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› DEVMO Mach3 USB Interface Board (Mach3-Board) 4-Axis CNC Motion Control Card User Manual

DEVMO Mach3-Board

DEVMO Mach3 USB Interface Board (Mach3-Board) User Manual

4-Axis CNC Motion Control Card for Stepper Motor Drivers

1. INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of your DEVMO Mach3 USB Interface Board. This 4-axis motion control card is designed to provide robust and reliable control for CNC systems, offering strong anti-interference capabilities and broad compatibility with Mach3 software.

2. PACKAGE CONTENTS

Please verify that all items listed below are included in your package:

- 1 × DEVMO Mach3 USB CNC Controller Card
- 1 × USB Cable
- 1 × CD (containing drivers and software)



Figure 1: Included CD for software and drivers.



Figure 2: USB cable for board connection.

3. SETUP AND INSTALLATION

3.1 Hardware Overview

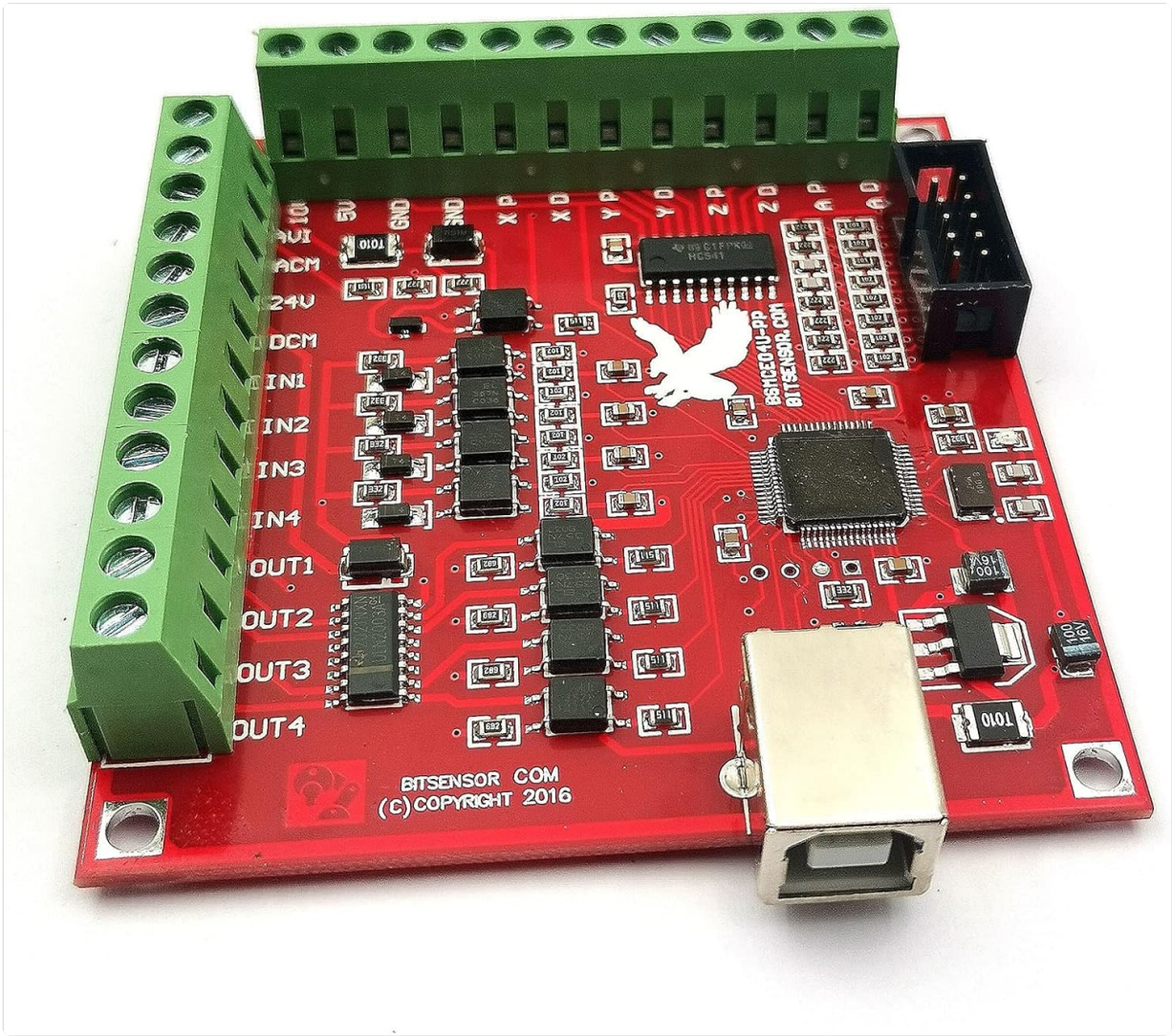


Figure 3: Top view of the Mach3 USB Interface Board, showing input/output terminals and USB port.

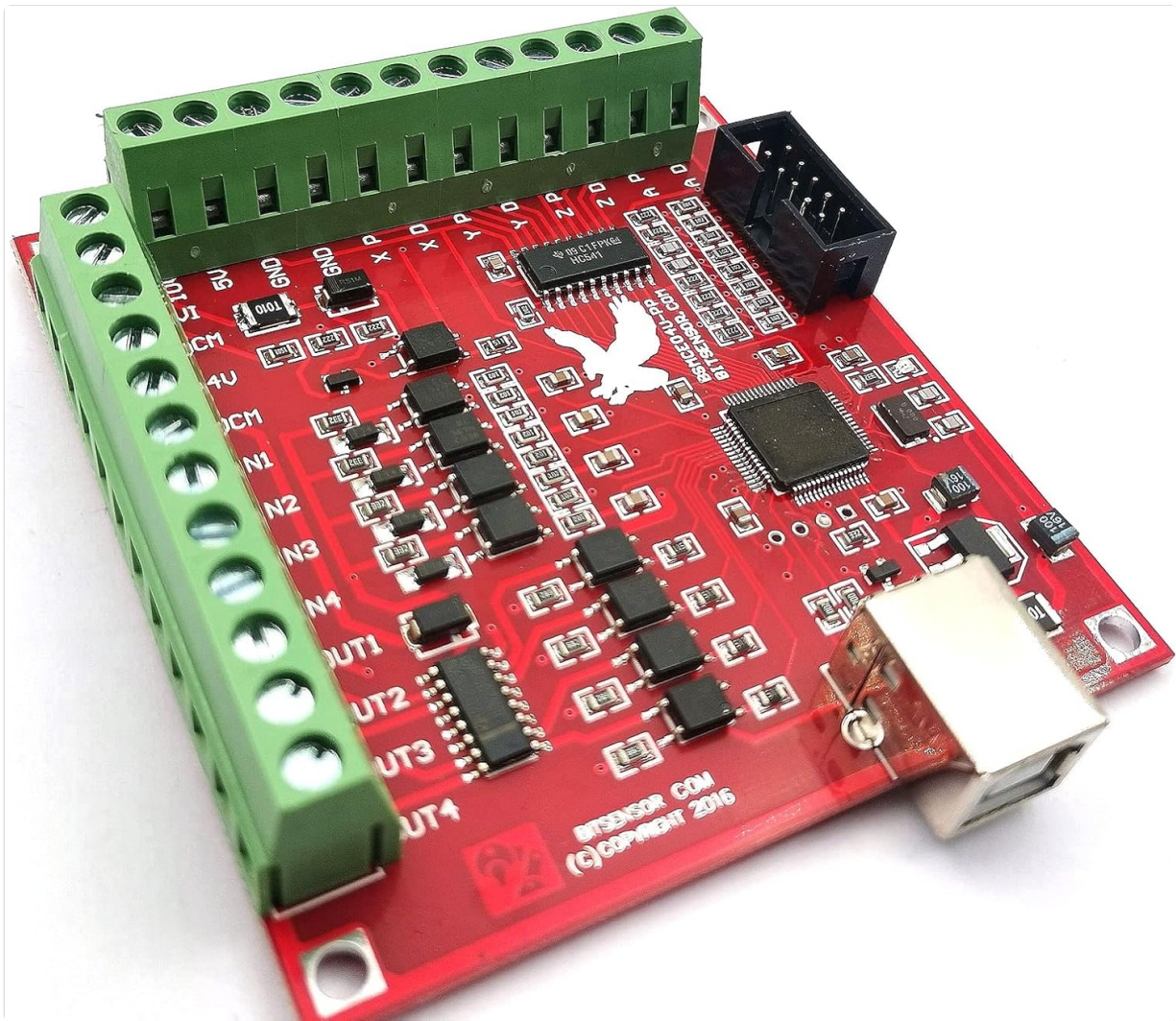


Figure 4: Angled view of the board, emphasizing the USB connection point.

3.2 Software Installation

1. Insert the provided CD into your computer's CD/DVD drive.
2. Install the Mach3 software and any necessary USB drivers from the CD. Ensure drivers are correctly installed for your operating system (Windows is supported).
3. Connect the Mach3 USB Interface Board to your computer using the supplied USB cable.

3.3 Wiring Connections

The board features terminal blocks for various connections:

- **Power Supply:** Connect an external 24V DC power supply to isolate USB and external ports for enhanced system stability.
- **Motor Drivers:** Connect up to four stepper motor drives or servo drives to the respective axis outputs.
- **Analog Output:** The interface outputs a 0-10V analog signal, configurable to 0-5V output as needed.
- **General-Purpose Inputs:** Four general-purpose inputs are available for connecting limit switches, E-stop switches, probe switches, and other operational controls.

Refer to the wiring diagrams provided in the software documentation on the CD for specific connection details.

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Video 1: Overview of a DIY CNC Controller Card, demonstrating components and basic connections. This video provides a visual guide to the physical aspects of a CNC control board.

4. OPERATING INSTRUCTIONS

4.1 Basic Operation with Mach3

Once the hardware is connected and software is installed, launch Mach3. The interface board will communicate with Mach3 to control your CNC machine. The maximum step-pulse frequency is 100KHz, suitable for both servo and stepping motors.

4.2 Using the Control Interface

The control interface allows for precise movement and control of your CNC machine. This includes:

- **4-Axis Linkage:** Supports simultaneous control of four axes (X, Y, Z, A).
- **Jogging:** Manually move each axis for setup and positioning.
- **Homing:** Return axes to their home positions.
- **Probing:** Utilize a probe switch for automatic tool length measurement or workpiece referencing.

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Video 2: Demonstration of an offline CNC controller, showing axis movement and interface interaction. This provides insight into typical CNC control operations.

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Video 3: A macro demo for a 7-inch IPS Touch GRBL Module, illustrating advanced functions and user interface navigation. This can be helpful for understanding macro programming.

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Video 4: A demonstration of the homing function on a DDCSV3.1 controller, showing how the machine returns to its reference point.

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Video 5: Detailed explanation of CNC Offline GRBL Control Module compatibility and features, useful for understanding system requirements and capabilities.

5. MAINTENANCE

To ensure the longevity and optimal performance of your Mach3 USB Interface Board, follow these maintenance guidelines:

- Keep the board clean and free from dust and debris. Use compressed air or a soft brush for cleaning.
- Ensure the operating environment is dry and free from excessive humidity to prevent corrosion.
- Avoid exposing the board to extreme temperatures.
- Regularly check all wiring connections for tightness and signs of wear.

6. TROUBLESHOOTING

6.1 Connection Issues

- **Board not recognized by computer:** Ensure USB drivers from the provided CD are correctly installed. Try a different USB port or cable.
- **Mach3 software not communicating:** Verify that the correct Mach3 plugin for the USB interface board is selected and configured.

6.2 Operational Problems

- **Motor movement erratic or incorrect:** Check motor driver connections and ensure pulse/direction signals are correctly configured in Mach3. Verify power supply to the board and motor drivers.

- **Interference issues:** The board is designed with strong anti-interference capabilities. However, ensure proper grounding of your CNC machine and use shielded cables where necessary to minimize electrical noise.
- **Limit switch or E-stop not functioning:** Confirm correct wiring of general-purpose inputs and proper configuration in Mach3.

6.3 Software Compatibility

While the board is designed for Mach3, ensure your operating system (e.g., Windows version) is compatible with the Mach3 version and drivers provided. Consult Mach3 documentation for specific OS requirements.

7. SPECIFICATIONS

Feature	Specification
Model	Mach3-Board
Axes Supported	4-Axis Linkage
Connectivity	USB
Max Step-Pulse Frequency	100KHz
Analog Output	0-10V (configurable to 0-5V)
Inputs	4 General-purpose inputs (limit switch, E-stop, probe)
Operating System	Windows
Dimensions	80 × 77mm (3.15 × 3.03 inches)
Weight	160g (0.35lb)

8. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the documentation included with your product or contact DEVMO customer service through your purchase platform. Ensure you have your product model and purchase details ready when seeking support.