Arduino - Motors

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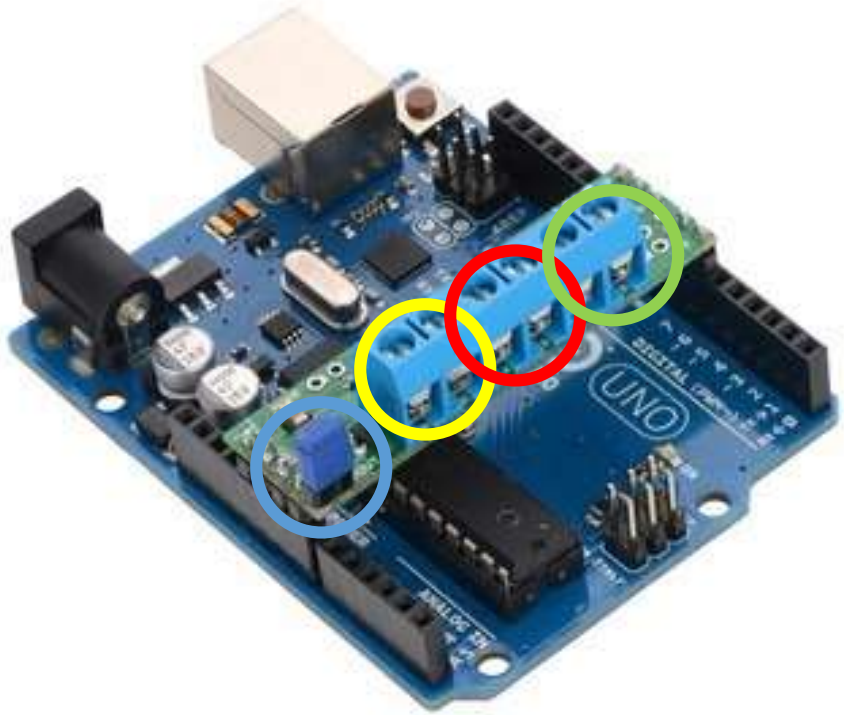
1 The Robot Car Kit has two motors which are driven by a board plugged into the Arduino – this is called a "Motor Driver Shield":



2 The Robot Car Battery Pack (4xAA batteries) is connected to one of the terminal blocks, **circled yellow**, on the shield. Take care to connect the positive voltage (Red) wire to the terminal marked "VIN", and the ground (Black) wire to the terminal marked "GND".

3 The **light blue** shorting link joins two pins on the shield to connect power from the battery to the main Arduino board.

4 The motors are connected to the two terminal blocks, circled **red** and **green**. Swapping the motor wires (red and black) will reverse the motor direction. Try it!

5 Download and install the DRV8835MotorShield Library[1] in the Arduino 'libraries' directory. As well as adding the library to the list of those available to you under the menu 'Sketch:Include_Library' in the 'Contributed libraries section (at the bottom of the list) this will also add an example program called "DRV8835MotorShield" to the examples.

6 Try out the example program – do the motors turn in the direction you expected? As well as the functions used in the example:

```
motors.setM1Speed(speed);
motors.setM2Speed(speed);
```

There is another function which can be used to set the speed of both motors at the same time – try using this to make the Robot move straight forwards and backwards:

```
Motors.setSpeeds(m1speed, m2speed);
```

[1] **Library is available from https://github.com/pololu/drv8835-motor-shield**

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7 A PWM signal applied to the ENABLE pin determines motor speed and the digital state of the PHASE pin determines direction of motor rotation. Arduino pins 9 and 7 are used to control the speed and direction, respectively, of motor 1, and pins 10 and 8 control the speed and direction of motor 2. The table below shows how the inputs affect the outputs in this mode:

Drive/brake operation in default PHASE/ENABLE mode				
Input to Motor Driver		Output to Motor		
xPHASE pins 7 & 8	xENABLE pins 9 & 10	MxA	MxB	operating mode
0	**PWM**	**PWM**	**L**	**forward/brake at speed *PWM %***
1	**PWM**	**L**	**PWM**	**reverse/brake at speed *PWM %***
X	**0**	**L**	**L**	**brake low (outputs shorted to ground)**

You can use the Arduino function analogWrite() to drive the ENABLE pins with a PWM signal.

Warning: When powering the Arduino from the motor shield, you must **never** connect a different power supply to the Arduino's VIN pin or plug a power supply into the Arduino's power jack, as doing so will create a short between the shield's power supply and the Arduino's power supply that could permanently damage both the Arduino and the motor shield.