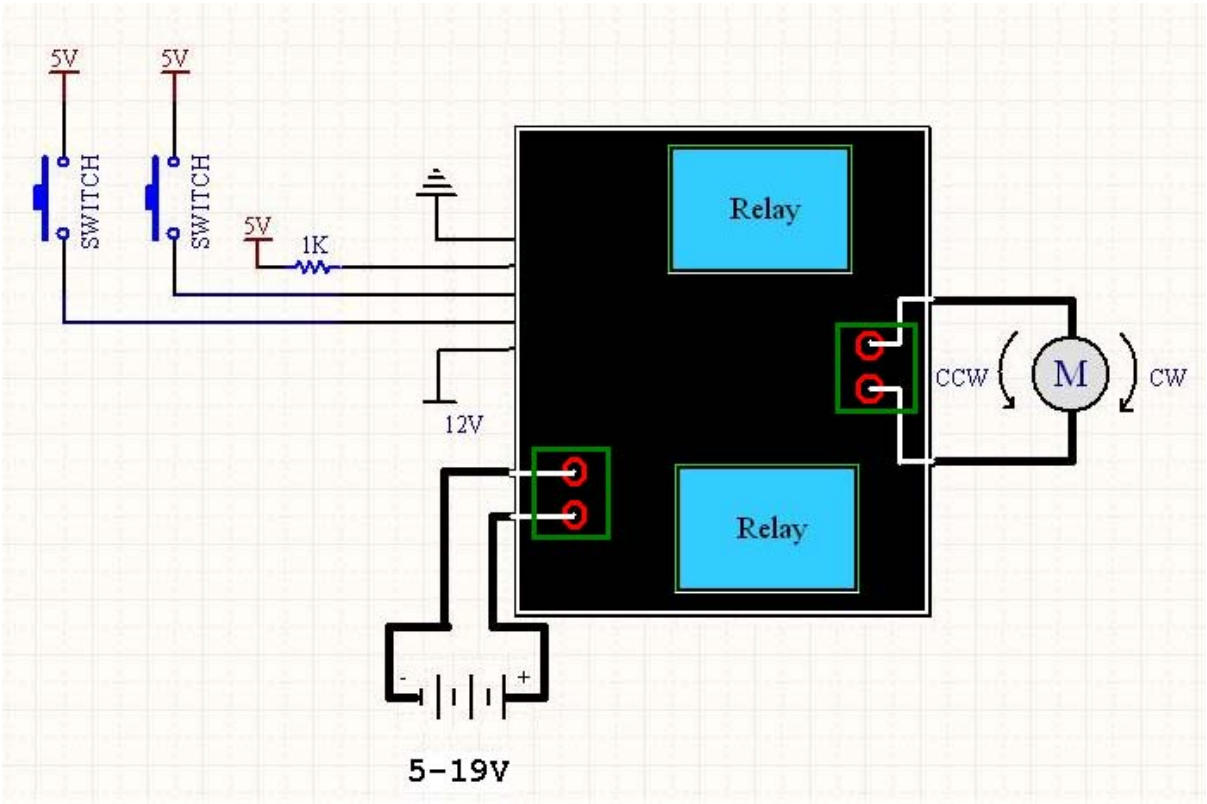
Typical Application Circuit for DC to 10KHz PWM Operation



Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

5.3 Connecting to switches (without microcontroller)

Typical Application Circuit using switches (no speed control)



5.4 Reverse-battery

The motor driver boards do not have any protection against reverse-battery. If user connects the battery or power source wrongly it will damage the on board clamping diode and further burn the driver. Thus please be careful during making connection.

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

6. GETTING STARTED

For this section, MD10B will be interface with PR10. Please refer PR10, DIY project from Cytron website for details example using MD30B. PR10 shows the method using MD10A; however MD10B have been designed to be compatible to MD10A, user may refer to this project. This DIY project also shows the method to writing program to use MD10B. Link to PR10 is http://www.cytron.com.my/PR10.asp

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved

7. WARRANTY

- Product warranty is valid for 6 months.
- Warranty only applies to manufacturing defect.
- Damage caused by mis-use is not covered under warranty.
- Warranty does not cover freight cost for both ways.

Prepared by
Cytron Technologies Sdn. Bhd.
19, Jalan Kebudayaan 1A,
Taman Universiti,
81300 Skudai,
Johor, Malaysia.

Tel: +607-521 3178
Fax: +607-521 1861

URL: www.cytron.com.my
Email: support@cytron.com.my
sales@cytron.com.my

Created by Cytron Technologies Sdn. Bhd. – All Rights Reserved