

HEXEH DDHMOV2.1

HEXEH DDHMOV2.1 5-axis CNC Motor Controller User Manual

Model: DDHMOV2.1

1. INTRODUCTION

This manual provides comprehensive instructions for the installation, operation, and maintenance of the HEXEH DDHMOV2.1 5-axis CNC Motor Controller. This system is designed for precise motion control in engraving machines and other industrial applications, offering independent control without the need for a computer.

2. SAFETY INFORMATION

Please read and understand all safety instructions before installing or operating the DDHMOV2.1 controller. Failure to follow these instructions may result in electric shock, fire, or serious injury.

- Ensure all power connections are made by qualified personnel.
- Disconnect all power sources before performing any installation, wiring, or maintenance.
- The controller operates with 24V-36V DC power. Verify correct voltage and polarity before connecting.
- Do not expose the unit to moisture, dust, or extreme temperatures.
- The metal casing provides strong anti-interference capabilities; however, ensure proper grounding.

3. PACKAGE CONTENTS

Verify that all items listed below are present in your package:

- Motion controller (DDHMOV2.1) x 1
- Patch panel x 1
- Connection line x 2
- U disk x 1

4. PRODUCT OVERVIEW

The DDHVM2.1 controller features a robust metal case designed for industrial environments. It includes various interfaces for motor control, input/output, and power.

4.1 Rear Panel Interfaces



Figure 4.1: Rear panel of the DDHVM2.1 controller, illustrating the IN & OUT, 5 AXIS & SPINDLE, MPG, IO POWER, and MAIN POWER ports.

- **IN & OUT (Input & Output):** General purpose digital input and output interfaces.
- **5 AXIS & SPINDLE:** Connects to stepper motor drivers for up to 5 axes and provides spindle control output.
- **MPG:** Manual Pulse Generator interface for precise manual control.
- **IO POWER:** Dedicated power input for the IO module (24-36V DC).
- **MAIN POWER:** Main power input for the controller (24-36V DC).

4.2 Front Panel Controls



Figure 4.2: Front panel of the DDHVM2.1 controller, featuring the display, function keys (F1-F6), operational buttons (START/PAUSE, SPINDLE, MDI, ESTOP), and navigation controls.

- **Display Screen:** Shows real-time machine status, coordinates, and menu options.
- **USB Port:** For loading G-code files and firmware updates.
- **Function Keys (F1-F6):** Context-sensitive keys for various operations displayed on the screen.
- **START/PAUSE:** Initiates or pauses the CNC program.
- **SPINDLE:** Controls spindle operation.
- **MDI (Manual Data Input):** Allows direct command input.
- **ESTOP (Emergency Stop):** Immediately halts all machine operations in an emergency.
- **Navigation and Control Buttons:** For axis movement (X, Y, Z, A), jogging, setting zero points (ZERO), returning to home (HOME), and probing (PROBE).

5. SETUP

5.1 Mounting the Controller

The DDHVM2.1 controller features an open structure with four mounting holes at the bottom. To install:

1. Prepare the cabinet by drilling four 4mm diameter holes according to the mounting hole size of 85mm x 212mm.
2. Ensure the cabinet opening for the front panel is (131+1)mm x (202+1)mm.
3. Secure the unit to the cabinet using appropriate fasteners.

Note: The product appearance size is 222mm x 145mm x 20mm, with a mounting seat width of 10mm.

5.2 Power Connections

The controller requires two separate DC power inputs:

- **Main Power Supply:** Connect a 24V-36V DC power supply (minimum 20W capacity) to the 4P green terminal labeled VIN and GND on the rear panel.
- **IO Module Power Supply:** Connect a separate 24V-36V DC power supply (minimum 20W capacity) to the terminal labeled COM+ and COM- for the IO module.

Important: Ensure correct polarity for both power supplies. Using two separate 24V 2A switching power supplies is recommended.

5.3 Motor and Spindle Connections

- **Stepper Motors:** Connect up to 4 channels of stepper motor control to the "5 AXIS & SPINDLE" interface. The controller supports a single-axis control pulse of 500KHz and provides differential output for stepper motors.
- **Spindle Control:** A 0-10V analog output interface is available for spindle speed control. This can be modified to PWM output if required.

5.4 Input/Output (IO) Connections

- **Digital Inputs:** The controller features a 13-channel optocoupler isolated common digital input interface. Connect sensors, limit switches, and other input devices here.
- **Digital Outputs:** A 12-channel optocoupler isolated common digital output interface is provided for controlling relays, indicators, and other output devices.

6. OPERATING INSTRUCTIONS

The DDHMV2.1 controller operates independently without a computer. All operations are performed via the front panel interface.

- **File Management:** Use the USB port to load G-code files. The system supports online editing of files directly on the controller.
- **Basic Operation:**
 - Press **START/PAUSE** to begin or temporarily stop a program.
 - Use the axis navigation buttons (X, Y, Z, A) for manual jogging.
 - Set work coordinates using the **ZERO** button.
 - Return to machine home position with the **HOME** button.
- **Advanced Features:**
 - **Trial Cutting:** The system supports trial cutting operations to verify tool paths before full execution.
 - **Tool Change:** Facilitates tool change operations during a program.
 - **MPG:** Connect a Manual Pulse Generator for fine manual control of axes.
- **Emergency Stop:** In case of any malfunction or emergency, press the large red **ESTOP** button immediately to halt all machine movement.

7. MAINTENANCE

Regular maintenance ensures the longevity and reliable operation of your DDHMV2.1 controller.

- Keep the controller clean and free from dust, debris, and metal shavings. Use a soft, dry cloth for cleaning.
- Periodically check all wiring connections for tightness and signs of wear or damage.
- Ensure adequate ventilation around the unit to prevent overheating.

- Avoid exposing the unit to strong electromagnetic interference sources.

8. TROUBLESHOOTING

If you encounter issues with your DDHMOV2.1 controller, refer to the following common troubleshooting steps:

- **No Power:**
 - Check both main power and IO power supply connections.
 - Verify that the power supplies are providing the correct voltage (24V-36V DC).
- **Motors Not Moving:**
 - Ensure motor drivers are correctly connected and powered.
 - Check G-code for errors or incorrect commands.
 - Verify axis limits and home positions are correctly set.
- **Display Issues:**
 - Restart the controller.
 - Ensure all internal connections are secure (if applicable and accessible).
- **Unexpected Behavior:**
 - Press the **ESTOP** button immediately.
 - Review your G-code program for logical errors.
 - Consult the detailed error messages on the display, if any.

For persistent issues, contact HEXEH customer support.

9. SPECIFICATIONS

Feature	Specification
Control Type	Independent (no computer required)
Axes Supported	Up to 4 channels stepper motor control
Max Pulse Frequency	500KHz per single axis
Stepper Motor Output	Differential output
Digital Input Interface	13-channel optocoupler isolated
Digital Output Interface	12-channel optocoupler isolated
Spindle Speed Control	1-way 0-10V analog output (PWM modifiable)
Main Control Power Input	24V-36V DC (min. 20W)
IO Power Input	24V-36V DC (min. 20W)
Housing Material	Metal case

Feature	Specification
Anti-interference	Strong anti-interference ability, excellent EMC design
Product Dimensions	222mm x 145mm x 20mm
Mounting Hole Size	85mm x 212mm
Cabinet Opening Size	(131+1)mm x (202+1)mm
Item Weight	1.76 pounds

10. WARRANTY AND SUPPORT

For warranty information or technical support, please contact your HEXEH product supplier or visit the official HEXEH website. Keep your purchase receipt for warranty claims.

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