

Project Checklist: Section 1 - Motor, Encoder, and Odometry Setup

- Preparation Phase

- ☐ Power supply (Eventek or alternative) arrived
- ☐ Buck converters (LM2596 or similar) arrived
- ☐ Arduino Nano 33 IoT prepared
- ☐ TB6612FNG motor drivers received
- ☐ AS5600 magnetic encoders received
- ☐ Motors and Mecanum wheels ready
- ☐ Wire, Dupont cables, connectors organized
- ☐ Bench space cleaned and prepared

- Power System Setup

- ☐ Set Eventek output to 12V, limit current to 2A-3A
- ☐ Configure buck converter to 7V-8V (for motors)
- ☐ Configure another buck converter to 5V (Arduino USB input)
- ☐ Confirm voltages with multimeter
- ☐ Label voltage rails clearly

- Mechanical Assembly

- ☐ Mount motors securely with temporary brackets
- ☐ Mount magnets centered on motor shafts
- ☐ Mount AS5600 encoders aligned (1.5mm-2mm from magnet)
- ☐ Prepare simple mounting for TB6612FNG

- Wiring and Schematic Validation

- ☐ Draw complete wiring diagram (Fritzing or Proteus)
- ☐ Wire motor driver to Arduino (PWM + direction + standby pins)
- ☐ Wire AS5600 to Arduino (SDA, SCL, 3.3V, GND)
- ☐ Confirm GND common between all devices
- ☐ Verify correct motor driver VM and VCC connections
- ☐ Label all cables (optional but highly recommended)

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- Firmware Development

- ☐ Sketch 1: Motor Test
- ☐ - Control motor A forward/reverse using PWM and IN1/IN2
- ☐ - Control motor B forward/reverse
- ☐ Sketch 2: Encoder Test
- ☐ - Read AS5600 angle over I2C
- ☐ - Print angle values to Serial Monitor
- ☐ Sketch 3: Combined Test
- ☐ - Spin motors and read encoder simultaneously
- ☐ - Monitor angle change with motor movement

- Functional Testing

- ☐ Motor forward/backward test success
- ☐ Encoder angle reading stable and increasing/decreasing correctly
- ☐ Basic odometry: Calculate delta angle over time
- ☐ Confirm logical correspondence between wheel rotation and encoder output

- Documentation

- ☐ Save schematic as PDF/image
- ☐ Save all Arduino sketches in organized folder
- ☐ Comment code neatly for later reuse
- ☐ Take photos of assembled test bench
- ☐ Record observations during tests (e.g., encoder noise, voltage drops)

- Project Milestone: Section 1 Completion

- ☐ Motors successfully driven and controlled
- ☐ Encoders successfully integrated and read
- ☐ Basic odometry verified
- ☐ Project notes and documents prepared