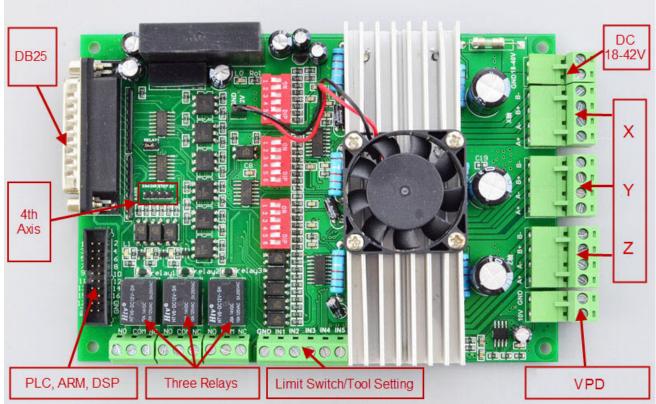
#### STEPPERONLINE Motors&Electronics

This document describes the basic functionality and the electrical specifications of StepperOnline's Three Axis TB6600 CNC Driver Board.

## 1. Key Features

- Supports MACH3, KCAM4, EMC2 etc...
- Can drive three channels 4.5A stepper motors, input voltage up to 18V 40V.
- Resolution 1, 1/2, 1/4, 1/8, 1/16 micro stepping output.
- 100% Full DC-DC high-speed optical isolation to protect the user's computer and equipment.
- Three channels of 0.4 4.5A adjustable output current for 2/4 phase bipolar stepper driver.
- Build with 3 ways relay output and 5 ways limit interface
- Automatic idle-current reduction.

# 2. Photo of 3-AXIS CNC Board

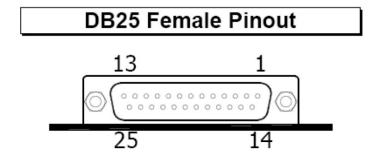


VFD: Variable-frequency Drive



## 3. PIN Define

### 3.1 DB25 LPT pin define:



PIN	Pin Symbols	Description
1	PWM	0-10V output control
2	STEPX	X axis pulse
3	DIRX	X axis direction
4	STEPY	Y axis pulse
5	DIRY	Y axis direction
6	STEPZ	Z axis pulse
7	DIRZ	Z axis direction
8	STEPA	Extending axis pulse
9	DIRA/Reply 1	Extending axis direction/Relay 1 control
7		(If control relay 1, please linking-up the jumper)
10	LIMIT-1	LPT input signal 1
11	LIMIT-2	LPT input signal 2
12	LIMIT-3	LPT input signal 3
13	LIMIT-4	LPT input signal 4
14	ENABLE_ALL	All axis enable input
15	LIMIT-5	LPT input signal 5
16	RELAY2	Relay 2 control
17	RELAY3	Relay 3 control
18-25	GND	GND

It is critical that the connection between computer parallel port and motor drive board be direct with the use of adapters (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 advisable and most likely will not work.

## 3.2 2x10 GPIO Define

Please note: If external device is PLC or other controllers which output voltage higher than 5V, please connect a

#### STEPPERONLINE Motors&Electronics

resistor in series. (12V controller connect 1K resistor, 24V controller connect 2K resistor).

PIN	Pin Symbols	Description
1	PWM	0-10V output control
2	STEPX	X axis pulse
3	DIRX	X axis direction
4	STEPY	Y axis pulse
5	DIRY	Y axis direction
6	STEPZ	Z axis pulse
7	DIRZ	Z axis direction
8	STEPA	Extending axis pulse
9	DIRA/Reply 1	Extending axis direction
10	LIMIT-1	LPT input signal 1
11	LIMIT-2	LPT input signal 2
12	LIMIT-3	LPT input signal 3
13	LIMIT-4	LPT input signal 4
14	ENABLE_ALL	All axis enable input
15	LIMIT-5	LPT input signal 5
16	RELAY2	Relay 2 control
17	RELAY3	Relay 3 control
5V	5V	Power for MCU (+5V)
GND	GND	GND

# 4. Setting

### 4.1 Current

Current	0.4A	1.6A	2.6A	3.2A	3.8A	4.0A	4.3A	4.5A
S1	ON	OFF	ON	OFF	ON	OFF	ON	OFF
S2	ON	ON	OFF	OFF	ON	ON	OFF	OFF
S3	ON	ON	ON	ON	OFF	OFF	OFF	OFF

### 4.2 Subdivision

Subdivision	NC	1	1/2	1/2	1/4	1/8	1/16	NC
S4	OFF	OFF	OFF	OFF	ON	ON	ON	ON
S5	OFF	OFF	ON	ON	OFF	OFF	ON	ON
S6	OFF	ON	OFF	ON	OFF	ON	OFF	ON



## 5. 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.

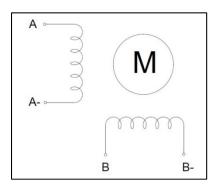
4 Wire, 6 Wire, and 8 Wire stepper motors can be used with 3-AXIS CNC Board.

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).

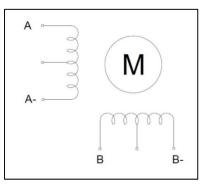
1.8 deg per step resolution is the industry standard for most automation grade stepper motors and is recommended for most applications.

### 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

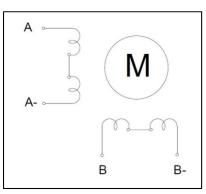


Center wire of each coil not connected (insulate termination)

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).

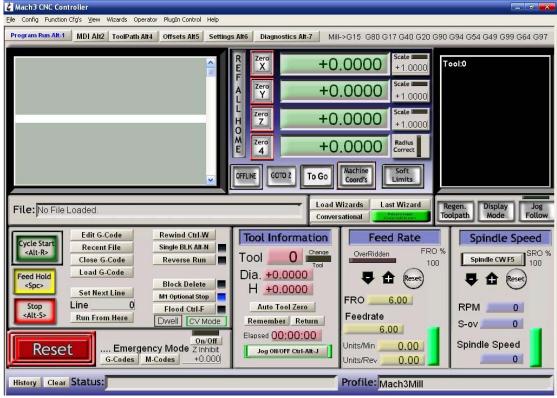
## 6. How to use MACH software?

ate Profile
ete Profile
Cancel OK

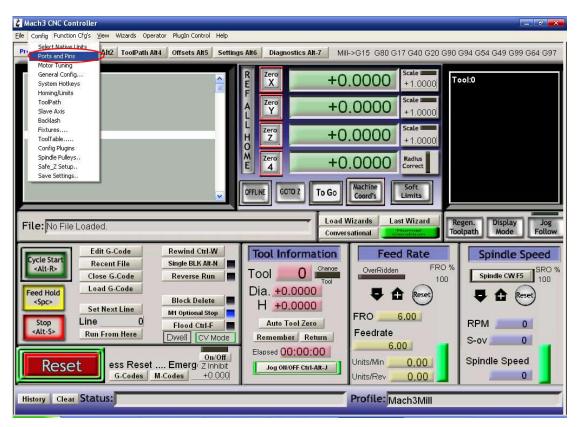
Pic.1



#### 3-Axis TB6600 CNC Driver Board Users Manual



Pic.2



Pic.3



🐇 Mach3 CNC Controller		_ # ×
Ele Config Function Cfg's	View Wizards Operator PlugIn Control Help	
Program Run Alt-1 MDI	I Alt2   ToolPath Alt4   Offsets Alt5   Settings Alt6   Diagnostics Alt-7   Mill->G15 G	80 G17 G40 G20 G90 G94 G54 G49 G99 G64 G97
	Engine Configuration Ports & Pins	Scate
	Encoder/MPG's Spindle Setup Port Setup and Axis Selection Motor Qutputs Input Signals	Mill Options Output Signals
File: No File Loade	0x378     Fort       Entry in Hex 0-9     Entry in Hex 0-9       Pins 2-9 as inp       Kernel Spece	Pulse mov utput Suppo usp PlugIn Supported Mode Follow
Cycle Start <alt-r> Feed Hold <spc></spc></alt-r>	Note: Software must be restarted and motors kernel speed is	Serial Con
Stop Line	确定	取消 应用 (A)
414.6	n From Here Dwell CV Made Remember Return Feed	rate S-ov 0
Reset	rgency Mode Active. Z Inhibit G-Codes M-Codes +0.000	inO_OO Spindle Speed
History Clear Stat	tus: Profile	e: Mach3Mill

Pic.4

	r Port
X Axis 🗹 2 3 X X 1 1	
Y Axis 🍕 4 5 🎇 X 1 1	
Z Axis 🗹 6. 7. 🏹 🕅 1. 1	
A Axis 🏼 🗐 88 99 🖉 🖉 00 0	
B Axis X 0. 0. X X 0. 0	
C Axis X 0. 0 0 X 0 0 0	
Spindle <b>4</b> 1 0 <b>8 4</b> 1 0	

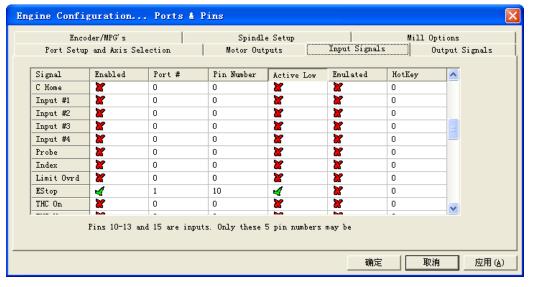
Pic.5



#### 3-Axis TB6600 CNC Driver Board Users Manual

ine Conf	iguration.	. Ports &	Pins				
En	.coder/MPG's	1	Spindl	e Setup	Ĩ		Options
Port Set	up and Axis Se	lection	Motor Out;	puts 🤇	Input Signal	.s	Output Signals
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey	~
X ++	4	1	11		X	0	
X	4	1	11	4	X	0	
X Home	X	1	0	X	X	0	
ү ++	4	1	12	4	X	0	
ү	4	1	12	4	X	0	
Y Home	X	1	0	X	X	0	
Z ++	4	1	13	4	X	0	
Z	4	1	13	4	X	0	
Z Home	X	0	0	X	X	0	
A ++	4	1	15	4	X	0	~
•		1.	· · -		h.a	-	
	Pins 10-13 a	nd 15 are inpu	its. Only these !	5 pin numbers	may be		
					确定	E   I	<b>以消</b> 应用 @







Port Setup an	nd Axis Selection	Motoz	Outputs II	aput Signals	Output Signals
Signal	Enabled	Port #	Pin Number	Active Low	~
Digit Trig	X	0	0	X	
Enable1	4	1	14	4	
Enable2	X	0	0	X	
Enable3	X	0	0	X	
Enable4	X	0	0	X	
Enable5	X	0	0	X	
Enable6	X	0	0	X	
Output #1	4	1	16	4	
Output #2	4	1	17	4	
Output #3	X	0	0	X	
Output #4	X	0	0	X	×
Pir	= 2 - 9 1 14	16 and 17 are or	utput pins. No other	nin	

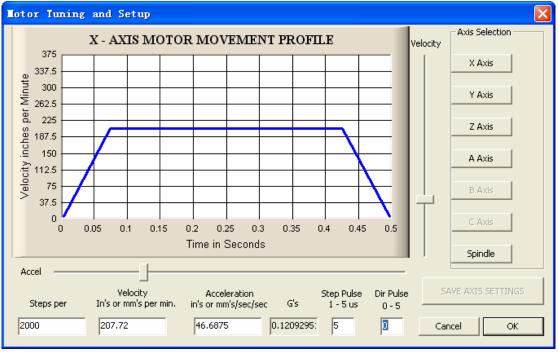
Pic.8

#### STEPPERONLINE Motors & Electronics

(Please note: some of computer has opposite "Active low" and "Active high", if it is with your computer, please change above three "Active Low" to "Active High".)

Engine Configuration Por	ts & Pins			X
Port Setup and Axis Selection Encoder/MPG's -Relay Control	SpindLe Setup	Input Signals	Output Signals Mill Options	
□ Disable Spindle Rel         Clockwise       Output         CCW 0M4)       Output         Output Signal #'s         Flood Mist Control         ✓ Disable Flood/Mist re         Mist       Output         3	Vise Spindle Motor Outr     Curret       PMM Control     P       Step/Dir Moto     P       Torch Volts Conti     P       PWMBase Freq.     S	nt Pulley Min Spec Pulley Ratio 0 Pulley Ratio 0 Pulley Ratio 0 Pulley Ratio 0 Pulley Ratio 10	1000 2000 4000 8000	
Flood Output 4 Output Signal #'s ModBus Spindle - Use Step/Dir as Enabled Reg 64 64 - Max ADC Count 16380	CW Delay Spin UP 1 Seco CCW Delay Spin UP 1 Seco well'Delay Spind DOWN 1 Seco CCW Delay Spin DOWN 1 Seco Immediate Relay off before	onds Closed Loo onds P 0.25 I	e. freq by Feedra Le Feedback in Sync M Ly Spindle Cont Ly D 0.3 Leed Averagi	
			取消 应用 (4)	)

Pic.9

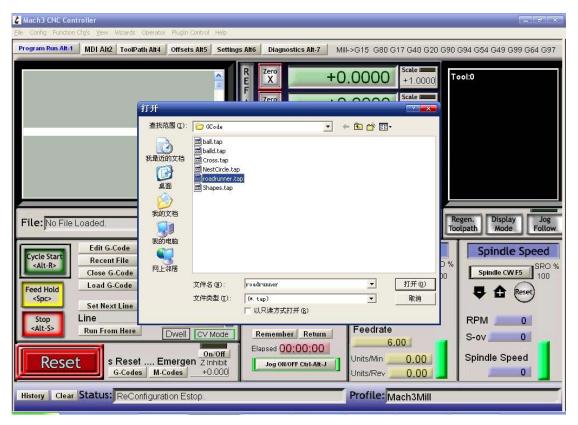


Pic.10



🐇 Mach3 CNC Controller			- 0 -
Eile Config Function Cfg's View Wizards Operator PlugIn Control Help			
Load G-Code 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
Close File(s)			
Exit A	R Zero +0	.0000 scale +1.0000	ool:0
	F	and the second se	
	A Y +0	.0000 scale +1.0000	n P
	비 블 드	1.0000	The
F60.000000	H Z +0	.0000 scale +1.0000	
G0 X0.000000 Y0.000000 Z0.200000 M3	O Zero		
S60.000000 G43H5	E 4 +0	.0000 Radius Correct	3
G0 X0.000000 Y0.000000 Z0.200000 G0 X1.179950 Y4.004260 Z0.200000			
G1 X1.179950 Y4.004260 Z-0.100000	OFFLINE GOTO Z TO GO	Machine Soft Coord's Limits	
File: D:\Mach3\GCode\roadrunner.tap	Load V		egen. Display Jog
	Conver	sational Condition	olpath Mode Follow
Edit G-Code Rewind Ctrl-W	Tool Information	Feed Rate	Spindle Speed
Cycle Start  Alt-R Recent File Single BLK Alt-N	Channe -	OverRidden FRO %	SRO %
Close G-Code Reverse Run		100	Spindle CW F5 100
Feed Hold Load G-Code Block Delete	Dia. +0.0000	Reset)	E f (Reset)
Set Next Line M1 Optional Stop	H +0.0000		
Stop Line 0 Eload CtrLE	Auto Tool Zero	FRO 6.00	RPM 0
CV Mode	Remember Return	Feedrate	S-ov 0
On/Off	Elapsed 00:00:01	6.00	
Reset Zinhibit	Jog Oll/OFF Ctrl-Alt-J	Units/Min 0.00	Spindle Speed
G-Codes M-Codes +0.000		Units/Rev 0.00	0
History Clear Status:		Profile: Mach3Mill	

Pic.11



Pic.12