DFROBOT DFR0004

DFROBOT Romeo DFR0004 Robot Control Board User Manual

Arduino Compatible Robot Control Board with Integrated Motor Driver

1. INTRODUCTION

The DFROBOT Romeo is an all-in-one robot control board specifically designed for robotics applications. Leveraging the open-source Arduino platform, it offers extensive compatibility with thousands of existing Arduino codes and can be easily expanded with various Arduino shields. This board integrates a 2-way DC motor driver and wireless sockets, enabling immediate initiation of robot projects without the need for additional motor driver components. Furthermore, the Romeo board provides extra power capabilities for servos that require higher current. This manual provides essential information for setting up, operating, and maintaining your DFROBOT Romeo DFR0004 board.
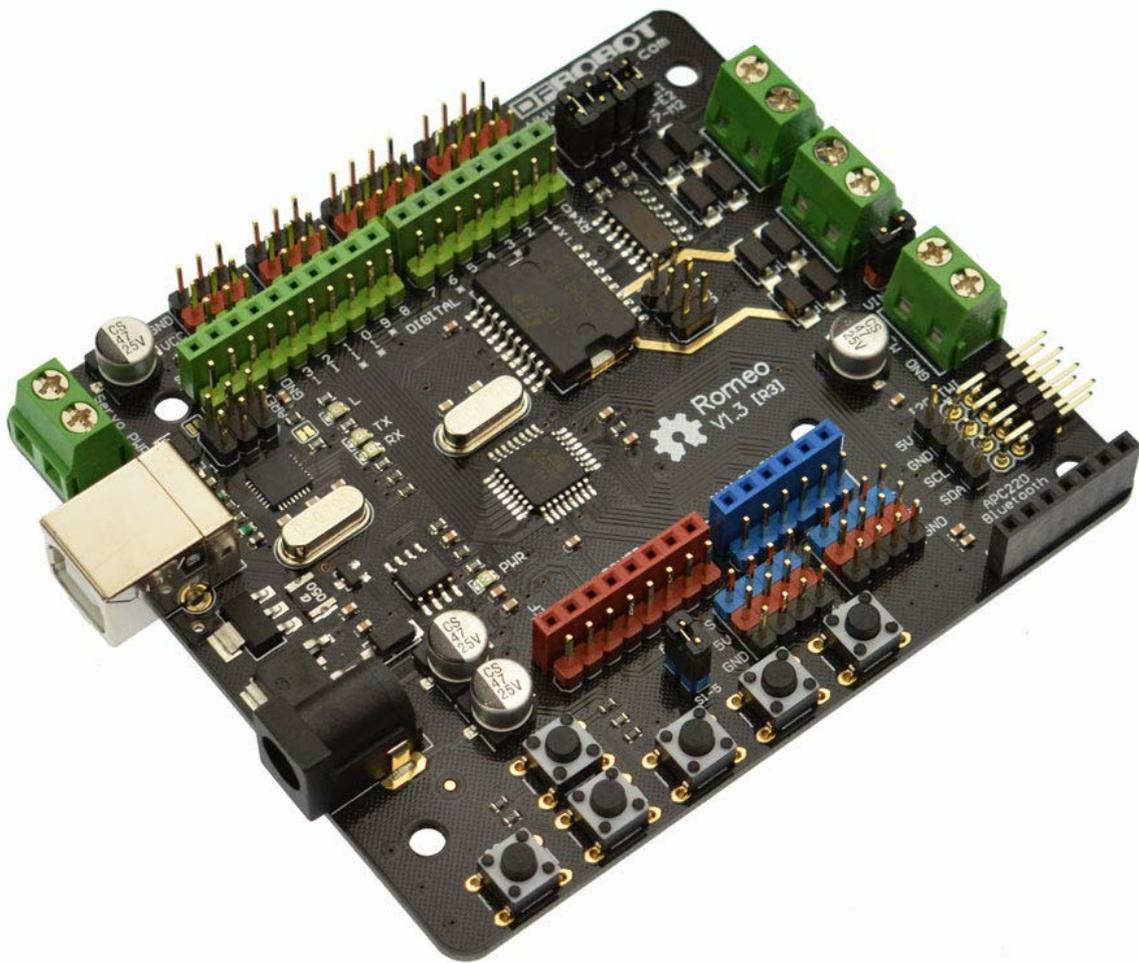
Figure 1: Overview of the DFROBOT Romeo DFR0004 Robot Control Board.

2. KEY FEATURES

- **Processor:** Atmega328
- **Bootloader:** Arduino Uno
- **Power Supply:** USB or External 7V-12V DC
- **DC Output:** 5V / 3.3V DC and External Power
- **Motor Driver:** Two-way, 2A Max Current
- **Analog I/O:** 8 Channels, 10-bit
- **Connection:** USB
- **Inputs:** 5 Keys
- **Power Input:** Auto Sensing/Switching
- **Programming:** ICSP Header for Direct Download
- **Interface:** Serial, TTL Level
- **Pin Header Support:** Male and Female

- **Module Sockets:** Integrated for APC220 RF and DF-Bluetooth
- **I2C Interface:** Three Pin Sets (two 90-degree headers)
- **Arduino Uno Pin Mapping Compatibility:** Ensures broad compatibility with existing Arduino projects.

3. SETUP GUIDE

3.1 Powering the Board

The Romeo board can be powered via its USB connection or an external DC power supply. For external power, connect a 7V-12V DC source to the designated power input jack. The board features auto-sensing/switching for power input.

3.2 USB Connection

Connect the Romeo board to your computer using a standard USB cable. This connection provides power and enables programming and serial communication.
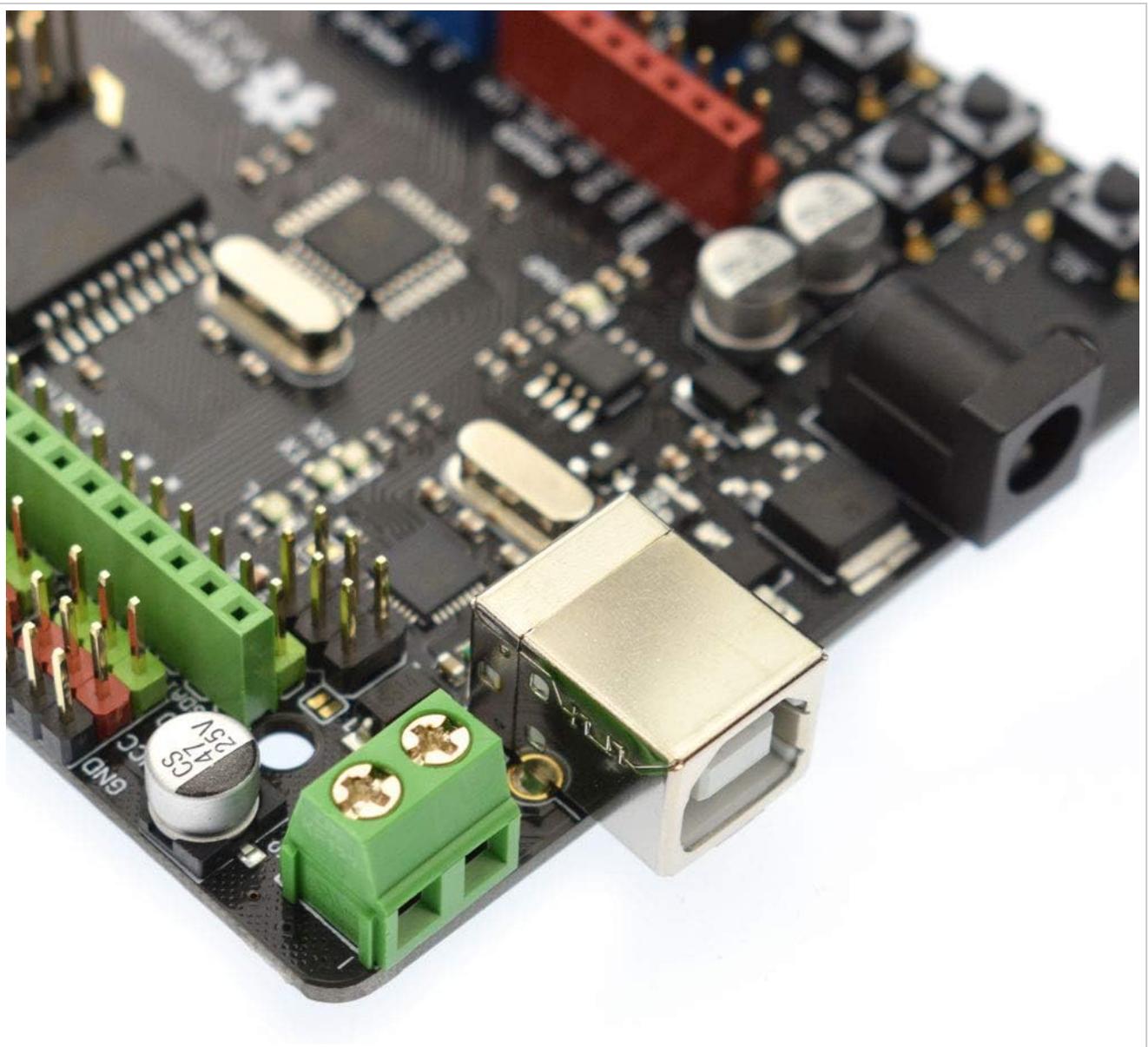

Figure 2: USB port and external power input on the Romeo board.

3.3 Driver Installation

For initial setup, ensure your computer has the necessary Arduino IDE and drivers installed. The Romeo board uses

the Arduino Uno bootloader, so standard Arduino Uno drivers are compatible. Refer to the official Arduino website for detailed driver installation instructions for your operating system (Windows, Linux, macOS).

4. OPERATING INSTRUCTIONS

4.1 Programming the Board

The Romeo board can be programmed using the Arduino IDE. Connect the board via USB, select "Arduino Uno" as the board type in the IDE, and choose the correct serial port. You can upload sketches directly through the USB connection. An ICSP header is also available for direct firmware download.

4.2 Motor Control

The integrated two-way DC motor driver supports a maximum current of 2A. Connect your DC motors to the designated motor driver terminals. Refer to the board's pinout diagram for specific motor control pins. Standard Arduino motor control libraries can be used to operate connected motors.

4.3 Wireless Communication

The Romeo board includes integrated module sockets for APC220 RF and DF-Bluetooth modules. These sockets simplify the connection of wireless communication modules, allowing for remote control or data transmission in your robotics projects. Ensure proper module installation and configuration according to the module's specific documentation.
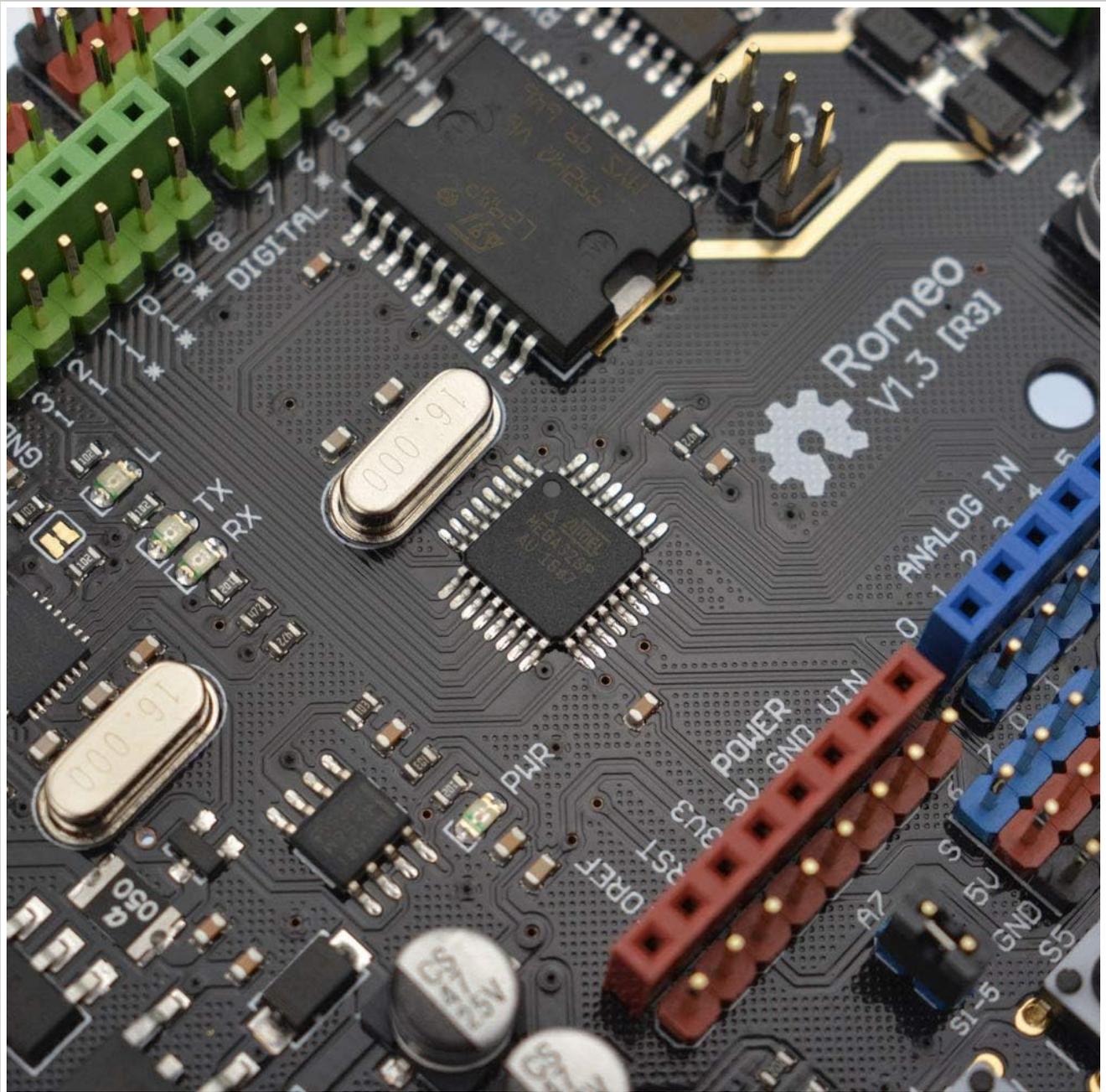
Figure 3: Close-up view of the Romeo board's components, including the Atmega328 processor and various headers.

5. SPECIFICATIONS

Feature	Detail
Brand	DFROBOT
Model Number	DFR0004
Processor	Atmega328
Bootloader	Arduino Uno
Power Supply	USB or External 7V-12V DC
DC Output	5V / 3.3V DC
Motor Driver	Two-way, 2A Max Current

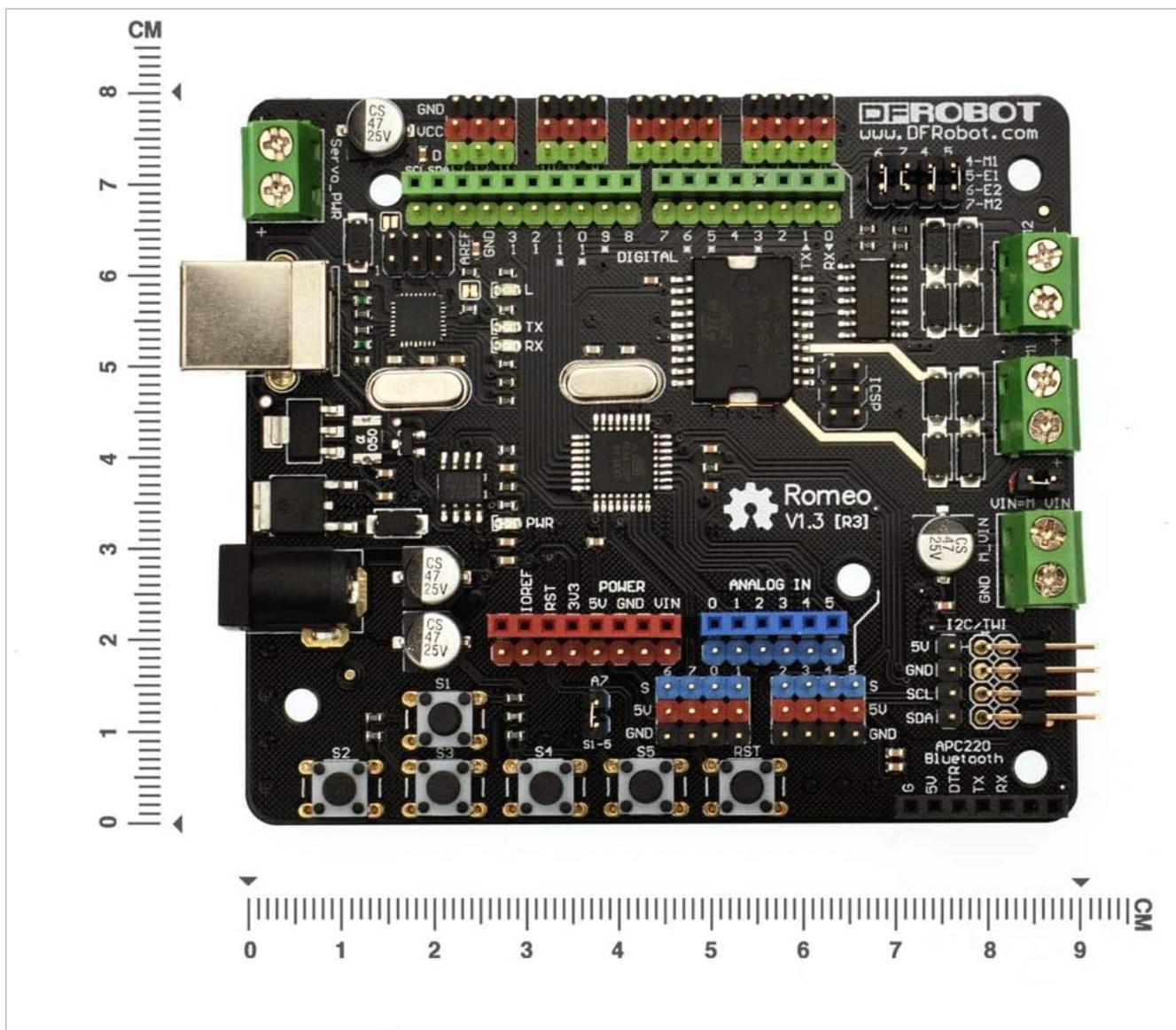| Feature	Detail
Analog I/O	8 Channels, 10-bit
Connection	USB
Inputs	5 Keys
Programming	ICSP Header for Direct Download
Interface	Serial, TTL Level
Wireless Type	Bluetooth (with compatible module)
Operating System Compatibility	Windows, Linux, macOS
Item Weight	2.12 ounces
Product Dimensions (LxWxH)	6.3 x 0.67 x 4.72 inches

Figure 4: Top-down view of the Romeo board with dimensions in centimeters.

6. MAINTENANCE

To ensure the longevity and optimal performance of your DFROBOT Romeo board, follow these maintenance guidelines:

- **Keep Clean:** Regularly clean the board with a soft, dry brush to remove dust and debris. Avoid using liquids or abrasive cleaners.
- **Handle with Care:** Electronic components are sensitive. Avoid dropping the board or subjecting it to excessive force.
- **Proper Storage:** Store the board in a dry, anti-static environment when not in use.
- **Power Off Before Connecting/Disconnecting:** Always disconnect power before making or changing any electrical connections to prevent short circuits or damage.

7. TROUBLESHOOTING

If you encounter issues with your DFROBOT Romeo board, consider the following troubleshooting steps:

- **No Power:**
  - Verify that the USB cable is securely connected to both the board and your computer.
  - If using external power, ensure the DC adapter is providing the correct voltage (7V-12V) and is properly connected.
  - Check for any visible damage to the power input jack or USB port.

- **Programming Errors:**
  - Ensure "Arduino Uno" is selected as the board in the Arduino IDE.
  - Confirm that the correct serial port is selected in the Arduino IDE.
  - Check your code for syntax errors or logical issues.
  - Try a simple "Blink" sketch to verify basic functionality.

- **Motor Driver Issues:**
  - Ensure motors are correctly wired to the motor driver terminals.
  - Verify that the motor power supply is adequate and connected.
  - Check if the motor control pins in your code match the physical connections.

- **Wireless Module Connection Problems:**
  - Ensure the APC220 RF or DF-Bluetooth module is correctly seated in its socket.
  - Verify that the module is powered and configured according to its specific documentation.
  - Check for any interference from other wireless devices.

For further assistance, refer to the DFROBOT official website or community forums.

8. WARRANTY AND SUPPORT

Information regarding specific warranty terms and conditions for the DFROBOT Romeo DFR0004 Robot Control Board is not available in this manual. Please refer to the product packaging, the official DFROBOT website, or contact your retailer for detailed warranty information and customer support options.