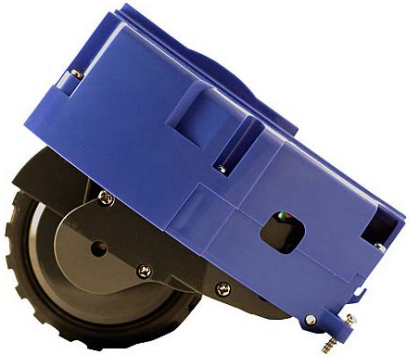


Roomba Wheel Hack Instructions

Overview

This is a Roomba® wheel module:



It can easily be removed from the robot chassis by removing 3 screws on each side:

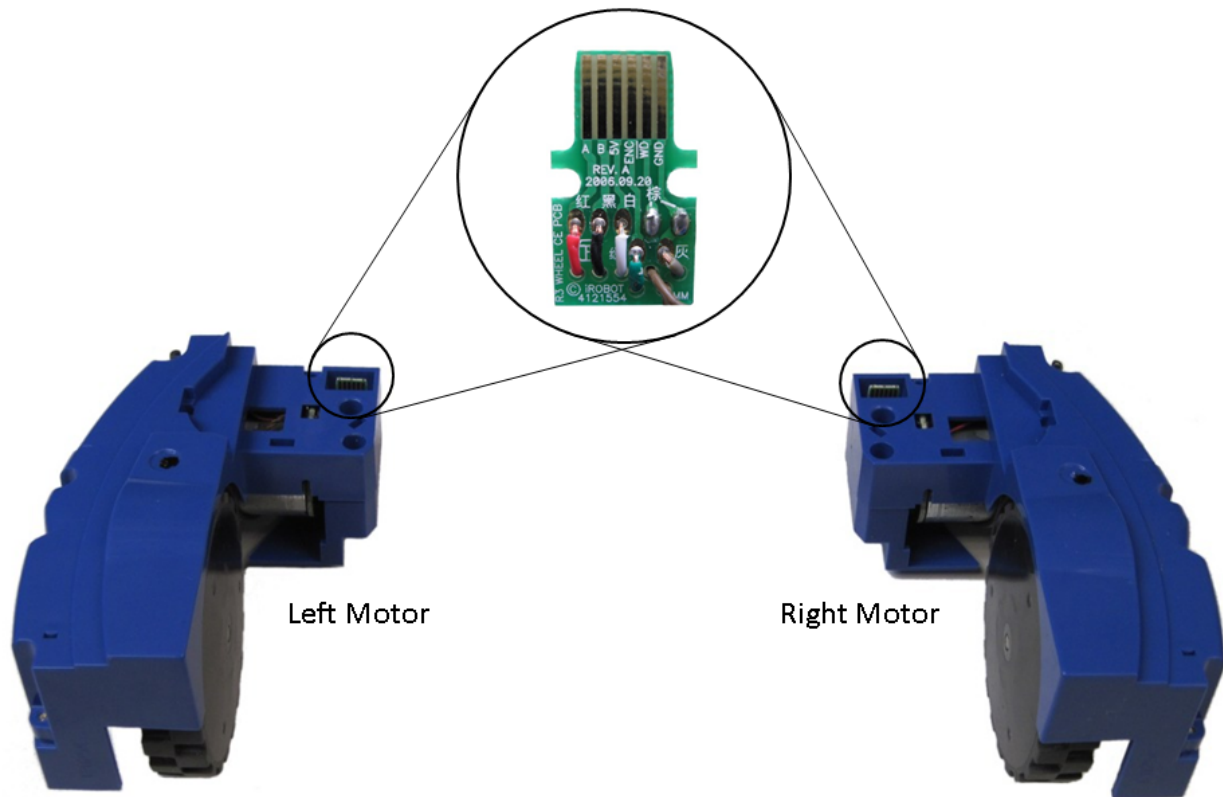


Each wheel module has a simple electrical interface with these features:

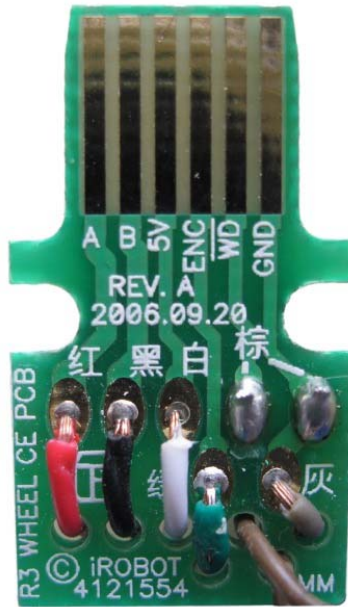
- Incremental encoder
 - Square wave, (not quadrature)
 - 508.8 transitions per wheel revolution. (Hall effect sensor monitors on a disk with 8 North/South transitions per motor revolution, and there is a 63.6:1 gear ratio between motor and wheel.)
- “Wheel drop” sensor
 - Wheel up (driving robot) → short to ground
 - Wheel down (robot lifted) → open circuit

- Motor terminals
 - This motor is safe to run continuously at 18V

The connector is not mirrored. So the “A” motor terminal contact is on the left side of the board in each module:



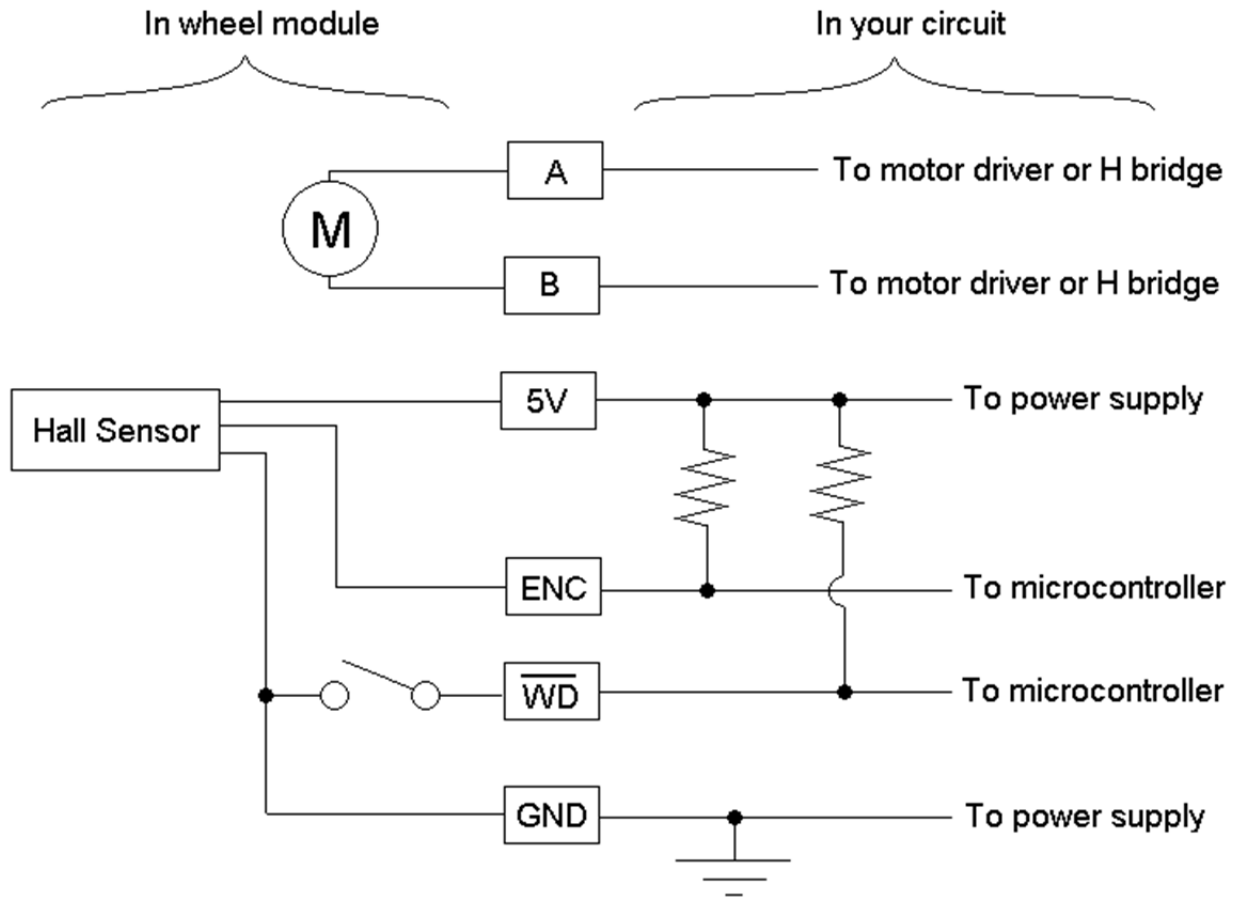
Here is a close-up of interface board. As you can see, it is silk-screened for convenience. Each conductor is also duplicated on the back side of the board.



Pin-out

Pin	Description
A	Motor terminal 1
B	Motor terminal 2
5V	Power for hall effect sensor
ENC	Hall effect sensor (requires pull-up resistor)
WD	Wheel drop switch (requires pull-up resistor)
GND	Common ground

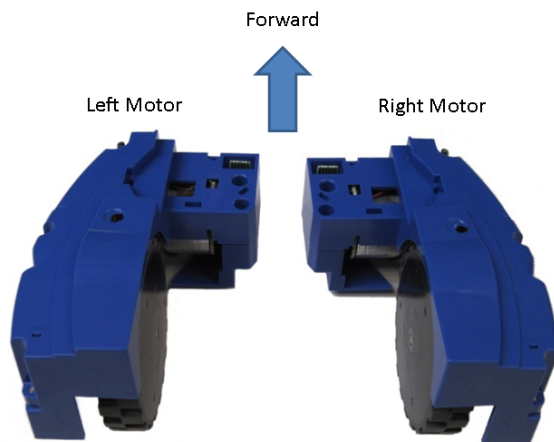
Recommended Circuit



Orientation




This is the required polarity to drive a robot forward with the motors in this orientation.

Left Wheel		Right Wheel	
Pin	Polarity	Pin	Polarity
A	+	A	-
B	-	B	+



Connector

Any of these connectors should work. However, if you are soldering wires directly on the pins, the S3364-ND part with staggered through hole pins is probably the easiest to use.

Digikey part number:	Manufacturer:	Mounting type:	Image
S3363-ND	Sullins Connector Solutions: RBB06DHFR	Surface mount with board lock	 A black surface-mount connector with six pins on the top and a board lock on the side.
S3364-ND	Sullins Connector Solutions: RBB06DHHN	Through Hole	 A black through-hole connector with six pins on the bottom. The top is labeled 'KLCZ RBB06DHHN'.
S3365-ND	Sullins Connector Solutions: RBB06DHRN	Board Edge, Straddle Mount	 A black board edge connector with six pins on the bottom. The top is labeled 'LGMK RBB06DHRN'.

Note that the connector will be slightly too big to fit into the recess in the wheel module. Some light sanding with a belt-sander works nicely.