Electronics Guide

# Infrared Sensor

This guy is mounted on the lifting side of the robot, and it’s ground and signal wires run under the bot to a small board that has the op amp mounted on it. The black wire is ground and the gray wire is signal. The op amp has a 1 Mega ohm resistor on it. Coming from it, there are 3 wires. The **purple wire** is the signal and goes into the pin slot labeled IR sensor on the pic. The **red wire** goes to the 3.3v bus. The **black wire** goes to the ground bus.

# QRD (Color Sensor)

This guy is mounted under the ball ramp, on the scissor lift side of the wall. It has four wires. The **blue wire** is signal wire, it goes into the pic. It should not need to be put into the op amp, but there is a slot open on the op amp The **green wire** is the power line for LED, it goes directly into the pic. The **black wire** is the ground for both the LED and the QRD, it goes into the ground bus. The **red wire** is power for the QRD, it goes into the 3.3v power bus.

# “Front” Bumper

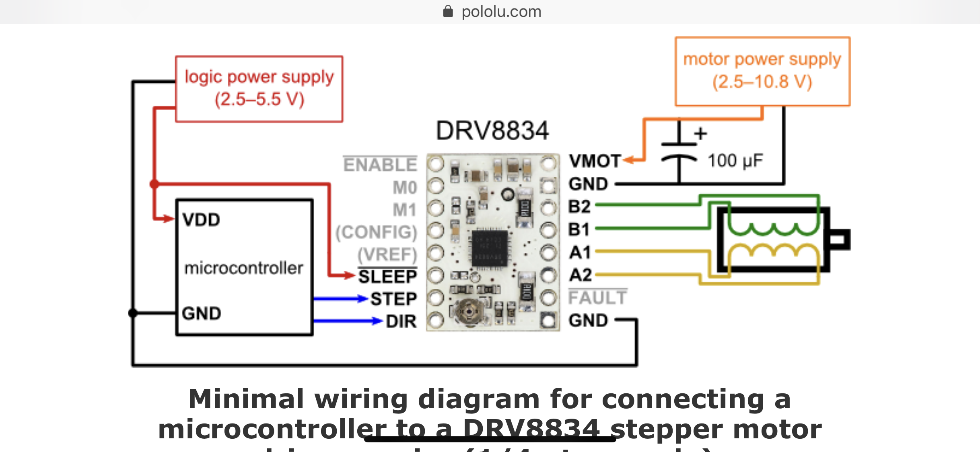
The front bumper is the bumper system for the side with all the electrical systems. Not very aptly named. **THE SIGNAL LINE IS CURRENTLY ZIP TIED TO THE BOTTOM OF THE ROBOT**. It has 3 wires. The **yellow wire** is the signal line and goes directly into the pic. The **black wire** is ground that is common with the “Back” bumper and goes into ground bus. The **red wire** is 3.3v power and is common with the “Back” bumper.

# “Back” Bumper

The back bumper is the bumper system for the lifting side of the bot. It has 3 wires. It has 3 wires. The **yellow wire** is the signal line and goes directly into the pic. The **black wire** is ground that is common with the “Front” bumper and goes into ground bus. The **red wire** is 3.3v power and is common with the “Front” bumper.

# Lifting Stepper (And Board)

This is the small white polulo board. It is using a little more than minimum connections as shown below.

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The **A and B wires** are the connection line from the stepper. Vmot and gnd is the **5v power line with the capacitor.** M0, M1, and GND are grounded with a ground wire to the ground bus with a **black line** that has black connectors to it. Dallin suggests we use a VREF line, there is a wire in the tool box to do so. The **blue line** is STEP, which is the PWM output from the pic. There is a line to do the sleep pin in the box, haven’t decided color yet.

# Sorting Servo

The sorting servo is found in the bucket. It has 3 wires. The **brown wire** is ground and connects with the **black wire** on the power line that goes to the 5v wire split. I don’t know if a capacitor is needed for the servo. We didn’t use it before, but I don’t know if it would make it work better. I don’t know what color the power line is, but it is the **middle wire**. It connects to the **red wire** on the 5v power line. THIS IS NOT THE WIRE WITH THE CAPACITOR ATTACHED. The **remaining wire** is the signal line and it connects with the **purple wire** that connects to the pic.

# Driving Steppers (And Board)

The driving steppers are mounted on the bottom of the robot. Their connection lines come up to the electrical systems area. The **connection lines** plug into the driver board with the tabs out. The **power line** WITHOUT **the capacitor** from the 5v line goes into the power pins. I created a **bus** that connects to the driver board. Look for the **red and black wires** and they line up with the power sockets on the board. Below are the lines of the bus:

Red – 3.3v power, goes into the power bus

Black – ground, goes into the ground bus

Blue or Purple – PWM line, I forget if it is purple or Blue. It goes into the PWM output of the pic.

Yellow – Direction line, goes into the pic

Orange – Direction line, goes into the pic

Gray – Sleep line, goes into the pic

# Debugging LED

This is a simple system, just a LED and a resistor in series. The **green line** goes into the pic (pin 11 I believe), and the **black line** goes into the ground bus.