**RoboMagellan 2024 Encoder and Motor Controller Choices**

**Problem**

We need to mount two encoders on the robot (one for the left and right sides).

**Requirements**

1) Encoder must fit on a ½” hexbore shaft.

2) Need easy-to-use interface to an Arduino.

**Encoder Options**

1) CIMCoder High Resolution CIM Encoder (<https://www.andymark.com/products/cimcoder-encoder-cim-motor-high-resolution>)

- **Price:** $29/each on AndyMark

**-** This encoder mounts on the shaft of a CIM motor. It includes a disk magnet that mounts on the motor shaft between the motor and the encoder. The setup decreases the shaft length by 0.31”.

- **TODO:** Will this work on our single-reduction clamping gearbox? Seems like it barely has enough space: <https://www.chiefdelphi.com/t/questions-about-vex-clamping-gearbox-versadrop/159467/5>

- 20 pulses per channel per revolution.

**-** Works with the **Talon SRX Speed Controller**

**-** Does not require any additional housing.

2) CIMcoder 256 High Resolution CIM Encoder (<https://www.andymark.com/products/hi-resolution-cim-encoder-cimcoder>)

- **Price:** $54/each on AndyMark

- Similar to (1), this is a higher-resolution version of the CIMcoder (256 pulses per channel per revolution)

- Requires a 10-pin wire to the **Talon SRX Speed Controller**

3) SRX Mag Encoder (<https://store.ctr-electronics.com/srx-mag-encoder/>)

- **Price:** $39.99/each on CTR Electronics

- **Requires a mag encoder housing such as** <https://www.vexrobotics.com/217-6785.html> (**price:** $9.99/each from VEX)

- A small magnet is provided, but this will need to be attached to the drive axle. **TODO:** Does this magnet need to be placed inside the drive axle, or can it be external?

- Works with the **Talon SRX Speed Controller**

4) Through-Bore Encoder (<https://www.revrobotics.com/rev-11-1271/>)

- **Price:** $48/each on Rev Robotics

- This encoder mounts directly on a ½” hex shaft.

**Motor Controller Options**

1) Talon SRX Speed Contoller (<https://store.ctr-electronics.com/talon-srx/>)

- **Price:** $89.99/each on VEX or CTR Electronics

- Supports either PWM or CAN Bus. Standard Arduino Servo library seems to work with sending commands to the Talon: <https://forum.arduino.cc/t/pwm-values-with-talon-srx/619816/5>

- Seems the standard Arduino Servo “Knob” example works as well: <https://mrmctavish.wordpress.com/2020/03/15/using-an-arduino-to-control-a-talon-or-spark-motor-controller-using-pwm/>

- There’s a 2x5 0.05” pitch keyed cable that allows a connection to an encoder.