Motor Controller

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## Introduction

The robot uses three omni-wheels to drive itself across the given terrain. These motors must each use a 24V battery to give them enough power to last a good amount of time on the football field.

## Problem

The robot needs 24V per motor to be driven effectively, though there are few microcontrollers which support a 24V output. To combat this, motor controllers exists. These combine a small control signal and a big driving power.  
  
The problem is that these motor controllers are present but are not yet implemented.

## Solution

Make a standardized way of addressing each motor controller individually, so that the code produced is readable and transferable.

## Progress

To start this product off, we first had a look at which motor controllers were at our disposal; and what we need to keep in mind.

The motor controller we use is the Cytron 5-30V DC Motor Driver (found here: <https://www.elektor.nl/products/cytron-10amp-5-30-v-dc-motor-driver#section-info>)

This is a 1 channel DC motor driver, which can be influenced with two PWM signals.

* Direction

The high or low of this pin determines the direction the motor shaft spins at. Since this is a DC motor, that means the output is just flipped.

* PWM

While the label and documentation say PWM, it really stands for speed. The duty cycle of the PWM signal determines how much time the motor controller get the “go ahead, give it power” signal; effectively controlling the speed.

The motor controller also has two buttons, these are used for testing. With this in mind, we headed to the lab to hook up the motor controller and to see it spinning!

After the fun moment in the lab, we quickly drew up the code we would need for the motor controller, it is simple though efficient.

The finished code can be seen in the folder this document is in.

## Reflection

This was a great little product to make, since it was so motivating to get small things done in a considerable timeframe. I wouldn’t change anything about how we did this, nor the way it was finished.

## Sources

<https://www.elektor.nl/products/cytron-10amp-5-30-v-dc-motor-driver#section-info>