User Guide for 3 axis TB6560 driver board

Product Features:

- Toshiba TB6560AHQ chip High power, maximum 3.5A drive current chipset !
- 1-1/16 microstep setting Higher accuracy and smoother operation than standard 1, 1/2 step!
- Adjustable drive current settings for each axis 25%,50%,75%,100% of full current can be set for different stepper motors
- Overload, over-current and over-temperature safety Full protection for your computer and peripheral equipment !
- On board current switching Power output can be set according to specific user requirement !
- · Full closed-type optical isolation to protect the user's computer and equipment
- Relay spindle interface Outputs Max. 36V 7.5A for spindle motors or coolant pump (only one device can be powered by this output!)
- 4 channel inputs interface- Can be used for XYZ limit and emergency stop !
- Professional design Two stage signal processing with super anti-jamming !
- Bipolar constant current chopper drive with non-resonant region Controls motors smoothly through range
 without creep effect !
- Four control inputs (divided into pairs of knives) Allows setting of limit and emergency stop !
- Universal architecture Supports most parallel software MACH3,KCAM4,EMC2 etc!

Dip settings:

Current Setting	1	2	Decay Mode Settings	3	4	MicroStep Settings	5	6
100%	ON	ON	FAST	ON	ON	1	ON	ON
75%	ON	OFF	25%	ON	OFF	1/2	ON	OFF
50%	OFF	ON	50%	OFF	ON	1/8	OFF	OFF
25%	OFF	OFF	SLOW	OFF	OFF	1/16	OFF	ON

* Important Notes:

• Power supply DC 12-36V (not included)

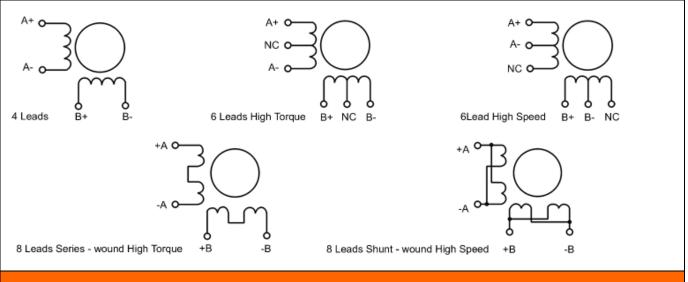
*Voltage Selection:

12-16V DC power supply for Nema 17 stepper motors

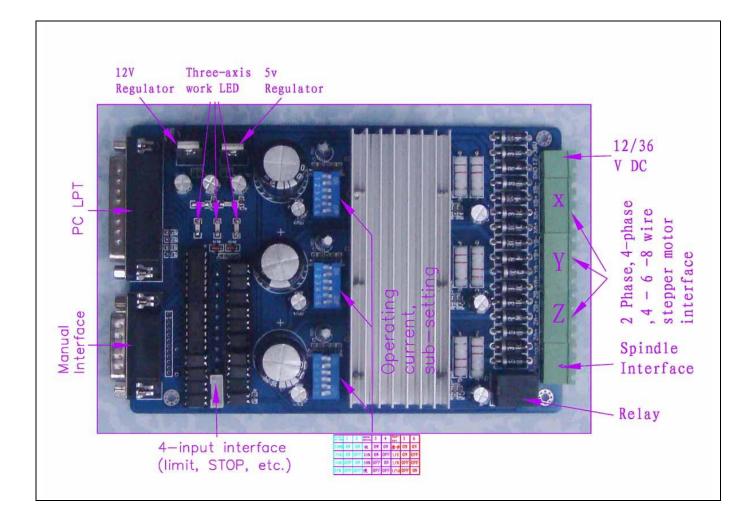
16-24V DC power supply for Nema 23 stepper motors
24-36V DC power supply for Nema 34 stepper motors
(High voltage will burn up the chips or stepper motors!!!)
*Ampertage Selection:
Output current of the power supply can be calculated by the following expressions:
Output current = Rated current of your stepper motors * quantity + 2A
(For example, if you want to drive 3 * 3A Nema 23 stepper motors, theoretically 24V 11A DC power supply is recommended, but higher power such as 24V 15A also will be good.
If you are not sure about the selection of power supply, please feel free to contact us for help)

- The power output of 12V shall be applied to the radiator fan of 12V
- Driver output compatible with 2 or 4 phase, 4,6 or 8 lead stepper motors, 3A max.
- Suitable for unipolar or bipolar stepper motors.
- Voltage regulated spindle speed controlled by parallel interface as function of supply voltage.

Wiring Diagram:



Simple introductions:



The definition of 1-PIN 25 of Parallel Interface:

PIN9	PIN14	PIN7	PIN1	PIN2	PIN3	PIN8	PIN6	PIN4	PIN5	PIN16	PIN17
spindle	X Enable	X Dir	X Step	Y Enable	Y Dir	Y Step	Z Enable	Z Dir	Z Step	Expand	Expand
motor										output 1	output2

The definition of 1-PIN15 of Manual Interface:

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
X Step	x	Spindle	X Dir	Y Enable	Z Dir	Z Step	Z Enable	Y Limit	Z Limit	Y Dir	Y Step	STOP	GND	5v/VDD
	Enable	Motor												

The definition of 4 channel inputs interface:

Input 1	Input 2	Input 3	Input 4	
Corresponding P10	Corresponding P11	Corresponding P12	Corresponding P13	

Limit setting for reference:

En	.coder/MPG's	I	Spindle			Mill Oj	ptions
Port Set	up and Axis Sel	.ection	Motor Outp	uts	Input Signals	0	utput Signals
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey	
X ++	4	1	10	4	X	0	
X	4	1	10	4	X	0	
X Home	4	1	10	4	X	0	
Y ++	4	1	11	4	X	0	
Ү	4	1	11	4	X	0	
Y Home	4	1	11	4	X	0	
Z ++	4	1	12	4	X	0	
z	4	1	12	4	X	0	
Z Home	4	1	12	4	X	0	
A ++	X	1	0	X	X	0	.
	- 1	· ·		h h h	h.a	-	
	Pins 10-13 a	und 15 are inp	uts. Only these	5 pin numbers	may be		
							r
					Automated	l Setup of]	Inputs

	der/MPG's	,	Spindle		 Input Signals	Mill Options
Port Setup	and Axis Sele	ction	Motor Outputs Input S			Output Signals
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey 🔺
Input #4	X	1	0	X	X	0
Probe	X	1	0	X	X	0
Index	X	1	0	X	X	0
Limit Ovrd	X	1	0	X	X	0
EStop	4	0	13	4	X	0
THC On	X	1	0	X	X	0
THC Up	X	1	0	X	X	0
THC Down	X	1	0	X	X	0
OEM Trig #1	X	1	0	X	X	0
OEM Trig #2	X	1	0	X	X	0
	1 b.a	· .	-	b.e	h.a	· ·
	Pins 10-13 an	d 15 are input	s. Only these	5 pin numbers	may be	
						a
					Automated	Setup of Inputs

The definition of output Interface:

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17
VD	GN	XA	XA-	XB	XB-	YA+	YA-	YB	YB-	ZA+	ZA-	ZB+	ZB-	MO	GN	MO
D	D	+		+				+						/V+	D	-

Instructions of MACH3





Open MACH3 software, select mach3MILL, and then click OK. Please refer to Fig.1

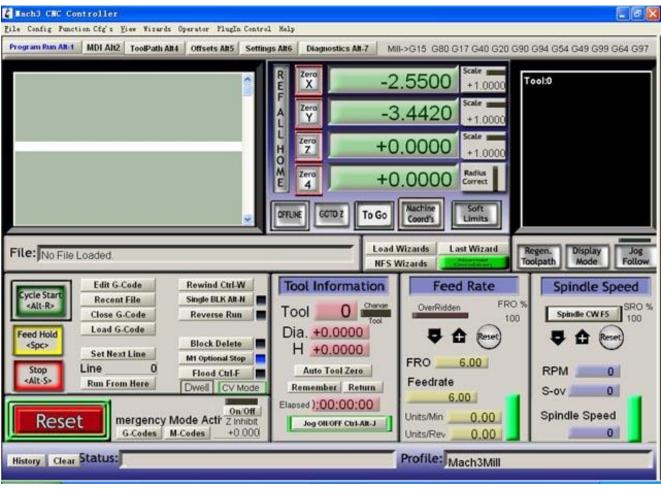


Fig.2

The interface of *MACH3* is displayed as Fig.2. The frequently-used action buttons are listed on the interface. We can configure *MACH* software at first.

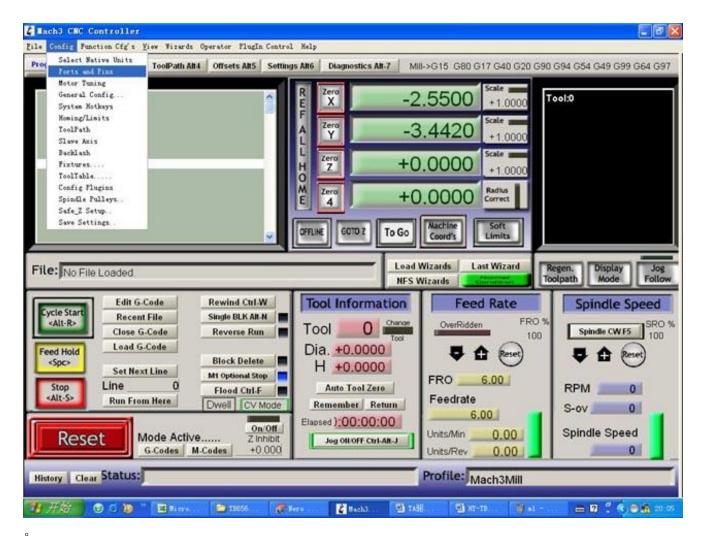


Fig.3

Click *PORT* & *PIN* sub-menu of *config* menu. Please refer to Fig.3. Please refer to Fig.4

Encoder/MPG's		idle Setup		Mill Options
· · · · · · · · · · · · · · · · · · ·	Port #2 Port Enable 0x278 Port Entry in Hex 0-9 Pins 2-9 as inp 45000Hz © 60000hz 100khz estarted and motors	OR MaxNC	Max CL Mode Max NC-10 Wa Program restart t if changed Sherline 1/2 Pulse ModBus InputQutput	ve Drive mo: Suppo lugIn Supportej 1 Co:

Fig.4

To set up the basic frequency within the above Circle 1. This parameter will affect the rotational speed of the motor. After the setup of basic frequency, select Circle 2 where *Configuration Scripting* will be defined, please refer to Fig.5.

Signal	Enabled	Step Pin#	n: n: #	Dir Low	St	Stor Port	Dir Port
Signar		Step Fin#	Dir Pin#		Step Lo	Step Port	Dir fort
X Axis	4	1	7	X	×	1	1
Y Axis	4	8	3	X	×	1	1
Z Axis	4	5	4	X	X	1	1
A Axis	×	0	0	X	X	0	0
B Axis	×	0	0	X	X	0	0
C Axis	×	0	0	X	X	0	0
Spindle	×	0	0	X	X	0	0

Fig.5

To modify the software settings according to the definition of Parallel Interface which is detailed in the above circle.

Eng	ine Configuration	. Ports & Pins				X
	Encoder/M Port Setup and s	· · · · ·	Spindle Motor Outp		Signals M	ill Options Output Signals
	_	1			_	<u> </u>
	Signal	Enabled	Port #	Pin Number	Active Low	A
	Digit Trig	X	1	0	X	
	Enable1	4	1	14	X	
	Enable2	4	1	2	X	
	Enable3	4	1	6	X	
	Enable4	X	1	9	X	
	Enable5	X	1	0	X	
	Enable6	X	1	0	X	
	Output #1	4	1	9	X 🕈	
	Output #2	X	1	0	X	
	Output #3	X	1	0	X	
	Output #4	X	1	0	X	▼
	Pins	2 - 9 , 1, 14, 16,	and 17 are output	pins. No other pi	n	
					确定	取消 应用 (A)

Fig.6

Then select the *output signals* column, as shown in Fig.6, and set up the corresponding items per the setup described in the circle.

Lad Grédet MDI ANZ ToolPath ANL Offsets ANS Settings ANC Mill>G15 G18 G40 G21 G90 G94 G54 G49 G99 G64 G97 Lass File(s) Image: Construction of the set of	Z Hach3 CRC Controller		
Clease File(s) File(s) Exit 64.7700 File(s) Scale H 87.4268 H 87.4268 H 87.4268 H 87.4268 Scale +1.0000 Scale +1.0000 Scale +1.0000 File(s) File(s) File(s)	Load G-Code MDI Alt2 ToolDath Alt4 Officate Alt5 Sattinge		34 G54 G49 G99 G64 G97
File: D:Mach3lGCOdelroadrunner tap NFS Wizards Toolpath Mode Follow Image: Start S	Close File(s) Exit	Provide -64.7700 +1.0000 F -87.4268 scale Provide +1.0000 scale Provide +0.0000 scale Provide +0.0000	Tool:0
Cycle Start (Alt-R) Recent File (Lose G-Code Single BLK Alt N Reverse Run (Load G-Code TOOI Change (Tool (Dia. +0.0000) FRO % (Dia. +0.0000) Stop (Alt-S) Block Delete (Mi Optional Stop) Block Delete (Mi Optional Stop) TOOI FRO % (Dia. +0.0000) IDO Mi Optional Stop (Alt-S) Flood Ctrl.F Mi Optional Stop) H +0.0000 FRO % (Dia. +0.0000) FRO % (Dia. +0.000) FRO % (Dia. +0.000)<	File: D:\Mach3\GCode\roadrunner.tap		
	Cycle Start Recent File Single BLK Alt.N <alt.r> Close G.Code Reverse Run Feed Hold Load G.Code Block Delete <spc> Set Next Line M1 Optional Stop <alt-s> Flood Ctrl.F Dwell Reset Emergency Mode 7 Inhibit On/Off G-Codes M-Codes +0.000</alt-s></spc></alt.r>	Tool O Change 100 Dia. +0.0000 H +0.0000 100 Auto Tool Zero FRO 100 Remember Return Elapsed):00:00:01 152.40 Feedrate Jog Oll OFF Ctrl-Alt-J Units/Min 0.00 Units/Rev 0.00	 Spindle CWF5 SRO % 100 RPM 0 S-ov 0 Spindle Speed
Eio 7	17 开始 🕑 😂 🐌 🤉 🔟 🛚 Hicroso 🎓 786560 🦷	🖉 Hero Ex 👔 Mach3 C 🜘 Adobe P 🖄 HT-TB31) 👝 😰 🕇 🄇 🕑 🖍 20:37

Fig.7

After all have been set up, open the G CODE that needs to run, as shown in Fig.7

打开						? 🔀
查找范围(<u>I</u>):	Code 🚰		•	+ 🗈 (r 📰	
我最近的文档	ball, tap balld, tap Cross, tap NestCircle, t roadrunner, t Shapes, tap					
	文件名 (M): 文件类型 (T):	roadrunner (*. tap) 」 以只读方式打开 (<u>R</u>)			•	打开 (0) 取消

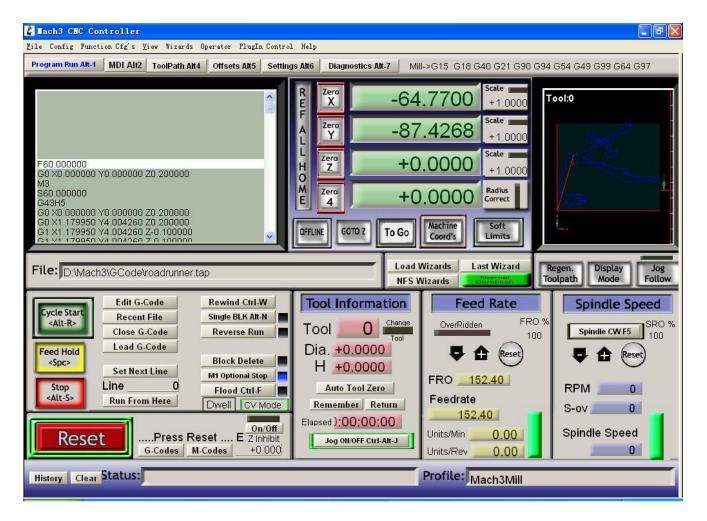


Fig.9

After G CODE has been opened, you may see the red button RESET flashing. Click RESET to stop the flashing and then press CYCLESTART at the location of Circle 2

*Simple solutions if the driver does not work properly:

- Please double check the software settings according to the Fig.5 and Fig.6
- Please conform the parallel cable has been pluged tightly
- Please turn off the power supply before changing dip settings
- Please use stable high quality DC power supply for this driver
- Problems in Mach3 using, Please refer to the Mach 3 User Manual
- If problem persist, please feel free to contact us!