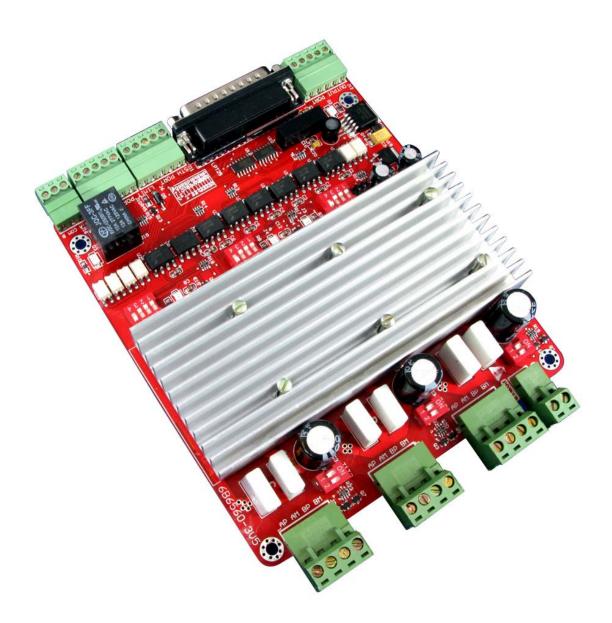
## 3-Axis Stepping Motor Driver (Model:TB6560T3V1) Rev1.5 2/23/2010



The TB6560T3V1 is a high performance 3 Axis (X,Y,Z) CNC stepping motor controller/driver. It built-in a spindle relay and all input/output are optical isolated from the external circuit that providing 'noise' free environment. The card support Mach2, Mach3, KCam, EMC2. It can be applied to a CNC machine or upgrade an old CNC machine with this card to take advantage of new technology. It works well for a CO2 laser machine to do cutting (software dependable)

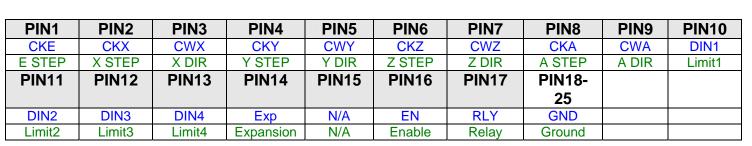
#### Features:

- \* Optical isolation for data In/Out
- \* Relay control for spindle (or laser)
- \* Four step speed setting
- \* High current output 3A in average
- \* Big Heat sink support without heat concern.

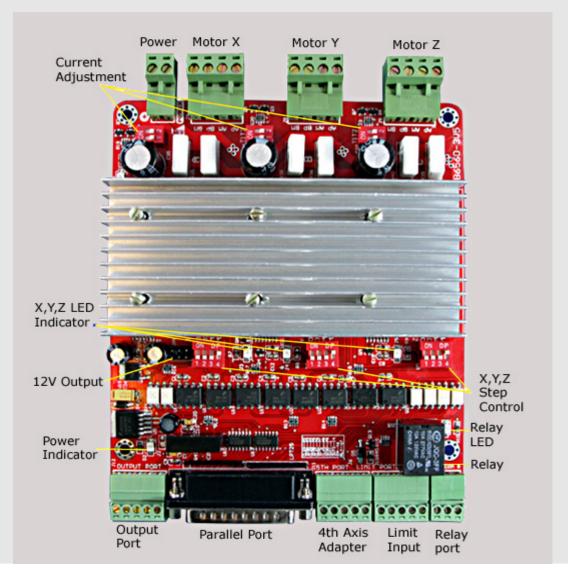
#### **Specification:**

- \* In/Out Interface port: Parallel
- \* Built in relay control for spindle
- \* Support 2/4 phases 4, 6, 8 wires stepping motor
- \* High speed optical isolation coupling
- \* Built in No. 4 Axis interface for expansion
- \* LED indicators for each axis & relay
- \* Current: 2.5A r.m.s (3.5A max)
- \* Resolution (speed): 1/16, 1/8, 1/2, 1
- \* Power: Single DC12 ~ 32V (no separated 5V needed)
- \* RC7414 auto half bridge current control
- \* Control port: Wheel control interface
- \* CAD system support: March2, Mach3, KCam

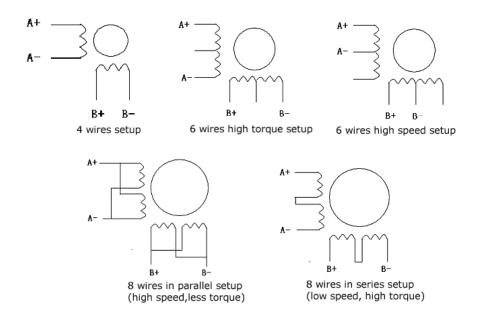
#### **DB 25 Connector Pin layout**



#### Board layout and motor type



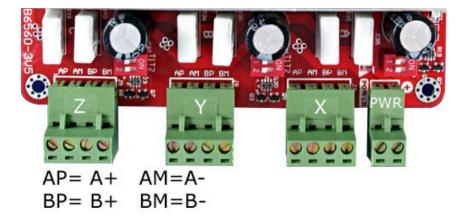
2 phases,4 phases stepping motor connection diagram (current 2A max)



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#### **Power Supply**

Power for the controller is DC 12~32V. To ensure smooth movement, the power supply should be at least 10A or higher current. DC24V, 15A is recommended.

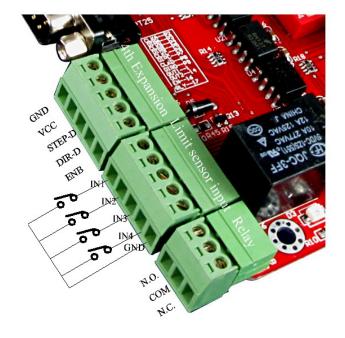


#### Home Limit and Emergency Stop Input

Note: All Limit Input are Active Low \*

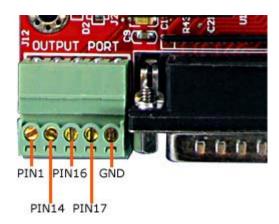
IN1 = Emergency Stop IN2 = X limit trigger IN3 = Y limit trigger IN4 = Z limit trigger GND= Ground

Relay N.O. = Normally Open N.C. = Normally Closed



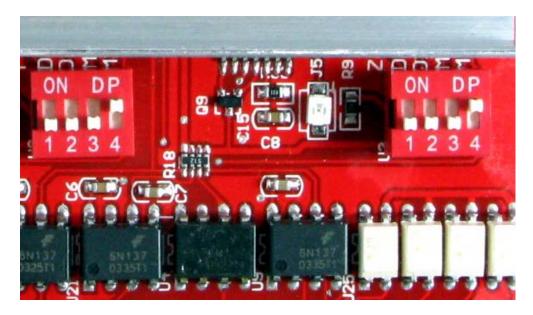
#### **Auxiliary Output port**

This port is dedicated to all outputs and it is controllable by Mach3. The pin# is corresponding to the pin number on the parallel port.



### **Resolution/ Speed Setting for X,Y,Z Stepping Motor**

Note: D1=1, D2=2, M1=3, M2=4



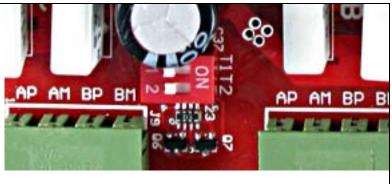
#### **Current Attenuation and Resolution**

Current attenuation setting is used to adjust overshoot or undershoot level for a motor

D1	D2	Attenuation Level	M1	M2	Resolution
DIP #1	DIP #2		DIP #3	DIP #4	
ON	ON	100%	ON	Off	1/16
OFF	ON	50%	OFF	OFF	1/8
ON	OFF	25%	OFF	ON	1/2
OFF	OFF	0%	ON	ON	1

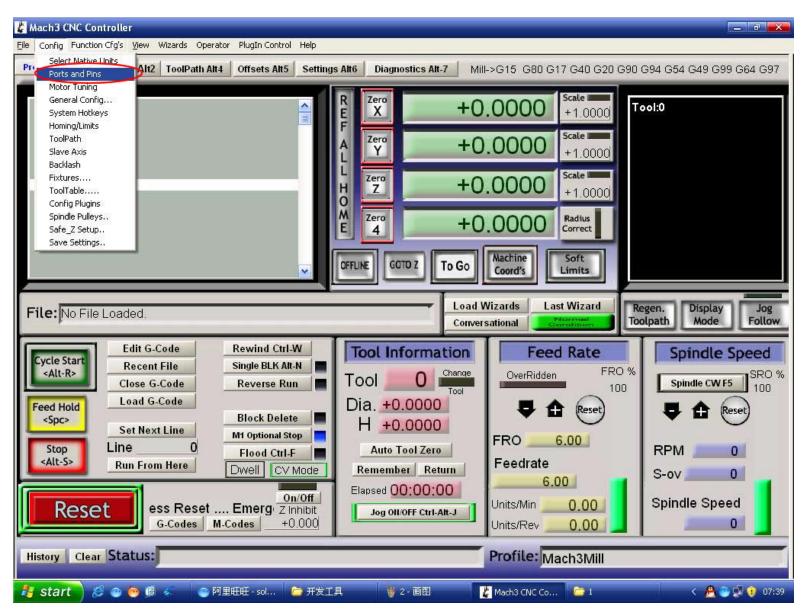
Current Adj	ustment:	
T1	T2	Current
Off	Off	2.5A~3A
On	Off	1.8A~2.25A
On	On	1.25A~ 1.5A
Off	On	0.65A~0.75A

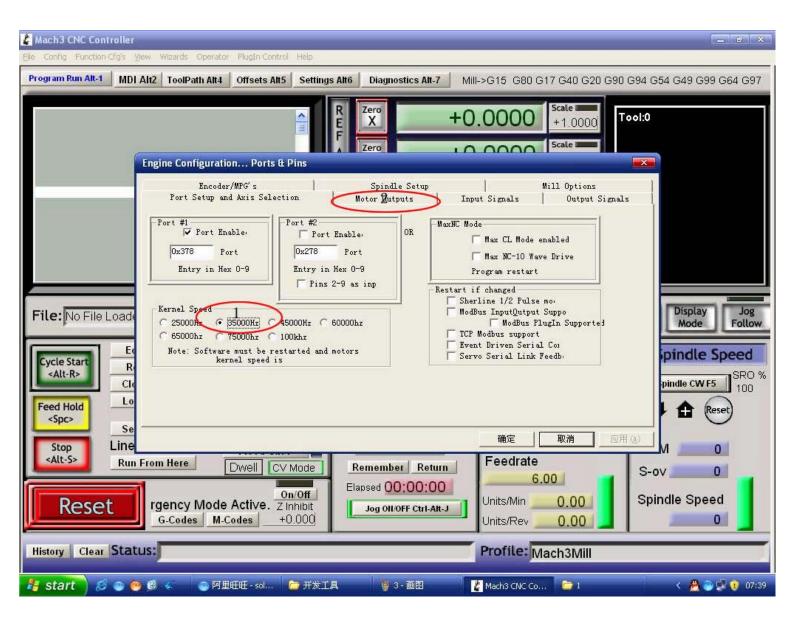
Note: there are three DIP switches, one per axis, dedicated for motor current adjustment.



#### **Basic MACH3 Setup**

Note: some parameters are in default setting without affecting the output





		Path (Alt4)	Offsets (Alt-5)	Settings (A R E F A Zero	-	+0.252	20 Scal	.0000	1 654 649 699 664 697 ol:0
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	Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActive	Step Low Ac	Step Port	Dir Port	
	X Axis	4	2	3	×	X	1	1	
	Y Axis	4	4	5	×	×	1	1	
	Z Axis	4	6	7	×	X	1	1	Display
e: No File Loaded.	A Axis	×	5	9	×	×	1	1	Mode Follo
cle Start	B Axis	×	0	0	×	X	0	0	pindle Speed
Alt-R>	C Axis	×	0	0	×	×	0	o	indle CW F5
ed Hold	Spindle	4	14	0	×	4	1	0	100
Stop Alt-S> Reset	G-Codes	M.Codes	Z Inhibit +0.000	Jog C	NVOFF Ctrl-Alt-J	Units/Re	av 0	ncel App .00	e Speed
ory Clear Statu	IS:					Profil	e: Mach3N	401	

Mach3 CNC Control Ap									
File Config View Wizards	Operator Help								
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			_		_		_		
				R Zero E X F Zero		+2.50 -0.25		.0500 Te	ool:0 Job Display
	Engine Configu	ration Por	ts & Pins						
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G40 G49 G54	Port Setup and A	-xis Selection	Motor Utiputs	input originalis   Utilit	out signals   Enco	oder/Minus   op	indie Setup   Mi	ii Opiions	
(tool_name: D	Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey	~	Course and Course
G00 X0. Y-25	X ++	×	0	0	×	X	0		the second s
M03	X	X	0	0	X	×	0		
- Revised and the second se	X Home	×	0	0	×	×	0		
Z5.	Y ++	×	0	0	X	×	0		
	Y	×	0	0	X	X	0		
	Y Home	×	0	0	×	*	0		Display Jog
File: C:\Mach3\G	Z ++	×	0	0	×	×	0		Mode Follow
	Z	×	0	0	×	×	0		- Mode
	Z Home	×	0	0	×	×	0		nindle Coord
Cycle Start	A ++	*	0	0	*	×	0		pindle Speed
<alt-r></alt-r>	Δ	*	0	0	*	*	0	~	
Feed HoldL <spc></spc>		Pins 10-13 an	d 15 are inputs. O	Inly these 5 pin num	bers may be used				M 0 Reset
<u>s</u>						0	< Ca	ncel Ap	PV 1000
Stop <alt-s> Run</alt-s>	From Here		CV Mode	Rememi	ber Return	Units/F	Rev 0	.00	Increment 10
Elapsed 00:00:07       MultiPass       L (Loop) +0       Times on M30         G-Codes       M-Codes       M-Codes       Lower Z Inhibit by +0.0000 on each pase									
History Clear Stat	us: tool_nam	ne: D1 RPM	=2200			Profi	le: Mach	3Mill	
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				-			
			R Zer E X F A Zer	+	2.5000	+0.0500	Tool:0 Job Display
	Engine Configura	tion Ports & Pin	ns				
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G40 G49 G54	Port Setup and Axis	Selection   Motor Ut	tputs   Input Signals	Output Signals   Encode	a/MPG s   Spindle Setup	Mill Uptions	
(tool name: D	Signal	Enabled	Port #	Pin Number	Active Low	~	
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M03	Enable1	4	1	16	4	_	
a contract of the second se	Enable2	X	0	0	X		
Z5.	Enable3	×	0	0	X		
	Enable4	×	0	0	×		
	Enable5	×	0	0	×		Display Jog
File: C:\Mach3\G	Enable6	×	0	0	X		Mode Follow
	Output #1	4	1	17	4		
	Output #2	4	1	14	X		pindle Speed
Cycle Start	Output #3	×	0	0	×		pindle speed
<alt-r></alt-r>	Output #4	×	0	0	×	~	pindle CW F5
Feed Hold		Pins 2 · 9 , 1, 14, 16, a	nd 17 are output pins. N	lo other pin numbers sho	ould be used.		M 0 Reset
s					ОК	Cancel	oply 1000
Stop Line <alt-s> Run</alt-s>	From Here	Flood Ctrl-F	Aode Rem	ember Return	Units/Rev	0.00	Increment 10
Reset	G-Codes	A-Codes	and the second second	d 00:00:07	<b>On/Off</b> Z Inhibit +1.000		(Loop) +0 Times on M30 bit by+0.0000 on each pas
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				REFA	Zero X Zero		2.500 0.250			Job Display
	Engine Config	uration P	orts & Pins						×	
G40 G49 G54	Port Setup and	Axis Selection	Motor Outpo	uts   Input Sign	als   Output Si	gnals Encode	n/MPG's Spine	dle Setup   Mill Option	is	
(tool_name: D	Signal	Enabled	A -Port #	A -Pin #	B -Port #	B-Pin #	Counts/Unit	Velocity		a second and a second
G00 X0. Y-25 M03	Encoder1	×	0	0	0	0	1.00	100.00		
Z5.	Encoder2	X	0	0	0	0	1.00	100.00		
	Encoder3	×	0	0	0	0	1.00	100.00		
File: C:\Mach3\G	Encoder4	×	0	0	0	0	1.00	100.00		Display Jog Mode Follow
	MPG #1	×	0	0	0	0	1.00	100.00		
Cycle Start <alt-r></alt-r>	MPG #2	X	0	0	0	0	1.00	100.00		pindle Speed
C	MPG #3	×	0	0	0	0	1.00	100.00		pindle CW F5
Feed Hold <spc></spc>										M 0 (Reset)
Stop Line							OK	Cancel	Apply	1000
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Note: this is a default setting.

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File Config Function Cfg's View Wizards Operator PlugIn Control Help
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R Zero +0.2520 Scale +1.0000 F Zero 10.6055 Scale
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File Config Function Cfg's Wew Wizards Operator PlugIn Control Help
Program Run (Alt-1) MDI (Alt-2) Tool Path (Alt-4) Offsets (Alt-5) Settings (Alt-6) Diagnostics (Alt-7) Mill>615 61 617 640 620 600 604 654 640 600 664 607
R     Zero     +0.2520     Scale     +1.0000       F     Zero     LO 6055     Scale     X       Engine Configuration Ports & Pins     X     X
Pot Setup and Axis Selection       Motor Outputs       Input Signals       Dutput Signals       Encoder/MPG's       Spindle Setup       Mill Options         Relay Control       Disable Spindle Relays       Use Spindle Feedback in Sync Moder       Use Spindle Feedback in Sync Moder         Cockwise (M3)       Output #       1       Output Signal #'s 1-6       If Use Spindle Motor Output       Use Spindle Feedback in Sync Moder         P 0.25 I       T       D       0.3       Spindle Speed Averaging         File:       No File Loaded       If Disable Flood/Mist relays       Delay       Minimum PVM       2         General Parameters       Output # 3       0       Output 5 Spin UP       Seconds       Special Options, Usually Off         CW Delay Spin UP       O       Seconds       Torch Voits Control       Torch Voits Control         ModBus Spindle - Use Step/Dir as well       If Enabled       Reg 64       64 + 127       Modey Spin DOWN       Seconds       Torch Voits Control         Max ADC Count       16380       If Insue diate Relay off before delay       Torch Auto Off       Mile Options       0         Max ADC Count       16380       Mode       If Insue diate Relay off before delay       OK       Cencel       Apply
Reset Zinhibt Jog ON/OFF Ctrl-Alt-J

Note: this is a default setting.

Mach3 CNC Control A	oplication			
File Config View Wizards	Operator Help			
Program Run Alt-1 MDI	Alt2 ToolPath Alt4 Offsets Alt5 Se	ttings Alt6 Diagnostics Alt-7	Mill->G15 G1 G17 G40	G20 G90 G94 G54 G49 G9
			2.5000 Scale +0.0500	l:0 Job Display
	Engine Configuration Ports & Pins			
G40 G49 G54	Port Setup and Axis Selection   Motor Outputs	s   Input Signals   Output Signals   Encoder/M	MPG's   Spindle Setup Mill Options	
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Z5.	Digitizing	Loop Control	1	
	4 Axis Point Clouds	Allow Servo Hold on Input#1		
File: C:\Mach3\G	Add Axis Letters to Coordinates	Max CL Closed Loop Emulation		Display Jog Mode Follow
Cycle Start <alt-r> C Feed Hold L</alt-r>	THC Options Allow THC UP/D0WN Control even if not in THC Mode. G28.1 No Initial Move.	General Options		pindle Speed pindle CW F5
<spc> s</spc>			OK Cancel Apply	
Stop Line	Flood Ctrl-F	Auto Toor Zero Remember Return	Units/Rev 0.00	
Reset	G-Codes M-Codes	Elapsed 00:00:07	7 Inhibit	oop) +0 Times on M30 ov <u>+0.0000</u> on each pas
History Clear Stat	tool_name: D1 RPM=2200		Profile: Mach3Mill	
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Note: this is a default setting.

Please go to Mach3 website <u>http://www.machsupport.com/</u> to get more update information. We don't support Mach3 or other 3<sup>rd</sup> software.

# www.LightObject.com