

# Arduino 2WD Smart Robot Car Kit

## You'll need the following:

1 x Arduino Sensor Shield v5.0	- Use a needle nose plier if pins need alignment
1 x L298N Dual H-Bridge Motor Driver	- Connected to both DC
1 x Arduino Uno board	- DO NOT plug in USB & DC at the same time
1 x 40 Pin Breakable Headers	- Not needed for the kit
4 x Servo Mounting Brackets	- You'll need this for fastening the servo
3 x Servo beams	- You'll need this for mounting the servo
1 x Servo Motor (SG90)	- You're going to mount HC-SR04 on this
1 x Arduino USB Cable	- To program your Arduino board
1 x HC-SR04 Sensor	- Ultrasonic Ranging Detector
2 x DC Motors	
2 x 2.51" Rubber wheels	- High Grip Rubber Tires
1 x Acrylic Robot Chassis	- That's covered with adhesive protection
2 x Speed encoders	- Not needed for the kit
1 x DC 1.5V Battery Holder	- Will be connected to the switch
4 x Motor Blocks	- To connect DC Motors to the chassis
2 x Stranded 24 AWG Wire Sets	- To connect switch and other components
1 x ON/OFF Switch	- Kill Switch
1 x Metal ball Caster	- The third wheel
1 x Female DC Power Adapter	- To be connected to the Arduino board
1 x M3 Screw, Spacer and Nut Set	
1 x Jumper Wire Set	
1 x Untapped Spacer Set	

## Recommended Tools

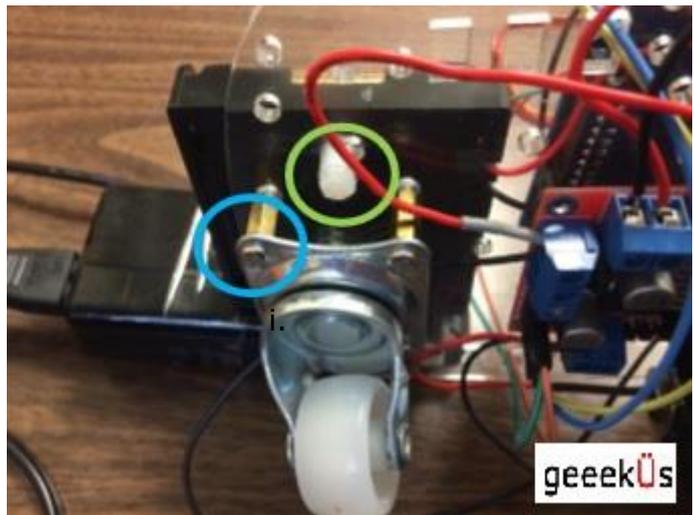
- 1 x Needle Nose Plier
- 1 x Flush Wire Cutter
- 1 x Wire Stripper
- 1 x Screwdriver (+)
- 1 x Hammer
- 1 x Soldering Iron (Optional)
- Heat Shrink (Optional)
- Brass Sponge (Optional)

## Installing the components

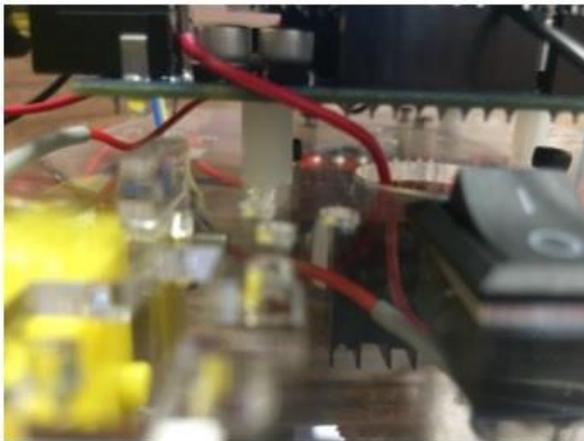
1. Take off the adhesive protection from both sides of the chassis.
2. Using two motor blocks for each DC Motor, install the latter on the chassis (as seen in the picture on the right)
3. Between the blocks and on the chassis, fasten the DC using the long screws and two nuts. The mounted motors should look like the picture on the left below:



4. Do the same with the second motor.
5. Add the ON/OFF switch in the middle of the chassis in its rectangular position.
6. Use the four brass standoffs and eight screws provided to install the metal ball caster. Mount it on the front of the chassis as seen here:



7. You can install the battery holder on top of the metal ball caster on the other side of the chassis. It is recommended that you use two plastic spacers, two screws and two nuts to separate the holder from the chassis plate.
8. Use the two long 18mm black screws along with the two untapped metal spacers two nuts to install the L298N Dual H-Bridge motor driver. You can mount this on the bottom of the chassis plate. **(Remember that only two sides of the motor can be screwed onto the chassis plate. You don't need to connect the other two sides.)**
9. You are now going to install your Arduino Uno board. On the opposite side of the motor, mount your board on the chassis by using one plastic spacer, one screw and one nut. You can see in the picture on the right that you don't need screw both sides of the Arduino board to the chassis.



10. You now need to prepare your servo mounting brackets and the servo beam so that you can add them. Use a flush cutter, or any other cutting tool, and cut the servo beam shaped like a cross so that it looks like the picture on the left. Place it inside the servo holder and fasten with two



small screws.

beam so that you can add them. Use a flush cutter, or any other cutting tool, and cut the servo beam shaped like a cross so that it looks like the picture on the left. Place it inside the servo holder and fasten with two

11. Fasten the servo in between the two servo mounting brackets and connect the mounting brackets tightly by using the longer screws from the servo bag. Connect your servo and the small white servo beam and use one of the screws found in the bag to ensure that the motor stays straight.

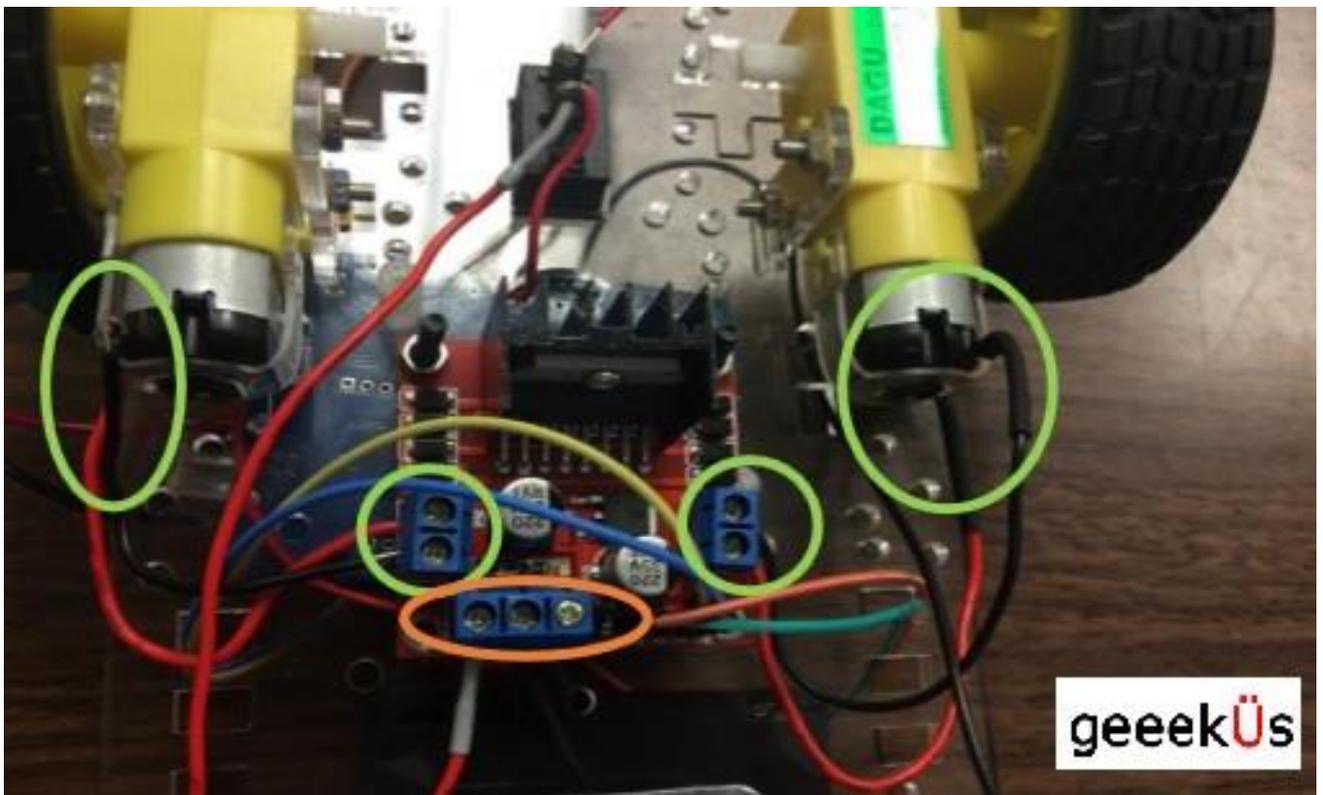
The HC-SR04 sensor can be mounted on the servo brackets and the servo holder can be installed on the back of the chassis. You can use four screws and four nuts to secure it. A good tip to keep the HC-SR04 sensor from reading the ground as an object in the software is to tilt it slightly upwards.

12. Now that all the parts are assembled, we need to connect them all. For that we are going to use the jumper wires and AWG wires. **The wires can be hooked on or soldered on.**

- Connect the power wire (red) of the battery holder to the lead under the "O" part of the ON/OFF switch. The ground wire (black) should go to the negative (-) sign on the power jack.
- Take another power wire (red) and connect it from the lead under the "I" part of the ON/OFF switch to the positive sign on the power jack.

You can use the heat shrinks to extend the wires.

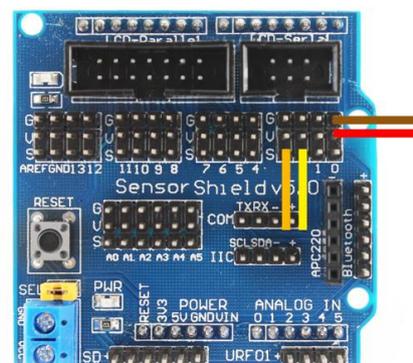
13. You need to connect the DC Motor next. Use the power and ground wires provided and connect the DC Motor to the L298N Dual H-Bridge motor driver. An example below to guide you:



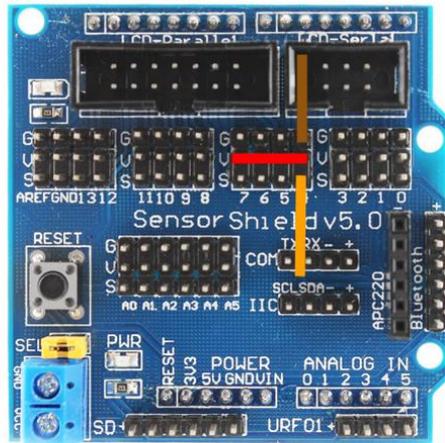
14. You now need to power the motor driver as well. Use a power wire (red) from the lead under "I" part of the ON/OFF switch to connect to the left lead under the orange oval shape in the picture above. Under the same orange oval in the picture, use a ground wire (black) to connect the middle lead to one of the ground (GND) pins on your Arduino Board.

15. On top of your Arduino board, place your Arduino Sensor Shield and connect the matching pins together on both boards.

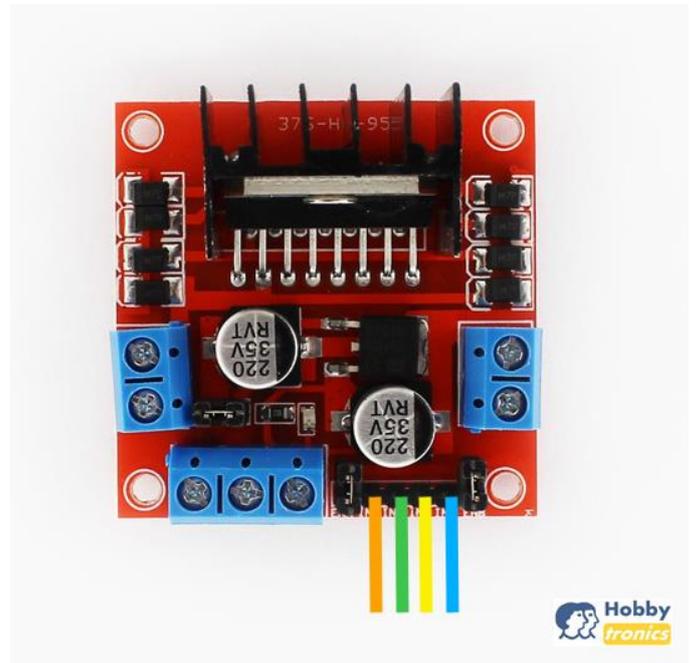
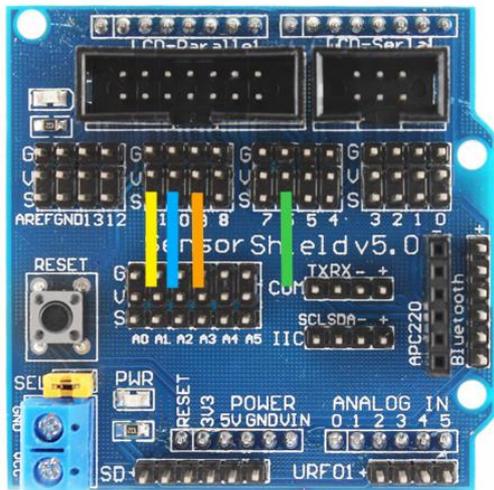
16. Using the jumper wires, connect the HC-SR04 and the servo to the correct pins on the Shield. The orange wire goes to the Trig pin, the yellow wire to the Echo pin, the red wire to the Vcc pin and the brown wire to the Gnd pin on the HC-SR04. Here's a picture to guide you:



17. Connect the servo's three jumper wires to the correct pins on the Shield like this:



18. You're almost done. Connect the pins of the motor driver to the Shield pins as below:



19. One more step! Add batteries in the battery holder and connect the Female DC Adapter to the Arduino. For codes check out [www.abraelectronics.com](http://www.abraelectronics.com). You can use the codes for calibration as well.