

QIYQTIG BTS7960 IBT-2

QIYQTIG BTS7960 IBT-2 43A Half-Bridge PWM Motor Driver Board User Manual

Model: BTS7960 IBT-2 | Brand: QIYQTIG

1. INTRODUCTION

This manual provides detailed instructions for the safe and effective use of the QIYQTIG BTS7960 IBT-2 43A Half-Bridge PWM Motor Driver Board. Please read this manual thoroughly before installation and operation to ensure proper functionality and to prevent damage to the module or connected devices.

2. PRODUCT OVERVIEW

The BTS7960 IBT-2 is a high-power H-bridge motor driver module designed for controlling DC motors. It is capable of handling significant current and features integrated protection mechanisms.

- **High Power Capability:** Controls high-power DC motors, delivering up to 43A.
- **Wide Supply Voltage Range:** Operates with supply voltages from 6V to 27V.
- **Thermal Over-temperature Protection:** Automatically protects the module from overheating.
- **Undervoltage Shutdown:** Shuts down if the supply voltage drops below 5.4V, restarting when voltage is 5.5V or higher.
- **H-Bridge Configuration:** Utilizes BTS7960 chips for robust motor control, allowing for forward and reverse operation.

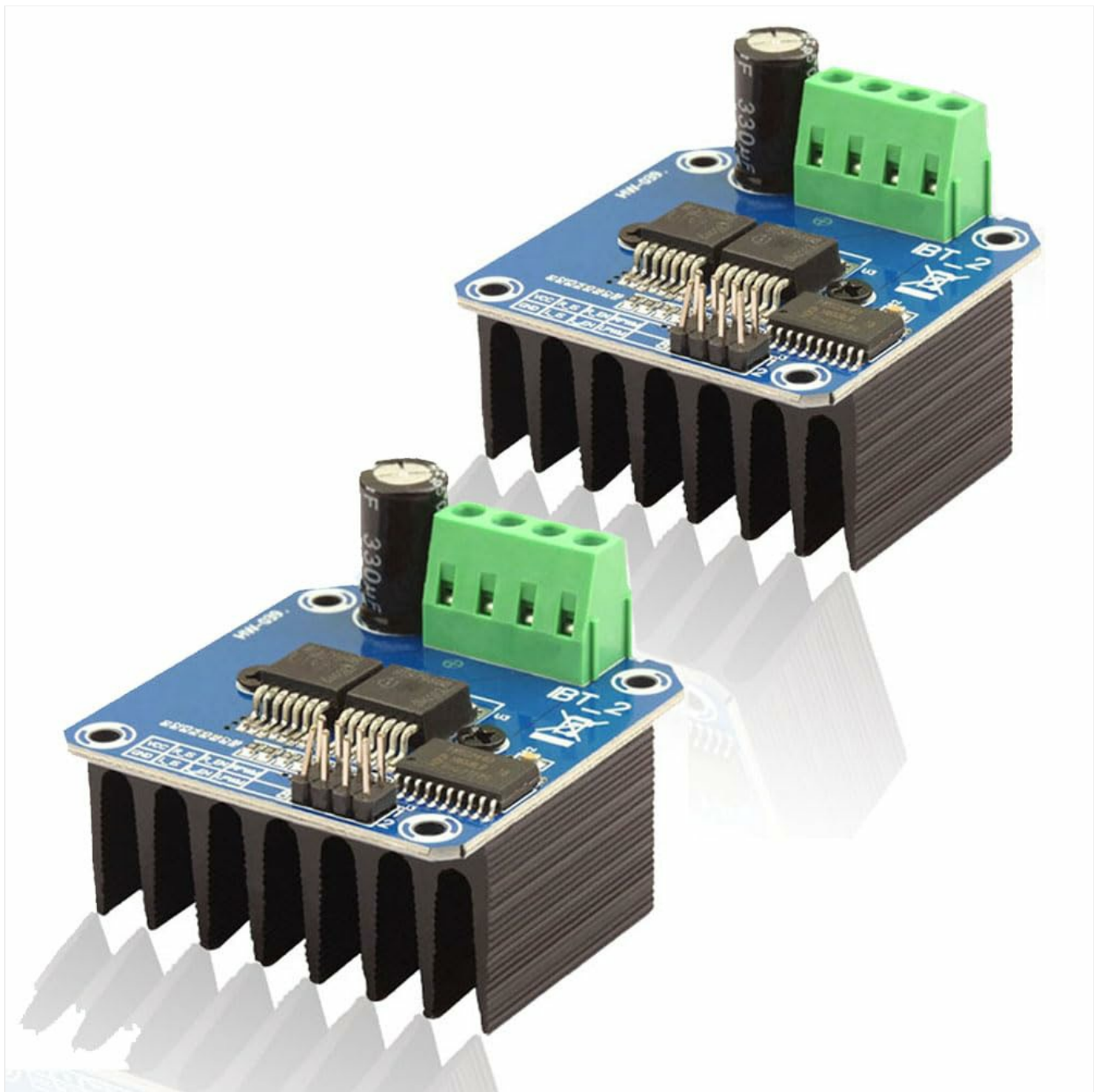


Figure 2.1: Two QIYQTIG BTS7960 IBT-2 motor driver boards, showcasing their compact design with integrated heatsinks.

The BTS 7960 can be combined with other BTS 7960s to form H-bridge and 3-phase drive configurations.

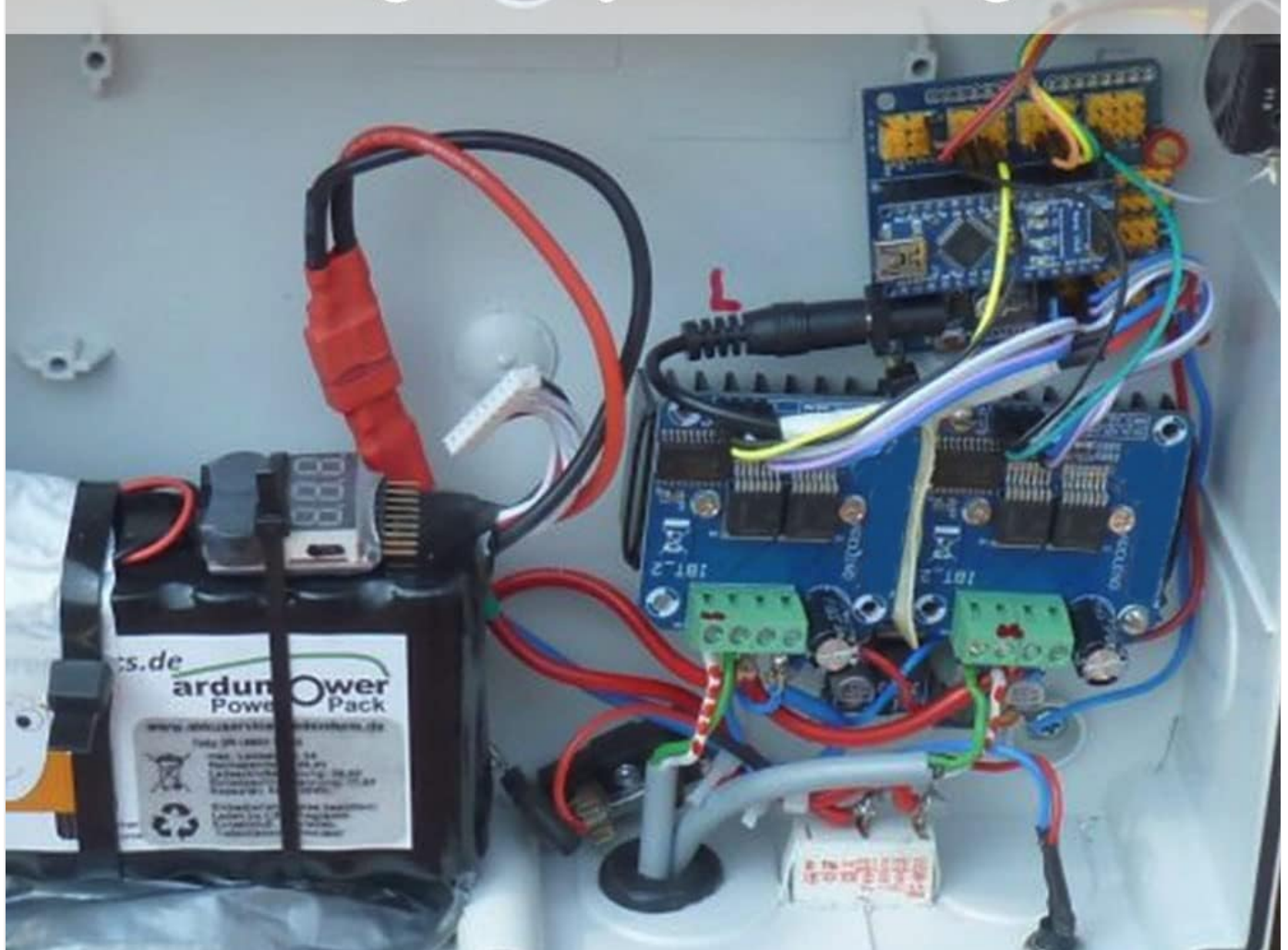


Figure 2.2: Example of BTS7960 modules combined to form an H-bridge configuration for motor control.

3. SPECIFICATIONS

Parameter	Value
Maximum Current	43A
Supply Voltage	6V - 27V DC
Input Level	3.3V - 5V
Material	Copper (Heatsink)
Item Weight	0.13 Kilograms
Color	Blue (PCB)

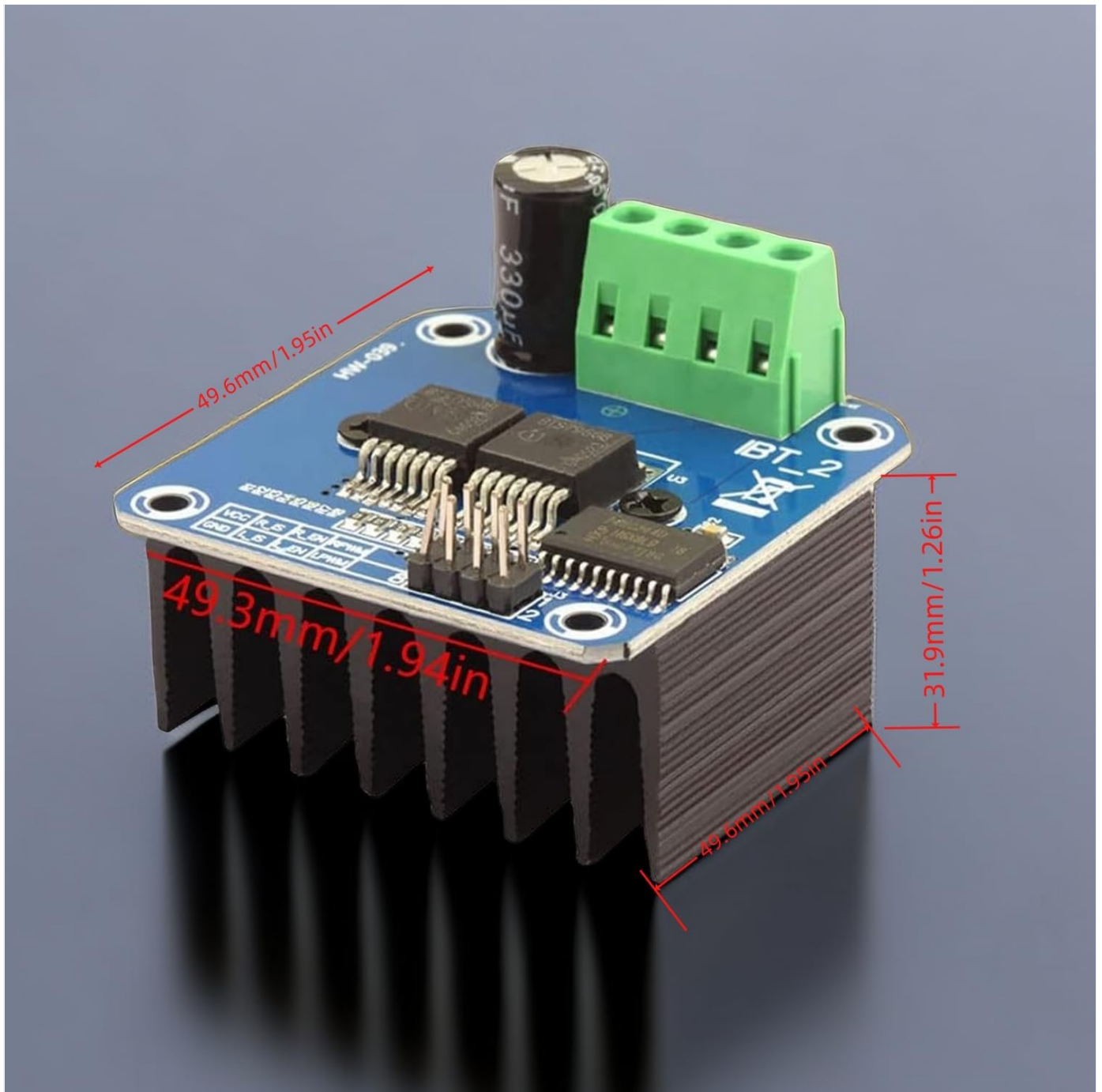


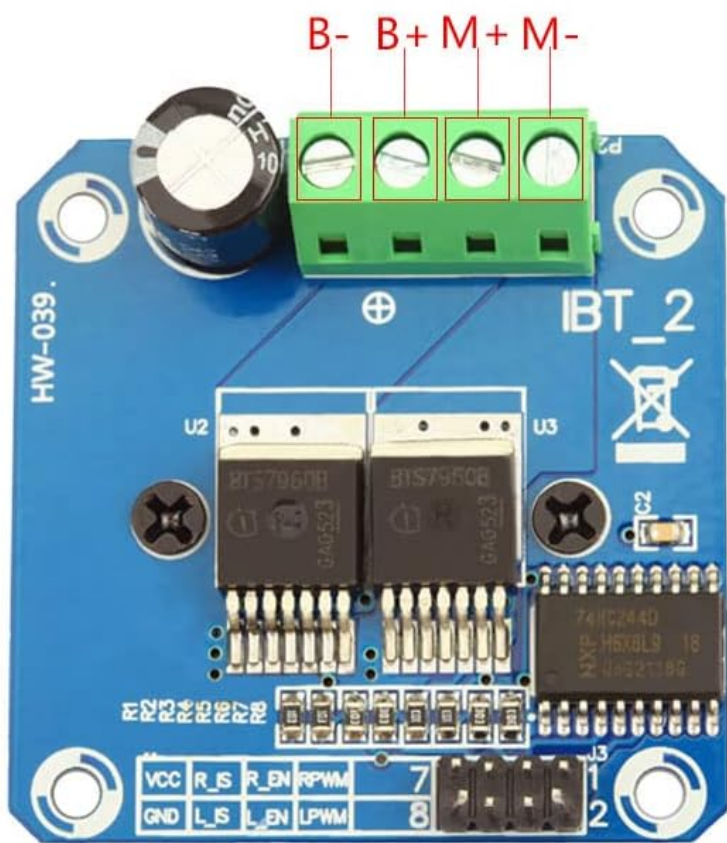
Figure 3.1: Physical dimensions of the BTS7960 IBT-2 module.

4. SETUP AND WIRING

Careful wiring is crucial for the correct and safe operation of the motor driver. Ensure all connections are secure before applying power.

4.1 Pinout Description

Power Supply Input Pin Motor Output Pin



Pin No	Function	Description
1	B-	B-: Negative Motor Power Supply Ground
2	B+	B+: Positive Motor Power Supply 6-27VDC
3	M+	M+: Motor Output +
4	M-	M-: Motor Output -

Figure 4.1: Detailed pinout of the BTS7960 IBT-2 module, showing power, motor, and control pins.

Pin No.	Function	Description
B-	Negative Motor Power Supply Ground	Connect to the negative terminal of the motor power supply.
B+	Positive Motor Power Supply (6-27VDC)	Connect to the positive terminal of the motor power supply.
M+	Motor Output +	Connect to one terminal of the DC motor.
M-	Motor Output -	Connect to the other terminal of the DC motor.
VCC	Logic Power Supply (5V)	Connect to 5V from your microcontroller (e.g., Arduino).
GND	Logic Ground	Connect to ground of your microcontroller.
R_IS	Right Current Sense	Current feedback for the right half-bridge.
L_IS	Left Current Sense	Current feedback for the left half-bridge.

Pin No.	Function	Description
R_EN	Right Enable	Enable pin for the right half-bridge. High to enable.
L_EN	Left Enable	Enable pin for the left half-bridge. High to enable.
RPWM	Right PWM Input	PWM signal for controlling the right half-bridge (motor direction/speed).
LPWM	Left PWM Input	PWM signal for controlling the left half-bridge (motor direction/speed).

4.2 Basic Wiring Diagram

The following diagram illustrates a typical wiring setup for controlling a DC motor with the BTS7960 IBT-2 module using a microcontroller (e.g., Arduino).

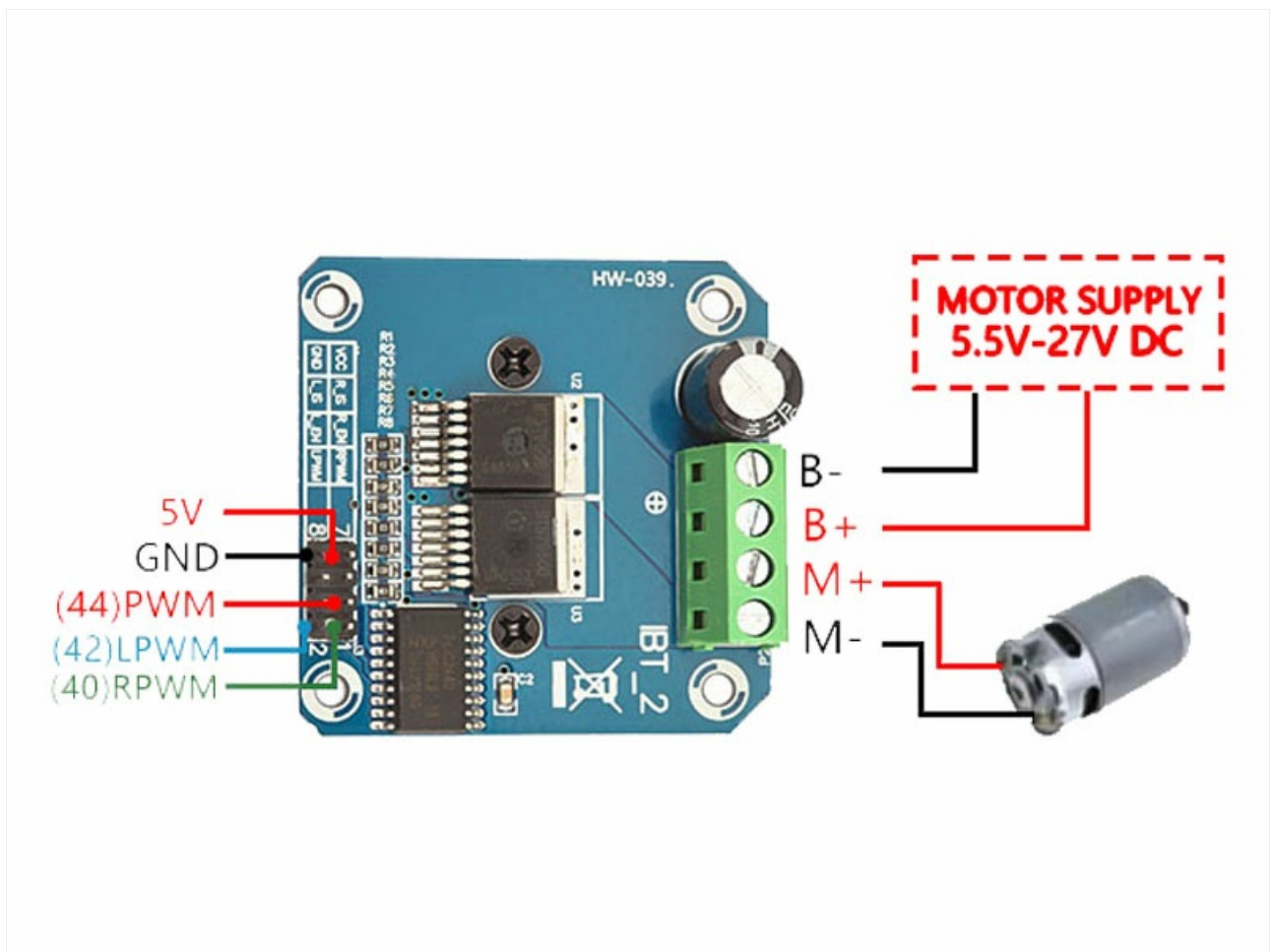


Figure 4.2: Basic wiring diagram showing connections for motor power, motor output, and logic control signals.

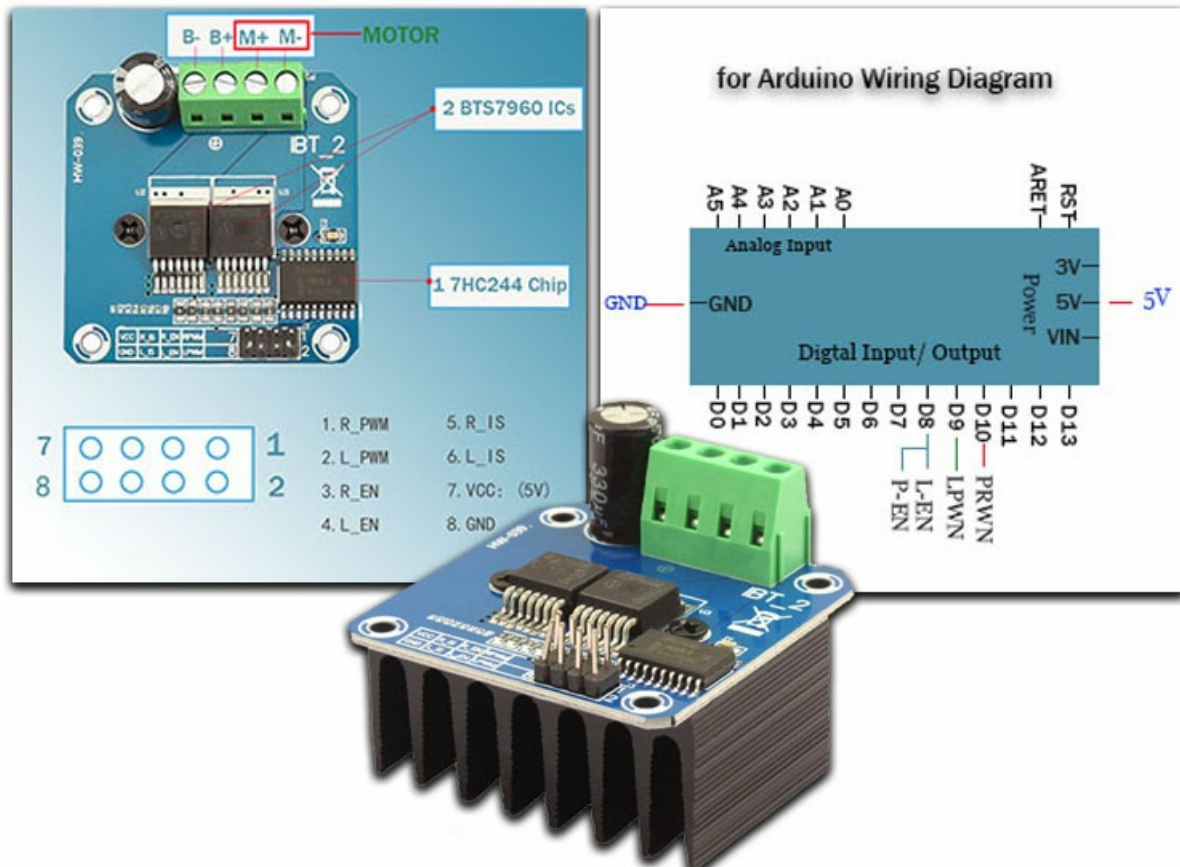


Figure 4.3: Example wiring diagram for connecting the BTS7960 IBT-2 to an Arduino board for control.

1. Connect the motor power supply (6-27V DC) to the **B+** (positive) and **B-** (negative) terminals on the driver board.
2. Connect your DC motor to the **M+** and **M-** output terminals.
3. Connect the 5V logic power from your microcontroller to the **VCC** pin on the driver board.
4. Connect the ground of your microcontroller to the **GND** pin on the driver board.
5. Connect the **RPWM** and **LPWM** pins to PWM-capable digital output pins on your microcontroller. These pins control the motor's direction and speed.
6. Connect the **R_EN** and **L_EN** pins to digital output pins on your microcontroller. These pins enable/disable the respective half-bridge. For basic operation, they can often be tied high (to 5V) if not dynamically controlled.
7. The **R_IS** and **L_IS** pins provide current feedback and can be connected to analog input pins on your microcontroller if current monitoring is desired.

5. OPERATING INSTRUCTIONS

The BTS7960 IBT-2 module uses PWM signals to control the speed and direction of a DC motor. The two PWM inputs, RPWM and LPWM, control the two half-bridges.

- **Motor Forward:** Apply a PWM signal to **RPWM** and keep **LPWM** low (GND). The motor speed is proportional to the RPWM duty cycle.
- **Motor Reverse:** Apply a PWM signal to **LPWM** and keep **RPWM** low (GND). The motor speed is proportional to the LPWM duty cycle.
- **Motor Stop (Brake):** Keep both **RPWM** and **LPWM** low (GND).
- **Motor Stop (Freewheel):** Keep both **RPWM** and **LPWM** high (5V).
- **Enable Pins (R_EN, L_EN):** Ensure these pins are set high (5V) to enable the driver. Setting them low will disable the respective half-bridge.

It is critical to avoid applying high signals to both RPWM and LPWM simultaneously, as this can lead to a short circuit (shoot-through) and damage the driver.

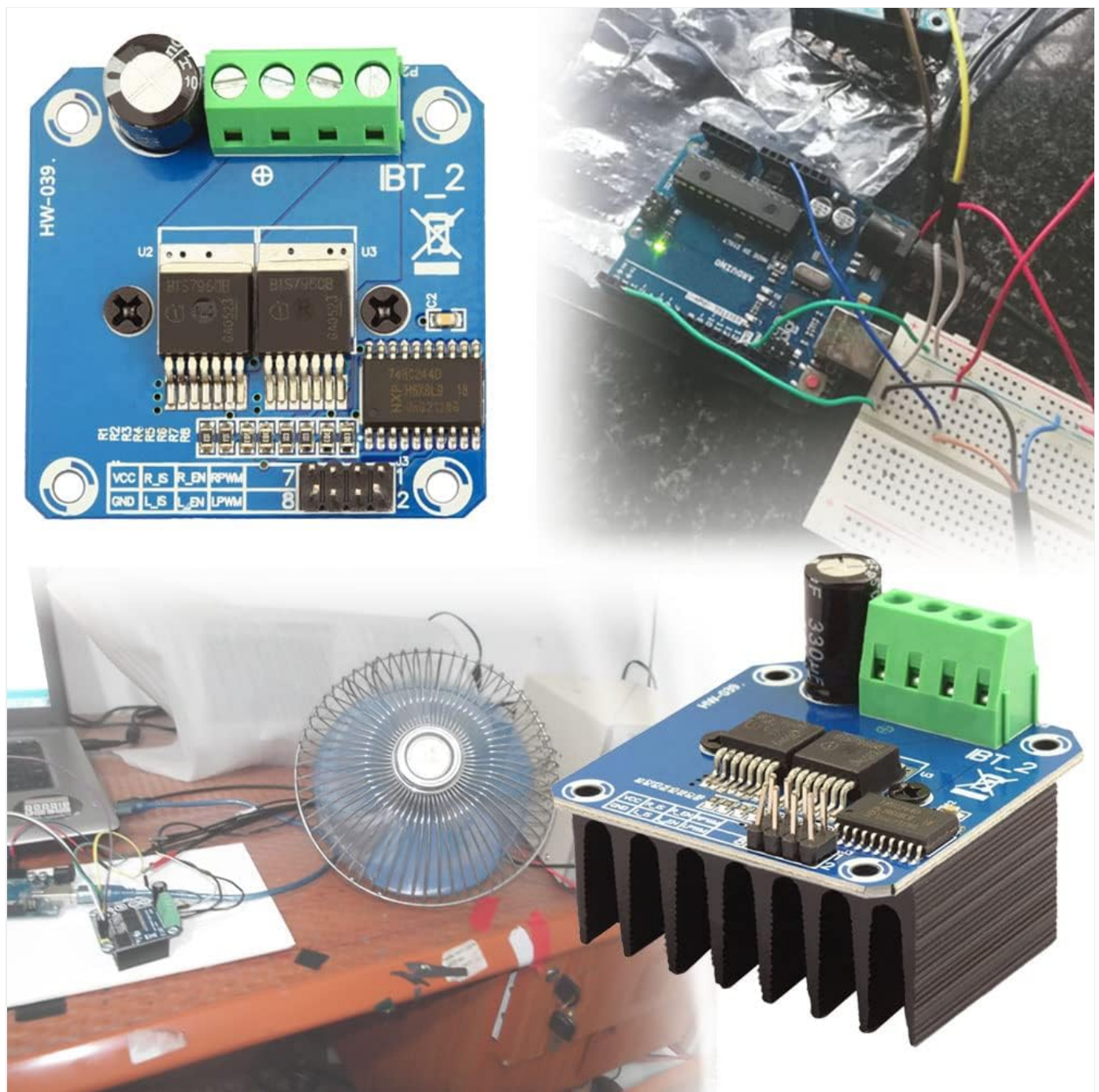


Figure 5.1: The BTS7960 IBT-2 module connected to an Arduino, controlling a small DC fan, demonstrating a typical application.

6. MAINTENANCE

The BTS7960 IBT-2 motor driver board is designed for durability and requires minimal maintenance. Follow these guidelines to ensure its longevity:

- **Keep Clean:** Ensure the module is free from dust, dirt, and moisture. Use a soft, dry brush or compressed air for cleaning.
- **Environmental Conditions:** Operate the module within its specified temperature and humidity ranges. Avoid extreme conditions.
- **Inspect Connections:** Periodically check all wiring connections for looseness or corrosion. Loose connections can lead to intermittent operation or damage.

- **Avoid Physical Stress:** Do not apply excessive force to the pins or the board itself.

7. TROUBLESHOOTING

If you encounter issues with your BTS7960 IBT-2 module, refer to the following troubleshooting steps:

Problem	Possible Cause	Solution
Motor does not move.	◦ Incorrect wiring. ◦ Insufficient power supply. ◦ Logic enable pins (R_EN, L_EN) are low. ◦ No PWM signal. ◦ Motor fault.	◦ Verify all connections according to the wiring diagram. ◦ Check motor power supply voltage (6-27V) and current capability. ◦ Ensure R_EN and L_EN are high (5V). ◦ Verify PWM signals are being sent to RPWM/LPWM. ◦ Test motor independently.
Motor moves erratically or slowly.	◦ Weak power supply. ◦ Incorrect PWM duty cycle. ◦ Loose connections.	◦ Ensure power supply can deliver sufficient current. ◦ Adjust PWM duty cycle for desired speed. ◦ Secure all wiring connections.
Module gets excessively hot.	◦ Overcurrent condition. ◦ Inadequate cooling. ◦ Short circuit on motor output.	◦ Reduce motor load or ensure motor current is within 43A limit. ◦ Ensure proper airflow around the heatsink. ◦ Check motor wiring for shorts.
Module shuts down unexpectedly.	◦ Undervoltage shutdown. ◦ Over-temperature protection activated.	◦ Check motor power supply voltage; ensure it stays above 5.4V. ◦ Allow module to cool down. Address causes of overheating (see above).

8. SAFETY INFORMATION

Please observe the following safety precautions when working with the BTS7960 IBT-2 motor driver board:

- **Power Off Before Wiring:** Always disconnect all power supplies before making or changing any connections.
- **Correct Voltage:** Ensure the motor power supply voltage is within the specified 6V-27V range. Exceeding this can damage the module.
- **Current Limits:** Do not exceed the maximum current rating of 43A. Overcurrent can lead to overheating and permanent damage.
- **Short Circuits:** Prevent short circuits on the motor output terminals and power input terminals.
- **ESD Protection:** Handle the module with care to prevent electrostatic discharge (ESD) damage.
- **Ventilation:** Ensure adequate ventilation, especially when operating at high currents, to prevent overheating.
- **Supervision:** Do not leave the module unattended during initial testing or high-power operation.

9. WARRANTY AND SUPPORT

Specific warranty information for this product is not provided in the available documentation. For support or warranty inquiries, please contact your retailer or the manufacturer, QIYQTIG, directly through their official channels.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question