# **TB6560-T4 CNC Driver Manual**

# 1. General introduction

Low noises and low vibration due to the using of the 16 excitation two-phase bipolar stepping motor driver chip TB6560AHQ imported from Japan. The electric circuit is well-designed. All the electric items have been strictly checked to insure the quality.

# 2. Specification

- rated voltage: DC12-DC30V;
- Single-chip motor driver for sinusoidal microstep control of stepping motors
- Forward and reverse rotation
- Selectable phase excitation modes (2, 1-2, 2W1-2 and 4W1-2)
- High output current: IOUT = AHQ: 3.5 A (peak)
- Thermal shutdown (TSD)

If you need 36v power please contact us.

# 3. Advantages

3.1 one power only The control parts and the driving parts share one power. Users don't need any more power.

3.2 adjustable electric current

The out-put current can be adjusted according to user's needs.

3.3 well-arranged ports

The X port, the Y port, the Z port and the A port are connected to one port (3.96 mm), which is very convenient for users to arrange the circuitry.

3.4 manual-control function

Users can manually control the drive board through a standard port which has 15 pins

3.5 protection of the computer

By using the isolating power(1000V DC\DC) and the optoelectronic coupler, the drive board are separated from the computer. Such design can protect user's computer in case the board are going abnormal.

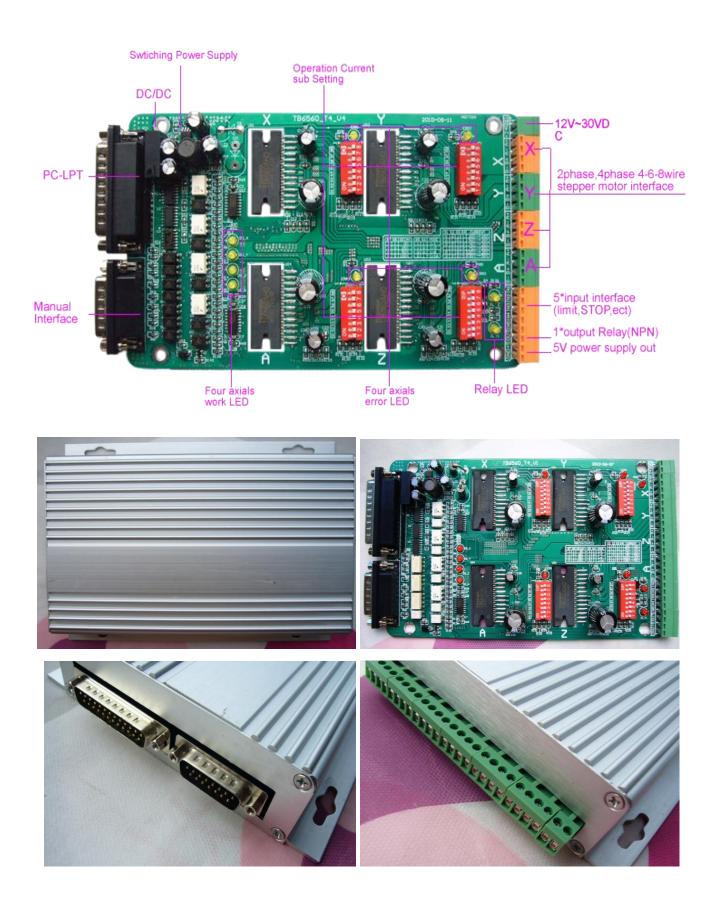
#### 3.6 protection of the drive board

The electric current of the drive board can be locked to 100% / 75% / 50% / 20% (up to user's needs) of the normal one when no signals are received from the computer, thus the service life of the drive board is assured with less heat.

3.7 good-cooling functions

All the items are fixed in an aluminum box which has good performance of the abstraction of heat to ensure the service life.

# 4. Configuration and pictures of the items



# 5. Ports

### 5.1 DB25 LPT pin definition:

1: the 2<sup>nd</sup> output control (corresponding circuitry please see OUT on the board, for electric relay or PWM OC output control, output current=50mA, voltage=24V)

- 2 : X axis pulse input
- 3 : X axis direction setting
- 4 : Y axis pulse input
- 5 : Y axis direction setting
- 6 : Z axis pulse input
- 7 : Z axis direction setting
- 8 : A axis pulse input
- 9 : A axis direction setting
- 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: The 1<sup>st</sup> circuitry output control (corresponding display light see RY1 on the board, for electric relay or PWM OC output control, output current=50mA, voltage=24V)

- 18: GND
- 19: GND
- 20: GND
- 21: GND
- 22: GND
- 23: GND
- 24: GND
- 25: GND

### 5.2 Manual control ports and definition

Input signal=0-5V

- 1 : X axis pulse input
- 2 : X axis direction setting
- 3 : Y axis pulse input
- 4 : Y axis direction setting
- 5 : Z axis pulse input
- 6 : Z axis direction setting
- 7 : All axis enable input

8 : The 1<sup>st</sup> circuitry output control (corresponding display light see RY1 on the board, for electric relay or PWM OC output control, output current=50mA, voltage=24V)

- 9 : A axis pulse input
- 10: A axis direction setting

- 11: 24V output
- 12: The  $1^{st}$  output
- 13: 5V output
- 14: Direct connecting to IN1
- 15: Power GND

### 5.3 Power port

Power: 12-24V Current: 10A Please see the picture for reference. Up: power GND Down: power 12-24V

### 5.4 Ports for extending

From up to down:

- 1、IN1
- 2, IN2
- 3、IN3
- 4、IN4
- 5、IN5
- 6、OUT (display light see RLY2 to show the working condition ;current=50mA,voltage=24V)
- 7、+5V
- 8、GND

# 6. Subdivision surface mode setting

	S5	S6
1	1	1
1/2	1	0
1/8	0	0
1/16	0	1

# 7. Decay mode setting

	S7	S8
NO DECAY	1	1
SLOW DECAY	1	0
MID DECAY	0	1
FAST DECAY	0	0

Notes: if the drive board has abnormal noise under working or locking condition, you can solve the problem by adjusting the decay mode.

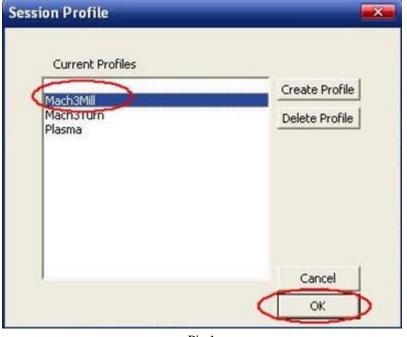
# 8. Current adjusting and default testing

	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

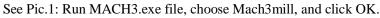
Explanation: EXAMPLE: 75%-->20% Working Current=3.5A \*75% Pause current=3.5A \*20%

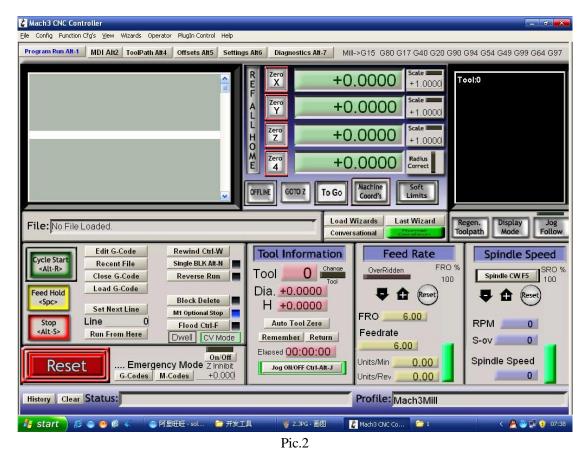
# 9. How to use MACH software?

### For reference:



Pic.1



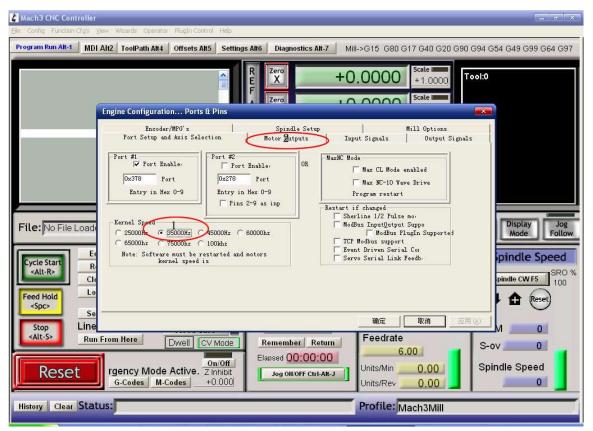


See the Pic.2 for reference, there are common use buttons.

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Pri Select Mative Links Alt2 ToolPath Alt4 Offsets Alt5 Settings	Alt6 Diagnostics Alt-7 Mill-	->G15 G80 G17 G40 G20 G90	G94 G54 G49 G99 G64 G97
Motor Tuning General Config System Hotkays Homing/Limits ToolPath Slave Axis Backlash Fixtures ToolTable Config Plugins Spindle Pulleys Safe_Z Setup Save Settings	F A L V H Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	.0000 .0000	ool:0
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History Clear Status:		Profile: Mach3Mill	

Pic.3

See Pic.3: Click "Config" ----- Ports and Pins



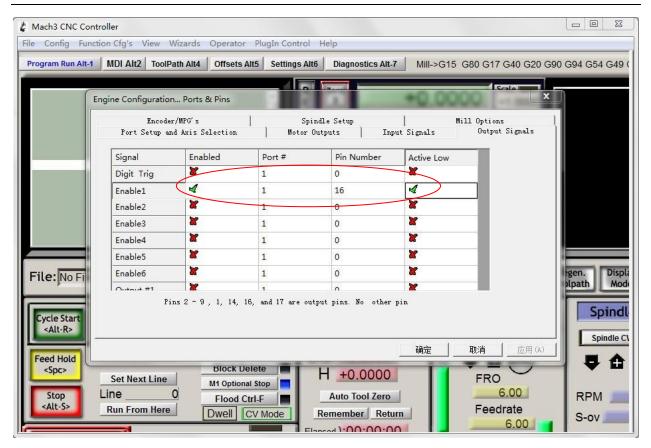
Pic.4

CIRCLE1: Frequencies setting, to control the speed (Pic.4) CIRCLE2: Ports & Pins setting (please see Pic.5 for reference)

Lach3 CNC Controller	<u>V</u> iew Wizards	Operator Pl	ugIn Control	Help					_ & ×
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	Y Axis Z Axis	<b>∢</b>	4	5 7	X				
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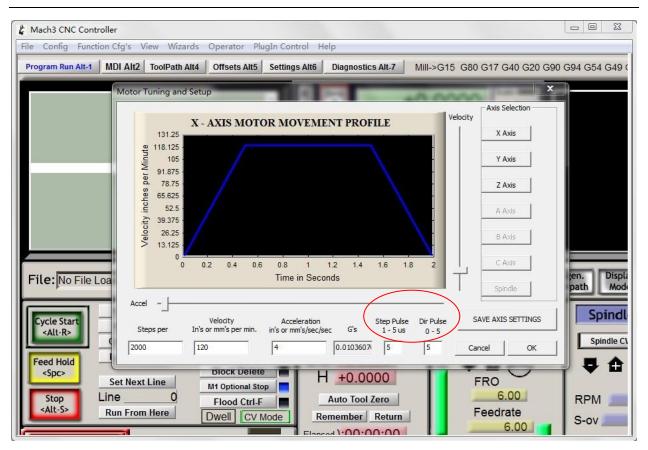
Pic.5

Please set the X  $Y \ A$  axis as Pic.5 shows.



Pic.6

Choose "Output Signals" and then set as Pic.6 shows.



Pic.7

### Pulse width setting:

Step impulse: 5us Direction impulse: 5us See Pic.7 for reference Please click "load G-code", see Pic.8 and Pic.9.



Pic.8

Mach3 CNC Controller
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
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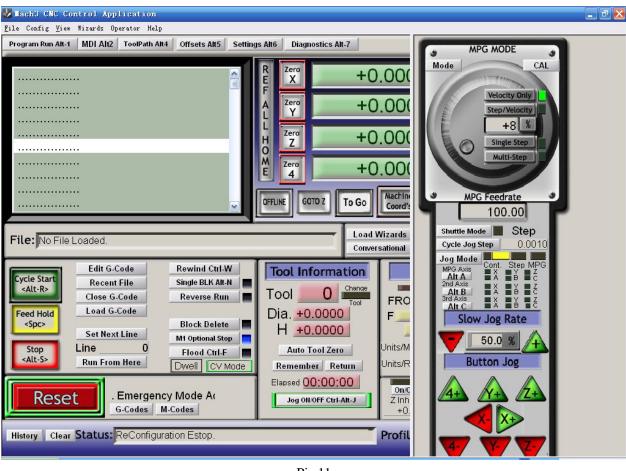
Pic.9

Mach3 CNC Controller ile Config Function Cfg's <u>Vi</u> ew Wizards Operator PlugIn Control Help Program Run Alt-1 MDI Alt2 ToolPath Alt4 Offsets Alt5 Setting	s Alt6 Diagnostics Alt-7 Mill	->G15 G80 G17 G40 G20 G90	G94 G54 G49 G99 G64 G97
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 G1 X1.179950 Y4.004260 Z0.200000 G1 X1.179950 Y4.004260 Z0.100000 G1 Y1.179950 Y4.004260 Z0.1000000 G1 Y1.179950 Y4.004260 Z0.100000 G1 Y1.17950 Y4.004260 Z0.10000 G1 Y1.17950 Y4.004260 Z0.100000	F A Y H Zero H Zero H Zero H Creation CFFLINE GOTD Z To Go Load V	.0000     \$cale       .10000     \$cale       +1.0000     +1.0000       .0000     \$cale       +1.0000     \$cale       .0000     \$cale       .0000     \$cale       .0000     \$cale       .0000     \$calus       .0000     \$correct       Machine     \$soft       Vizards     Last Wizard	egen. Display Jog
Edit G-Code   Rewind3Ctrl-W     Single BLK Alt-N   Reverse Run     Close G-Code   Block Delete     Feed Hold   Set Next Line     Stop   Line     Alt-S>   Run From Here     Dwell   CV Mode     Block Delete   Mt Optional Stop     Flood Ctrl-F   Dwell     CV Mode   Dwell	Tool Information     Tool   0     Change   Tool     Dia. +0.0000   H     H +0.0000   Auto Tool Zero     Remember   Return     Elapsed   00:00:01     Jog Oll/OFF Ctrl-Alt-J	FRO 6.00 Feedrate 6.00 Units/Min 0.00 Units/Rev 0.00	Mode Follow   Spindle Speed SRO %   Spindle CWF5 SRO %   100 Reset   RPM 0   S-ov 0   Spindle Speed 0
History Clear Status:		Profile: Mach3Mill	

Pic.10

After loading 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, please click "TAB" button on the Keyboard (see Pic.11)



Pic.11

## **10.Notes**

Please make sure that the drive board is under the rated temperature after working inconsistently for half an hour. If not, please contact us for help.

## **11.Contact us**

Web:	http://stores.ebay.co.uk/SAVEBASE
E-mail:	ebay@savebase.com