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# 4-Axis TB6560 CNC Driver Board Users Manual

## 1. General Information

### 1.1 Scope

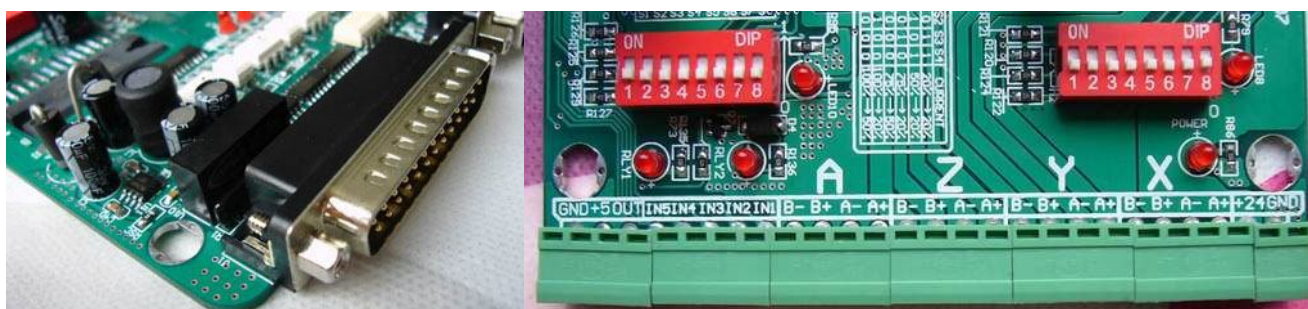
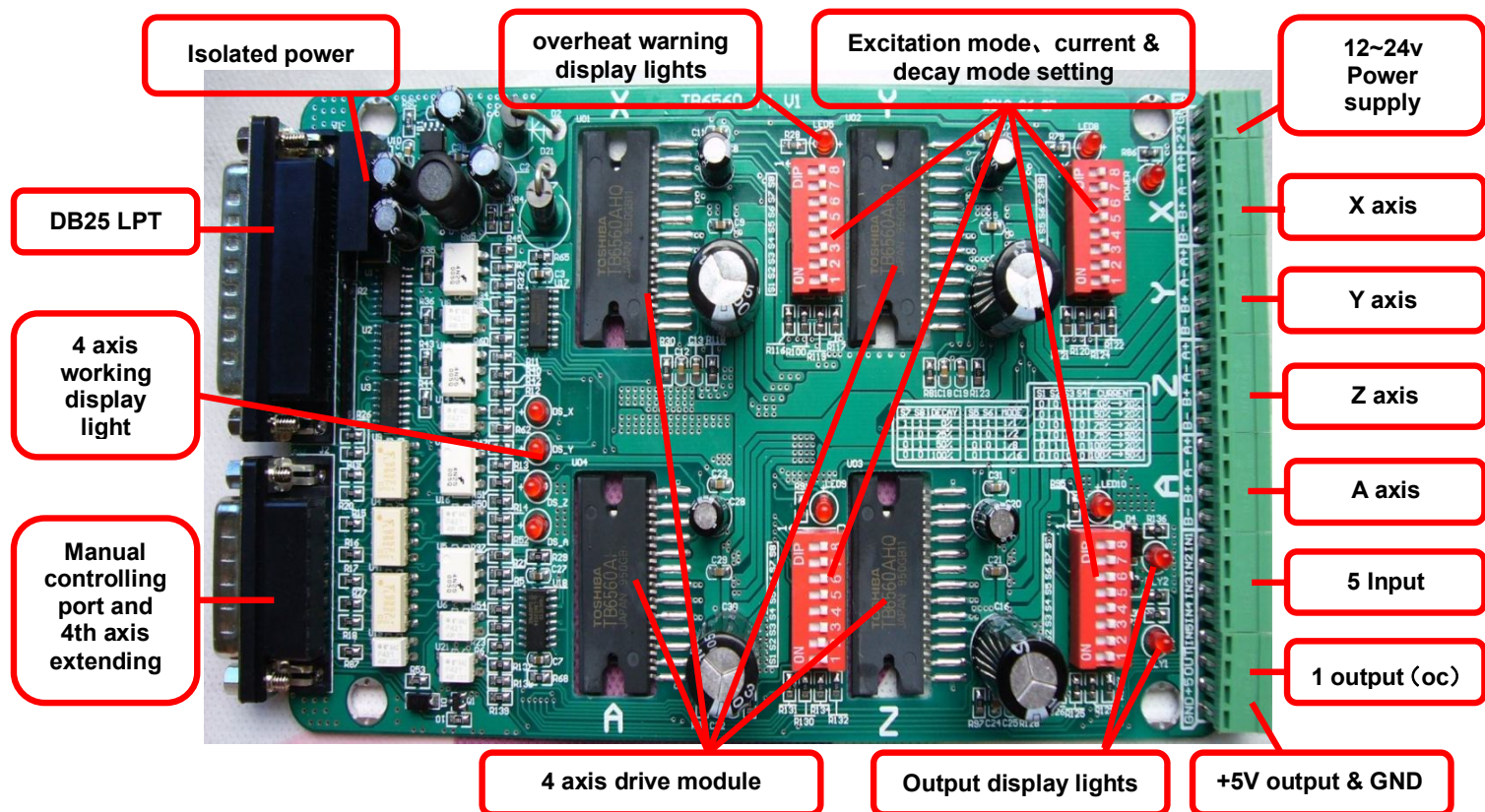
This document describes the basic functionality and the electrical specifications of StepperOnline Co.,Ltd.'s Four Axis TB6560 CNC Driver board.

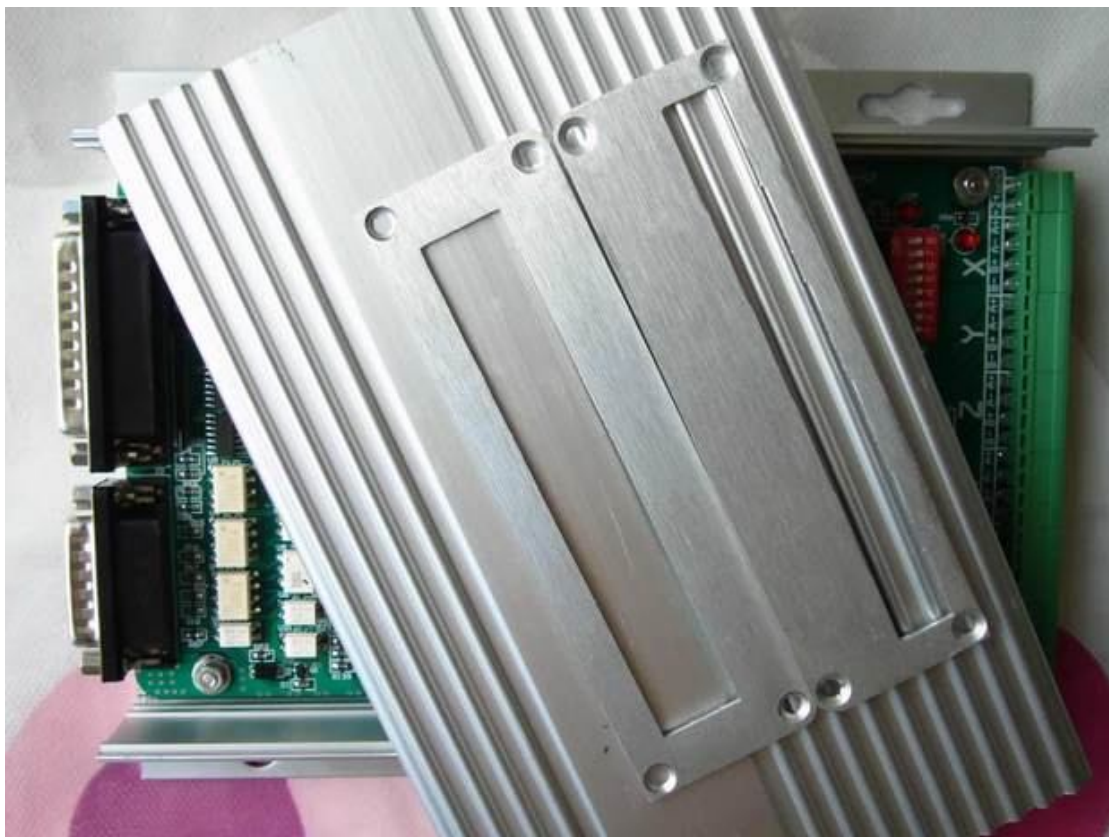
### 1.2 General Description

- Rated voltage: DC12-DC30V;
- High output current: IOUT = AHQ: 3.5 A (peak)
- Resolution 1, 1/2, 1/8, 1/16 micro stepping output
- Selectable phase excitation modes
- Thermal shutdown (TSD)
- Better cooling and safer protection with Aluminum box

## 2. Descriptions of 4-AXIS CNC Board

### 2.1 Photo of 4-AXIS CNC Board





### 2.2 Key Features

- Supports KCAM4, MACH 2/3, NINOS, etc...
- Resolution 1, 1/2, 1/8, 1/16 micro stepping output
- Suitable for 4, 6, or 8 wire motors
- Only a single power needed: control parts and drive parts share one power, you don't need any more power.
- Absolute Maximum Ratings: 3.5 amps(peak) /phase motor output, Rated voltage: DC12-DC30V
- Current adjustable at 100%, 75%, 50%, 20% of full current by on-board switch.
- Limit/Home Signal input
- Manual Control circuit included
- Built-in overheat protection circuit: Thermal shutdown (TSD)
- Protect the computer by using the isolating power(1000V DC\DC) and the optoelectronic coupler, the drive board are separated from the computer.
- Fixed in a Aluminum box has better cooling function than fan and safer protection for board.

### 3. Hardware Installation

#### 3.1 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.

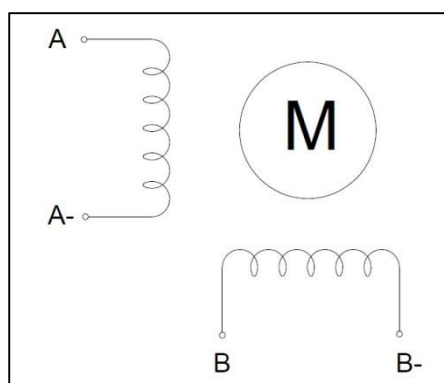
4 Wire, 6 Wire, and 8 Wire stepper motors can be used with 4-AXIS CNC Board.

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).

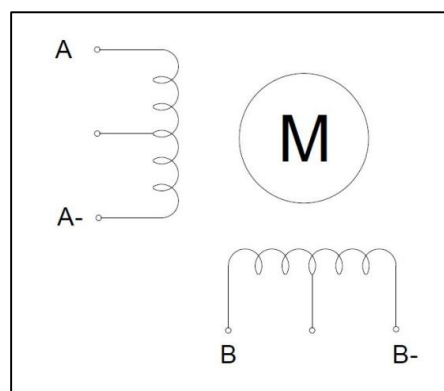
1.8 deg per step resolution is the industry standard for most automation grade stepper motors and is recommended for most applications.

##### 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



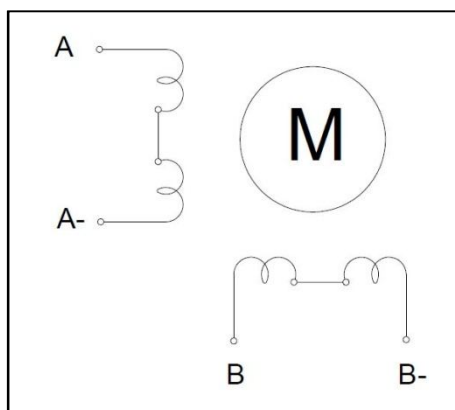
Center wire of each coil not connected (insulate termination)

Remaining wires are connected to their corresponding terminal block location (i.e. A- wire is connected at A- location).



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### c. 8 WIRE STEPPER DIAGRAM



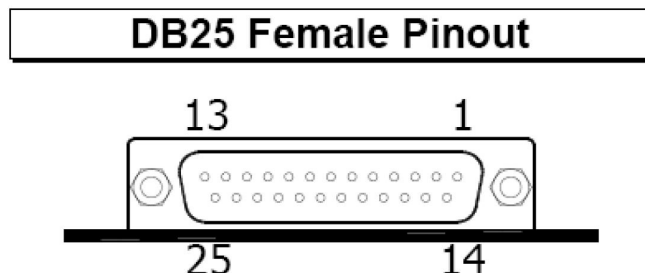
2 center wires of each coil connected (insulate connection)

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).

### 3.2 CONNECTING with Computer by DB25

The following is to aid in the setup of the use of controller with various CAM software programs operating on your computer.



**DB25 LPT pin define:**

PIN	Signal
1	The 2 <sup>nd</sup> output control (corresponding circuitry pls see RY2 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)

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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 circuitry pls see RY1 on the board, for electric relay or PWM OC output control, output current=50mA, voltage=24V)
18-25	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.

### 3.3 Manual Control

#### Manual control ports and definition

PIN	Signal 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 circuitry pls see RY1, 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 1st output
13	5V output
14	Direct connecting to IN1
15	Power GND

### 3.4 Port for extending

PIN	Signal
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)

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7	+5V
8	GND

### 4. Setting

#### 4.1 Current adjusting and default testing

Working Current--> Pause current	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

**EXAMPLE:** 75%-->20%

Working Current=3.5A \*75%

Pause current=3.5A \*20%

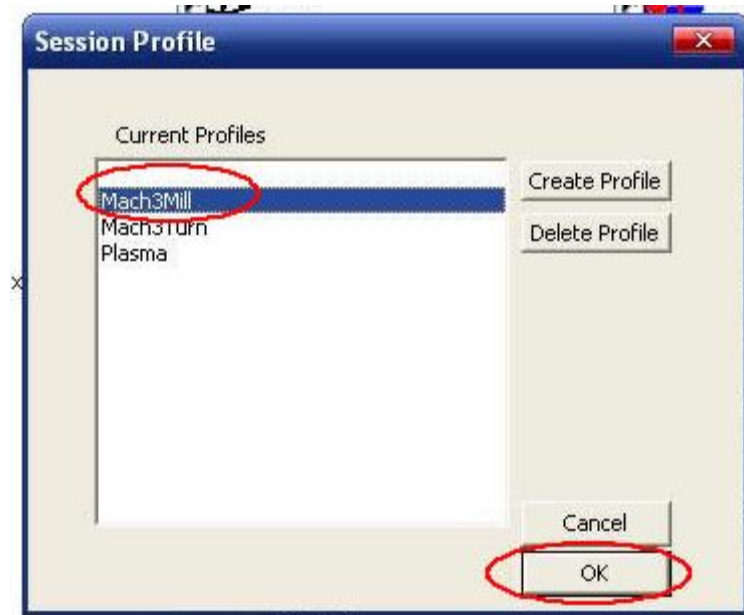
#### 4.2 Subdivision surface mode setting

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

#### 4.3 Decay mode setting

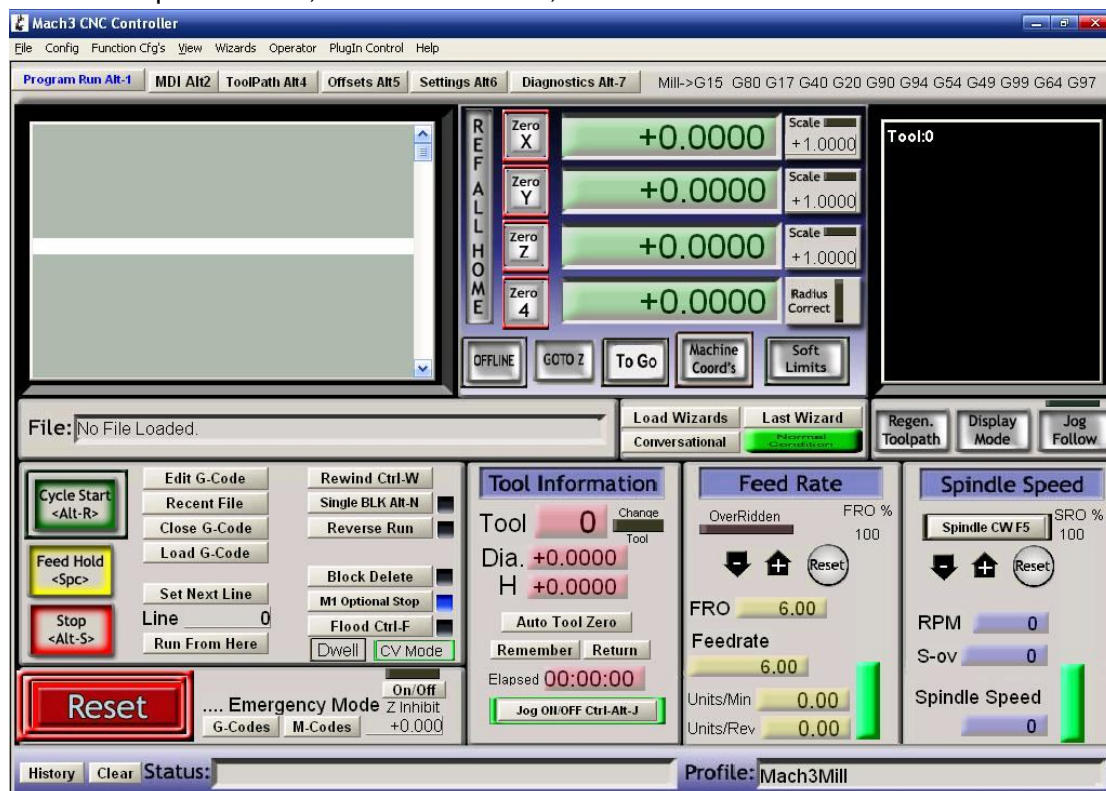
	S7	S8
NO DECAY	1	1
SLOW DECAY	1	0
MID DECAY	0	1
FAST DECAY	0	0

### 5. How to use MACH software?



Pic.1

See Pic.1: open MACH3, choose Mach3mill, click OK.

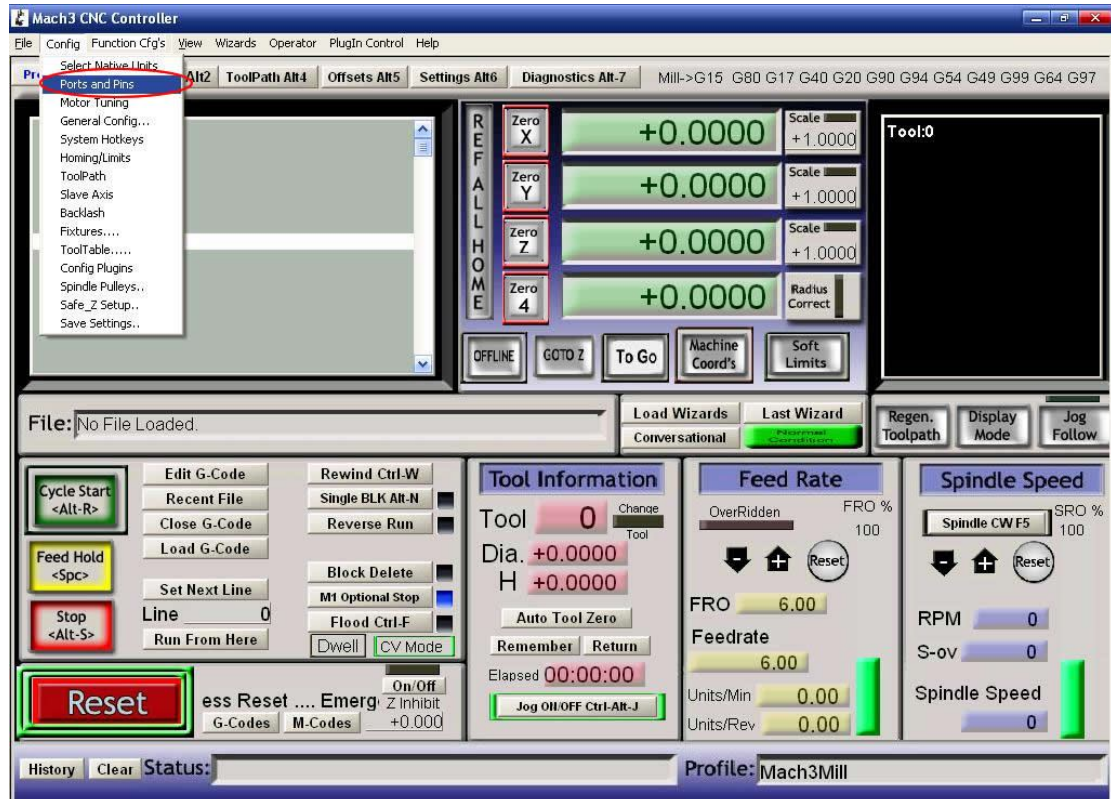


Pic.2

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

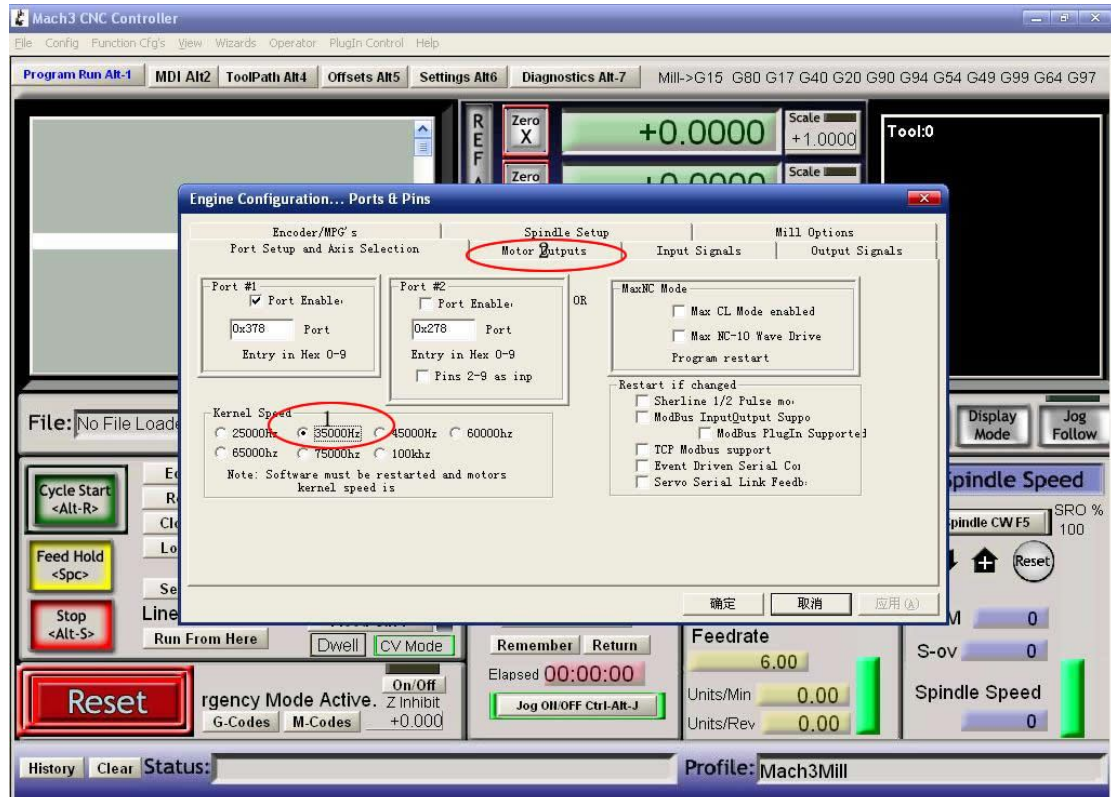


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Pic.3

See Pic.3, open config-----ports and pins



Pic.4

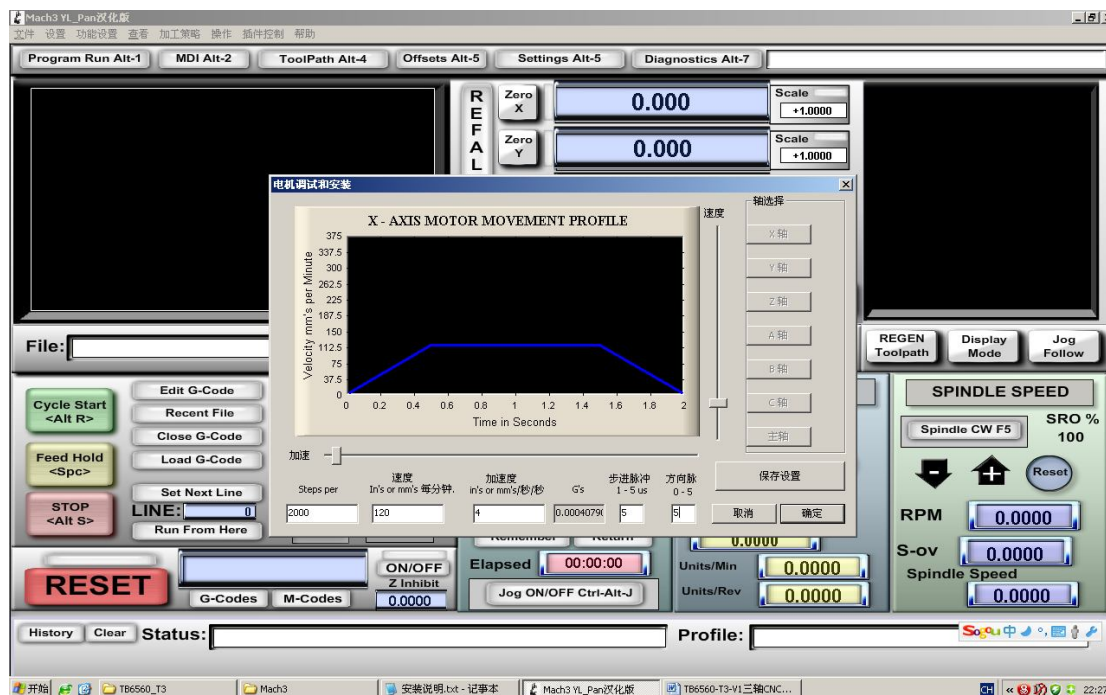
CIRCLE1: frequencies setting, to control the speed



Pls set the X\ Y\ Z\ axis as Pic.5 shows.

Choose “output signals” and then set as Pic.6 shows.

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Pic.7

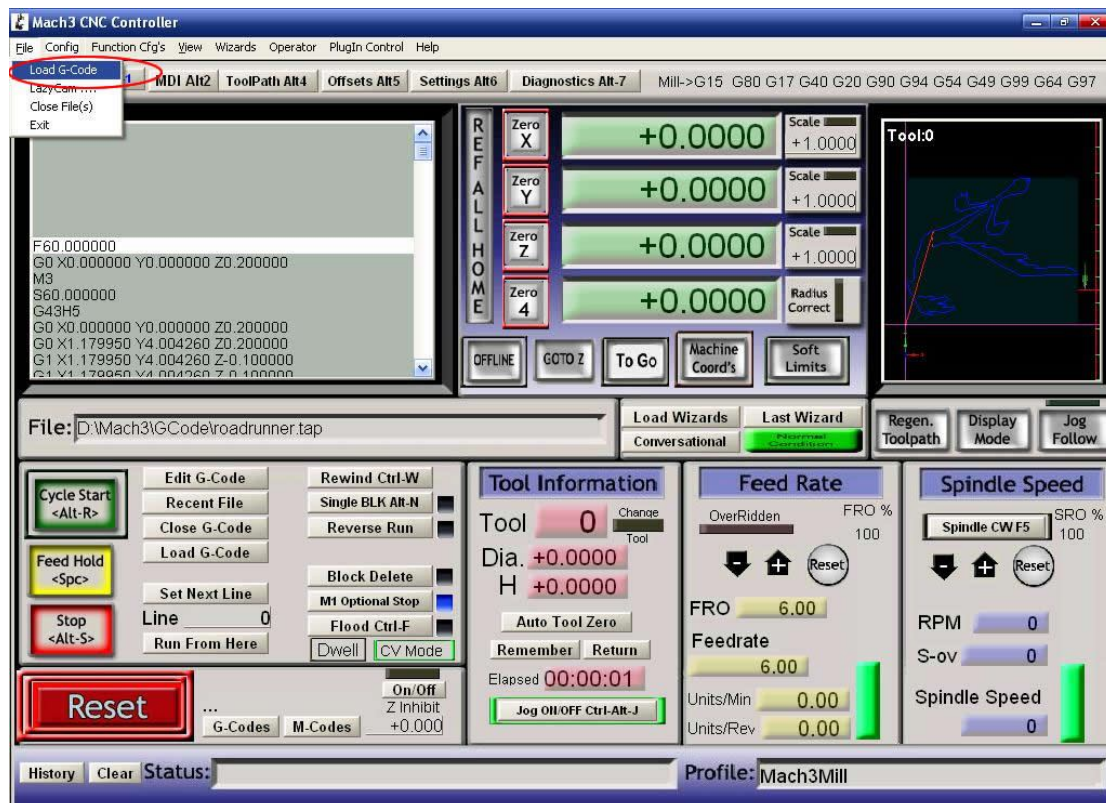
Pulse width setting:

Step impulse: 5us

Direction impulse: 5us

See Pic.7 for reference

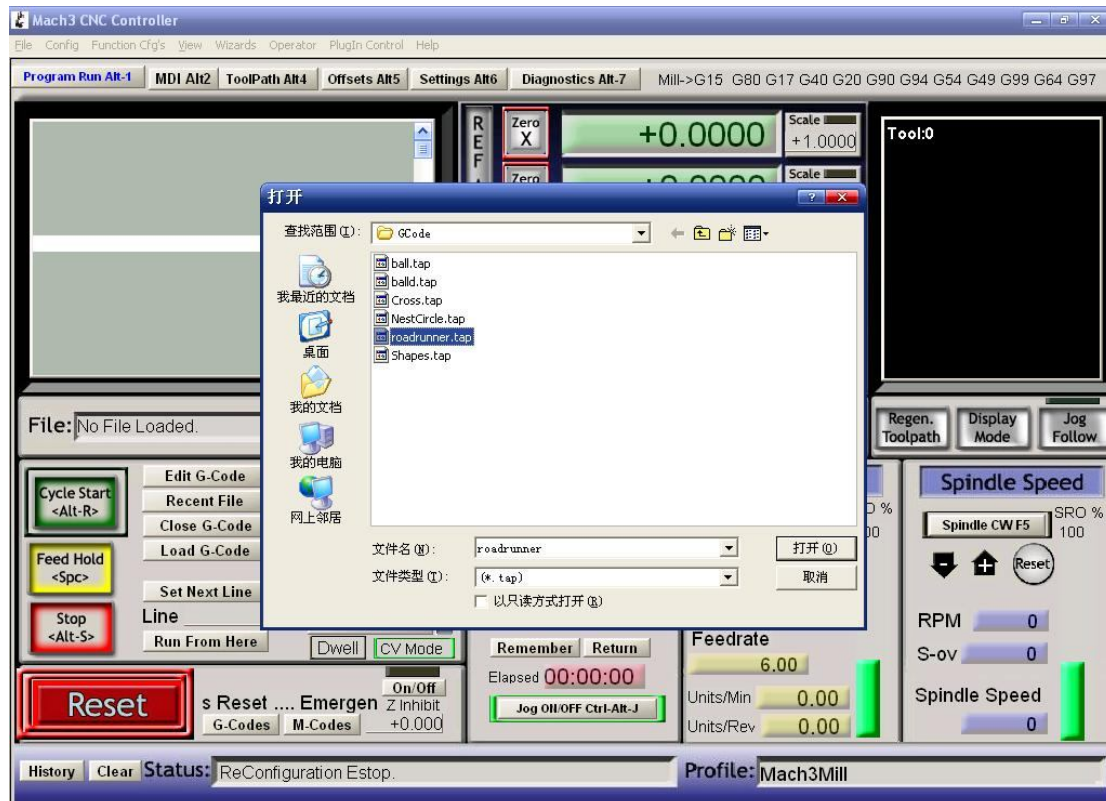
Pls click "load G-code", see Pic.8 and Pic.9



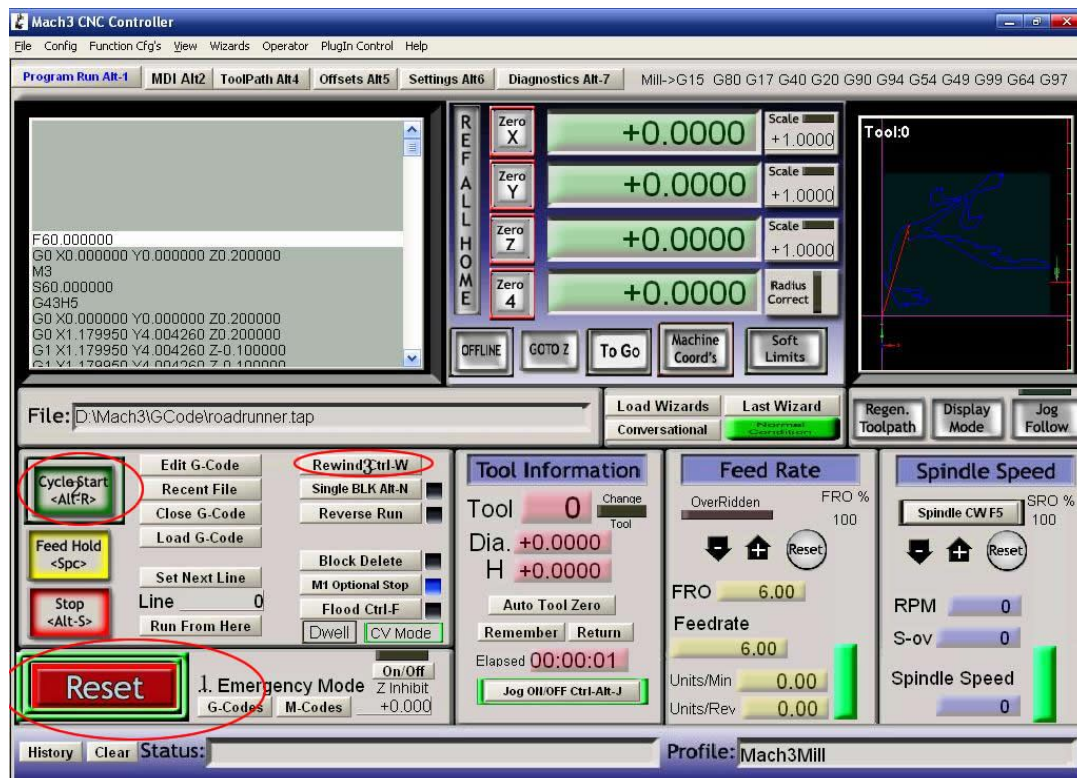
Pic.8



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Pic.9

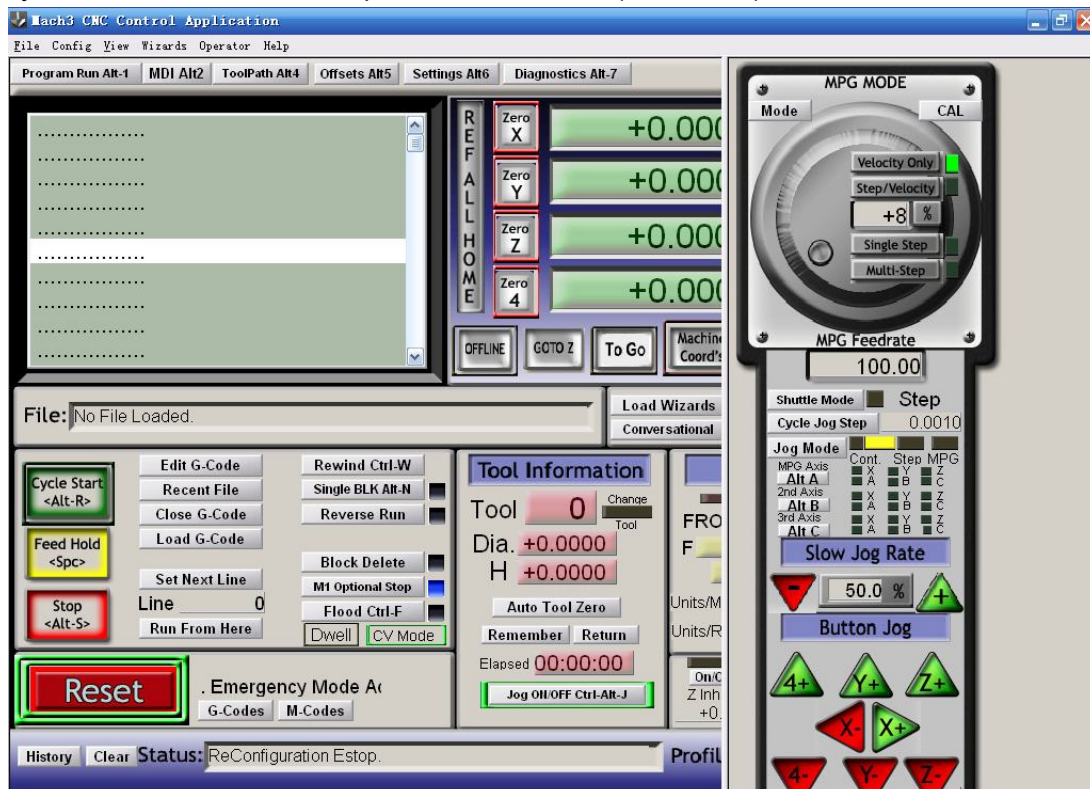


Pic.10

After open 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".

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If you need manual control, please click TAB button (see Pic.11)



Pic.11

## 6. Notes and Contacts

To make sure the drive board is under the rated temperature after working inconsistently for half an hour.

Contact us:

[sales@stepperonline.com](mailto:sales@stepperonline.com)

[www.stepperonline.com](http://www.stepperonline.com)