User's Manual

For

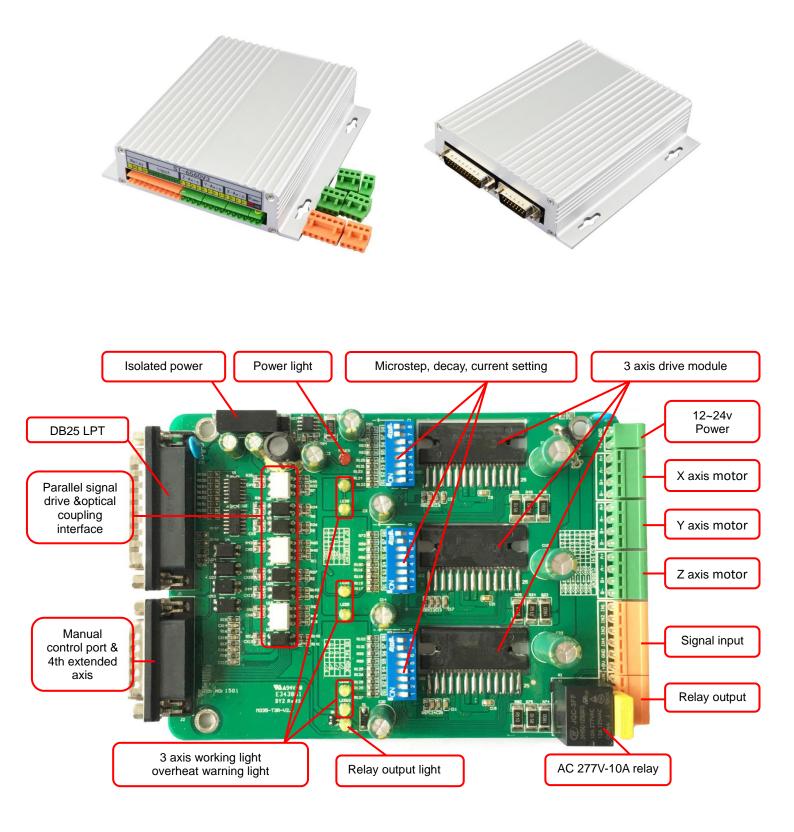
ST-6560V3

Version 2.0 2016.08.25 All Rights Reserved

1. Key Features

- Toshiba TB6560AHQ chip High power, maximum current 3.5A
- Resolution 1, 1/2, 1/8, 1/16 micro stepping output
- Working voltage DC12-DC30V, rated voltage 24V
- Adjustable current with 100%, 75%, 50%, 20% of full current by on-board switch.
- Half current function when no signal to prevent motor heating
- Build with a 227V 10A Relay
- Manual Control circuit included
- Overload, over-current and over-temperature safety
- Protect the computer by using isolating power(1000V DC\DC) and optoelectronic coupler
- Supports most parallel software MACH3, KCAM4, EMC2 etc.
- Fixed in Aluminum box, better cooling function than fan and safer protection for board circuit

2. Photo of 3-AXIS CNC Board



3. Hardware Installation

3.1 Selecting and Connecting Stepper Motors

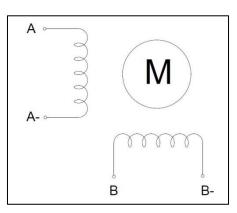
WARNING: INCORRECT WIRING OF THE STEPPER MOTOR TO THE DRIVE BOARD CAN LEAD TO

IMMEDIATE DAMAGE OF DRIVE BOARD - DO NOT CONNECT OR DISCONNECT MOTORS WHILE POWER

IS ON.

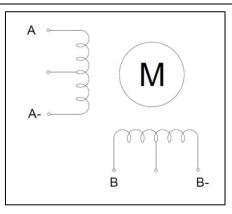
- 4 Wire, 6 Wire, and 8 Wire stepper motors can be used.
- 4 Wire motors are recommended as they are by their manufacture true bipolar motors and easier to properly connect to stepper motor drive controller.
- It is critical to obtain a proper motor coil diagram of any motor you wish to utilize (making cross connections between the two coils will destroy the control circuitry).
- 1.8 deg per step resolution is the industry standard for most automation grade stepper motors and is recommended for most applications.

a. 4 Wire Stepper Diagram



Each wire is connected to its corresponding terminal block location (i.e. A- wire is connected at A-location).

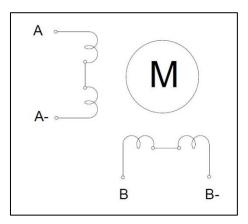
b. 6 Wire Stepper Diagram



Center wire of each coil not connected (insulate termination). Remaining wires are connected to their

corresponding terminal block location (i.e. A- wire is connected at A- location).

c. 8 Wire Stepper Diagram



2 center wires of each coil connected (insulate connection)

Remaining wires are connected to their corresponding terminal block location (i.e. A- wire is connected

at A- location).

If using 6 or 8 wire motors, connected using series wiring method, reduce labeled amperage rating by 50%

(i.e. a motor rated at 4 amps should thus be considered now rated at 2 amps).

3.2 Connect to Computer by DB25

The following is to aid in the setup of the use of controller with various CAM software programs operating on your computer.

PIN	Signal
1	NC
2	X axis pulse input
3	X axis direction input
4	Y axis pulse input
5	Y axis direction input
6	Z axis pulse input
7	Z axis direction input
8	NC
9	NC
10	LPT input signal 1 (corresponding IN1 on the board)
11	LPT input signal 2 (corresponding IN2 on the board)
12	LPT input signal 3 (corresponding IN3 on the board)
13	LPT input signal 4 (corresponding IN4 on the board)
14	NC
15	LPT input signal 5 (corresponding IN5 on the board)
16	All axis enable input
17	Output control of relay (227V/10A)
18-25	GND

It is critical that your computer has parallel port DB25 outlet, If your computer does not feature a DB25

outlet, you must install one, (these can be achieved via PCMIA cards on laptop computers). The use of

adapters and hubs is not recommended and most likely will not work.

3.3 Manual Control

PIN	Input Signal 0V~5V
1	X axis pulse input
2	X axis direction input
3	Y axis pulse input
4	Y axis direction input
5	Z axis pulse input
6	Z axis direction input
7	All axis enable input
8	Connect to the collector of NPN in relay, and connect to 24V through relay
9	NC
10	NC
11	NC
12	Connect to the base of NPN in relay, and pull-up to 5V by 4.7K resistance
13	5V power output (<50mA condition)
14	Direct connecting to IN1, as the input signal of parallel port PIN10
15	Power GND

3.4 Port for extending and relay

PIN (0V~5V)	1	2	3	4	5	6	7	8	9	10
Input Signal	IN1	IN2	IN3	IN4	GND	NC	NC	L2	NC	L1

4. Setting

Working Current> Pause current	S1	S2	S 3	S 4
20%>20%	0	0	1	1
50%>20%	0	1	0	1
75%>20%	0	0	1	0
75%>50%	1	0	0	0
100%>20%	0	1	0	0
100%>50%	0	0	0	0

4.1 Current adjusting and default testing

EXAMPLE: 75%-->20%

Working current=3.5A *75%, Pause current=3.5A *20%

4.2	Subdivision	mode	& Decay	mode	setting
-----	-------------	------	---------	------	---------

	S5	S 6		S 7	S 8
1	1	1	NO DECAY	1	1
1/2	1	0	SLOW DECAY	1	0
1/8	0	0	MID DECAY	0	1
1/16	0	1	FAST DECAY	0	0

Note: If there is bumming when motor running or locked, it can be eliminated by setting the decay mode.

5. How to use MACH software?

See Pic.1: open MACH3, choose Mach3mill,click OK.

	Session Profile	×
Macho Joader	Current Profiles Mach3Mill Mach3Turn Plasma	Create Profile Delete Profile
Mach3Mill		
Plasma		Cancel



See Pic.2, there are common use buttons.

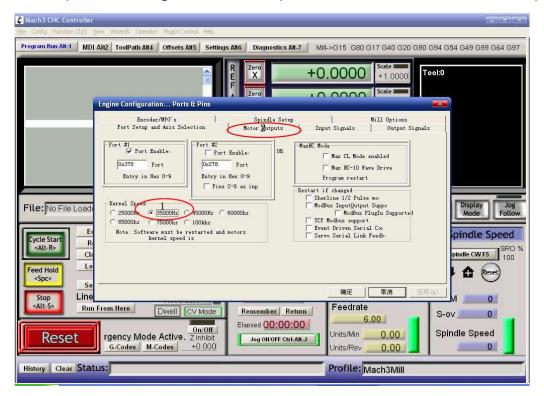
🛃 Mach3 CNC Controller						
Elle Config Function Cfg's View Wizards Operator Plugin Control Help						
Program Run Alt-1 MDI Alt2 ToolPath Alt4 Offsets Alt5 Settings Alt6 Diagnostics Alt-7 Mill->G15 G80 G17 G40 G20 G90 G94 G54 G49 G99 G64 G97						
F Zero H Zero H Zero	O.0000 \$cale + 1.0000 \$cale • 0.0000 \$cale • 1.0000 \$cale • 1.0000 \$cale • 1.0000 \$carret • 1.0000 \$corret • 1.0000 \$corret					
File: No File Loaded	ad Wizards Last Wizard Regen. Display Jog rversational Clearant					
Edit G-Code Rewind Ctrl-W Cycle Start Recent File Single BLK Alt-N Calt-R> Close G-Code Reverse Run Feed Hold Load G-Code Block Delete M1 Optional Stop Auto Tool Zero Stop Line On/Off Run From Here Owell CV Mode M-Codes H-0.0000 Line Geodes M-Codes +0.0000	OverRidden FRO % 100 FRO % FRO 6.00 Feedrate 6.00 Solution Units/Min 0.00 Units/Rev 0.00					
History Clear Status:	Profile: Mach3Mill					

See Pic.3, open config----ports and pins

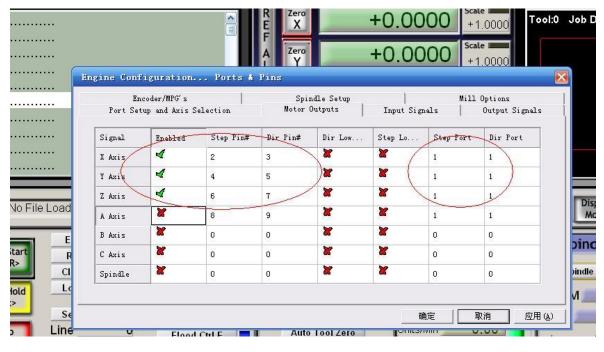
👔 Mach3 CNC Controller	- •
Ele Config Function Cfg's View Wizards Operator PlugIn Control Help	
Pre Ports and Pins Alt2 ToolPath Alt4 Offsets Alt5 Settings	Alt6 Diagnostics Alt-7 Mill->G15 G80 G17 G40 G20 G90 G94 G54 G49 G99 G64 G97
Motor Taning General Config System Holdwys Homing/Linits ToolPath Slave Axis Baddash Fixtures ToolTable Config Plugns Spindle Pulleys Safe_Z Setup Save Settings	R Zero +0.0000 Scale F A +0.0000 scale Zero +0.0000 scale H Zero +0.0000 scale Zero +0.0000 scale scale V +0.0000 Scale scale V +0.0000 Radus Correct OFFLNE GOTD Z To Go Nachine Soft Load Wizards Last Wizard Regen. Display Jog
File: No File Loaded.	Conversational Conversion Mode Follow
Edit G-Code Rewind Ctrl-W Cycle Start Recent File Close G-Code Reverse Run Feed Hold Load G-Code Stop Set Next Line M1 Optional Stop Calt-S> Run From Here On/Off Gess Reset On/Off G-Codes M-Codes	Tool Information Feed Rate Spindle Speed Tool O Chance OverRidden FRO % 100 Dia. +0.0000 +0.0000 P P Reset 100 H +0.0000 FRO 6.00 Peedrate Spindle CWF5 FRO 6.00 Feedrate S-ov 0 Jog ONLOFF ChLAR-J Units/Min 0.00 Spindle Speed
History Clear Status:	Profile: Mach3Mill

Pic.3

See Pic.4, Circle 1 frequencies setting, to control the speed, and then click Circle 2 to define ports & pins.

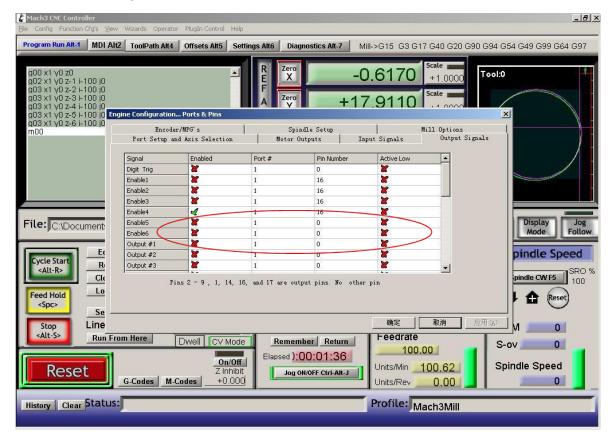


See Pic. 5, X\ Y\ Z\ axis "motor outputs"



Pic.5

See Pic. 6, set "output signals"



Mach3 YL_Pan次化版 文件 设置 功能设置 查看 加工策略 操作 插件控制 帮助		<u>_ = -</u>
Program Run Alt-1 MDI Alt-2 ToolPath Alt	-4 Offsets Alt-5 Settings Alt-5 Diagnostics Alt-7	
		Scale +1.0000 Scale
		+1.0000
电机调试和安装		▲ 補选择
375	X - AXIS MOTOR MOVEMENT PROFILE	×釉 ×釉
9 337.5 E 300 ¥ 262.5 8 202.5		V 稍 Z 缃
File:		A 细 REGEN Display Jog Toolpath Mode Follow
Cycle Start Cycle Start Calt R> Close G-Code Feed Hold Close G-Code ME	0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2	○ 第 主將
<spc> Set Next Line Steps per</spc>	速度 加速度 步进脉冲 方向脉 In'sormm's每分钟. in'sormm's每分钟. G's 1-5us 0-5	(RFVB
<pre><alt s=""></alt></pre> LINE: 2000 2000 2000 2000 2000 2000 20		
RESET G-Codes M-Codes	ON/OFF Z Inhibit 0.0000 Jog ON/OFF Ctrl-Alt-J Units/Min Units/Rev	0.0000 S-ov 0.0000 0.0000 Spindle Speed 0.0000
History Clear Status:	Profile:	<mark></mark>
🏂 开始 🥵 🕑 TB6560_T3 🕒 Mach3	📄 安装说明.txt - 记事本 🔰 🥻 Mach3 YL_Pan汉化版 📃 TB6560-T3-V1三	₩CNC 🖬 🔍 🕲 🕼 🥥 🗘 22:27

See Pic. 7, pulse width setting: Step impulse: 5us, Direction impulse: 5us

Pic.7

Pls click "load G-code", see Pic.8 and Pic.9

🛃 Mach3 CNC Controller		
Ele Config Function Cfg's View Wizards Operator PlugIn Control Help		
Load G-Code 1 MDI Alt2 ToolPath Alt4 Offsets Alt5 Settings Al	Diagnostics Alt-7 Mill->G15 G80 G1	7 G40 G20 G90 G94 G54 G49 G99 G64 G97
Close Fiel(s) Exit F60.000000 G0 X0.000000 Y0.000000 Z0.200000 M3 S60.000000 G43H5 G0 X0.000000 Y0.000000 Z0.200000 G0 X1.179950 Y4.004260 Z0.200000	Zero +0.0000 Y +0.0000 Zero +0.0000 Zero +0.0000 Zero +0.0000 Zero +0.0000 Zero +0.0000	Scale +1.0000 Scale +1.0000 Scale +1.0000 Radius Correct Soft
File: D:\Mach3\GCode\roadrunner.tap	Load Wizards Las	t Wizard Regen. Display Jog Toolpath Mode Follow
Feed Hold Load G-Code Spc> Set Next Line Stop Line Alt-S> Run From Here	Ool Chance OverRidden Tool Tool Tool Dia. +0.0000 +0.0000 +0.0000 H +0.0000 +0.0000	RPM 0
History Clear Status:	Profile: Ma	ch3Mill

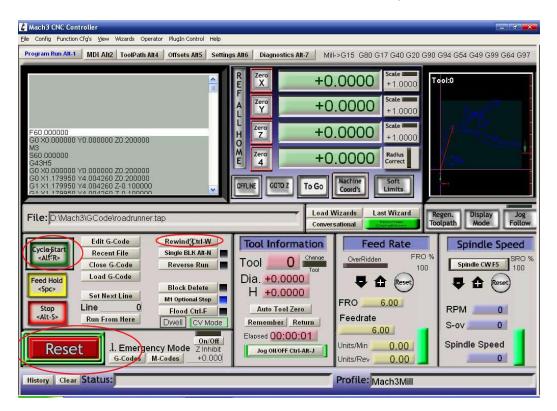
& Mach3 CNC Controlle Program Run Alt-1 MDI Alt/2 ToolPath Alt/4 Offsets Alt/5 Settings Alt/6 Diagnostics Alt.7 Mill->G15 G80 G17 G40 G20 G94 G54 G49 G99 G64 G97 Zero X +0.0000ool:0 +1.0000 Scale I 打开 查找范围 (L): Code - 🗧 🖆 📰 ball.tap balld.tap Cross.tap Ì 我最近的文档 🖻 NestCircle.tap G roadrup 桌面 我的文档 Regen. Display Jog Toolpath Mode Follow File: No File Loaded **夏**夏 我的电脑 Edit G-Code Spindle Speed Cycle Star <Alt-R> Recent File 网上邻居 Spindle CW F5 SRO 1 Close G-Code roadrunner • 打开(0) 文件名 (M): Load G-Code Feed Hold B 🔒 (Reset <Spc> 文件类型(T): • (*. tap) 取消 Set Next Line 「 以只读方式打开 (R) Line RPM 0 <Alt-S> Feedrate Run From Here Dwell CV Mode Remember Return S-ov 0 6.00 Elapsed 00:00:00 s Reset Emergen Z Inhibit G-Codes M-Codes +0.000 Spindle Speed Units/Min 0.00 Reset Jog ON/OFF Ctrl-Alt-J Jnits/Rev 0.00 0 History Clear Status: ReConfiguration Estop Profile: Mach3Mill

3-Axis TB6560 CNC Driver Board User Manual - ST-6560V3

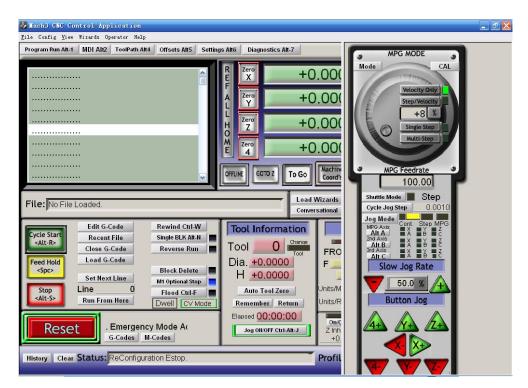
Pic.9

After open the G-code, the Reset light is blinking which means you are in stop condition. You can solve it

by clicking the Reset button(see circle 1), then click circle 2 to start "Cycle-start" .



If you need manual control, pls click TAB button (see Pic.11)





6. FAQ

1. Q: For long time working, the aluminum housing very hot, it' s normal?

A: Yes. It' s normal, at normal temperature, housing temperature reach 90°C is normal.

2. Q: How to confirm A+, A-, B+, B- of stepper motor?

A: Choose two wire randomly, connect them, see if there is resistance when run the motor shaft using finger, if there is resistance, then you take these two wires with A+ and A-, and the rest of the wire will be B+ and B-.

3. Q: There is vibration when motor running or noise when motor locking, how to eliminate it?

A: You can try to set the decay mode to eliminate it.

7. Contact

For further technical questions, please don't hesitate contact us at our email