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› HEXEH TC55H USB G Code Motion Controller User Manual

HEXEH TC55H

HEXEH TC55H USB G Code Motion Controller User Manual

MODEL: TC55H (1/2/3/4 Axis)

1. Introduction

The HEXEH TC55H is an advanced motion controller designed for CNC applications, supporting 1, 2, 3, or 4 feeding axes and 1 analog spindle. It features 16 input ports and 8 output ports, enabling comprehensive control over various machinery. The controller supports importing G-code files from a USB disk and can display a boot picture. It also includes a function to save current coordinates after power loss, ensuring operational continuity.

This manual provides essential information for the proper installation, operation, and maintenance of your TC55H motion controller. Please read it thoroughly before use to ensure safe and efficient operation.

2. Safety Information

Always observe the following safety precautions to prevent injury or damage to the equipment:

- Ensure the power supply is disconnected before performing any wiring or maintenance.
- Verify all wiring connections are correct and secure to prevent short circuits or component damage.
- Operate the controller within its specified voltage and current ratings.
- Avoid exposing the controller to moisture, dust, or extreme temperatures.
- Only qualified personnel should install and service this equipment.

3. Product Overview

The TC55H motion controller features a robust design with a user-friendly interface. Key components include a 3.5-inch color LCD screen, a manual pulse generator (MPG), and a comprehensive keypad for input and control.



Figure 3.1: Front panel of the TC55H controller, showing the LCD screen, MPG dial, and control keypad.



Figure 3.2: Key features of the TC55H controller, including the 3.5-inch color LCD screen (320*240 resolution), USB port for program import, and durable metal protection buttons.

The controller's side and rear panels house various input/output terminals for connecting to motors, power supplies, and other peripheral devices.



1/2/3/4 Axis

CNC CONTROLLER

**TC55H motion controller
Servo/stepper Motor controller**

Figure 3.3: Angled view of the TC55H controller, illustrating its compact design and accessible connection points.

4. Technical Specifications

The following table outlines the technical specifications for the TC55H motion controller:

Feature	Specification
Model	TC55H
Minimum Data Unit	0.001 mm
Maximum Data Size	±99999.999 mm
Maximum Speed	9000 mm/min (pulse is 0.001mm)
Maximum Pulse Output Frequency	150 KHz
Controlled Axes	1-4 (X, Y, Z, C)
Interpolation	X, Y, Z, C axis for linear interpolation; X, Y for circular interpolation
Electric Gear	Numerator: 1-99999, Denominator: 1-99999

Feature	Specification
USB	Program and boot picture import
I/O Port	Isolated I/O port
Maximum Program Lines	1000
Maximum Programs	99
RAM	128 MB
External Manual Operation	Motor clockwise/counter-clockwise spinning, start, pause, alert, stop
Supported Codes	G code and M code
MPG	One panel MPG
LCD Screen	3.5 inch color LCD, pixel 320*240
Analog Spindle Output	0-10V analog spindle
Motor Support	Servo and stepper motor
Measurement Systems	Metric system, round, division, degree, inch, etc.
USB Power	Supports USB connecting computer as power supply

5. Setup

5.1 Power Supply

The TC55H motion controller utilizes a dual isolation power supply. The control voltage and working voltage are isolated to enhance anti-interference performance. The circuit incorporates anti-reverse connection measures to prevent damage from incorrect wiring. Two power sources are connected to a 24V switching power supply.

3. Instruction sheet

G Code	functionality	G Code	functionality
G00	Quick Positioning	G26	circulate
G01	linear interpolation	G27	Judgment jump, eligible jump
G02	Clockwise circular interpolation	G28	Judgement jump, does not meet the conditions of the jump
G03	Counterclockwise circular interpolation	G60	Cancel G64, Precise Path Mode
G04	Delay time (in seconds)	G64	Cancel G60, continuous path mode
G20	subroutine call	G74	return to mechanical zero
G22	Subroutine start	G90	Absolute mode programming
G24	end of subroutine	G91	Incremental Programming
G25	Absolute Jump	G92	Setting coordinates

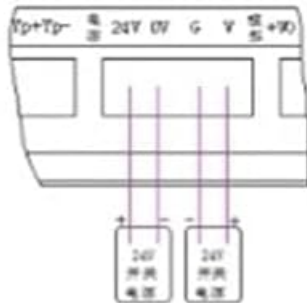
M Code	functionality	M Code	functionality
M00	pause (media player)	M05	Spindle stop
M02	Stop automatic processing	M47	Zeroing the workpiece count value
M03	Positive spindle rotation	M48	Workpiece count +1
M04	Spindle reversal	M51 M66	Output on/off, need to set the corresponding output port in IO.

4. power supply

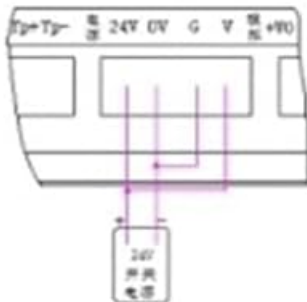
The TC55H motion controller adopts a dual isolation power supply, and the control voltage and working voltage are isolated in order to enhance the anti-interference performance of the system.

The circuit adopts anti reverse connection measures, which can effectively prevent customers from connecting incorrectly and burning the controller.

Two power sources are connected to a 24V switching power supply.



When the input and output are small and the load is small, the following wiring method can also be selected:



Functions that can only be achieved by the system power supply controller:

1-4 axis drive motor; USB drive import; Analog output

The functions that can be achieved by the system powered IO power supply controller at the same time: 16 input states; 8-channel output status

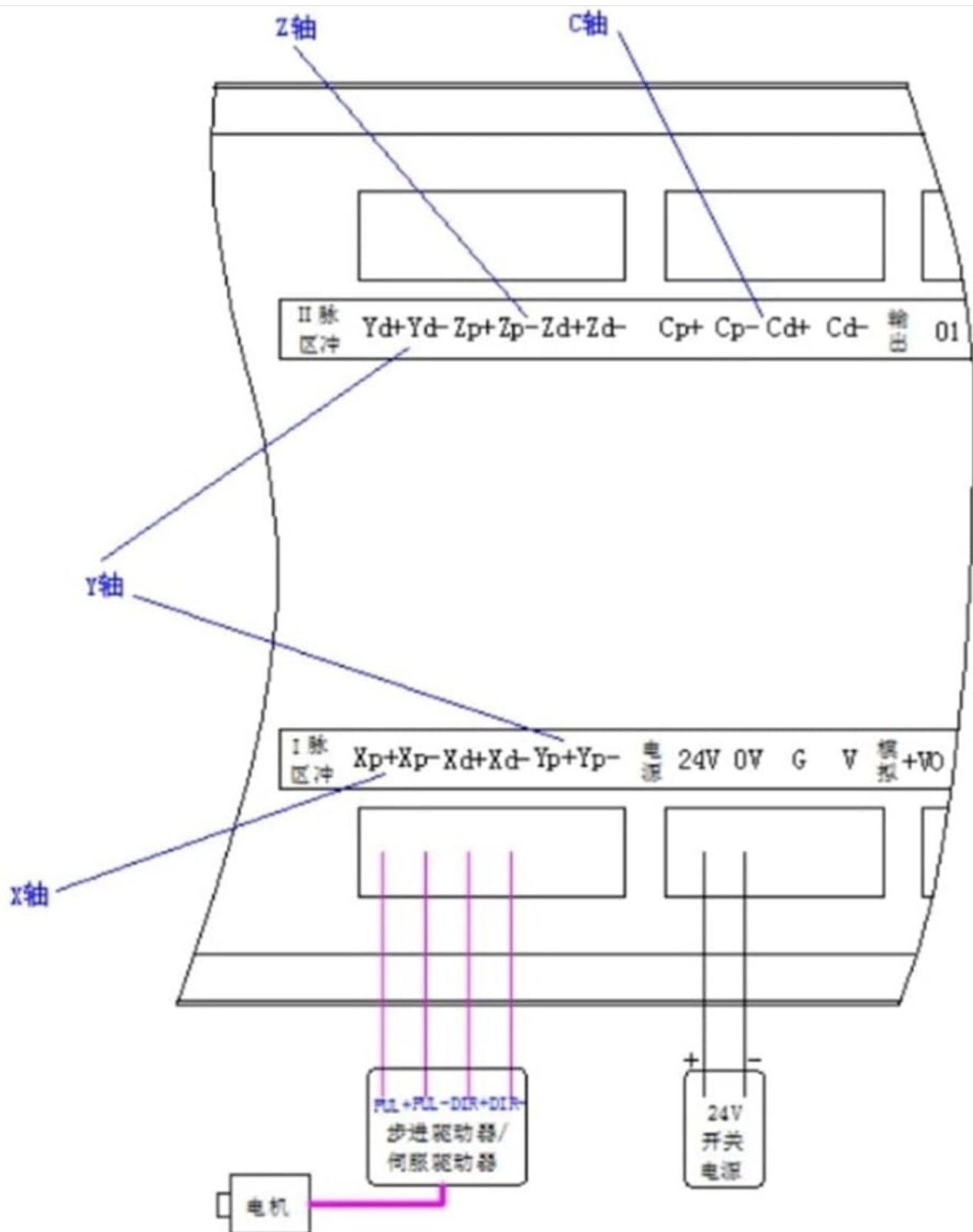
5. Connecting to the driver unit

The TC55H motion controller can drive servo or stepper motor drivers on axes 1-4.

The 4-axis motion controller is divided into X, Y, Z, and C axes, with the same wiring method. The following figure illustrates the X-axis with an example.

Figure 5.1: Power supply wiring diagram for the TC55H controller. Two 24V switching power supplies are shown connected to the controller's power inputs.

For scenarios where the input and output are small, and the load is minimal, a simplified wiring method can be used:



Controller Definition	Stepper/Servo Interface Definition
Xp+	PUL+
Xp-	PUL-
Xd+	DIR+/SIGN+
Xd-	DIR-/SIGN-

Figure 5.2: Simplified power supply wiring for low load applications, using a single 24V power supply.

5.2 Connecting to the Driver Unit

The TC55H motion controller can drive servo or stepper motor drivers on axes 1-4. The 4-axis motion controller is divided into X, Y, Z, and C axes. The following figure illustrates the X-axis connection as an example.

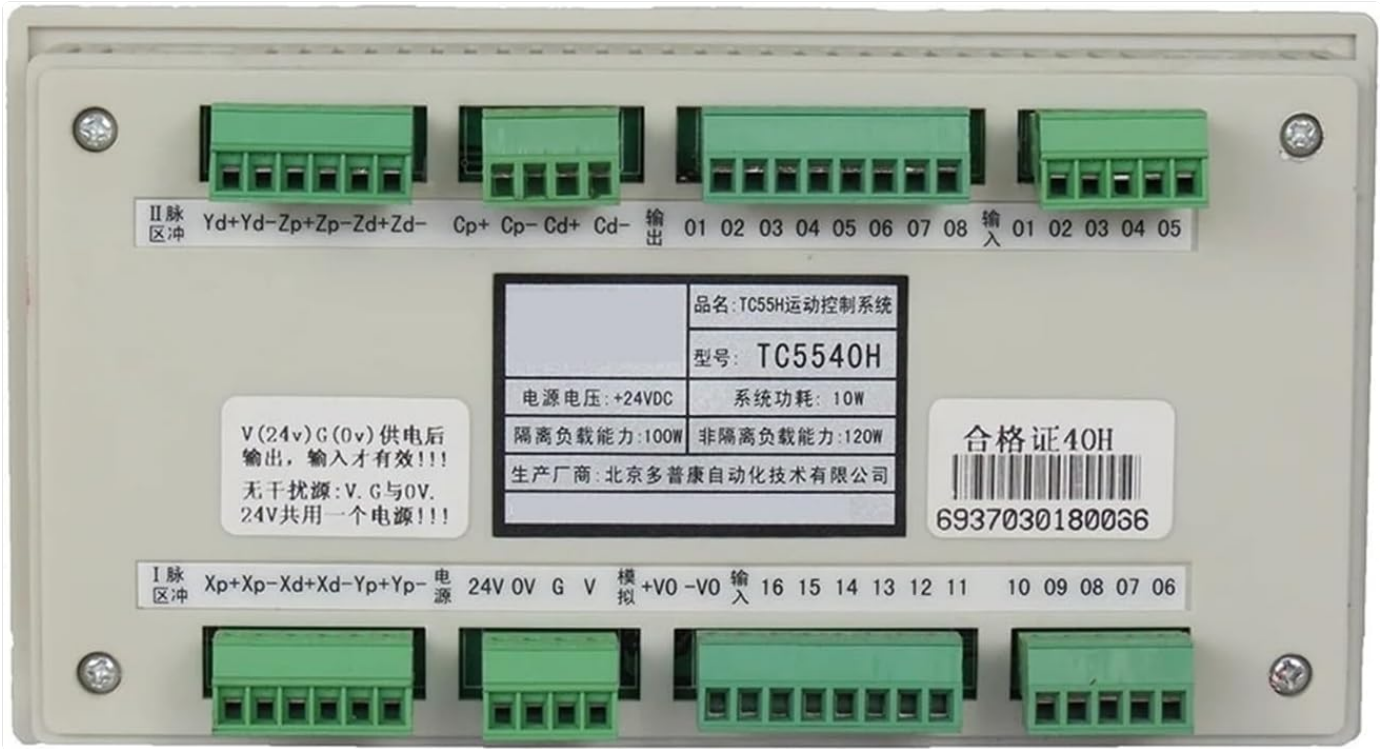


Figure 5.3: Rear panel of the TC55H controller with terminal blocks for input, output, and axis connections.

Controller Definition	Stepper/Servo Interface Definition
Xp+	PUL+
Xp-	PUL-
Xd+	DIR+/SIGN+
Xd-	DIR-/SIGN-
Yp+, Yp-, Yd+, Yd-	Corresponding PUL+/-, DIR+/- for Y-axis
Zp+, Zp-, Zd+, Zd-	Corresponding PUL+/-, DIR+/- for Z-axis
Cp+, Cp-, Cd+, Cd-	Corresponding PUL+/-, DIR+/- for C-axis

The functions that can be achieved by the system powered IO power supply controller at the same time include 16 input states and 8 channel output status.

6. Operating Instructions

6.1 G-Code and M-Code Functions

The TC55H controller supports a range of G-codes and M-codes for precise machine control. Below are some common codes and their functionalities:

G Code	Functionality	G Code	Functionality
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G Code	Functionality	G Code	Functionality
G00	Quick Positioning	G06	Judgment jump, eligible jump
G01	Linear Interpolation	G25	Judgment jump, does not meet the conditions of the jump
G02	Clockwise circular interpolation	G28	Cancel G04, Precise Path Mode
G03	Counterclockwise circular interpolation	G60	Cancel G60, continuous path mode
G04	Dwell time (in seconds)	G74	Return to mechanical zero
G20	Subroutine start	G90	Absolute mode programming
G21	Subroutine end	G91	Incremental Programming
G22	Absolute Jump	G92	Setting coordinates

M Code	Functionality	M Code	Functionality
M00	Pause (media player)	M05	Spindle stop
M02	Stop automatic processing	M47	Zeroing the workpiece count +1
M03	Positive spindle rotation	M48	Workpiece count -1
M04	Spindle reversal	M51~M66	Output on/off, need to set the corresponding output port in IO.



Figure 6.1: Example of a G-code program displayed on the TC55H controller screen.

6.2 Program Import via USB

G-code programs can be imported into the TC55H controller using a USB disk. Connect the USB disk to the designated USB port on the controller. Navigate through the menu to select the program import function and choose the desired G-code file.

6.3 Manual Pulse Generator (MPG)

The integrated MPG allows for precise manual control of axis movement. Use the MPG dial to incrementally move the selected axis. The 'Feed' and 'x10/x100' buttons adjust the step size for finer or coarser control.

7. Maintenance

To ensure the longevity and optimal performance of your TC55H motion controller, follow these maintenance guidelines:

- **Cleaning:** Regularly clean the exterior of the controller with a soft, dry cloth. Avoid using harsh chemicals or abrasive materials.
- **Environmental Control:** Keep the controller in a clean, dry environment, free from excessive dust, moisture, and corrosive substances.
- **Connection Checks:** Periodically inspect all wiring connections to ensure they are secure and free from damage.
- **Software Updates:** Check the manufacturer's website for any available firmware updates to ensure your controller has the latest features and bug fixes.

8. Troubleshooting

If you encounter issues with your TC55H motion controller, consider the following basic troubleshooting steps:

- **No Power:** Verify that the power supply is correctly connected and providing the specified 24V. Check all power cables and connections.
- **Axis Not Moving:** Ensure motor drivers are correctly wired and powered. Check G-code for correct axis commands and limits. Verify the electric gear ratio settings.
- **Program Not Loading:** Confirm the USB disk is formatted correctly and the G-code file is valid. Ensure the file is placed in the root directory or a recognized folder on the USB disk.
- **Incorrect Movement:** Review the G-code program for errors. Check the unit settings (metric/inch) on the controller to match your program.
- **Error Messages:** Refer to the controller's display for any specific error codes or messages. Consult the manufacturer's support resources if the error persists.

9. Warranty and Support

Specific warranty details for the HEXEH TC55H motion controller are not provided in this manual. For warranty information, technical support, or service inquiries, please contact the manufacturer or your authorized dealer directly. Ensure you have your product model number (TC55H) and purchase details available when contacting support.

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