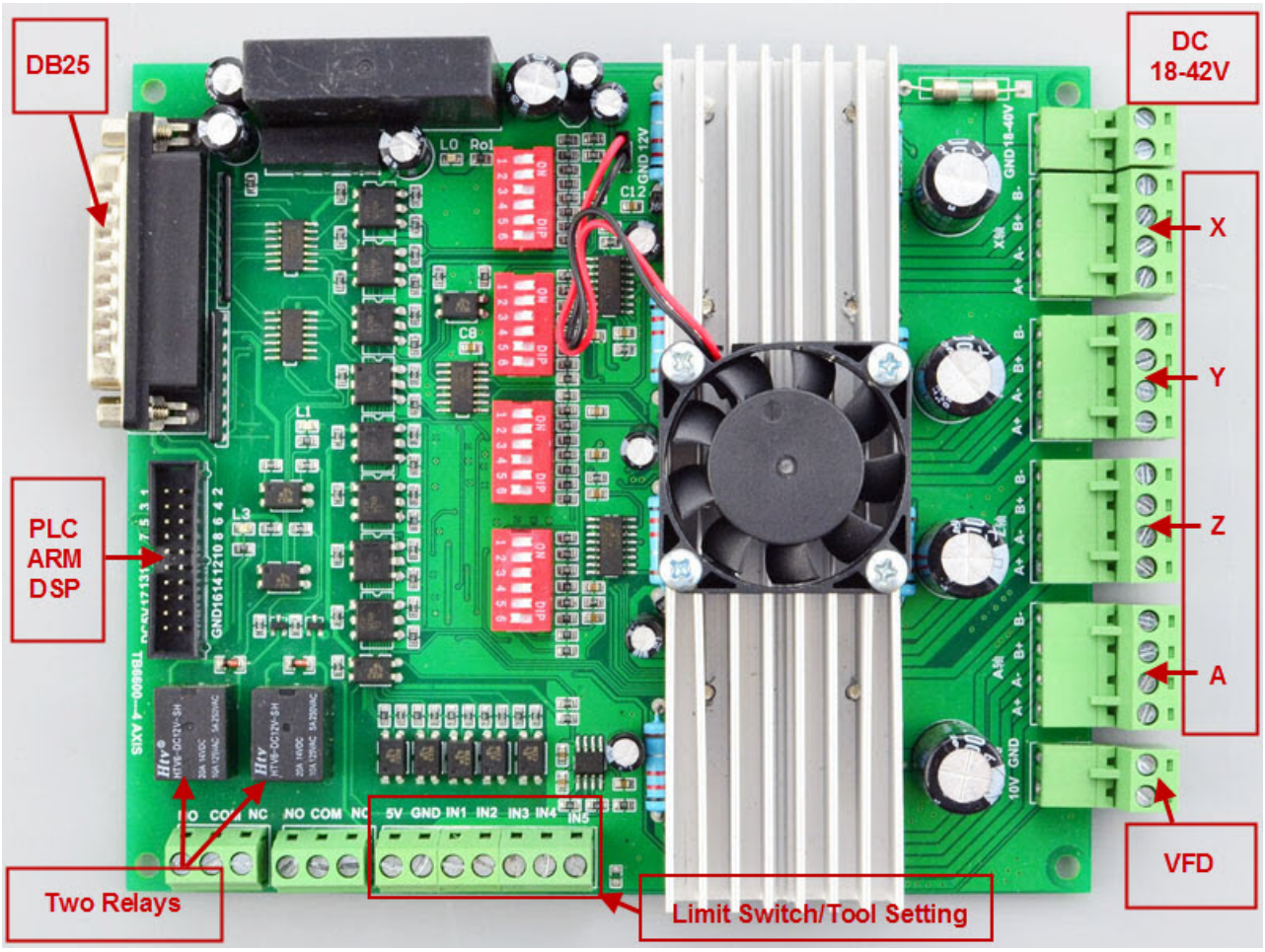
This document describes the basic functionality and the electrical specifications of StepperOnline's Four Axis TB6600 CNC Driver Board.

1. Key Features

- Supports MACH3, KCAM4, EMC2 etc…
- Can drive four 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.
- Four channels of 0.4 - 4.5A adjustable output current for 2/4 phase bipolar stepper driver.
- Build with 2 ways relay output and 5 ways limit interface
- Automatic idle-current reduction.

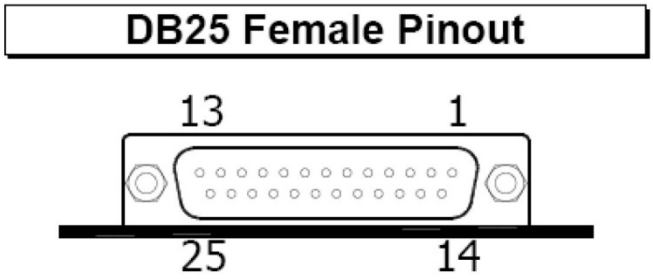
2. Photo of 4-AXIS CNC Board



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	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	RELAY1	Relay 1 control
17	RELAY2	Relay 2 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 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	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	RELAY1	Relay 1 control
17	RELAY2	Relay 2 control
D5V	Digital 5V	Power for MCU (+5V)
DGND	Digital GND	Power for MCU(OV)
P5V	Analog 5V	Power for external sensor (+5V)
PGND	Analog GND	Power for external sensor (OV)

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

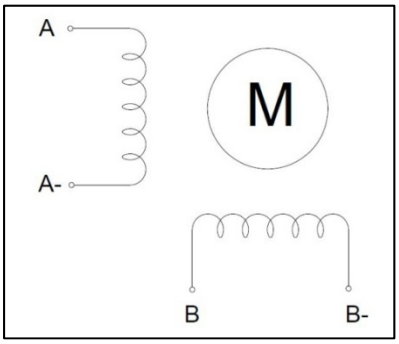
Subdivision	NC	1	1/2	1/2	1/4	1/8	1/16	NC
S4	OFF	OFF	OFF	OFF	ON	ON	ON	ON
S5	OFF	OFF	ON	ON	OFF	OFF	ON	ON
S6	OFF	ON	OFF	ON	OFF	ON	OFF	ON

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.

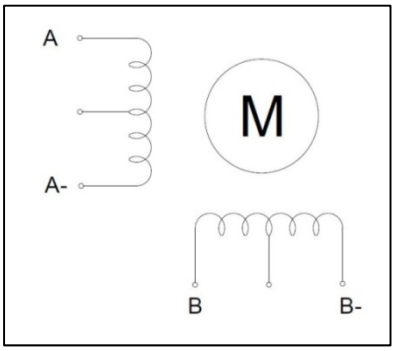
4 Wire, 6 Wire, and 8 Wire stepper motors can be used with 4-AXIS CNC Board.
4 Wire motors are recommended as they are by their manufacture true bipolar motors and easier to properly connect to stepper motor drive controller.
It is critical to obtain a proper motor coil diagram of any motor you wish 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



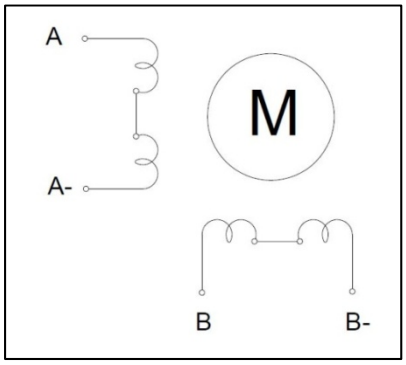
Each wire is connected to its corresponding terminal block location (i.e. A- wire is connected at A- location)

b. 6 WIRE STEPPER DIAGRAM



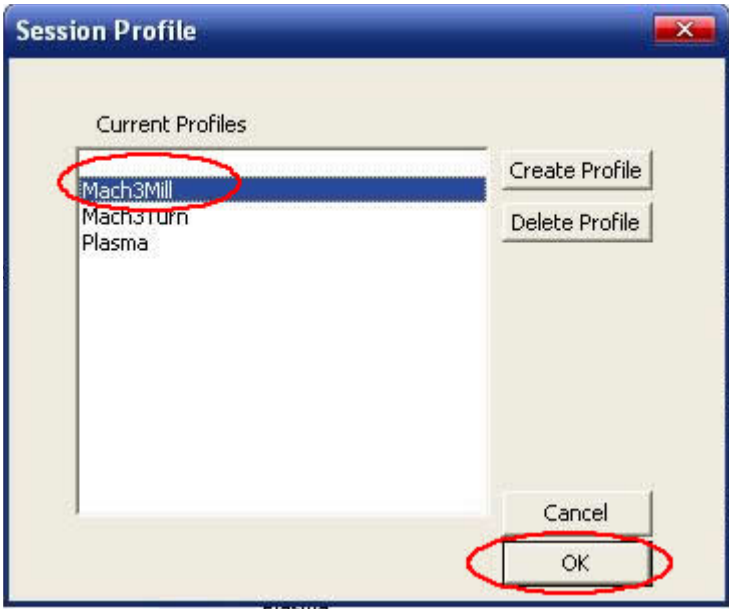
Center wire of each coil not connected (insulate termination)
Remaining wires are connected to their corresponding terminal block location (i.e. A- wire is connected at A- location).

c. 8 WIRE STEPPER DIAGRAM

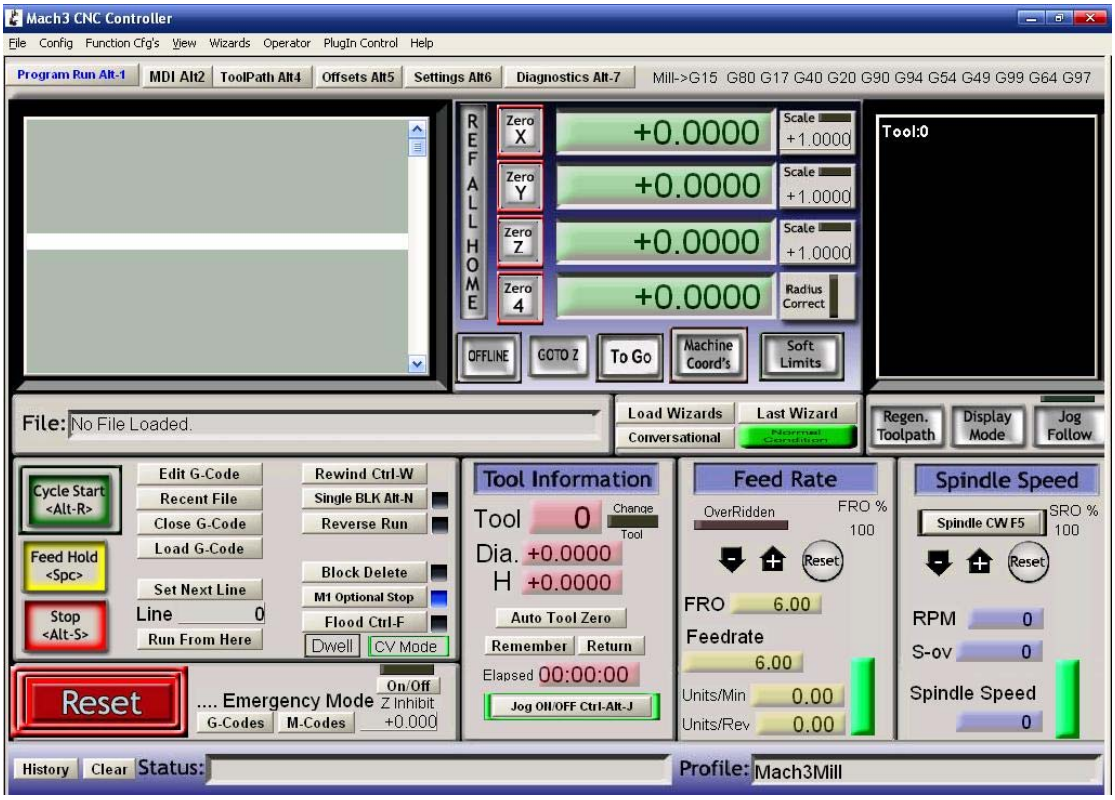


2 center wires of each coil connected (insulate connection)
Remaining wires are connected to their corresponding terminal block location (i.e. A- wire is connected at A- location).
If using 6 or 8 wire motors, connected using series wiring method, reduce labeled amperage rating by 50% (i.e. a motor rated at 4 amps should thus be considered now rated at 2 amps).

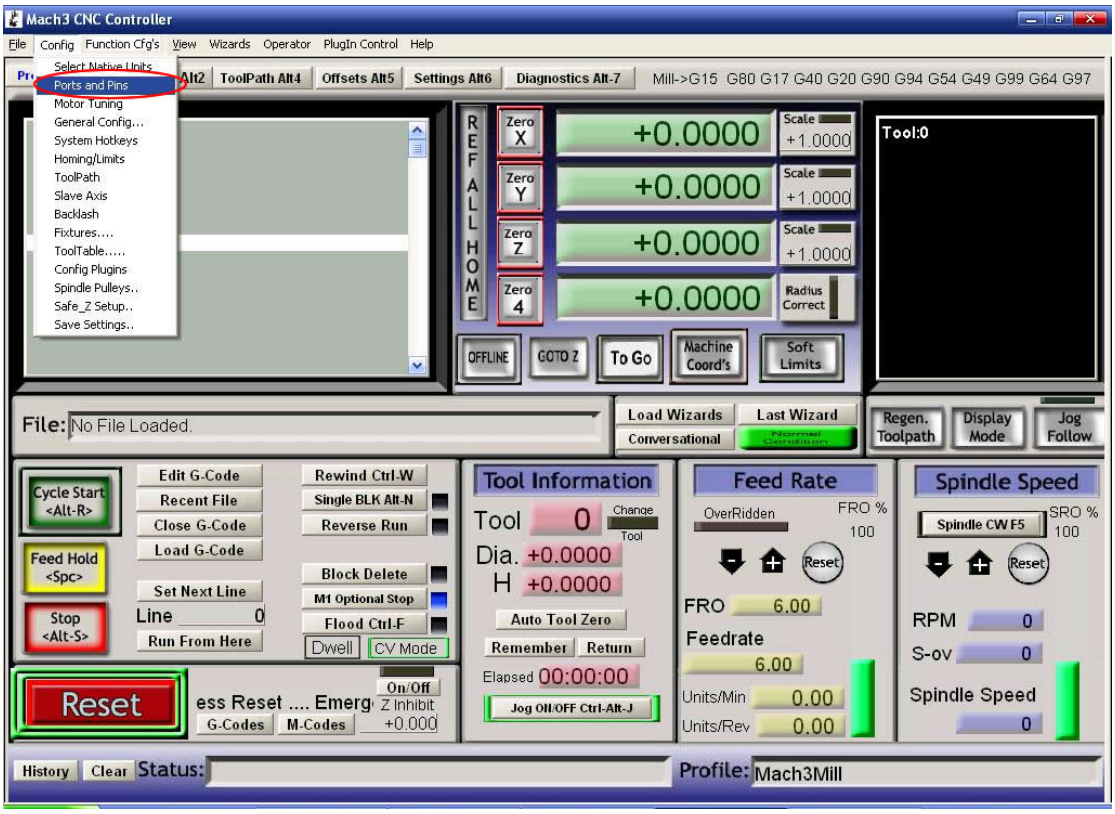
6. How to use MACH software?



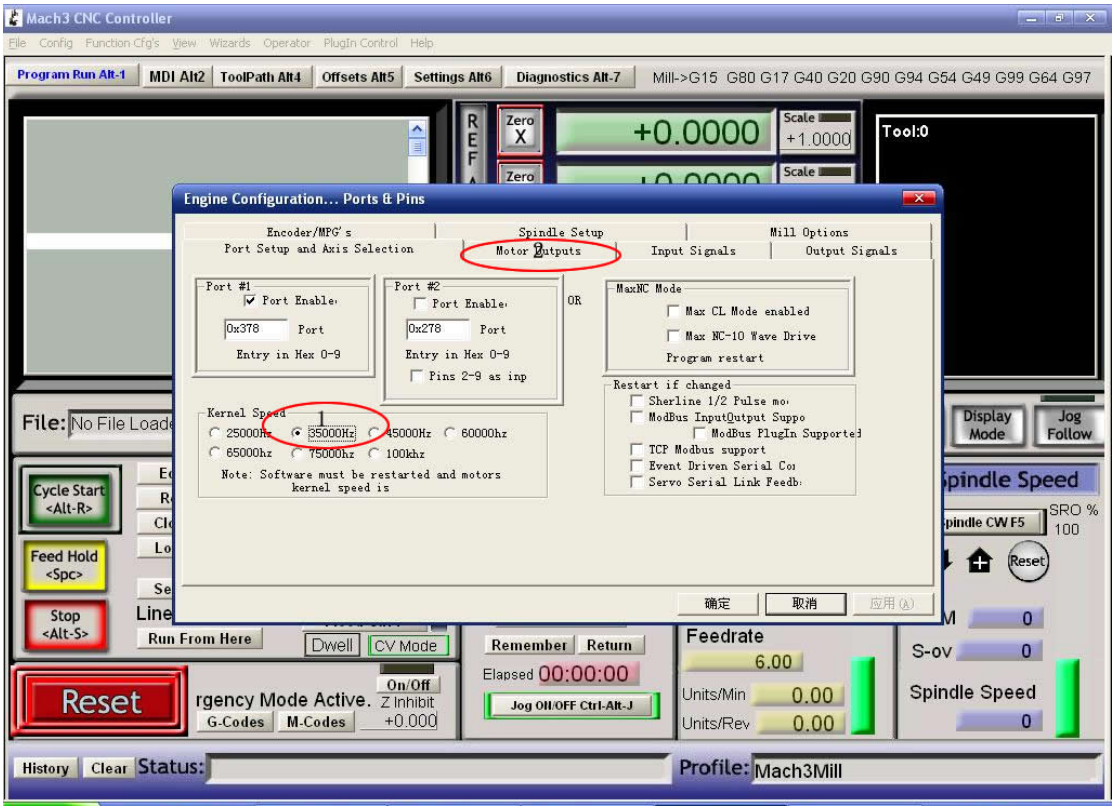
Pic.1


Mach3 CNC Controller
File 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
REF ALL HOME
Zero X
Zero Y
Zero Z
Zero 4
+0.0000
Scale +1.0000
Radius Correct
Tool:0
OFFLINE GOTO Z To Go Machine Coord's Soft Limits
File: No File Loaded.
Load Wizards Last Wizard Conversational
Regen. Toolpath Display Mode Jog Follow
Cycle Start <Alt-R>
Feed Hold <Spc>
Stop <Alt-S>
Edit G-Code Recent File Close G-Code Load G-Code
Set Next Line Line 0 Run From Here
Rewind Ctrl-W Single BLK Alt-N Reverse Run
Block Delete M1 Optional Stop Flood Ctrl-F Dwell CV Mode
Reset
.... Emergency Mode
On/Off Z Inhibit +0.000
G-Codes M-Codes
Tool Information
Tool 0 Change Tool
Dia. +0.0000
H +0.0000
Auto Tool Zero
Remember Return
Elapsed 00:00:00
Jog ON/OFF Ctrl-Alt-J
Feed Rate
OverRidden FRO % 100
Reset
FRO 6.00
Feedrate 6.00
Units/Min 0.00
Units/Rev 0.00
Spindle Speed
Spindle CW F5 SRO % 100
RPM 0
S-ov 0
Spindle Speed 0
History Clear Status:
Profile: Mach3Mill

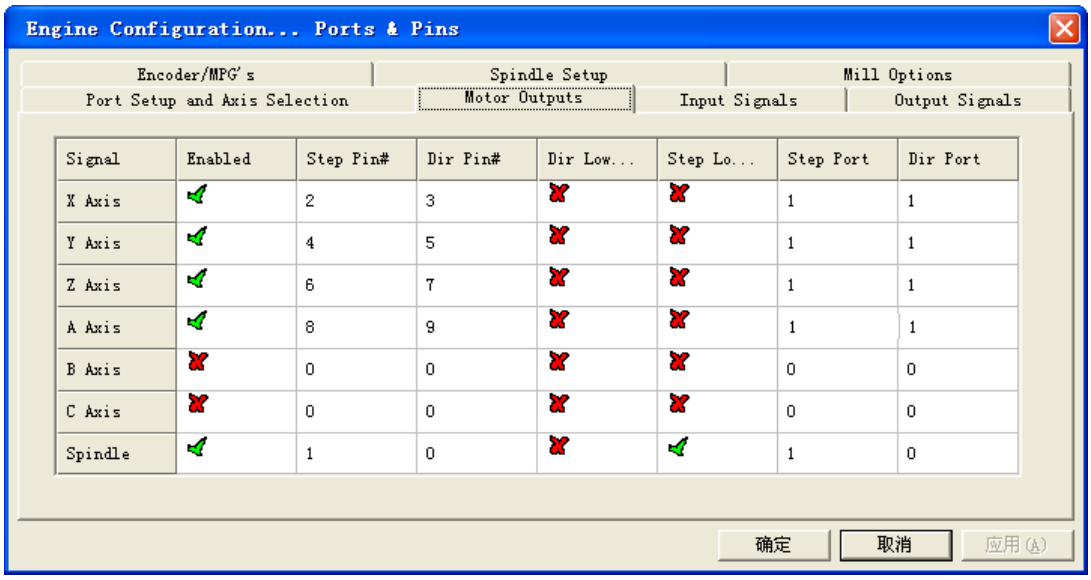
Pic.2


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
Select Native Units
Ports and Pins
Motor Tuning
General Config...
System Hotkeys
Homing/Limits
ToolPath
Slave Axis
Backlash
Fixtures....
ToolTable.....
Config Plugins
Spindle Pulleys..
Safe_Z Setup..
Save Settings..
Alt2 ToolPath Alt4 Offsets Alt5 Settings Alt6 Diagnostics Alt-7 Mill->G15 G80 G17 G40 G20 G90 G94 G54 G49 G99 G64 G97
REF ALL HOME
Zero X
Zero Y
Zero Z
Zero 4
+0.0000
Scale +1.0000
Radius Correct
Tool:0
OFFLINE GOTO Z To Go Machine Coord's Soft Limits
File: No File Loaded.
Load Wizards Last Wizard Conversational
Regen. Toolpath Display Mode Jog Follow
Cycle Start <Alt-R>
Feed Hold <Spc>
Stop <Alt-S>
Edit G-Code Recent File Close G-Code Load G-Code
Set Next Line Line 0 Run From Here
Rewind Ctrl-W Single BLK Alt-N Reverse Run
Block Delete M1 Optional Stop Flood Ctrl-F Dwell CV Mode
Reset
ess Reset .... Emerg
On/Off Z Inhibit +0.000
G-Codes M-Codes
Tool Information
Tool 0 Change Tool
Dia. +0.0000
H +0.0000
Auto Tool Zero
Remember Return
Elapsed 00:00:00
Jog ON/OFF Ctrl-Alt-J
Feed Rate
OverRidden FRO % 100
Reset
FRO 6.00
Feedrate 6.00
Units/Min 0.00
Units/Rev 0.00
Spindle Speed
Spindle CW F5 SRO % 100
RPM 0
S-ov 0
Spindle Speed 0
History Clear Status:
Profile: Mach3Mill

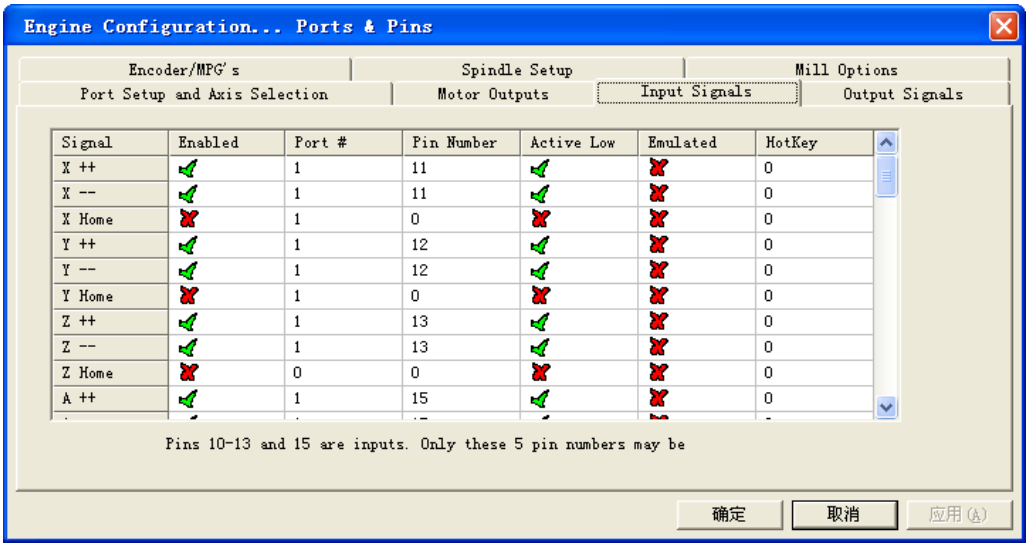
Pic.3


Mach3 CNC Controller
Engine Configuration... Ports & Pins
Encoder/MPG's
Spindle Setup
Mill Options
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Port #1
Port Enable
0x378
Port
Entry in Hex 0-9
Port #2
Port Enable
0x278
Port
Entry in Hex 0-9
Pins 2-9 as inp
OR
MaxNC Mode
Max CL Mode enabled
Max NC-10 Wave Drive
Program restart
Restart if changed
Kernel Speed
25000Hz
35000Hz
45000Hz
60000hz
65000hz
75000hz
100khz
Note: Software must be restarted and motors
kernel speed is
确定
取消
应用 (A)
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
Zero X
+0.0000
Scale
+1.0000
Tool:0
File:
Cycle Start <Alt-R>
Feed Hold <Spc>
Stop <Alt-S>
Run From Here
Dwell
CV Mode
Remember
Return
Elapsed 00:00:00
Jog ON/OFF Ctrl-Alt-J
Feedrate
6.00
Units/Min
0.00
Units/Rev
0.00
S-ov
Spindle Speed
Display Mode
Jog Follow
Reset
G-Codes
M-Codes
History
Clear
Status:
Profile:
Mach3Mill

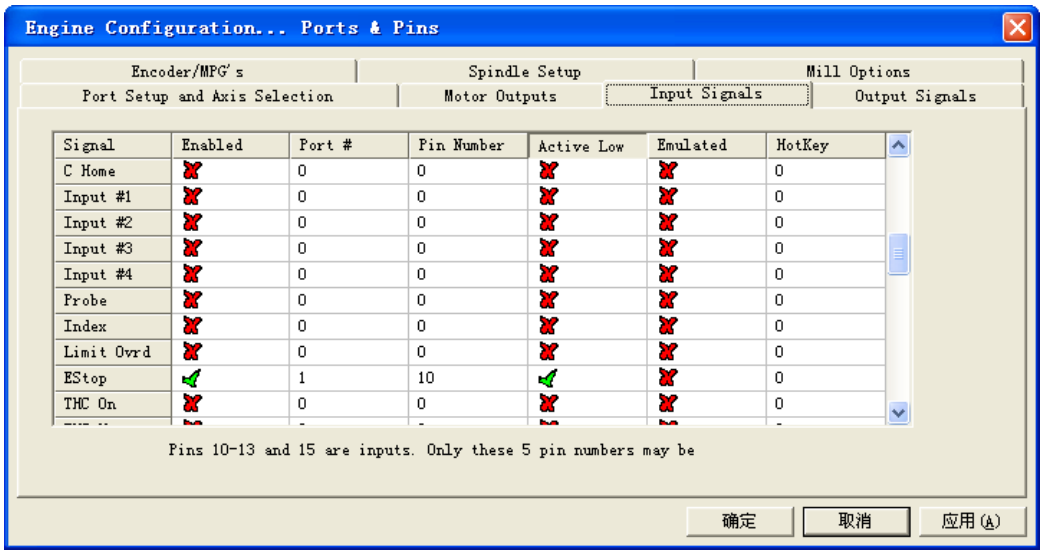
Pic.4


Engine Configuration... Ports & Pins
Encoder/MPG's
Spindle Setup
Mill Options
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Signal
Enabled
Step Pin#
Dir Pin#
Dir Low...
Step Lo...
Step Port
Dir Port
X Axis 2 3 1 1
Y Axis 4 5 1 1
Z Axis 6 7 1 1
A Axis 8 9 1 1
B Axis 0 0 0 0
C Axis 0 0 0 0
Spindle 1 0 1 0
确定
取消
应用 (A)

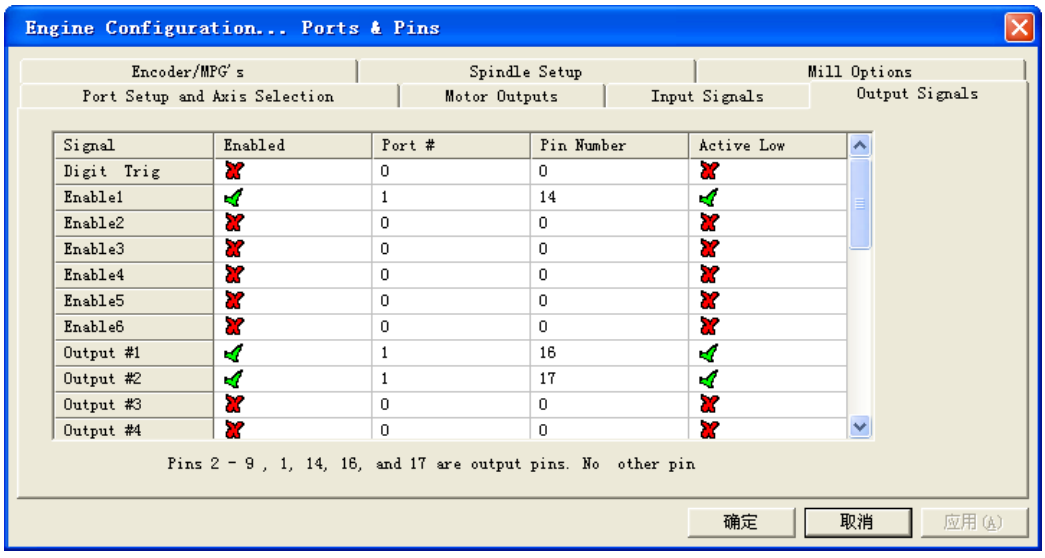
Pic.5



Pic.6

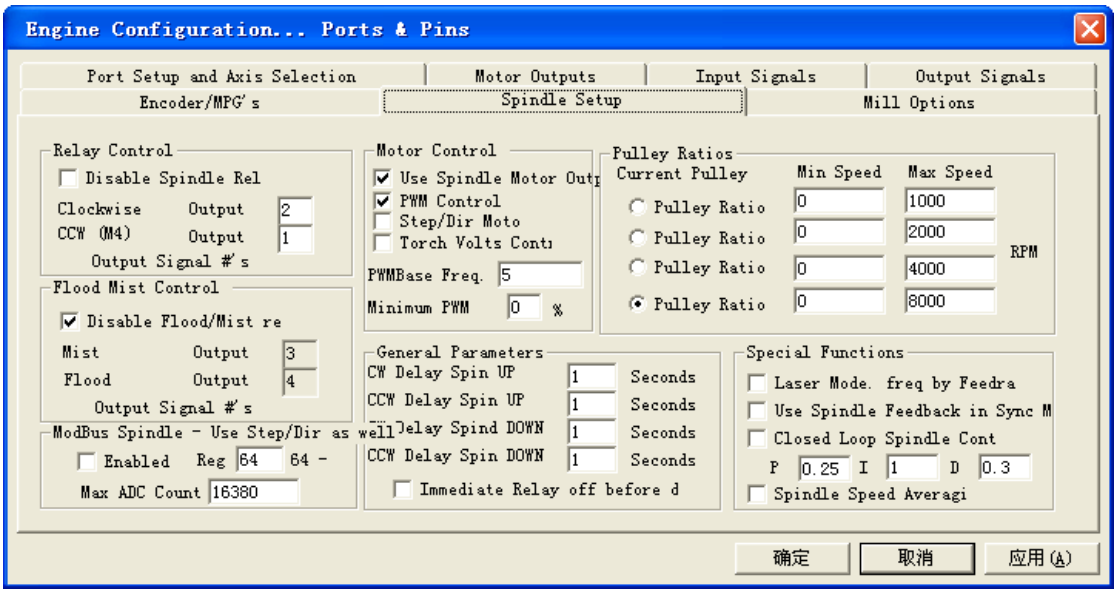


Pic.7

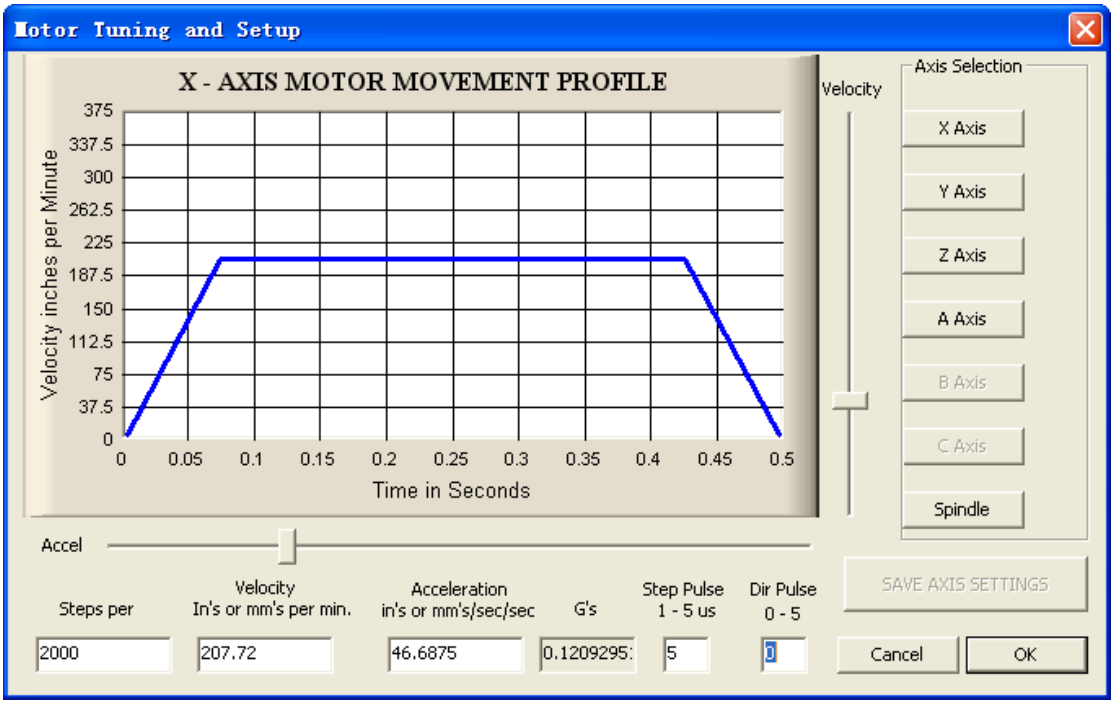


Pic.8

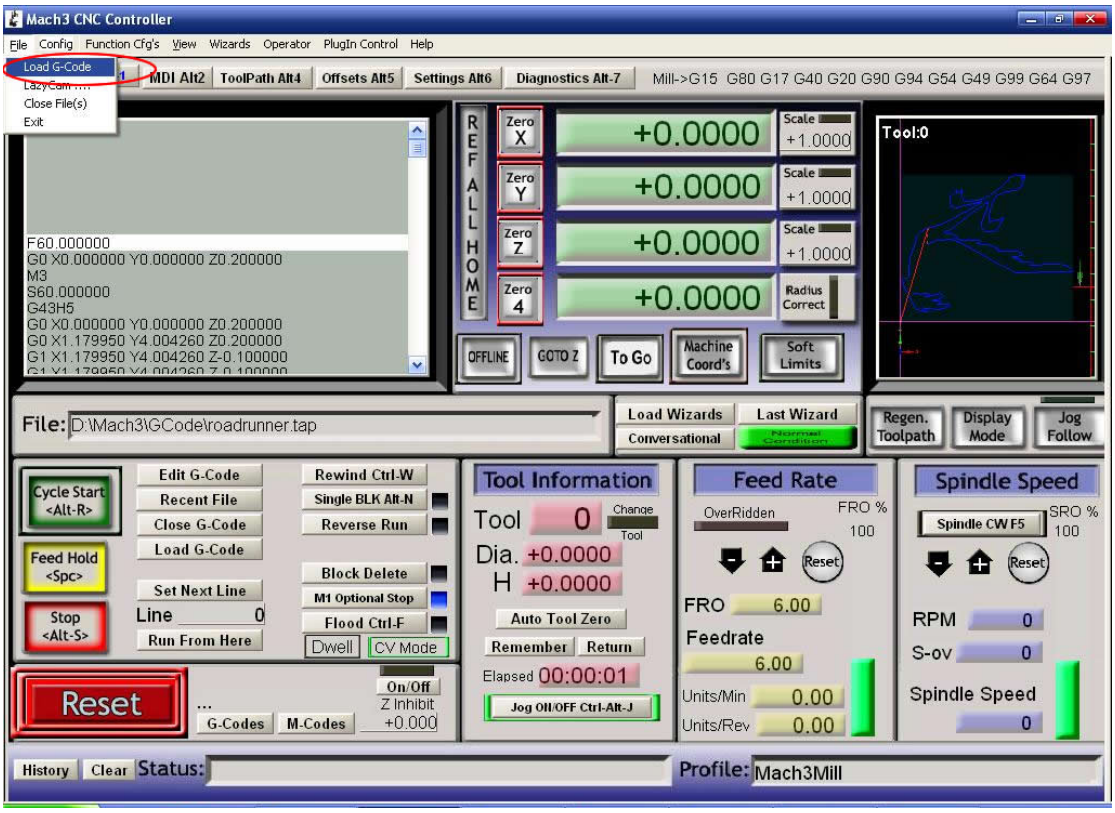
(Please note: some of computer has opposite "Active low" and "Active high", if it is with your computer, please change above three "Active Low" to "Active High".)



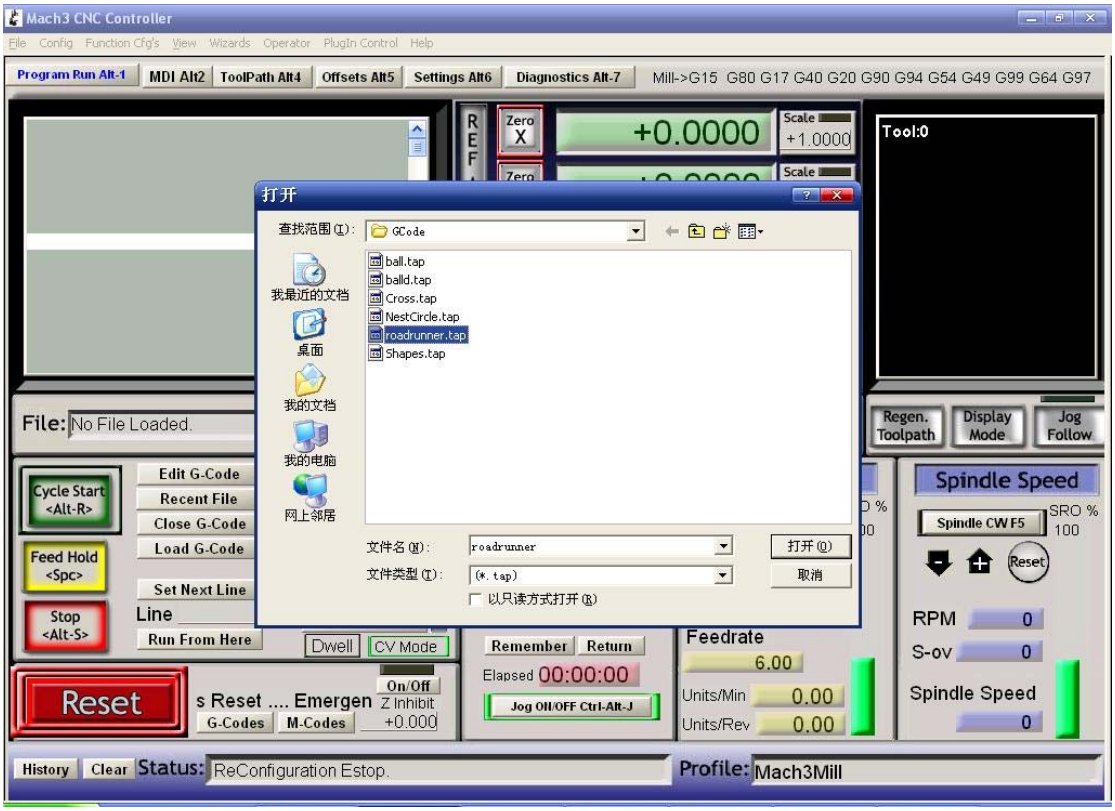
Pic.9



Pic.10


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
Load G-Code
Close File(s)
Exit
MDI Alt2 ToolPath Alt4 Offsets Alt5 Settings Alt6 Diagnostics Alt-7
Mill->G15 G80 G17 G40 G20 G90 G94 G54 G49 G99 G64 G97
REF ALL HOME
Zero X
Zero Y
Zero Z
Zero 4
+0.0000
Scale +1.0000
Radius Correct
OFFLINE GOTO Z To Go Machine Coord's Soft Limits
Tool:0
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 Z-0.100000
File: D:\Mach3\GCode\roadrunner.tap
Load Wizards Last Wizard
Conversational
Regen. Toolpath Display Mode Jog Follow
Cycle Start <Alt-R>
Feed Hold <Spc>
Stop <Alt-S>
Edit G-Code
Recent File
Close G-Code
Load G-Code
Set Next Line
Line 0
Run From Here
Rewind Ctrl-W
Single BLK Alt-N
Reverse Run
Block Delete
M1 Optional Stop
Flood Ctrl-F
Dwell CV Mode
Reset
On/Off
Z Inhibit +0.000
G-Codes M-Codes
Tool Information
Tool 0 Change Tool
Dia. +0.0000
H +0.0000
Auto Tool Zero
Remember Return
Elapsed 00:00:01
Jog ON/OFF Ctrl-Alt-J
Feed Rate
OverRidden FRO % 100
FRO 6.00
Feedrate 6.00
Units/Min 0.00
Units/Rev 0.00
Spindle Speed
Spindle CW F5 SRO % 100
RPM 0
S-ov 0
Spindle Speed 0
History Clear Status:
Profile: Mach3Mill

Pic.11


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
打开
查找范围(I): GCode
ball.tap
balld.tap
Cross.tap
NestCircle.tap
roadrunner.tap
Shapes.tap
我最近的文档
桌面
我的文档
我的电脑
网上邻居
文件名(N): roadrunner
文件类型(T): (*.tap)
打开(O)
取消
以只读方式打开(R)
File: No File Loaded.
Reset s Reset .... Emergen
Status: ReConfiguration Estop.
Profile: Mach3Mill

Pic.12