Team 3176 White Paper

Title: something about quad encoders	Author(s): Mitchell Tennancour, Christopher Harrison, Aden Craig, Luke Ambler
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Abstract

This paper documents the function and the implementation of quadrature encoders onto the robot. The paper is directed towards people with a basic knowledge of electrical components.

Definitions

PWM wires - a bundle of three gauge 20 wires used to transmit a PWM signal. One wires is ground, the middle wire is power, and the last wire is signal; often referred to as PWMs in shorthand

PWM - Pulse Width Modulation; a method of displaying a value between one and zero using a specific duty cycle

Quadrature Encoders - a device used to measure both the position and rotation of a rotation; also referred to as quad encoders

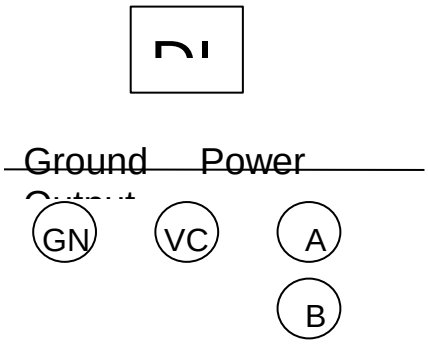
DIO - Digital Input-Output;

Assembly

Quadrature encoders come in many shapes and sizes meaning they all mount differently. The quad encoders that attach to the cim motors are AMT103-V encoders, a type of hollow shaft quadrature encoder built for a a gearbox with a protruding rotating shaft - in this specific chassis an Andymark Toughbox Mini was used. The encoder slides onto the protruding part of the rotating shaft and is fastened either by screws inside of the encoder body or by electrical tape.

Wiring

The quadrature encoder has four PWM wires which lead to two standard three-pin outputs. The brown wire is ground, the orange wire is Power, the blue wire is output A, and the yellow wire is output B, as shown by figure 1. The two inputs are wired to two consecutive DIO ports. The quadrature encoder gets power from the RoboRio via the PWM designated for power (VCC).



Figure