

What is SD540C ?

SD540C is a smart motor controller to control high current DC motors with roboRIO. There are several variants of SD540, this document refers to the one controlled over CAN and introduced in the 2017 FRC season.

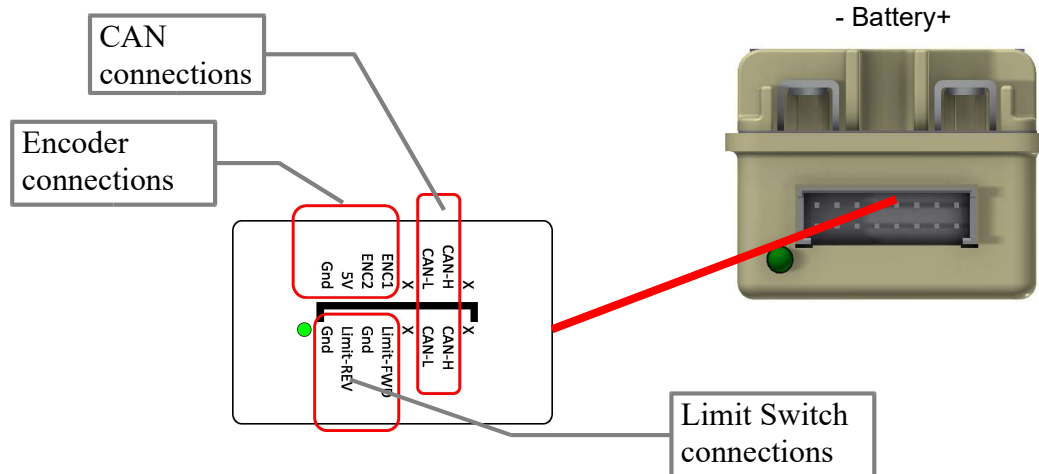


Connections and Placement

SD540C can be connected to roboRIO's CAN port. We suggest the mindsensors CAN Splitter to simplify using multiple CAN devices:

<http://www.mindsensors.com/frc/184-splitter-for-can-network>

One CIM or any high power DC motor can be connected to SD540C through the screw in terminals.



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

Mounting SD540C on your Robot

There are screw holes on the on the bottom side of your SD540C.

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)

Supplying power to your SD540C

The SD540C has a two screw-in lug connections on one side marked with battery symbol. Connect your 12V battery to these connectors.



NOTE

SD540C 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.

LED Indicators

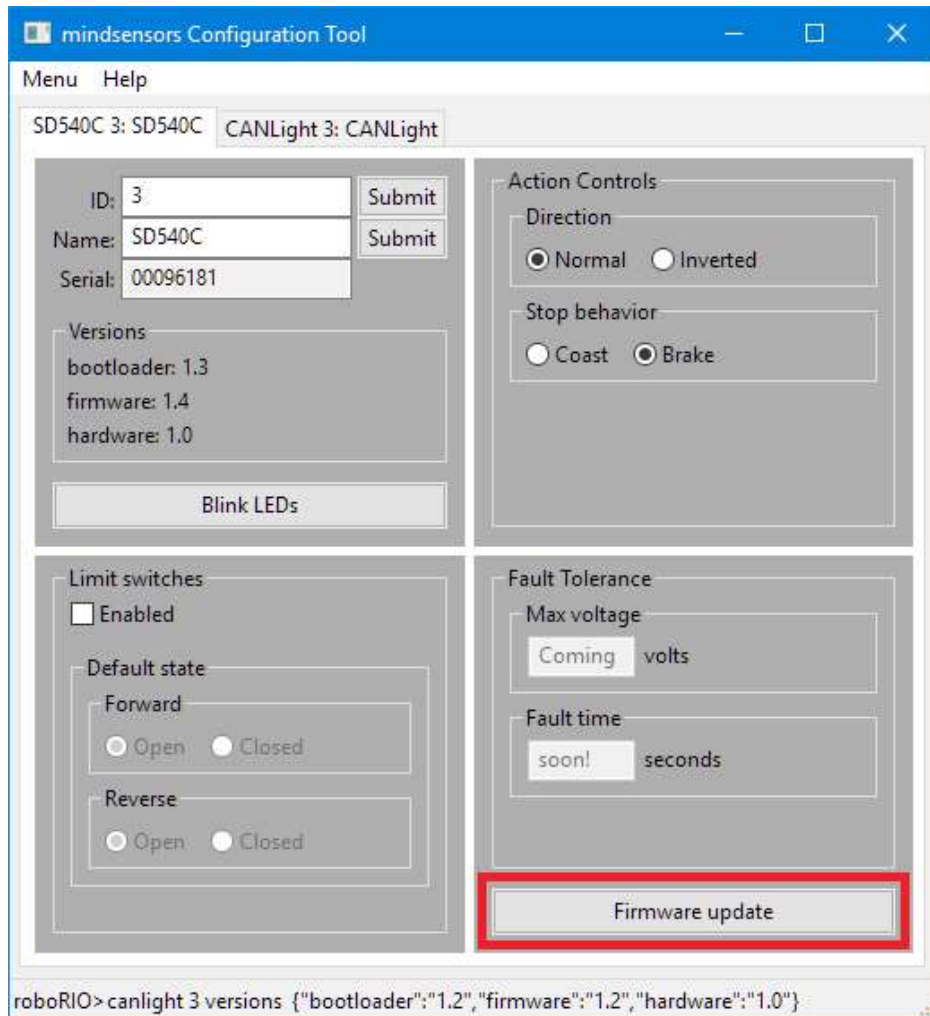
There are three LED indicators on Device. Power LED will turn Red when power is connected. Motor LED is Red in forward direction, Green in Reverse Direction.

The status LED is next to the pinout. The red and green components will blink together quickly (about 5 times per second or 300 BPM) if it detects no connected CAN devices. The LED will be off if it is connected to the roboRIO and the roboRIO is connected to the driver station. Please note the LED will also be off if the SD540C does not have power.

Configuration using the mindsensors Configuration Tool

The mindsensors Configuration Tool can be used to change the parameters of your SD540C devices and CANLights. This includes changing the ID, name, limit switch settings, invertedness, and stop behavior. It will also allow you to update firmware. Read more on how to download and use this tool on our blog post:

<http://www.mindsensors.com/blog/how-to/using-the-mindsensors-configuration-tool>



Programming for SD540C

SD540C uses the mindsensors FRC library. This will allow you to program the SD540C in Java, C++, and LabVIEW. Read our blog post for information on downloading and installing the library, along with some example programs: <http://www.mindsensors.com/blog/how-to/how-to-use-sd540c-and-canlight-with-roborio>

Online API Reference:

Java:

<http://www.mindsensors.com/reference/FRC/html/Java/>

C++:

http://www.mindsensors.com/reference/FRC/html/C++/classmindsensors_1_1_c_a_n_s_d540.html

CAN Characteristics

This product will only function with the National Instruments roboRIO using the libraries developed in the "Device Library" framework. <http://www.firstinspires.org/robotics/frc/blog/2017-control-system-update>

Its security features and communication were designed specifically for the NI roboRIO.

Features and Specifications

No deadband, motor voltage proportional to speed set in API

Load capacity: 60 amps continuous, 100 amps peak

Passive Cooling

Bidirectional Limit Switches

Power, Direction and Status Indicator LEDs

Field Upgradable Firmware

Weight: 2.3 oz (65 grams)

Dimensions: length: 2.7", width: 1.6", height: 1.2"

Product Page

<http://www.mindsensors.com/frc/183-sd540c-can-based-motor-controller-for-frc>

Note

Closed loop Control feature is not available in firmware at this time. However, you can upgrade firmware of your device to use those features as soon as the firmware is available.