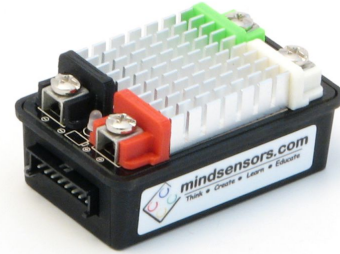## What is SD540B ?

SD540B is a smart motor controller to control high current DC motors with roboRIO. There are several variants of SD540B, as follows:

SD540Bx1

SD540Bx2 (bank of 2 model)
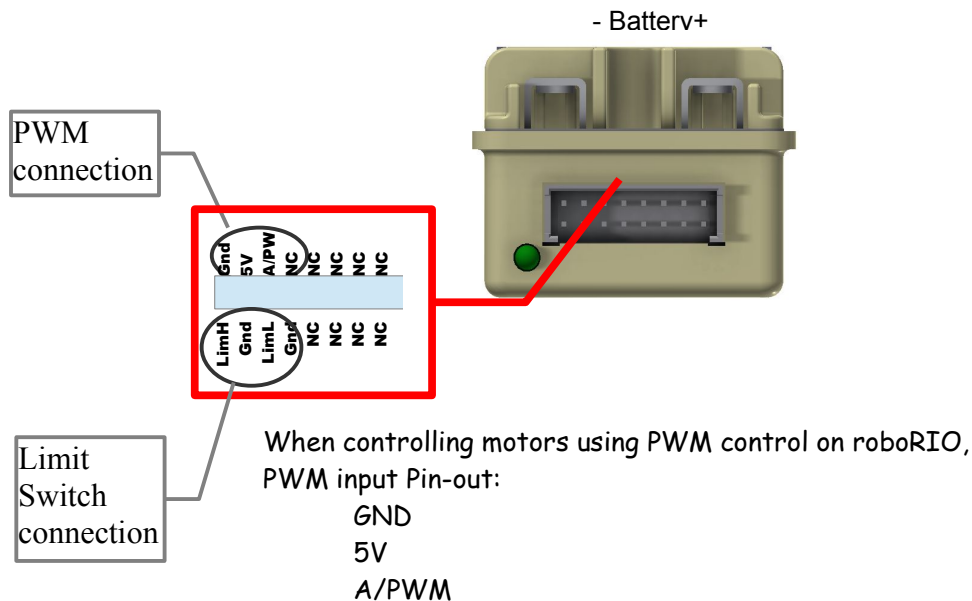
SD540Bx4 (bank of 4 model)

Unless specifically mentioned, the information from this guide applies to all models.
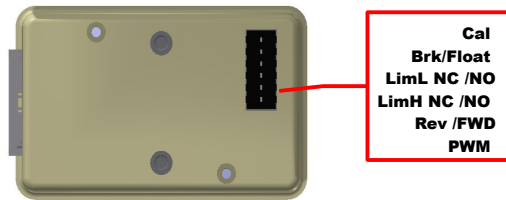
Connections and Placement

SD540B can be connected to roboRIO's PWM outputs to control any DC motor.

One CIM or any high power motor can be connected to SD540B through the screw in terminals.

- Battery+

PWM connection

Gnd 5V A/PW NC NC NC NC

LimH Gnd LimL Gnd NC NC NC NC

Limit Switch connection

When controlling motors using PWM control on roboRIO, PWM input Pin-out:

GND

5V

A/PWM

Input power should be connected to the power screw-in terminals of the device.

Cal
Brk/Float
LimL NC /NO
LimH NC /NO
Rev /FWD
PWM

Mounting SD540B on your Robot

There are screw holes on the on the bottom side of your SD540B.
Recommended screws:
Thread size: 6-32
Length: 1/4" (for 1/8" substrate, adjust your screw length based on your substrate thickness)
Hole spacing: 1" (for single unit)
2 1/2" (for bank of 2 model)
5 1/2" (for bank of 4 model)

DIP Switches

Configure Switch option

There are six dip switches at the bottom of Device. You can use these to quickly change the behavior of SD540B to tune your robot design. REV switch can change the direction of the motor rotation and role of High and Low limit switches.

LimH NC/NO and LimL NC/NO can change the behavior of Limit switch from Normally open to Normally Close.

Brake /Float can brake or float the motor in pwm dead band or in case loss of pwm signal.

Calibrate switch can be used to calibrate the pwm signal.

This switch is also used for firmware upgrade – read more about it here: http://www.mindsensors.com/blog/how-to/how-to-upgrade-firmware-of-sd540-motor-controller-for-frc

PWM Calibration

The SD540B is calibrated at factory for roboRIO signals, so if you are using it with roboRIO, you don't need to calibrate it.

If you plan to use it with a different controller, please write to us for calibration instructions at: support@mindsensors.com.

LED Indicator

There are three LED indicators on Device. Power LED will turn Red when power is connected. Motor LED is Red in forward direction, Green in Reverse Direction. PWM signal LED will be Red if no valid pwm signal is detected, however, it will turn Green as soon as valid signal is detected.

Supplying power to your SD540B

The SD540B has a two screw-in lug connections on one side marked with battery symbol. Connect your 12V battery to these connectors.

⚠

NOTE

SD540B is rated for external power supply of 9.2V min to 18V DC max. Do not exceed 18 volts DC. While connecting external battery, ensure correct polarity.

Current Characteristics

Average current delivered to motor is 60Amp. However Peak current for 2sec duration can be as high as 100Amp.

Programming for SD540B

SD540B uses PWM signal to operate motors, any library that provides PWM API will work with SD540B.
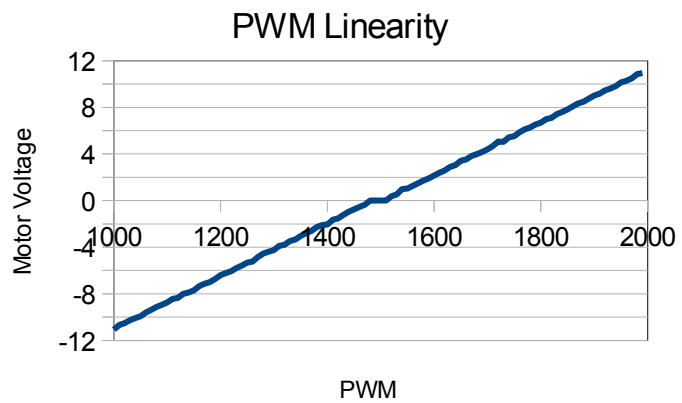
PWM Characteristics

PWM Signal requirement

PWM pulse of 1000uS to 2000us with center at 1500us is valid pulse for the device.

PWM Current Requirements

PWM input Signal should be 5V 2mA

Output Characteristics

Output Voltage

PWM Linearity

Voltage delivered to motor is linear with the PWM duty cycle. Dead band around 1500us is around 4 % of the total PWM span.

Output switching frequency
15.6 kHz