LV8727T4V3

Product manual

(English version)

Count

Chapter 1 introduction

▶ 1.1 product Introduction

LV8727T4V3 is designed by our company and it adopt driver chip manufactured by Japan Sanyo. Embedded control system has a function that you can put your program into driver board to accomplish your control function and make up small control system. LV8727T4V3 is suitable to drive the small and medium phase (the two or four phase) hybrid step motor. Current of LV8727T4V3 have eight choices, such 0.6A 1.2A 1.8A 2.4A 3A 3.6A 4.2A 4.8A. LV8727T4V3 support a series of MACH2 and MACH3 and KCAM4 software. It applies mould processing and plane sculpture widely.

The new style bipolar constant current chopping technology enables the LV8727T4V3 output higher speed and power when you use the same motor. Its sub-division feature improves the motor operating accuracy, decreases the shaking and reduces the noise.

1.2 feature and appearance of product
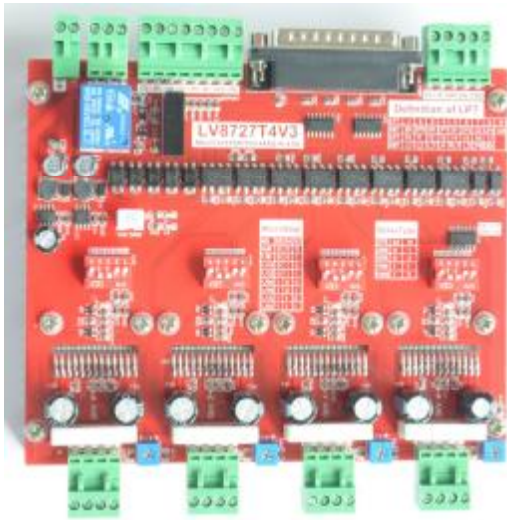
1. Can drive four 4A stepper motor at the same time and have the fifth axis extension interface.

2. High-speed opt coupler (DCDC) enables complete isolation, which protect your computer indeed.

3. Main axle relay output enables to use mach3 software to control start and stop of main axle easily

4. Half-current control function enables current reduce to the minimum when motor stop.

5. Have fan interface and can add some fans.

6. Have 8 current choices (0.6-4.8A) of output two phase bipolar stepper motor drive.

7.Normal parallel port，support a series of MACH2 and KCAM4 software

8. Have four limiting inserted connectors，you can connect them conveniently.

9. Have four types work mod, mixed mode and fast mode and slow mode and general mode.

10. have 8 subdivisions——2\8\16\32\64\128\10\20；

11. 12—36V one power supply ,adopt switch power supply chip, voltage 5V，stabilization and low temperature.

▶ 1.3 requirement of computer system

the basic requirement：

1) CPU：1GHz；

2) RAM：512MB

3) 500MB available disk space

4) USB 2.0 interface

Recommendation

1) CPU：2GHz dual-core；

2) RAM：2GB；

3) 1G available disk space

4) USB 2.0 interface

▶1.4　attention and warning

1.After connecting parallel port and motor ，you can connect power supply.

2. As picture, if you connect or break control interface of step motor during turning on power, the red button RESET in mach3 need to be flickering. (The red button of RESET has two states, flicker and stop flicker. You can switch two states by clicking the red button of RESET.)　If not, the chip damage possibly.
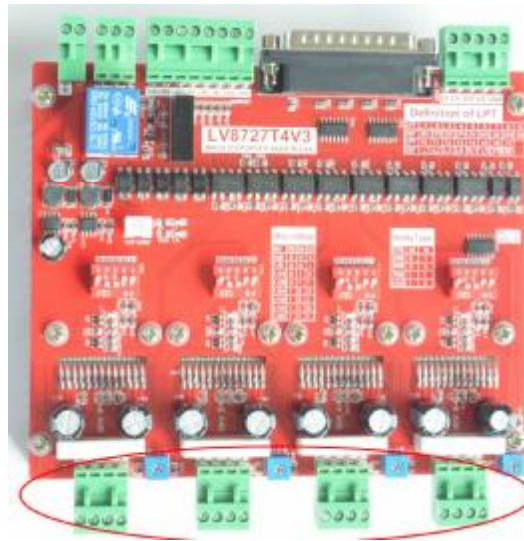
Prohibit the rain ，LV8727T4V3 is a high- performance and precision equipment ，water can lead to short circuit.

Attention and warning，all wirings must connect strictly, Please according to the product manual.

High voltage is dangerous; LV8727T4V3 keeps away from high voltage.
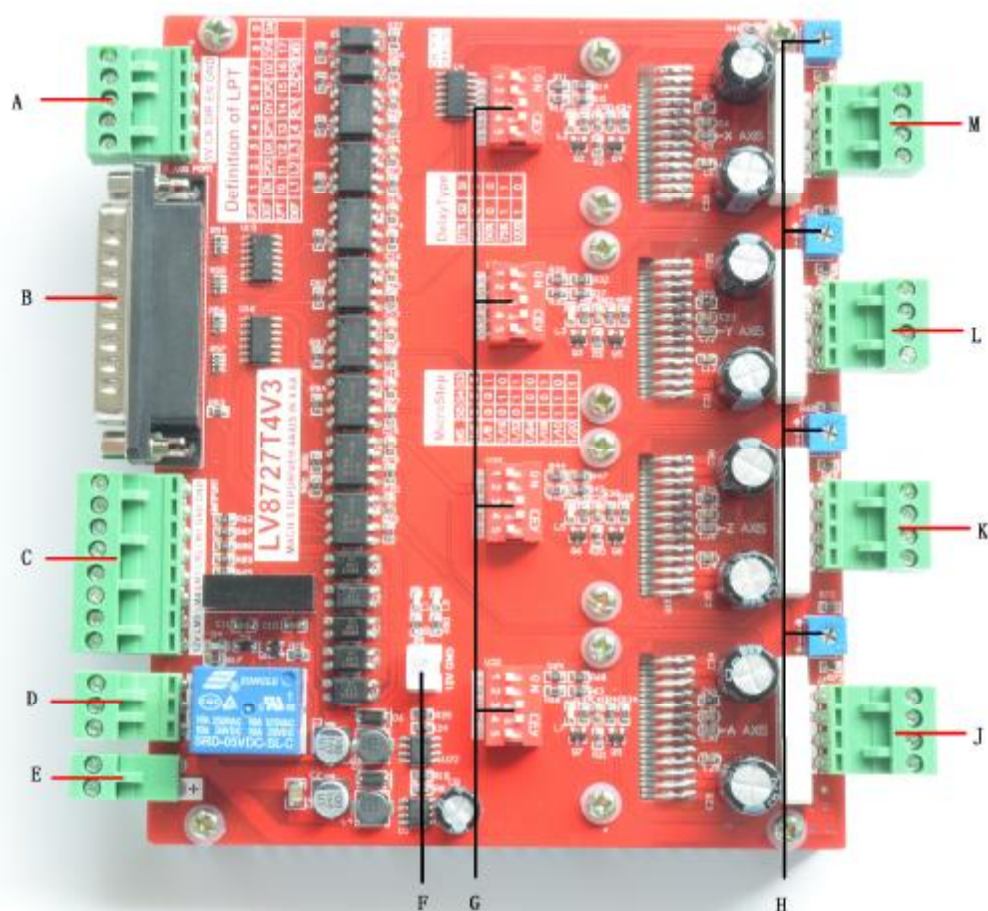
Chapter2　instruction

▶ 2.1　Definition figure

Figure3

No.		Definition	Description
	A	The 5th axis signal output port	See as figure 3:it's set as 5V,CK,DIR,EN,GND from down to up. They are 5Vsignal power,pulse of B axis,direction of B axis,enable of B axis,Ground. The relation of the port and LPT port see as Form 2
	B	LPT port	See as Form 2
	C	Limit & probe & home port	See as figure 3:This port is set as： 12V LM5 LM4 LM3 LM2 LM1 GND GND from down to up. The relation of this port and LPT port see as Form2
	D	Relay port	Set as A COM B from down to up.They are Close,Common,Open.
	E	Power input port	See as figure 3:This is power input port.Pin marked + is power's positive ,the other Pin is power's negative. The Input voltage should be in DC12V-DC48V
	F	12V fan's power port	See as figure 3:Pin marked 12V is positive.
	G	Mod SW	Each axis has a 5P switch.Definition see as Form of Decay and subdivision.
	H	Current ajust	See as figure 3:Each axis has a blue Potentiometer.clockwise is increasing current.anticlockwise is decreasing current.Adjust range is from 0.6A-4A
	J	A axis steppermotor port	See as figure 3:It's set as A+/A-/B+/B- from down to up
	K	Z axis steppermotor port	See as figure 3: It's set as A+/A-/B+/B- from down to up
	L	Y axis steppermotor port	See as figure 3: It's set as A+/A-/B+/B- from down to up
	M	X axis steppermotor port	See as figure 3: It's set as A+/A-/B+/B- from down to up

Figure1 Definition of all port

▶ 2.2 parallel port definition
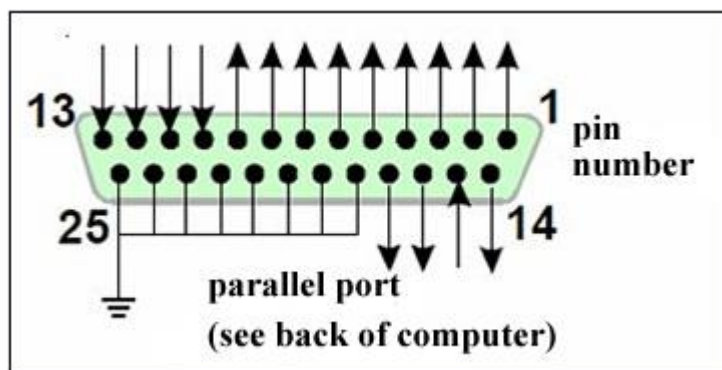
Definition of 25 controllable parallel port pins

DB25 controllable pin(PIN)	Pin function on driving board	note
1	EN	Enable pin of all axis
2	STEPX	X（the first axis）pulse signal
3	DIRX	X（the first axis）direction signal
4	STEPY	Y（the second axis）pulse signal
5	DIRY	Y（the second axis）direction signal
6	STEPZ	Z（the third axis）pulse signal
7	DIRZ	Z（the third axis）direction signal
8	STEPA	A（the fourth axis）pulse signal
9	DIRA	A（the fourth axis）direction signal
10	LIMIT-1	Limit input interface 1
11	LIMIT-2	Limit input interface 2
12	LIMIT-3	Limit input interface 3
13	LIMIT-4	Limit input interface 4
14	Relay control	
15	LIMIT-5	Limit input interface 5
16	STEPB-	B（the fifth axis）pulse signal
17	DIRB-	B（the fifth axis）direction signal
18-25	GND	

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▶ 2.3 adjustments of Decay and subdivision and current output

▶ Decay   adjustment

Decay mode	SW1	SW2
slow mode	OFF	OFF
mixed mode	ON	OFF
fast mode	OFF	ON

▶ subdivision   adjustment

Subdivision multiple	Step /circle（1.8° /full step）	SW3	SW4	SW5
2	400	OFF	OFF	OFF
8	1600	ON	OFF	OFF
16	3200	OFF	ON	OFF
32	6400	ON	ON	OFF
64	12800	OFF	OFF	ON
128	25600	ON	OFF	ON
10	2000	OFF	ON	ON
20	4000	ON	ON	ON

2.4 limit switch connection way

ordinary switch

12V LM5 LM4 LM3 LM2 LM1 GND GND

brown
two-wire sensor switch
blue

12V LM5 LM4 LM3 LM2 LM1 GND GND

brown
three-wire sensor swith
blue
black

12V LM5 LM4 LM3 LM2 LM1 GND GND
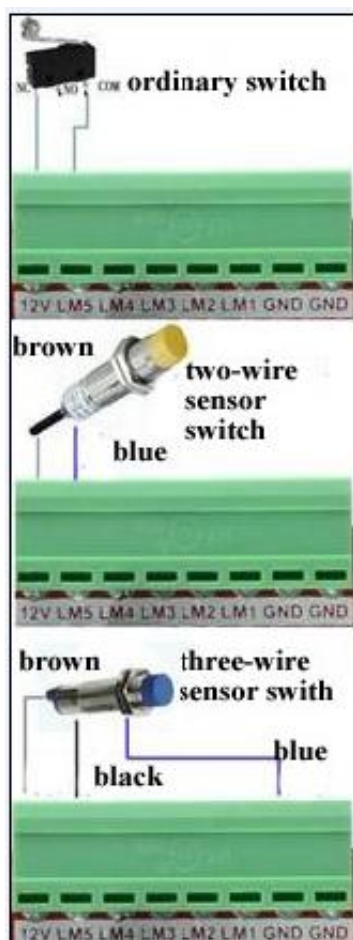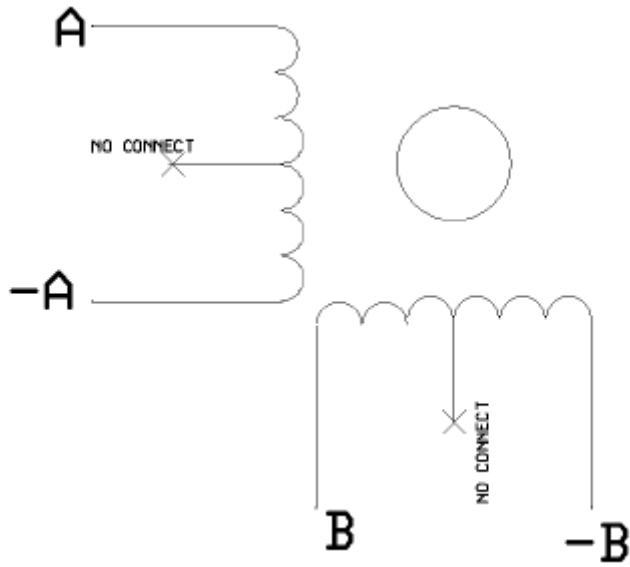
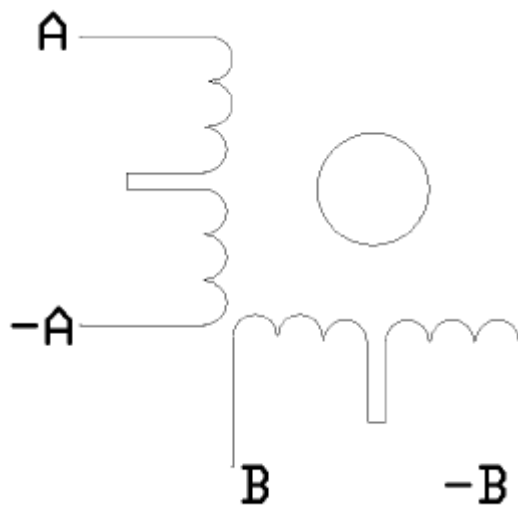## 2.5 all step motor connection

Four-wiring step motor

A

−A

B   −B
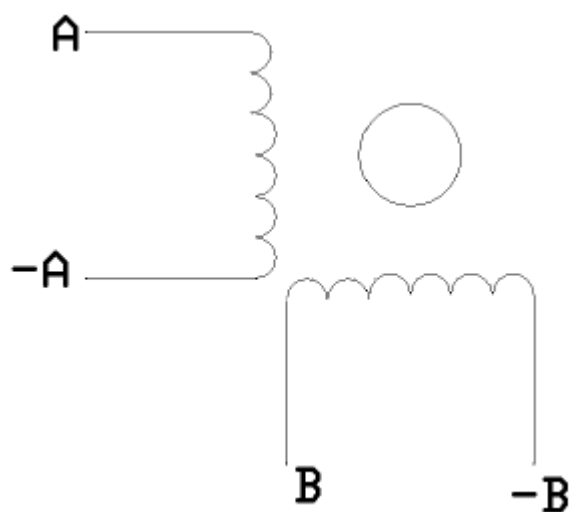
Six-wiring step motor

Eight-wiring step motor

+A ,-A ,B and −B of step motor take turns to connect A+,A-,B+ and B- of the LV8727.

2.6 Selection of step motor and power supply

LV8727T4V3 could drive the two phases and four phase step motor manufactured by domestic and overseas company. It is needed to choose the suitable power supply and setting current in order to reach the satisfying effect. The height of power voltage decides the motor performance, while the electric current setting value decides the motor's output torque.
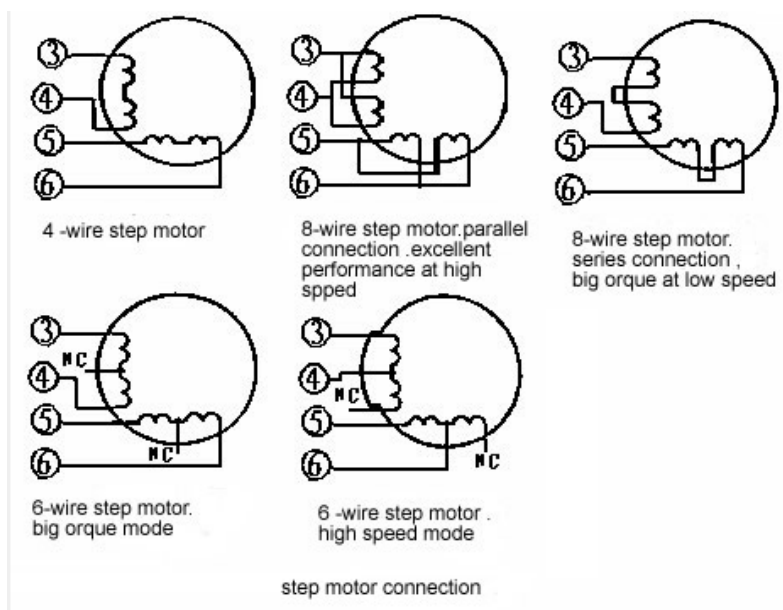
1. *The setting of power supply voltage*
Generally speaking, the higher of the power supply voltage, the stronger of the motor high speed torque, which can avoid the breakdown in high speed. But, on the other hand, if the voltage is too high, it will damage the driver, and the machine would lead low speed shake under the high voltage. So, we recommend to select a 24-36V 10A DC power supply.

2. *Output current setting*
As to the same motor, the higher of the electric current setting value, the higher is the motor output torque, but the motor and driver also generate heat greatly under the high electric current. Therefore mostly the electricity value shall be set at warm but not too heat condition when the motor is under long term operation.

⑴ High speed mode of four wire motor and six wire motor----setting of output current is equal to or lower than rated current value.

⑵ 6 wire high torque mode-------output current is equal to 70% rated current.

⑶ 8 wire motor connection in series-----output current is equal to 70% rated current.

⑷ 8 wire motor parallel connection ---- output current is equal to 1.4 rated current.

4 -wire step motor

8-wire step motor.parallel connection .excellent performance at high spped

8-wire step motor. series connection , big orque at low speed

6-wire step motor. big orque mode

6 -wire step motor . high speed mode

step motor connection

Attention: Please run the motor 15-30 minutes after setting the electricity, if the motor temperature is too high, the electricity setting value shall be reduced. If the motor output torque is not enough after setting the motor electricity value, the heat dissipation condition shall be improved to ensure that motor and drive temperature are not too high.

Chapter3 software installation
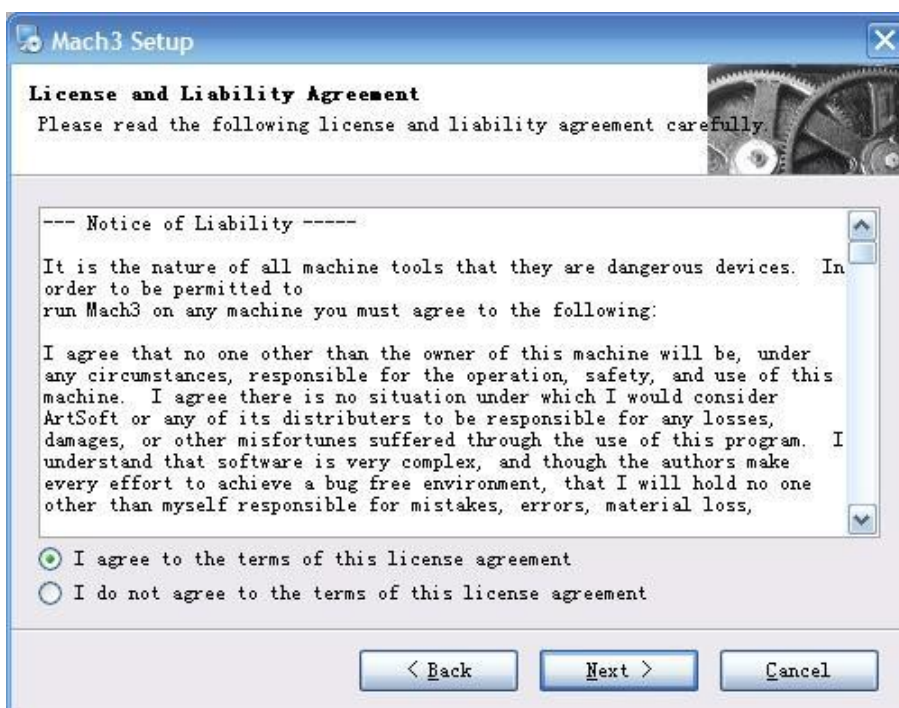
▶ 3.1 MACH3 installation

The First, running Mach3Version3.043.066 [Mach3Version3.043.066 Setup Application], enter into the first page ,as is shown in the picture.

Click next

Select 'I agree to the terms of this license agreement', and then click next

Select the path that you want to install. (C,D,E,F is ok, recommend C or D), as is shown in

the picture

As is shown in the picture, Click next until finish.

▶ **3.2 Mach3 register**

Copy the ' **Mach1Lic.dat** 'in the folder of register and localization, and put it in path of

mach3. (For example C:/MACH3)
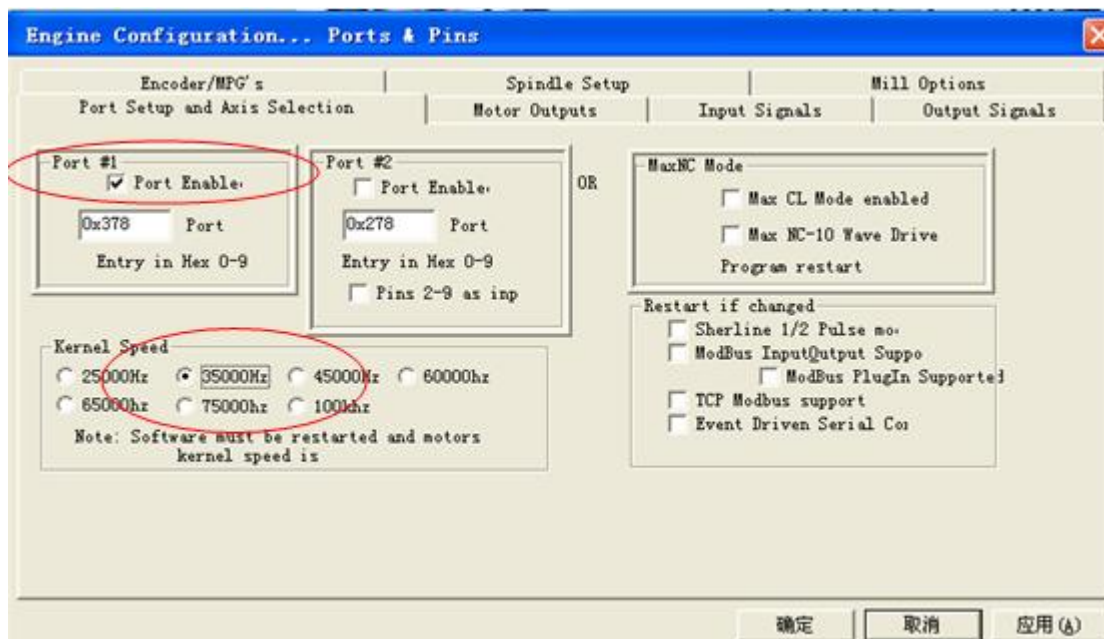
Chapter 4   software use

▶ **4.1 Run software**

Double-left Click **'mach3mil'** [icon: Mill 快捷方式 1 KB]   enter into mach3 software.
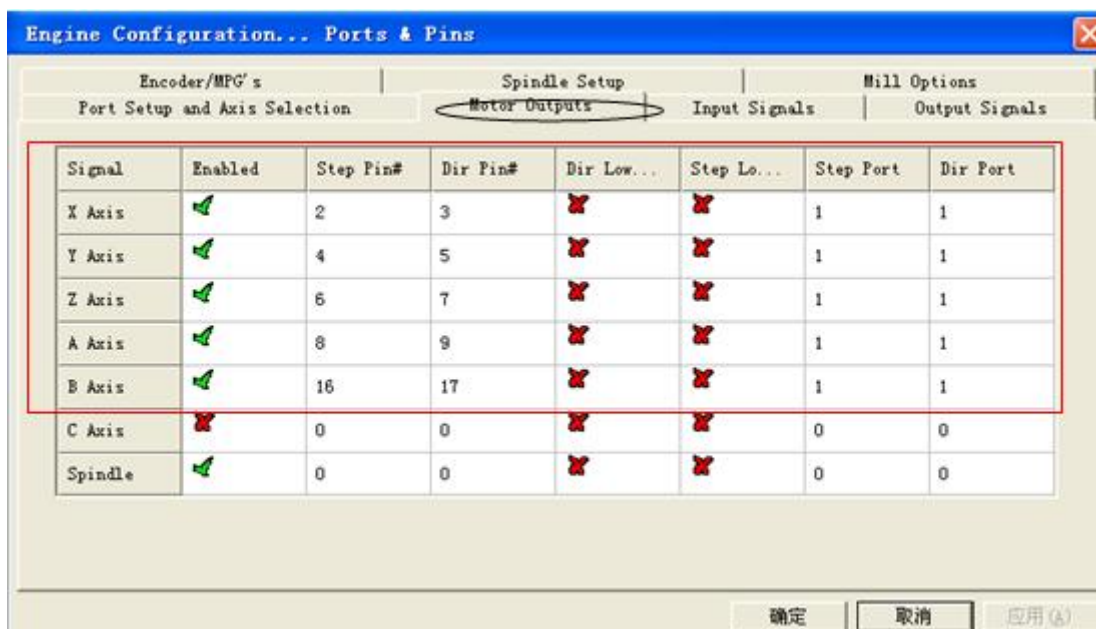
▶ **4.2   Mach3 basic settings**

Select **'ports and pins'** under '**Config**' menu. Choice as the picture
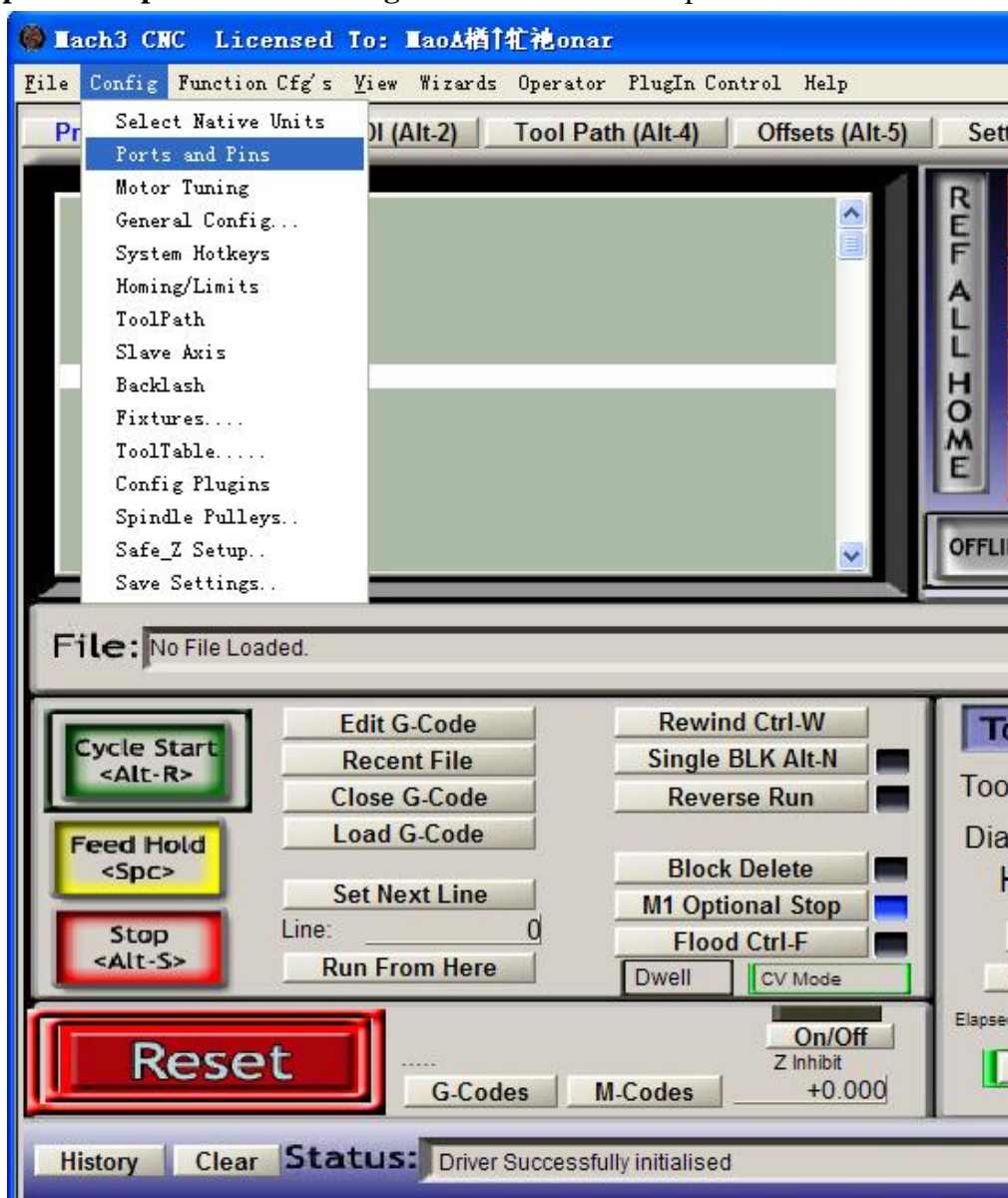
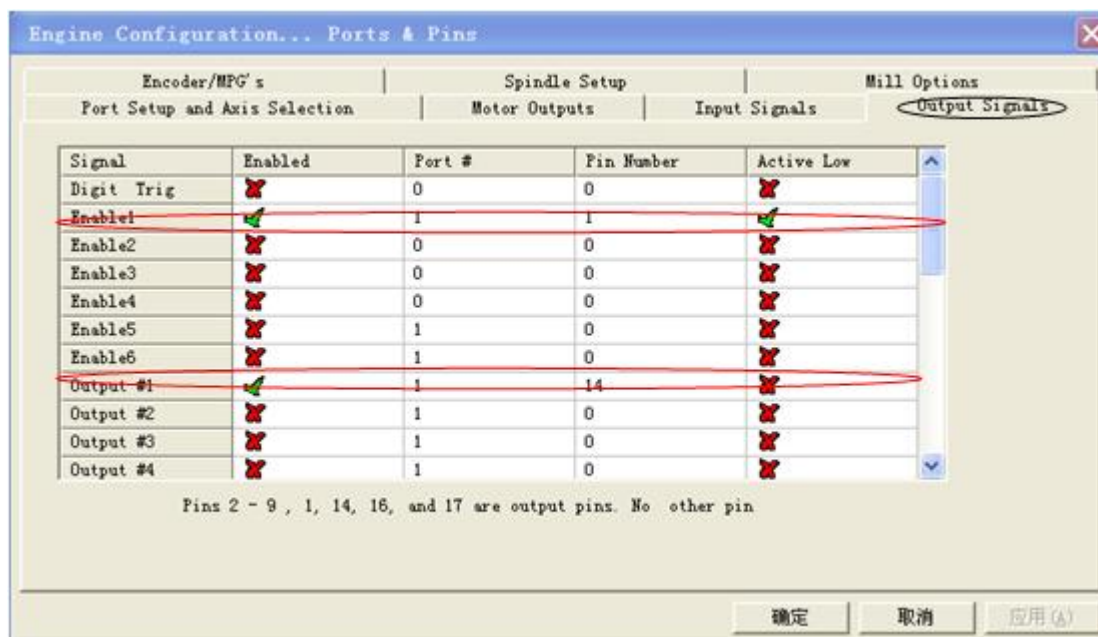

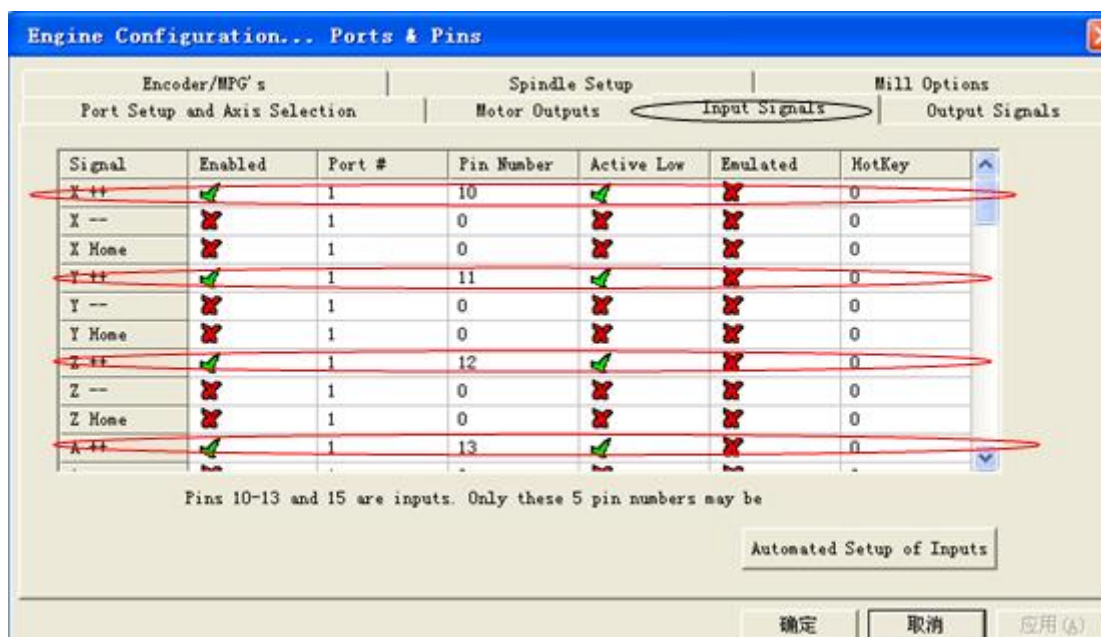The menu entry of setting motor running parameter

Basic frequency setting

Basic direction pulse pin setting

Click the black circle ，Set Enable and Relay

Setting of Enable and main axis pin

Click the black circle 'Input Signals', Set limit and tool setting and zero point and urgent stop.

According to your need, you can select relevant functions, include up and down limit of XYZAB5 axis, Home zero point of XYZAB5 axis, PROBE tool setting, and ESTOP— urgent stop and others.

Click '确定', When you accomplish these settings/

As picture, Click **'Config'----'Motor Tuning'**
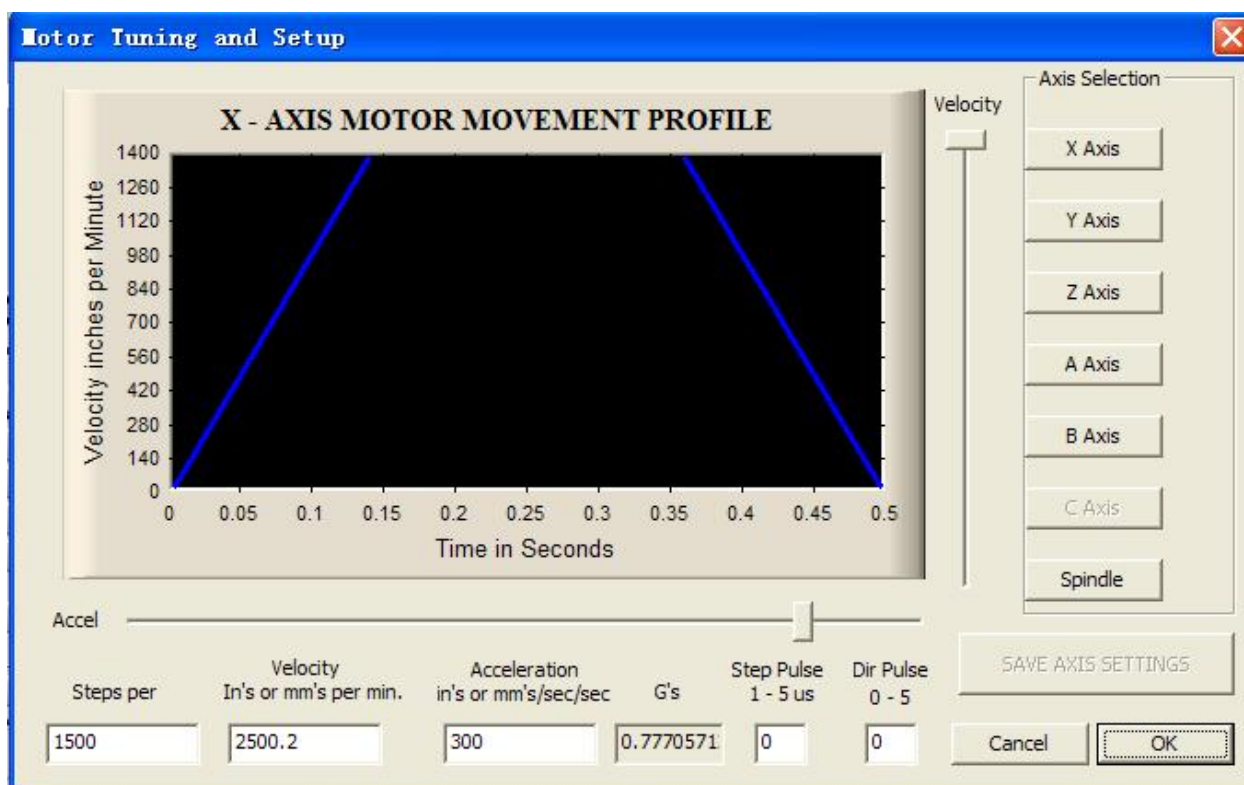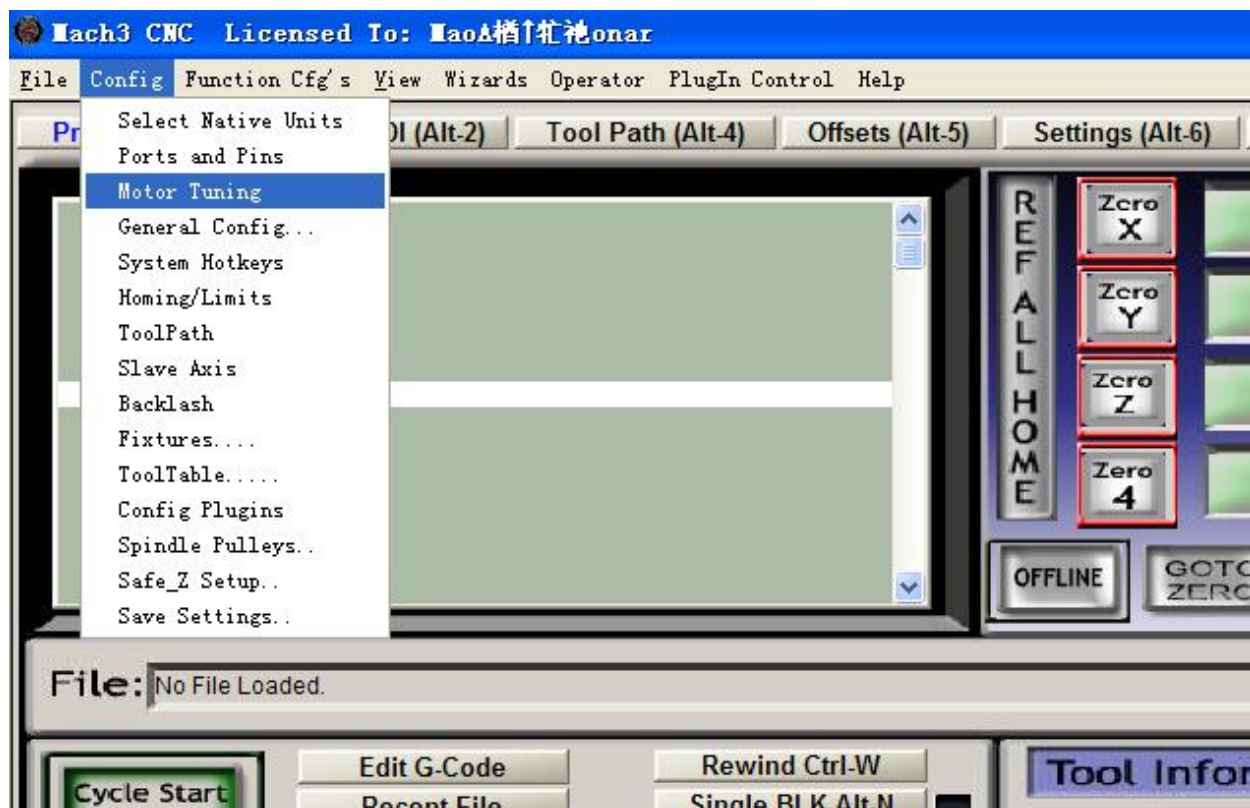
The motor running parameter setting

All parameters definition as follows

Steps per：computational way of pulse equivalent.

　Pulse equivalent is pulse quantities that the motor rotate 1 mm, it can be calculated according screw pitch and subdivision of motor driver .For example, 　　thread pitch 2.5mm. Two phases motor, eight subdivisions.

Computational way 　　8*200/2.5=640.

Velocity：speed，it is speed of axis ， unit mm/s，recommendation 1500.

Acceleration： accelerometer，unit: mm/s2，recommendation 200.
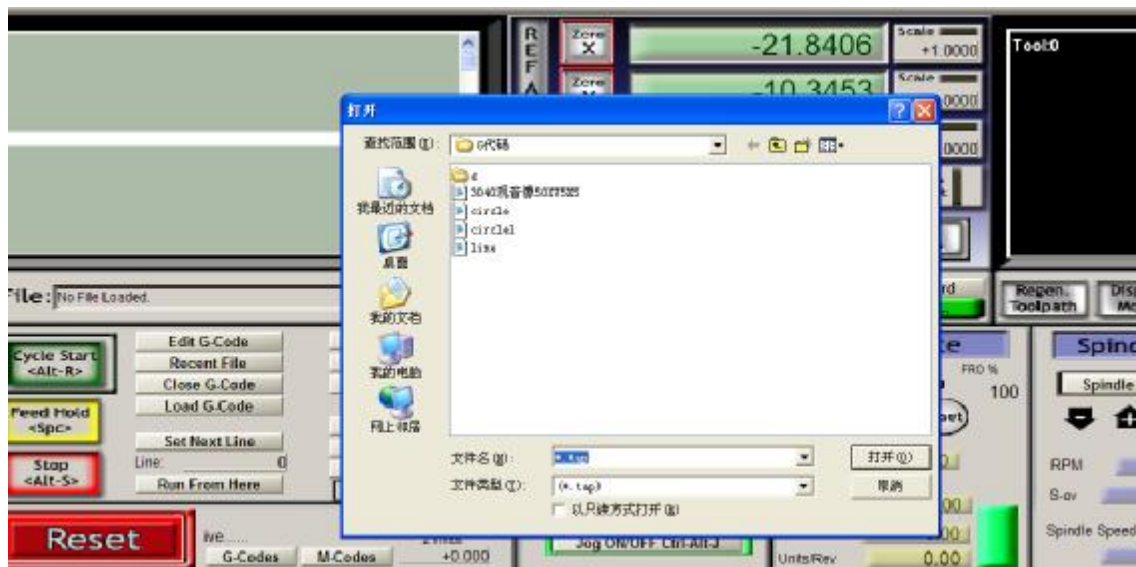
Step Pulse：the min pulse breadth ， recommendation 2.

Dir Pulse：the min breadth direction ， recommendation 2.

Attention ： parameter of every axis may 　 be not same ， so you must select axis then set the parameter. Click the **'SAVE AXIS SETTINGS '** when you finish the setting of parameters.

> **4.3 run G code**

As the picture**, Click 'File—Load G-Code'.**

Open G code in mach3

After opening the G code, you can see the red button, urgent stop F4, flickering. The first, you must click the red button to stop flicker then you can run your G code.

If you want to run your code, operating way is same.   .

4.4 How to use manual control of mach3?

If you want to use manual controller of mach3, you can press 'Tab', as is shown in the picture.

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