

User's Manual

For

ST-6560V3

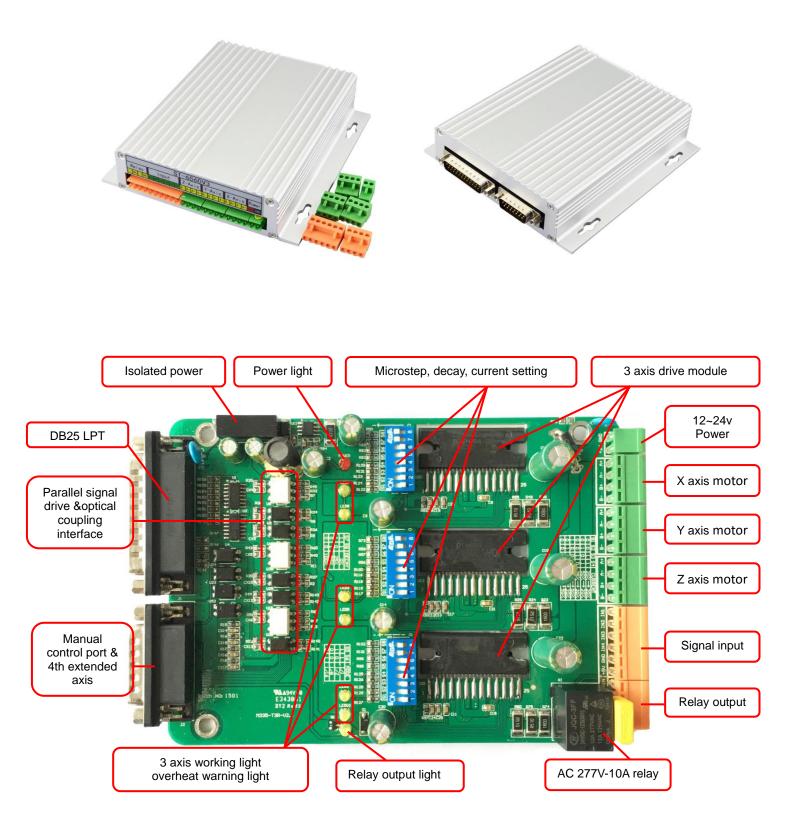
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1. Key Features

- 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

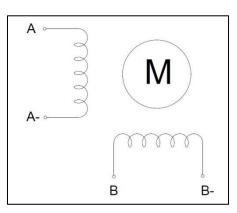
WARNING: INCORRECT WIRING OF THE STEPPER MOTOR TO THE DRIVE BOARD CAN LEAD TO

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

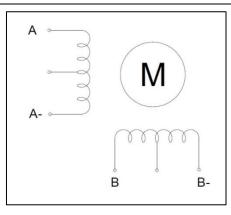


Each wire is connected to its corresponding terminal block location (i.e. A- wire is connected at A-location).

b. 6 Wire Stepper Diagram



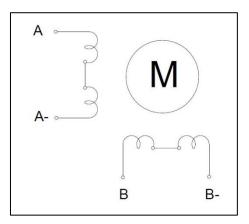
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Center wire of each coil not connected (insulate termination). Remaining wires are connected to their

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.



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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

4.1 Current adjusting and default testing

Working Current> Pause current	S1	S2	S3	S4
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

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	×
Mache Loader Mach3Mill	Current Profiles Mach3Mill Mach3Turn Plasma	Create Profile Delete Profile
Mach3Turn Plasma		Cancel



See Pic.2, there are common use buttons.

🛃 Mach3 CNC Controller			
Eile Config Function Cfg's View Wizards Operator PlugIn Control Help			
Program Run Alt-1 MDI Alt2 ToolPath Alt4 Offsets Alt5 Setting:	s Alt6 Diagnostics Alt-7 Mil	I->G15 G80 G17 G40 G20 G90	G94 G54 G49 G99 G64 G97
	F Zero +0 H Zero +0	.0000 Scale +1.0000 .0000 Scale +1.0000 .0000 Scale +1.0000 .0000 Scale -1.0000 .00000 Radius correct Scale .00000 Radius correct Soft Machine Soft Limits	ool:0
File: No File Loaded.			egen. Display Jog olpath Mode Follow
Edit G-Code Rewind Ctrl-W Cycle Start Recent File Close G-Code Single BLK Alt-N Feed Hold Load G-Code Stop Set Next Line Mt Optional Stop Flood Ctrl-F CAlt-S> Run From Here On/Off CV Mode G-Codes M-Codes	Tool Information Tool 0 Change Tool Dia. +0.0000 H H +0.0000 Auto Tool Zero Remember Return Elapsed 00:00:00 Jog Oll/OFF Ctrl-Alt-J	Feed Rate OverRidden FRO % 100 FRO 6.00 Feedrate 6.00 Units/Min 0.00 Units/Rev 0.00	Spindle Speed
History Clear Status:		Profile: Mach3Mill	1

Pic.2

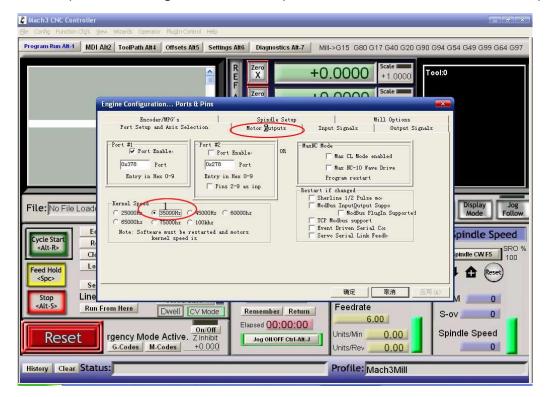


See Pic.3, open config----ports and pins

🐇 Mach3 CNC Controller			- 0 - x
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General Config System Hotkeys Homing/Limbs ToolPath Slave Axis Backdash Fixtures ToolTable Config Pulgins Spindle Pulleys Safe_Z Setup Save Settings	F Zerro +O H Zerro +O M Zerro +O M Zerro +O OFFLINE GOTD Z To Go	.0000 + 1.000 .0000 Scale + 1.000 .0000 Scale + 1.000 .0000 Radius .0000 Radius Correct Nachine Soft Limits	egen. Display Jog
File: No File Loaded.	Conver		olpath 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 Stop Line Quit S> Plood Ctrl-F Dwell CV Mode	Tool Information Tool 0 Change Tool 0 Dia. +0.0000 H +0.0000 Auto Tool Zero Remember Return Elapsed 00:00:00	Feed Rate	Spindle Speed
Reset ess Reset Emerg Z Inhibit G-Codes M-Codes +0.000	Jog ON/OFF Ctrl-Alt-J	Units/Rev 0.00	
History Clear Status:		Profile: Mach3Mill	

Pic.3

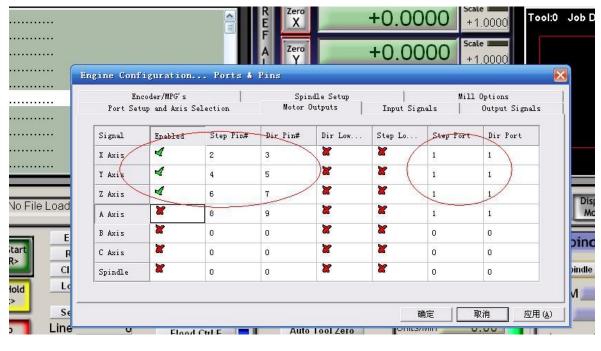
See Pic.4, Circle 1 frequencies setting, to control the speed, and then click Circle 2 to define ports & pins.



Pic.4



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



Pic.5

See Pic. 6, set "output signals"

Mach3 CNC Controller Config Function Cfg's <u>Vi</u> e	w Wizards Operato	r PlugIn Control He	lp				<u>_ </u>
rogram Run Alt-1 MDI A	It2 ToolPath Alt4	Offsets Alt5 S	ettings Alt6 Dia	agnostics Alt-7 M	1ill->G15 G3 G17 G40	G20 G90 G94 G54 G49 G99	G64 G97
900 x1 y0 z0 902 x1 y0 z-1 i-100 j0 903 x1 y0 z-2 i-100 j0 903 x1 y0 z-3 i-100 j0 903 x1 y0 z-4 i-100 j0 903 x1 y0 z-5 i-100 j0 903 x1 y0 z-6 i-100 j0	ngine Configuration	Ports & Pins	R Zero E X F Zero A Zero		0.6170 +1. 7.9110 Scale	00000	
m00		r/MPG's		indle Setup	Mill 0		
	Port Setup an	nd Axis Selection	Motor	Outputs Ir	nput Signals C	utput Signals	1
	Signal	Enabled	Port #	Pin Number	Active Low		
	Digit Trig	8	1	0	X		1
	Enable1	2	1	16	X		and a
	Enable2	2	1	16	*		
	Enable3	2	1	16	8		
	Enable4	4	1	16	X		
ile: C:\Document	Enable5	8	1	0	X	Display	Jo
C. Document.	Enable6	2	1	0	×)	Mode	Foll
	Output #1	X	1	0	X		
Et Et	Output #2	× 1	1	0	X	pindle S	peed
Cycle Start Ri	Output #3	X	1	0	X	-1	SRO
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Pic.6



Mach3 YL_Pan汉化版 文件 设置 功能设置 查看 加工策略 操作 插件控制 帮助			<u>_ 5 ×</u>
Program Run Ait-1 MDI Ait-2 ToolPath Alt	-4 Offsets Alt-5 Settings Alt-5 Di	agnostics Alt-7	
		000 Scale	
		000 scale +1.0000	
电机调试和安装		X	
375 0.337.5	X - AXIS MOTOR MOVEMENT PROFILE	速度 × 抽	
a 337.5 a 337.5 a 337.5 a 337.5 a 225.5 a 225.5 a 125.5 a 15.5 a		· · · · · · · · · · · · · · · · · · ·	
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Cycle Start Alt R> Cycle Start Colose G-Code Colose G-Code	0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 Time in Seconds	2 <u> 2</u> <u> 二</u> <u> 正</u> 融	SPINDLE SPEED Spindle CW F5 SRO % 100
Feed Hold Coad G-Code Milž -	速度 In's or min's 毎分钟. in's or min's 節子 話 1 - 5 us	方向脉 保存设置 0-5	
CAIt S> LINE: 0 2000 Run From Here		5 取消 确定 1 U.UUUU]	RPM 0.0000
RESET G-Codes M-Codes	ON/OFF Z Inhibit 0.0000 Jog ON/OFF Ctri-Alt-J	Units/Min 10,0000 Units/Rev 0,0000	Spindle Speed
History Clear Status:		Profile:	<mark>Sogu 中 ♪ °. ⊠ ∲</mark> ≯
🥭 开始 🥵 🎯 🗀 TB6560_T3 📄 Mach3	🕞 安装说明.txt - 记事本 🛛 🧯 Mach3 VL_Pan汉化版	☑ TB6560-T3-V1三轴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	- • 💌
Elle Config Function Cfg's View Wizards Operator PlugIn Control Help	
Load G-Code MDI Alt2 ToolPath Alt4 Offsets Alt5 Settings Alt6 Dia	agnostics Alt-7 Mill->G15 G80 G17 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	+0.0000 +1.0000 +0.0000 +1.0000 +0.0000 scale +0.0000 Radius Correct
G1 X1.179950 Y4.004260 Z-0.100000	GOTO Z To GO
File: D:\Mach3\GCode\roadrunner.tap	Load Wizards Last Wizard Regen. Display Jog Conversational Conversational Conversational Conversational Conversation
Cycle Start Recent File Single BLK Alt-N TOOI Close G-Code Reverse Run Dia. Dia. Feed Hold Load G-Code Block Delete H Stop Set Next Line Mt Optional Stop H Stop Line On/Off Divell CV Mode Reset G-Codes M-Codes +0.0000	Information Feed Rate OrerRidden FRO % ±0.0000 Tool ±0.0000 Tool ±0.0000 Tool ±0.0000 FRO 6.00 FRO 6.00 Feedrate 500:00:01 Outliss/Min 00:000 Units/Rev 0.000 0
History Clear Status:	Profile: Mach3Mill



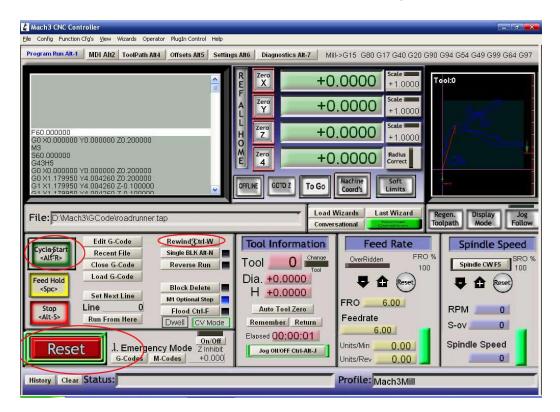
Program Run Alt-1 MDI Alt2 ToolPat	h Alt4 Offsets Alt5 Settings	R Zero E X +	0.0000 Scale C.0000 Scale C.000 Scale C.0	
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Pic.9

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

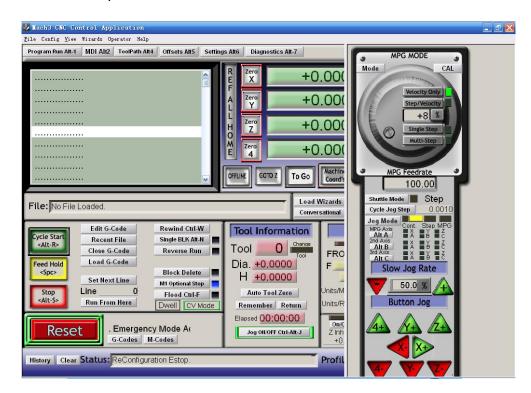
by clicking the Reset button(see circle 1), then click circle 2 to start "Cycle-start" .



Pic.10



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