

User's Manual

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 277V 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	NC
16	All axis enable input
17	Output control of relay (277V/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	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

EXAMPLE: 75%-->20%

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

4.2 Subdivision mode & Decay mode setting

	S5	S 6		S7	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.

A	Session Profile	×
A solid coadar	Current Profiles Mach3Mill Mach3Turn Plasma	Create Profile Delete Profile
Mach3Turn		Cancel



See Pic.2, there are common use buttons.

🛃 Mach3 CNC Controller	
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Edit G.Code Rewind Ctrl.W Cycle Start Recent File Close G.Code Reverse Run Close G.Code Reverse Run Load G.Code Block Delete Stop Set Next Line Line Flood Ctrl.F Run From Here Dwell CV Mode Reset Emergency Mode Z inhibit G.Codes M.Codes	Information O Chance O Chance Spindle Speed Spindle CW F5 100 P C CW F5 C CW C CW F5 100 P C CW F5 C CW C CW
History Clear Status:	Profile: Mach3Mill



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

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Motor Tuning			
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History Clear Status:		Profile: Mach3Mill	
		widenowill	

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"

Engine Con	figuration	Ports A	Pins		. 0.00		1.0000
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Signal	Enabled	Step Pin#	Dir Pin#	Dir Low	Step Lo	Step Port	Dir Port
X Axis	4	2	3	×	* /	1	1
Y Axi	4	4	5)*	X (1	1
Z Axis	4	6	7	×	*	1	1
A Axis	×	8	9	×	×	1	1
B Axis	*	0	0	*	*	0	0
C Axis	×	0	0	×	×	0	0
Spindle	*	0	0	×	×	0	0

Pic.5

See Pic. 6, set "output signals"

Mach3 ENC Controller	v Wizards Operati	or PlugIn Control Help					X
Program Run Alt-1 MDI Al	t2 ToolPath Alt4	Offsets Alt5 Sett	ings Alt6 Dia	gnostics Alt-7 Mi	II->G15 G3 G17 G40 (G20 G90 G94 G	54 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-4 i-100 j0 903 x1 y0 z-5 i-100 j0	igine Configuration	Ports & Pins	R Zero E X F Zero A V	-C +17	0.6170 Scale 1 +1.0 5cale 1 +1.0	0000 Tool:0	
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	Enable2		1	16			
	Enable3		1	16		1	
	Enable4	-	1	16	2		
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C:Document	Enable6	2	1	0			Mode Follow
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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		_ 8 X
File Config Function Cfg's View Wizards	Operator PlugIn Control Help	
Program Run Alt-1 MDI Alt2 ToolF	Path Att 4 Offsets Att5 Settings Att6 Diagnostics Alt-7 Mill->G15 G80 G17 G40 G20 G90	3 G94 G54 G49 G99 G64 G97
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History Clear Status: ReCo	onfiguration Estop. Profile: Mach3Mill	

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" .

🛃 Mach3 CNC Controller			
Ele 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
F60 000000 G0 X0 000000 Z0 200000 M3 S60 000000 G1 X1 179950 V4 004260 Z0 100000 G1 X1 179050 V4 004260 Z0 1000000 G1 X1 179050 V4 00426			
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History Clear Status:		Profile: Mach3Mill	



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: **technical@stepperonline.com**.