Solutions

Chapter 23: Project: Designing and building an autonomous robot

Knowledge probe: How this sketch works, page 145

1 We divide the result by 2 because the time the 'ping' takes to echo back is the time that it takes to travel to the object and back; therefore, the distance of the object is half the travel time of the 'ping'.

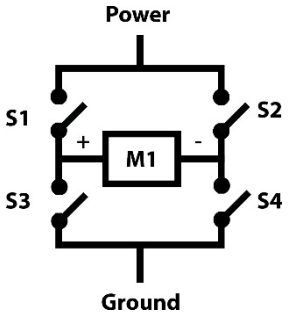
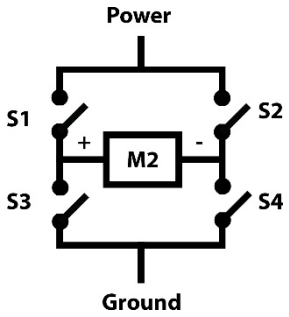
2 If the ping took 500 microseconds to return, then using the formula (pingTime / 29) / 2 the object would be (500/29)/2 = 8.6 cm.

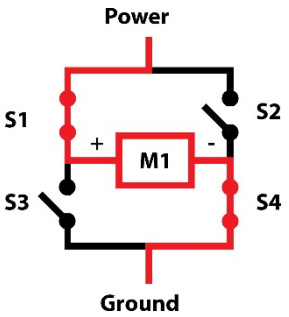
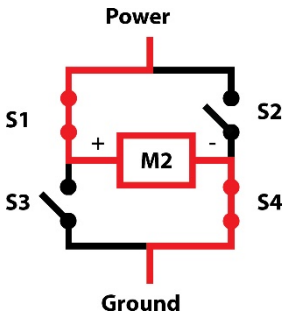
Dual_motor sketch functions, page 147

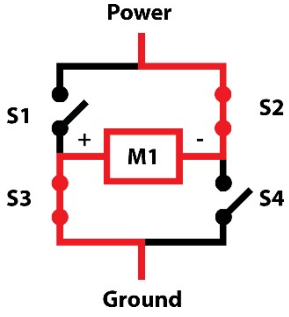
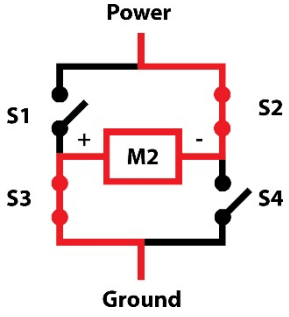
(Also used in Hbridge.cpp file.)

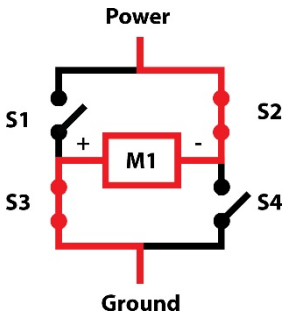
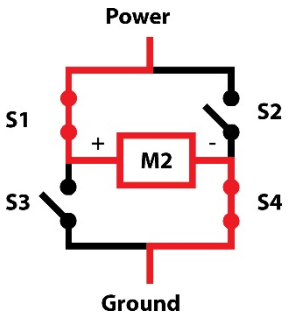
Table 23.1

Direction	Code	Motor 1	Motor 2

Off	void allOff()
	{
	digitalWrite(in1, LOW);
	digitalWrite(in2, LOW);
	digitalWrite(in3, LOW);
	digitalWrite(in4, LOW);
	}
			

Forward	void goForward()
	{
	digitalWrite(in1, HIGH);
	digitalWrite(in2, LOW);
	analogWrite(enA, 255);
	digitalWrite(in3, HIGH);
	digitalWrite(in4, LOW);
	analogWrite(enB, 255);
	}
			

Backward	void goBackward()
	{
	digitalWrite(in1, LOW);
	digitalWrite(in2, HIGH);
	analogWrite(enA, 200);
	digitalWrite(in3, LOW);
	digitalWrite(in4, HIGH);
	analogWrite(enB, 200);
	}
			

Right	void goRight()
	{
	digitalWrite(in1, LOW);
	digitalWrite(in2, HIGH);
	analogWrite(enA, 200);
	digitalWrite(in3, HIGH);
	digitalWrite(in4, LOW);
	analogWrite(enB, 200);
	}
			

Left	void goLeft()
	{
	digitalWrite(in1, HIGH);
	digitalWrite(in2, LOW);
	analogWrite(enA, 200);
	digitalWrite(in3, LOW);
	digitalWrite(in4, HIGH);
	analogWrite(enB, 200);
	}