Stemedu ST3176MX4-

Stemedu DC TT Gearbox Motor User Manual

Model: ST3176MX4-

Brand: Stemedu

1. Introduction

This manual provides instructions for the Stemedu DC TT Gearbox Motor. These motors are designed for various DIY electronics projects, including smart cars, robotics, and educational applications. Please read this manual carefully before use to ensure proper operation and longevity of the product.

2. Product Overview

2.1 Key Features

- **Dual-Axis Design:** Equipped with two axes, allowing for integration with speed-measuring code plates for convenient speed measurement.
- **Wide Voltage Range:** Rated for operation between 3V and 6V DC.
- **High Reduction Ratio:** Features a 1:48 reduction ratio gearbox, providing strong torque and anti-interference capabilities.
- **Broad Compatibility:** Suitable for DIY smart cars, compatible with platforms like Arduino and Micro:bit.
- **Versatile Applications:** Ideal for scientific research electronic products, robot humanoids, bubble gun toy bodies, four-wheel drive toy cars, aircraft toys, vibration products, and other electric toys.

2.2 Components

Each Stemedu DC TT Gearbox Motor unit consists of a DC motor integrated with a gearbox, featuring a dual-shaft output. Wires with male DuPont connectors are pre-attached for easy connection.

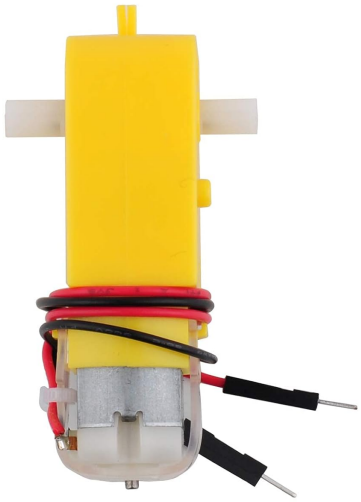

Figure 1: A single Stemedu DC TT Gearbox Motor, showing the yellow gearbox and the motor housing with pre-attached red and black wires.

Figure 2: The DC TT Gearbox Motor with key dimensions indicated: 65mm length, 22mm height, 19mm width, and 8mm shaft length.

Figure 3: A close-up view of the DC TT Gearbox Motor, highlighting the pre-attached red and black wires with male DuPont connectors for convenient hookup.

Figure 4: A set of four Stemedu DC TT Gearbox Motors, as typically supplied, each with its own wiring.

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Video 1: A short demonstration of the DC TT Gearbox Motors in operation, showcasing their movement and compact design.

3. Specifications

Specification	Value
Brand	Stemedu
Model Name	gear
Rated Voltage	3-6 Volts DC
Speed (at 6V)	200 RPM

Specification	Value
Reduction Ratio	1:48
Horsepower	28 Watts
Product Dimensions (L x W x H)	65mm x 19mm x 22mm (approx. 2.56" x 0.75" x 0.87")
Shaft Diameter	0.1 Inches (approx. 2.54mm)
Material	Plastic
Item Weight	29 Grams (approx. 1.02 ounces)

4. Setup Instructions

1. **Mounting:** Securely attach the motor to your project chassis using appropriate fasteners or mounting brackets. Ensure the motor is stable and its shafts are free to rotate without obstruction.
2. **Wiring:** Connect the pre-attached red and black wires to your power source or motor driver. The red wire typically connects to the positive (+) terminal, and the black wire to the negative (-) terminal.
3. **Power Supply:** Connect a DC power supply within the rated voltage range of 3V to 6V. Using a voltage outside this range may damage the motor.
4. **Optional Speed Sensor:** If using a speed-measuring code plate, ensure it is properly aligned and connected to the dual-axis shaft.

5. Operating Instructions

1. **Basic Operation:** Apply the rated DC voltage (3-6V) to the motor's terminals. The motor will begin to rotate.
2. **Direction Control:** To reverse the direction of rotation, reverse the polarity of the voltage applied to the motor terminals (connect red to negative, black to positive).
3. **Speed Control (Advanced):** For precise speed control, use a Pulse Width Modulation (PWM) signal from a microcontroller (e.g., Arduino, Micro:bit) in conjunction with a motor driver. Adjusting the PWM duty cycle will vary the motor's effective voltage and thus its speed.

6. Maintenance

- **Keep Clean:** Regularly inspect the motor and gearbox for dust, dirt, or debris. Clean gently with a soft, dry cloth. Avoid using liquids or solvents.
- **Avoid Overvoltage:** Always operate the motor within its specified voltage range (3-6V) to prevent overheating and damage.
- **Check Connections:** Periodically ensure that all electrical connections are secure and free from corrosion. Loose connections can lead to intermittent operation or damage.
- **Lubrication:** The gearbox is factory-lubricated. Avoid disassembling the gearbox or applying additional lubricants unless specifically instructed by the manufacturer.

7. Troubleshooting

- **Motor Not Spinning:**

    - Verify the power supply is connected and providing voltage within the 3-6V range.
    - Check all wiring connections for proper polarity and secure contact.
    - Ensure there are no physical obstructions preventing the motor shaft from rotating.
- **Inconsistent Speed or Torque:**
    - Slight variations in speed and torque between individual motors are normal due to manufacturing tolerances. For precise control, use PWM.
    - Ensure the power supply can provide sufficient current for the motor under load.
- **Excessive Noise or Vibration:**
    - Check for loose mounting or foreign objects caught in the gearbox or around the shaft.
    - Ensure the motor is not overloaded beyond its rated capacity.

8. Safety Information

- **Electrical Safety:** Always handle electrical components with care. Avoid short circuits, which can damage the motor, power supply, or cause fire.
- **Moving Parts:** Keep fingers, hair, loose clothing, and other objects away from the rotating motor shafts and gears to prevent injury.
- **Voltage Limits:** Do not exceed the maximum rated voltage of 6V. Overvoltage can lead to overheating and permanent damage to the motor.
- **Adult Supervision:** This product is intended for use in DIY projects and may involve electrical components. Adult supervision is recommended, especially when used by children.

9. Warranty and Support

For technical support, product inquiries, or warranty information, please contact Stemedu customer service. Refer to your purchase documentation for specific warranty terms and conditions.

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