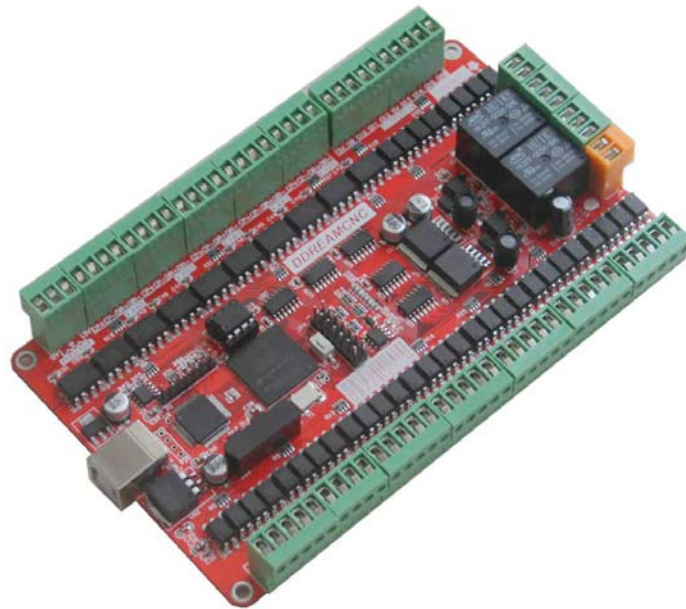# FASTERCNC CO., LTD.

FASTERCNC CO., LTD.

DDREAMCNC CO., LTD.

USBMACH3

USBMACH3 数控卡 V1.0
Simple Description
（English）

C ontens

目　　录

M

USBmach3 Product Manual

Chapter 1 Overview

▶ 1.1 Simply Introduction

USBMACH3V1.0X is designed by our Studio,it is a CNC system based mach3.You do not need to add other Hardware，and you can complete the signal conversion from the G-code to the movement of the stepper motor drive control. This card is compatible with most stepper drives and servo drives. And it is perfect weapon to replace mach3 parallel interface board.
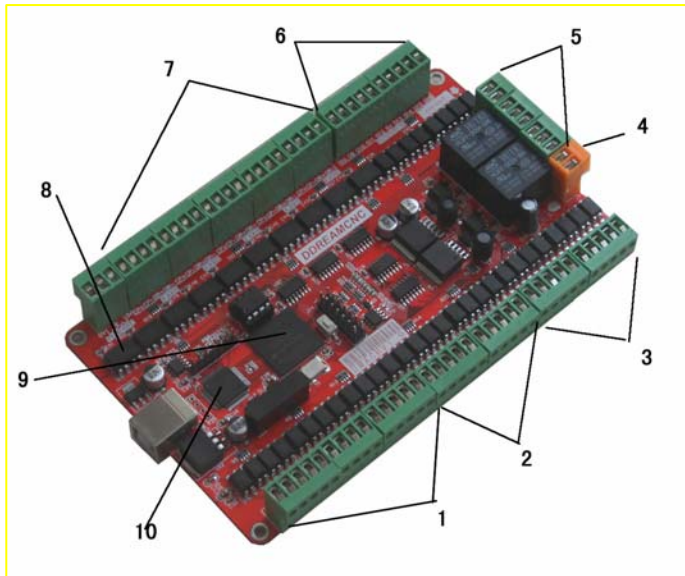
▶ 1.2 Requirements of Computer

Basic Configuration：

1) CPU：1GHz；

2) Memory：512MB

3) 500MB Available disk space

4) USB 2.0

Recommended configuration：

1) CPU：2GHz Dual Core；

2) Memory：2GB；

3) 1G Available disk space

4) USB 2.0

# Chapter 1 Overview

▶1.3 appearance and size of poduct

■ 1、5V General input interface，there are 12 intotal， opto-isolated, 10V maximum acceptable level.

■ 2、12V General input interface，there are 8 intotal， opto-isolated,

20V maximum acceptable level.

■ 3、Low 8 IO outputs, opto-isolated；

■ 4、Power input in 12~36VDC；Attention please at the picture Below.It shows you the "+"and the "-" of the POWER input port.
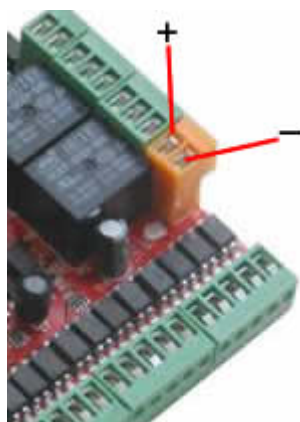
■ 5、2 Relays output port；

■ 6、High 8 IO outputs, opto-isolated；

Chapter 1 Overview

■ 7、5 axis stepper driver signal output, High speed opto-isolated；

■ 8、The board Size is 153*92mm

■ 9、using FPGA as a Hardware Interpolation algorithm device；

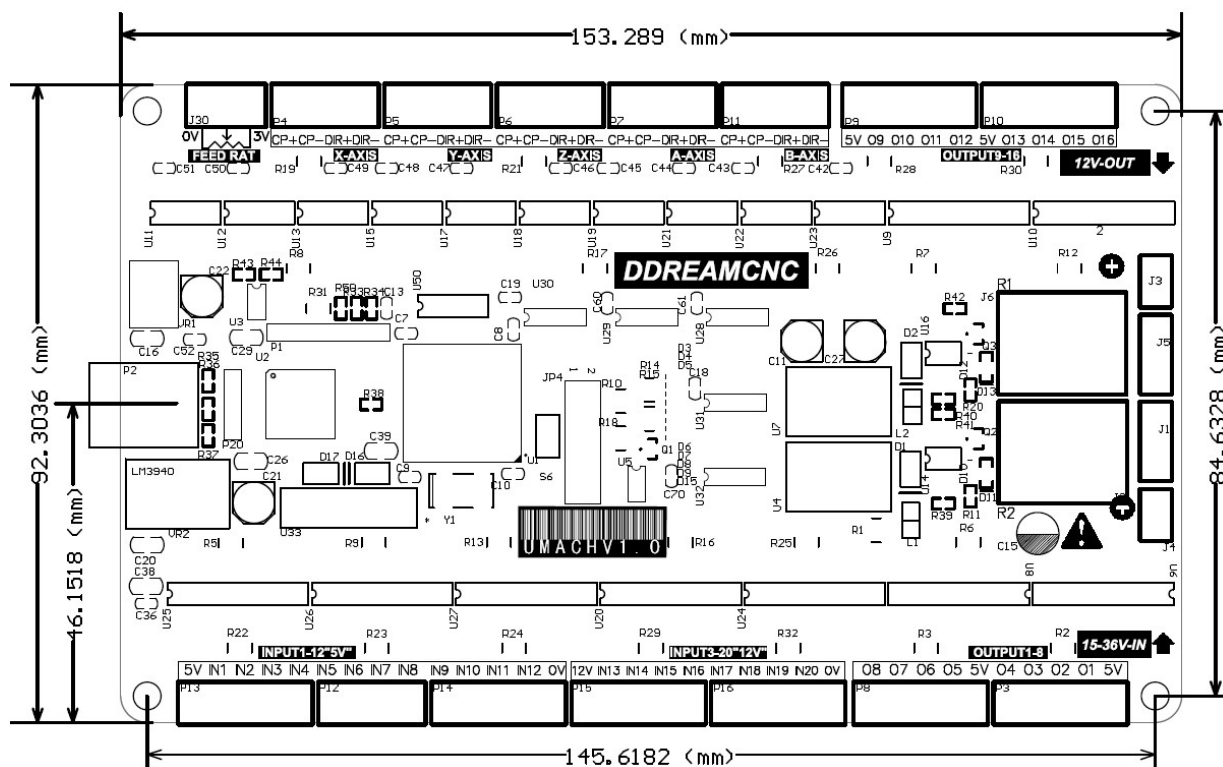■ 10、Using ARM7 of ATMEL as a Master and communication Chip；

Figure 1-1. Product Outline

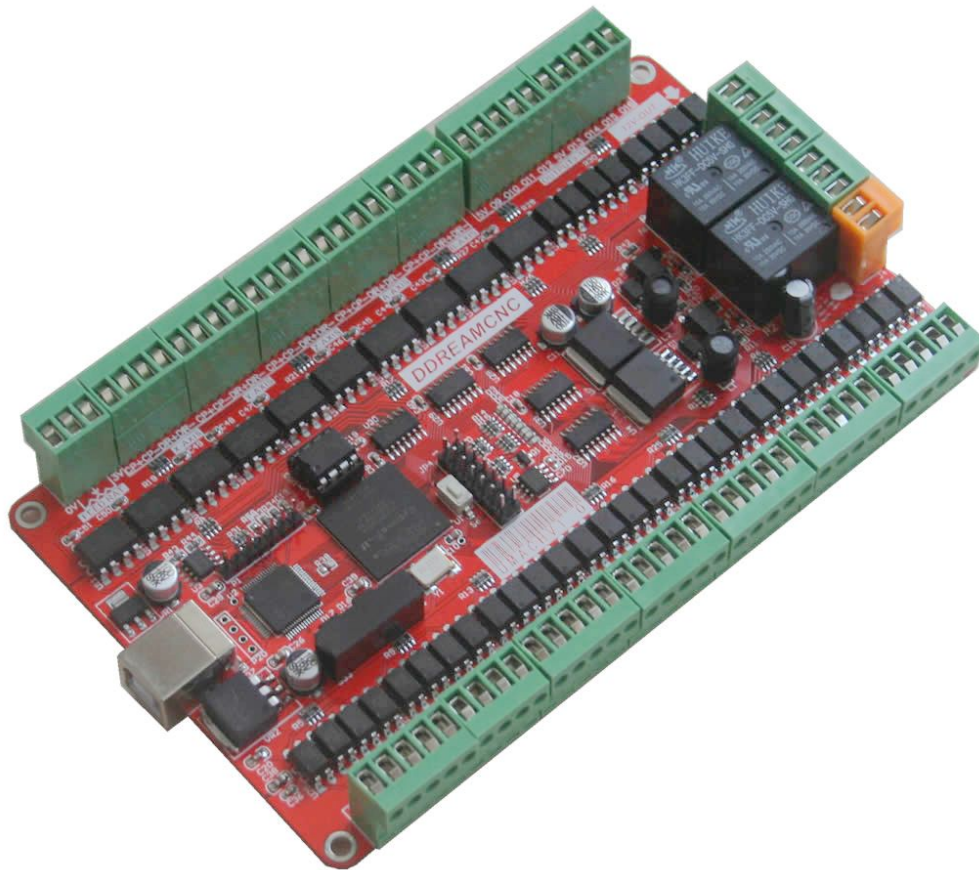See as Figure 1-1，Product size is 153.3*92.3mm，Product positioning holes size is 145.6*84.6mm。

Chapter 1 Overview

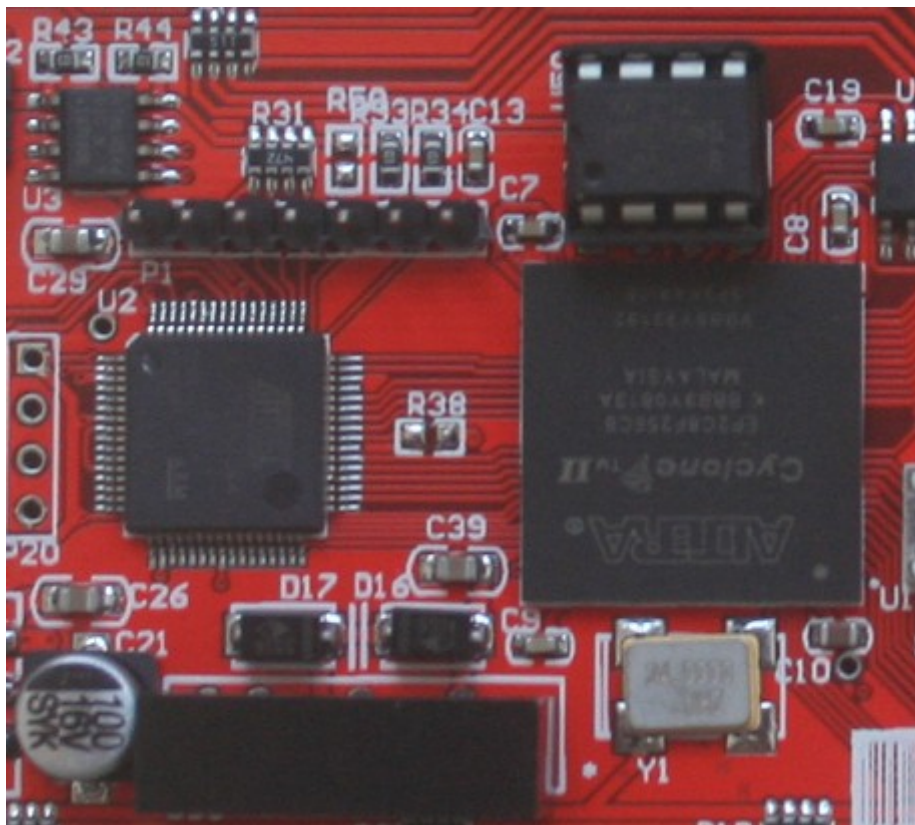
Figure 1-2. Overall appearance

Figure 1-3. Closeup 1 Master chip

Chapter 1 Overview

▶1.4 Notes and Cautions

· Prohibits the rain, boards for high-performance precision equipment, rain can

cause short-circuit

· CAUTION WARNING, various wiring in strict accordance with installation

Description document specification

· High risk, boards need to stay away from high-pressure.

Chapter 2 Detailed Features

▶ 2.1 Electrical parameters

A. System input voltage：15~36V；

B. Operating voltage of input interface：5V/12V；

C. Operating voltage of output interface：5V；

D. stepper motor control signal output voltage：5V；

NOTE: The marked as 15 ~ 36IN is input interface, you should connected correctly。
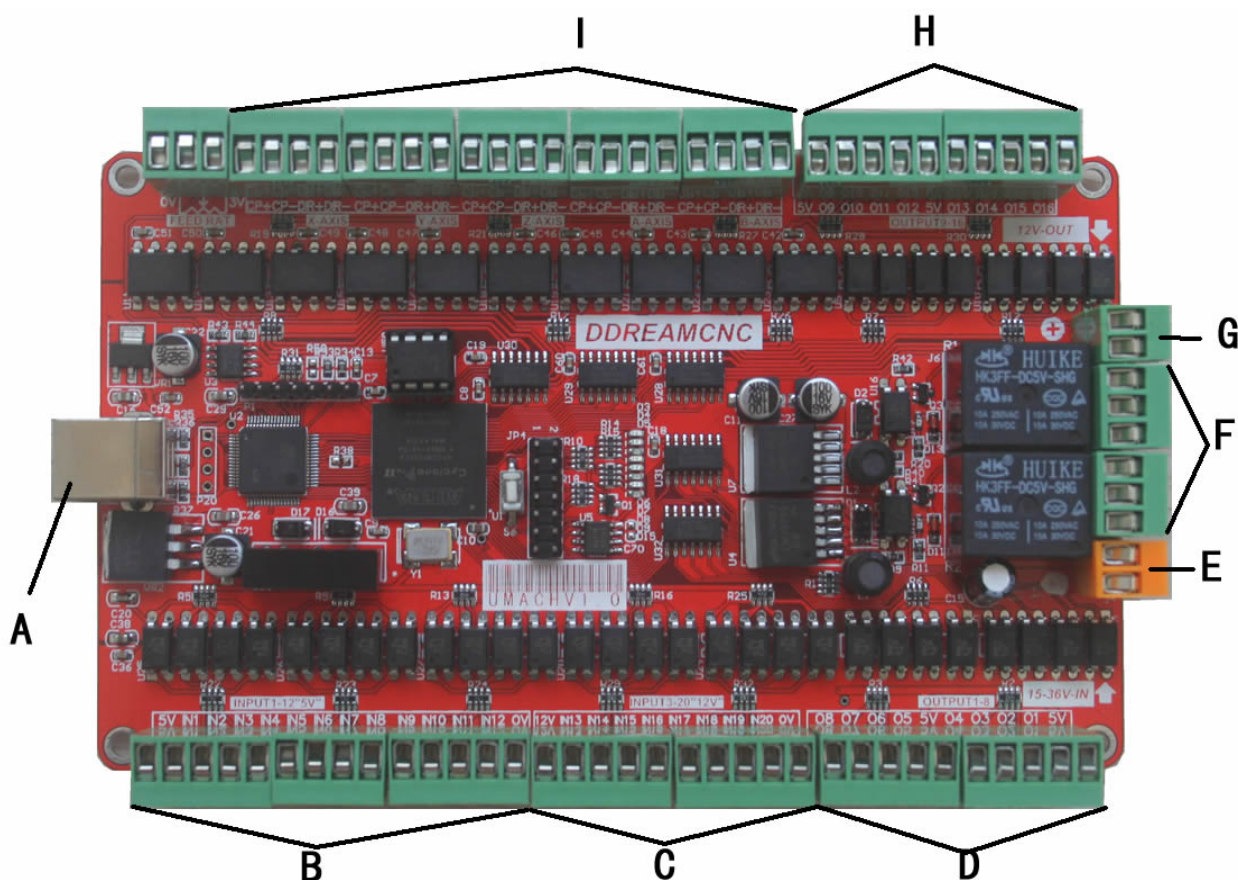
▶ 2.2 Functions and define of each module

Figure 2-1. 各功能模块定义图

■ A)USB PORT，This interface is connected to the computer through a USB line.You can

use the software mach3 to control this board, Note that you should use a USB2.0 cable with shielding and ferrite core,and cable length should be not more than 2 meters。

■ B) 5V General INPUT PORT，see as Figure 2-2,it is defined as 5V、IN1、IN2、IN3、IN4、IN5、IN6、IN7、IN8、IN9、IN10、IN11、IN12、GND from left to right, The interface uses opto-isolated, using common positive input,5V is used as the common Port. Wiring methods see as Figure 2-2.

Figure 2-2. normal Tact limit switch connection

■ C) 12 V General INPUT PORT，see as Figure 2-3 ,it is defined as 12V、IN13、IN14、IN15、IN16、IN17、IN18、IN19、IN20、GND from left to right, The interface uses opto-isolated, using common positive input,5V i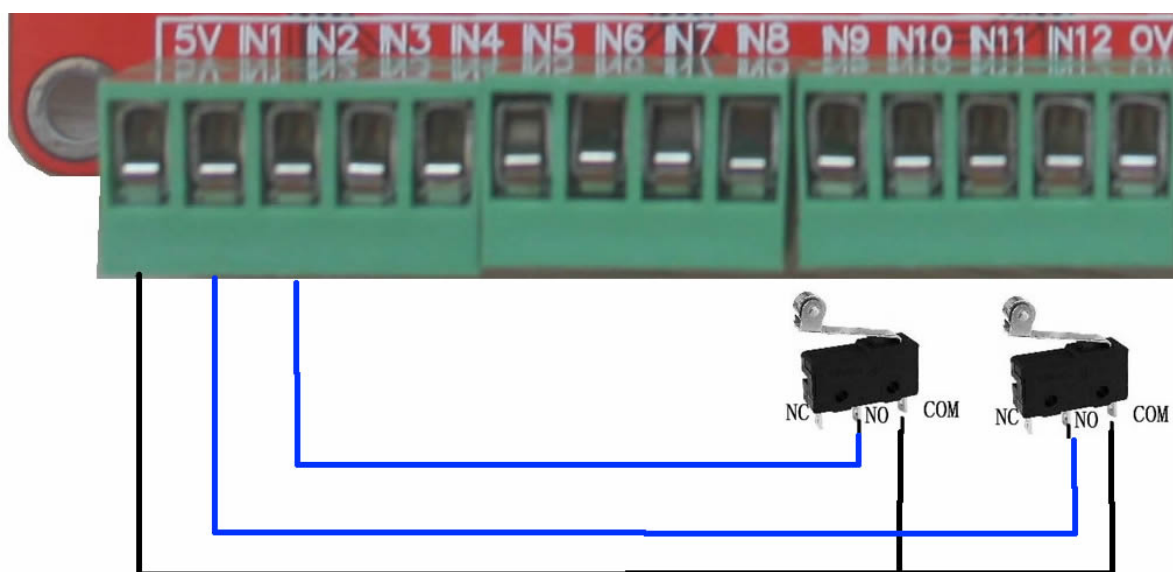s used as the common Port. Wiring methods see as Figure 2-2. Can also be used with 3-wire sensor switch. See as figure2-3。
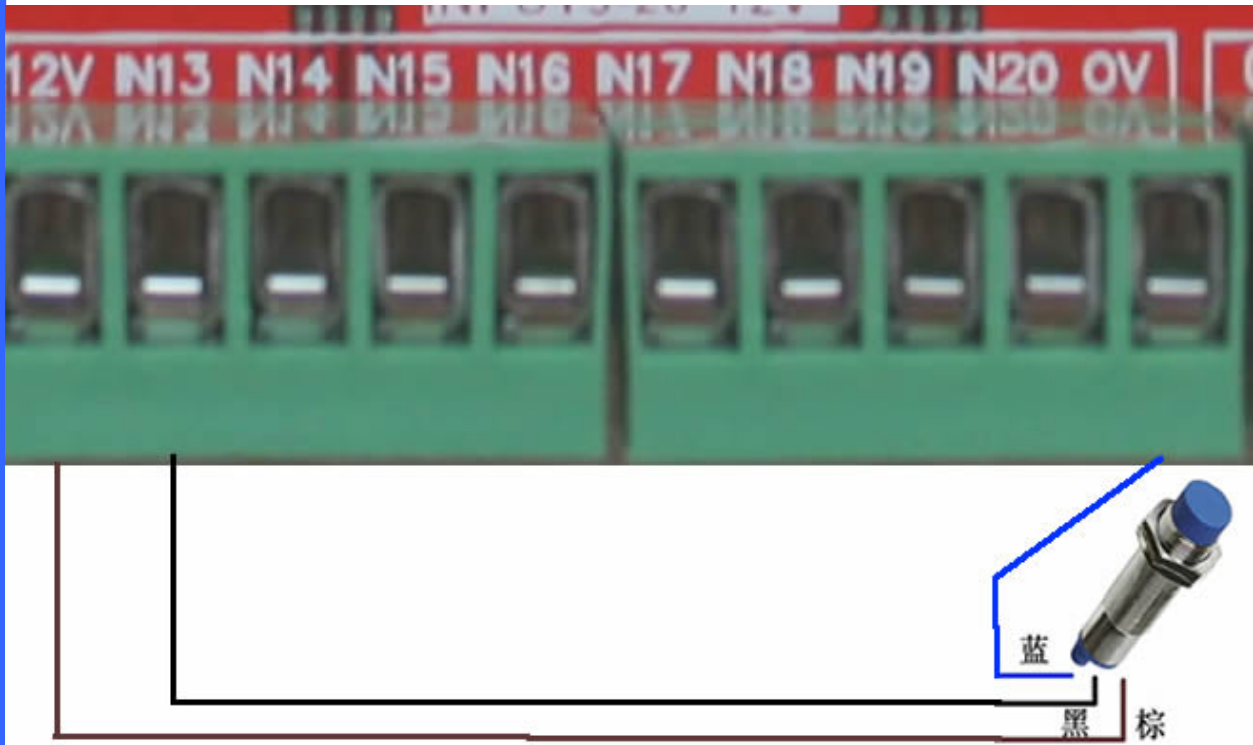
Figure 2-3. Inductive limit switch connection

■ D) Low 8 General IO output interface，see as Figure 2-1, Internal structure show as Figure 2-4. If you need to have a greater output current drive capability（More than 2MA）Recommended to use 5V as the output common, then the port can get enough current when it is pulled down.
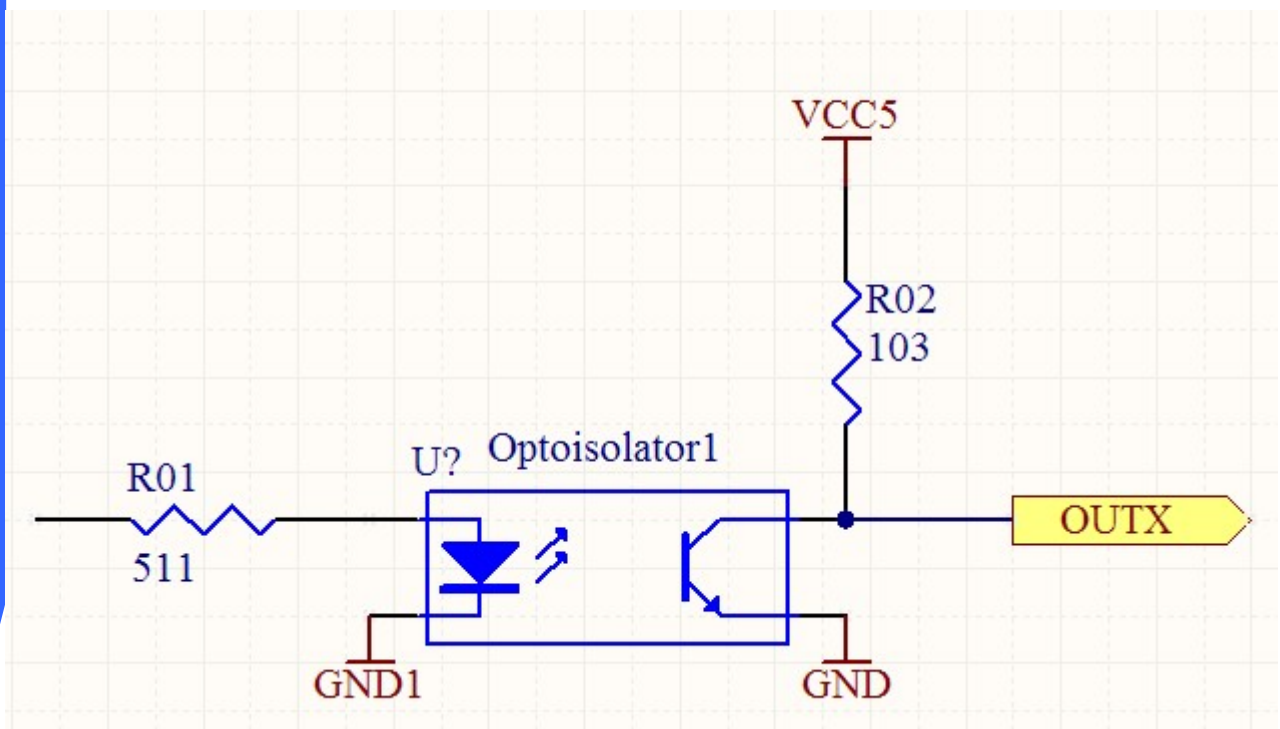
Figure 2-4. General IO output interface internal structure

■ E) Yellow terminals is the power input， 15~36VDC，See as the Figure 2-5.

Figure 2-5. The correct Positive and negative connection of power supply

■ F)2 Relay Output，Relay R1 and R2 are set as O17 and O18 in mach3，Each relay's 3 Terminal are CLOSE\COM\OPEN from up to down, see as Figure 2-1.

■ G)12V Power Output, it can supply 12V equipment.

■ H) High 8 General IO output interface，see as Figure 2-1, Internal structure show as Figure 2-4. If you need to have a greater output current drive capability（More than 2MA）Recommended to use 5V as the output common, 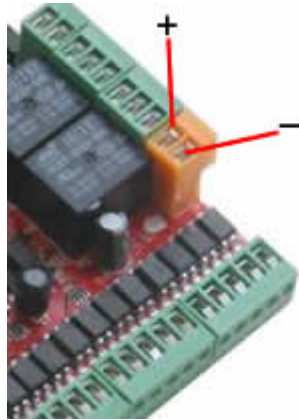then the port can get enough current when it is pulled down.。**Spindle PWM speed fixed at O16. It can not be set to other port. You can adjust the output PWM waveform via software.**

■ L) 5-axis stepper motor control signal output，defined as CK+\CK-\DIR+\DIR-.There are positive pulse, negative pulse, positive direction, negative direction. These port are common positive connection.Therefore, on the board of CK + and DIR + are linked together to 5V. So this board does not support the common negative connection. Wiring method refer to Figure 2-5.This card doesn't have EN signal, Most drives on sale should not connected to the EN signal. It is defined as X \ Y \ Z \ A \ B channel from left to right, see as Figure 2-1.
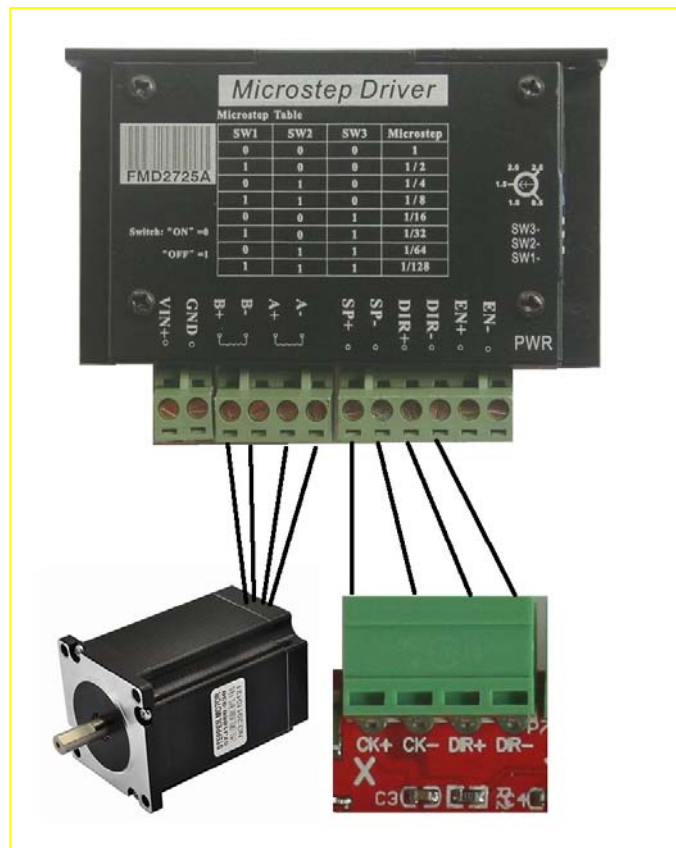
Figure 2-6.   Stepper motor driver connection method

Chapter 3 **Software Installation**

▶3.1 MACH3 Install

When you purchase our product, we will supply a CD-ROM, which contains the MACH3 installation, registration, and USB plug-ins. See as Figure 3-1.
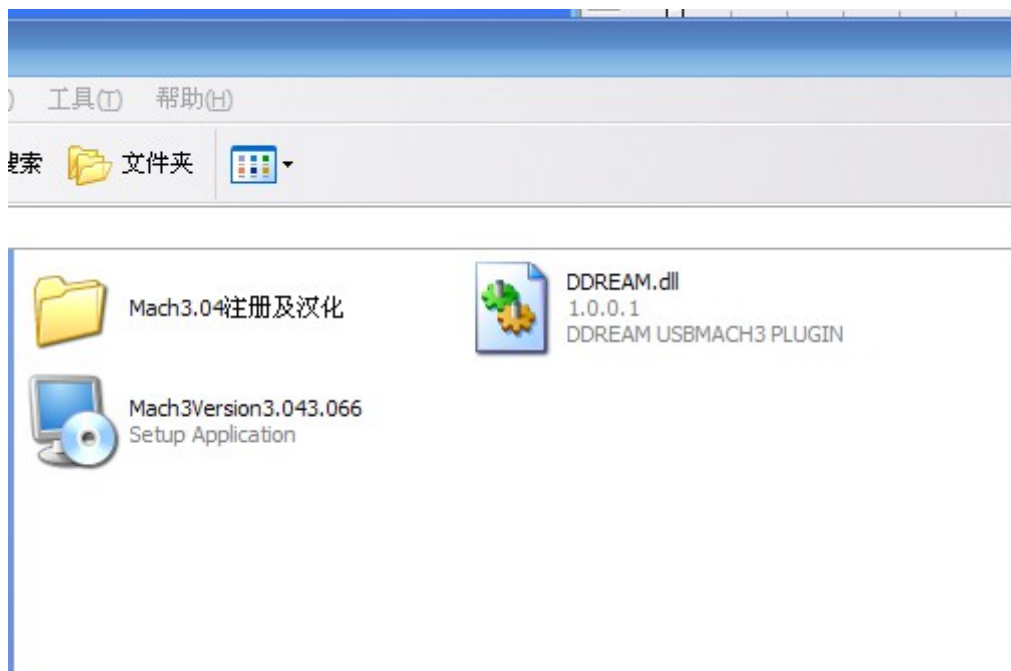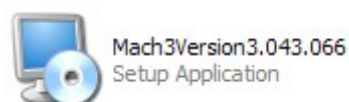

Figure 3-1. CD-ROM Screenshot

First run the installation Mach3Version3.043.066 . Into the first page. See as Figure 3-2.
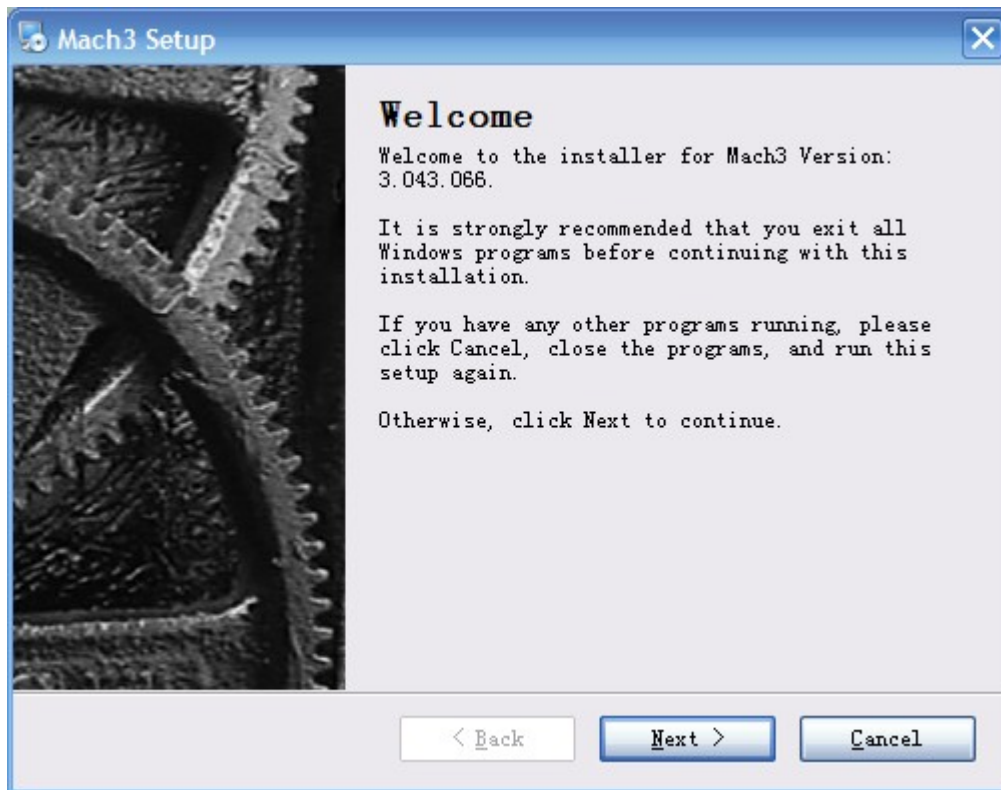
11

Figure 3-2. MACH3 installation process 1

Click Next and then enter the page shown in Figure 3-3.

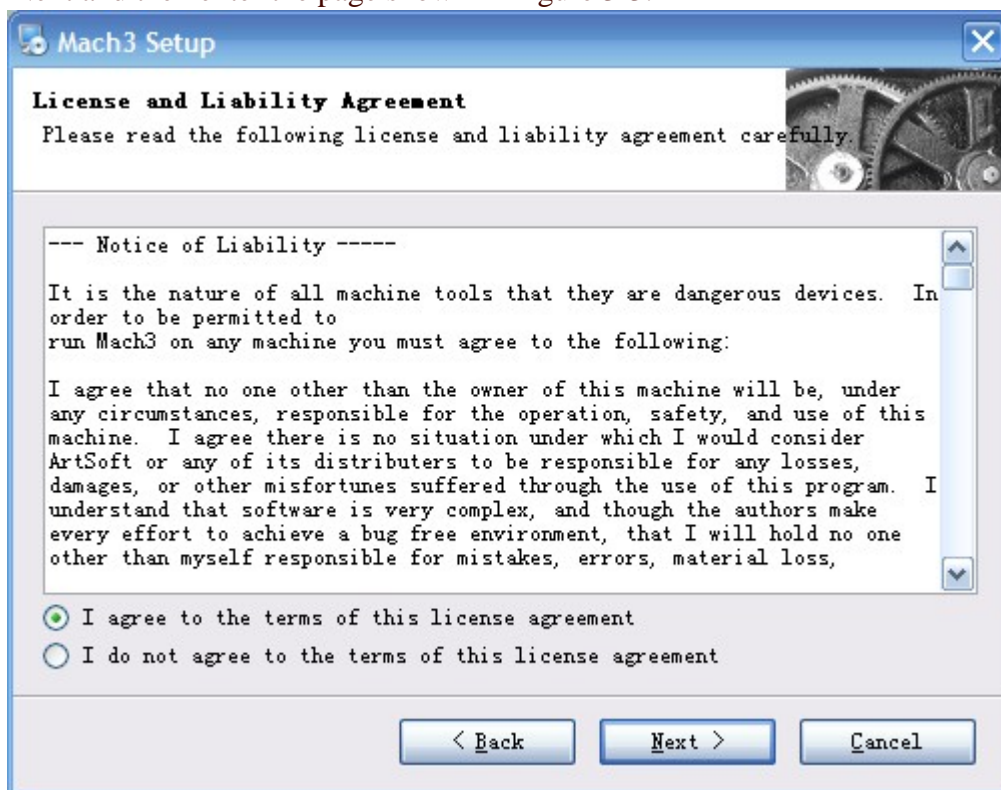
Figure 3-3. MACH3 installation process 2

Select the consent agreement, click Next, See as Figure 3-4

Chapter 3 Software Installation

Figure 3-4. MACH3 installation process 3

Select the installation path, click Next (it can be installed on any disk, and recommended to install the C drive or the D drive) See as Figure 3-5

Figure 3-5. MACH3 installation process 4

Click Next until completion. Then restart the computer.

Chapter 3 Software Installation

▶ 3.2 MACH3 Registration

Copy the file Mach1Lic.dat in The CD-ROM to mach3 installation path (eg C :/ MACH3) .

▶ 3.3 USBPlug-in installation

DDREAM.dll
1.0.0.1
DDREAM USBMACH3 PLUGIN

Copy the file DDREAM.dll   to X:\Mach3\PlugIns.

Chapter 4 Software uses

▶ 4.1 Open Software

■ Double-click the mach3mill   。

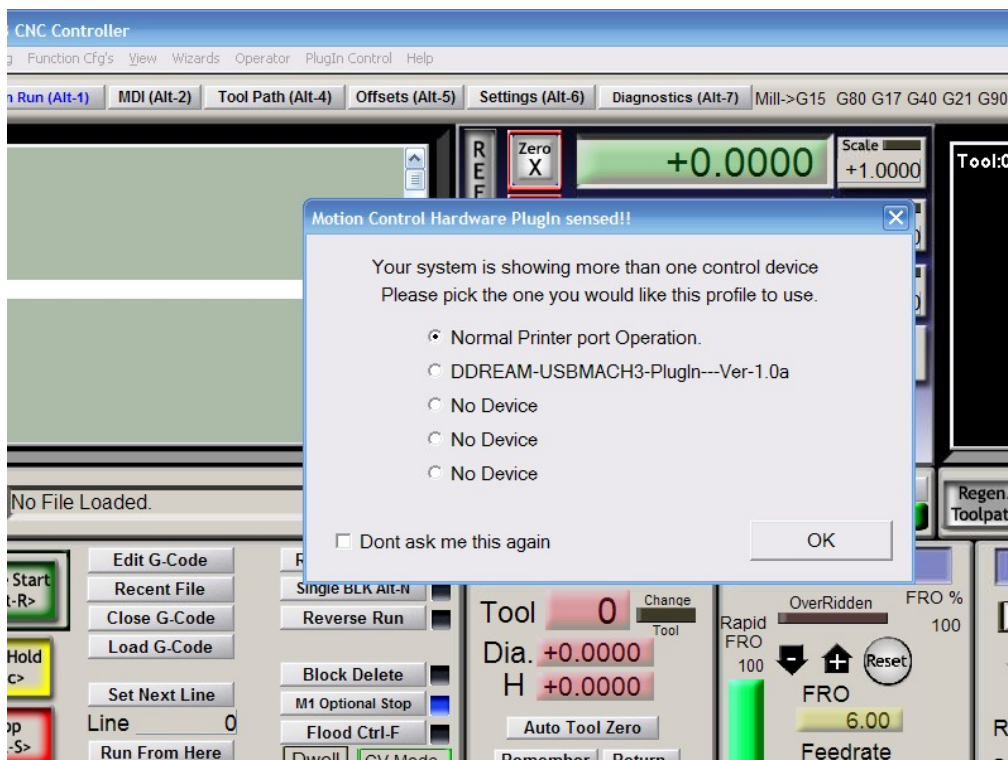Enter mach3 software. Pop-up the plug-in dialog box. See as Figure 4-1。

Figure 4-1. Plugin selection dialog

Choose our plugin DDREAM-USBMACH3-PlugIn---Ver-1.0a。Then press OK. If you do not want to the dialog box pop up again next time, you can select Don't ask me this again. If USBmach3 interface board is not properly connected, or other connection fails, the dialog box in Figure 4-2 will appear, Please re-connected properly USBmach3 interface board or contact sales.

Figure 4-2. Not connected correctly

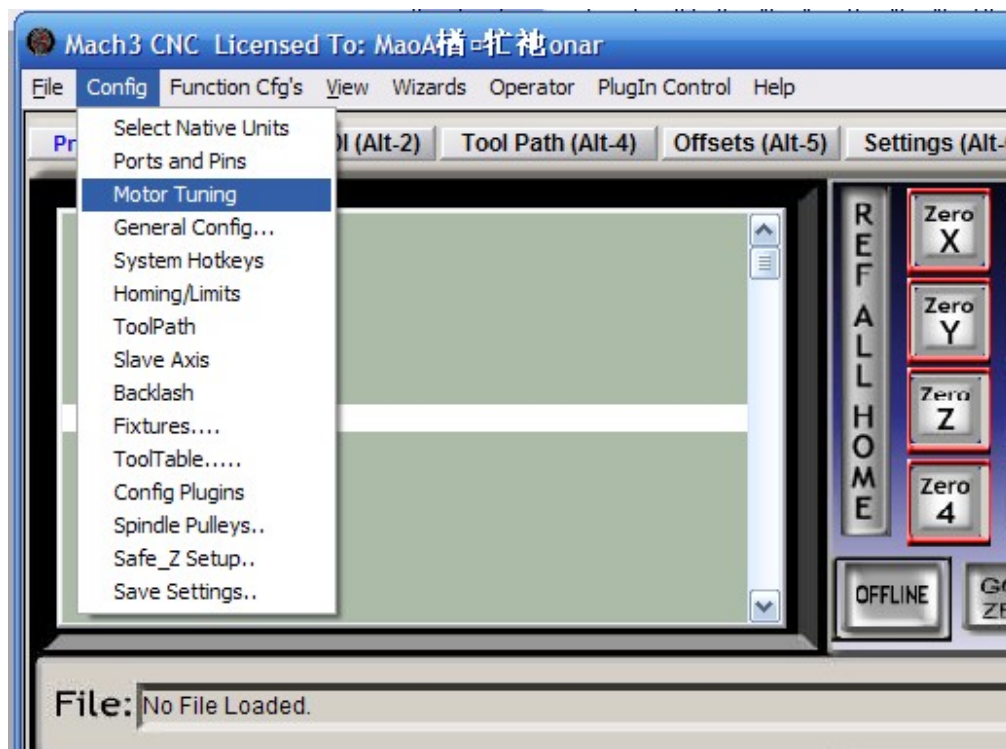## ▶4.2 Software Common settings

■ Motor operating parameters setting

Figure 4-3. Motor operating parameter setting menu entry

See as Figure 4-3.From submenu "motor tuning" of the menu "config" into the motor parameter settings dialog. See as Figure 4-4.
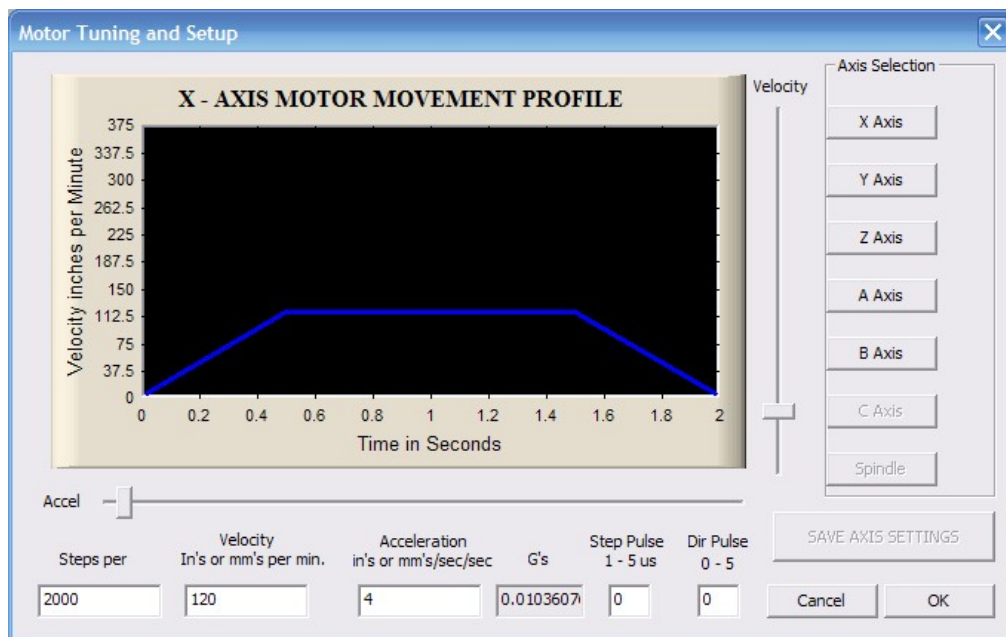
Chapter 3 Software Installation

Figure 4-4. Motor operating parameter settings dialog

The parameters are defined as follows:

Steps per：Pulse equivalent ,it is number of pulses required with axial movement 1mm, This can be calculated by lead screw pitch and motor drive segment. Such as pitch 2.5mm,2-phase motor 8 segments, Calculation method is 8*200/2.5=640。

Velocity：The speed is the axial velocity, Units is mm/s，Recommended settings 1500.

Acceleration：Units is mm/s2，Recommended settings 200.

Step Pulse：Minimum pulse width,Recommended settings 2.

Dir Pulse：Minimum width direction, Recommended settings 2.

Attention:The parameters for each axis is not necessarily the same，To select the axis, and then set parameters. You should click "SAVE AXIS SETTINGS" After setting.
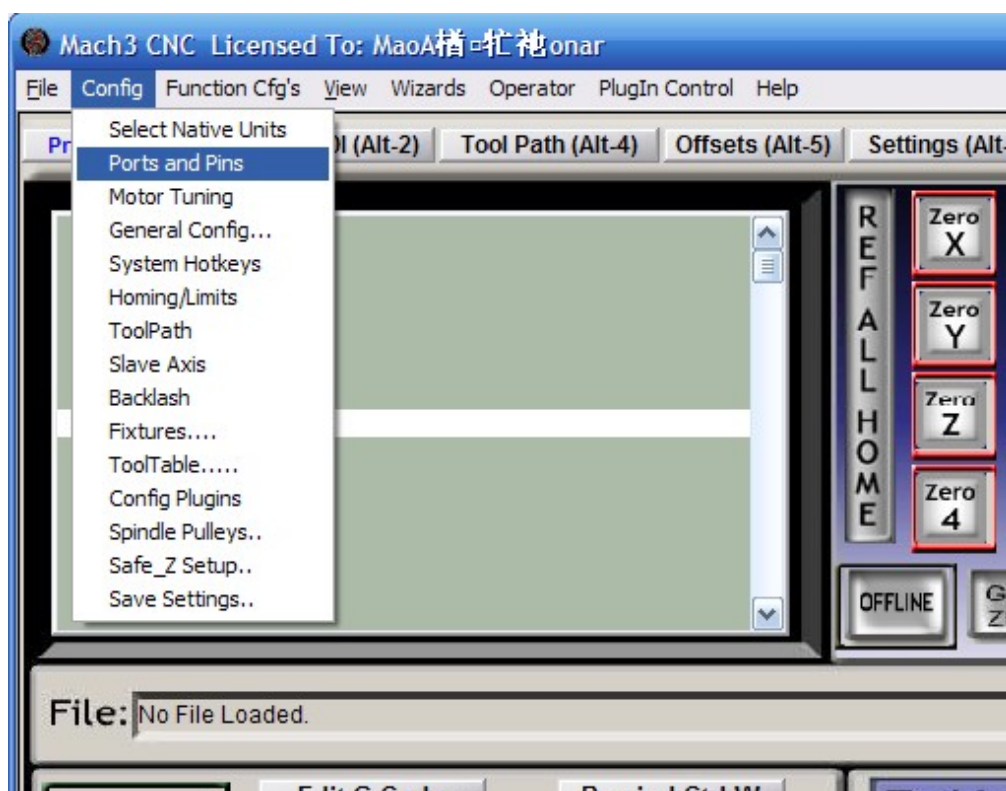
■ Port Settings

Figure 4-5. Port settings

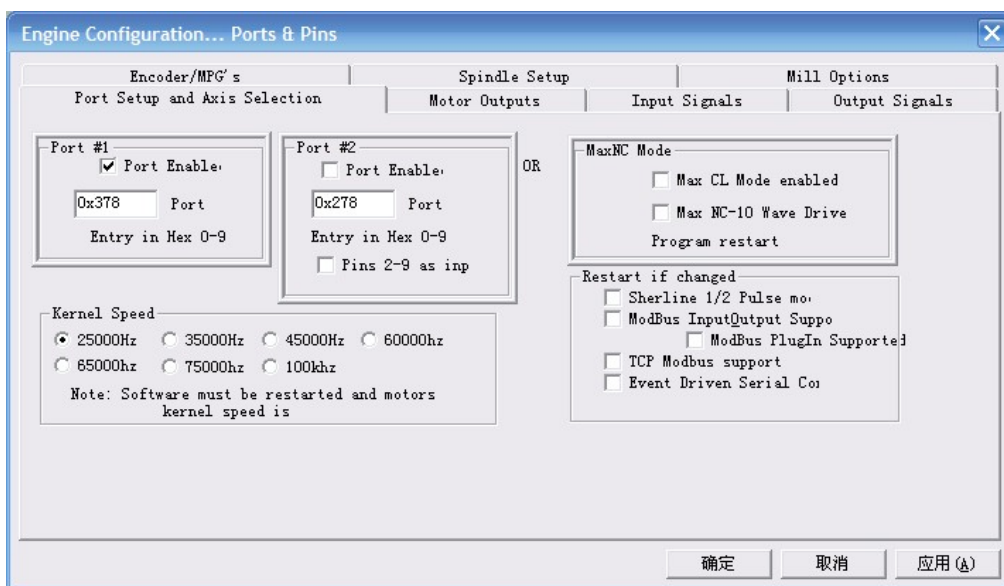See as Figure 4-5，Click the sub-menu "ports and pins" of menu "Config" into Port Settings dialog box.

Figure 4-6. Port Settings dialog box

The sub-pages you need to set include "Motor Outputs", "Input Signals", "Output Signals" and "Spindle Setup".First Click to enter "Motor Outputs". This page is to select the stepper motor control pin. Because our usbmach3 interface board stepper motor signals are fixed, So here only need to Select, no need to select the specific pin. See as Figure4-7
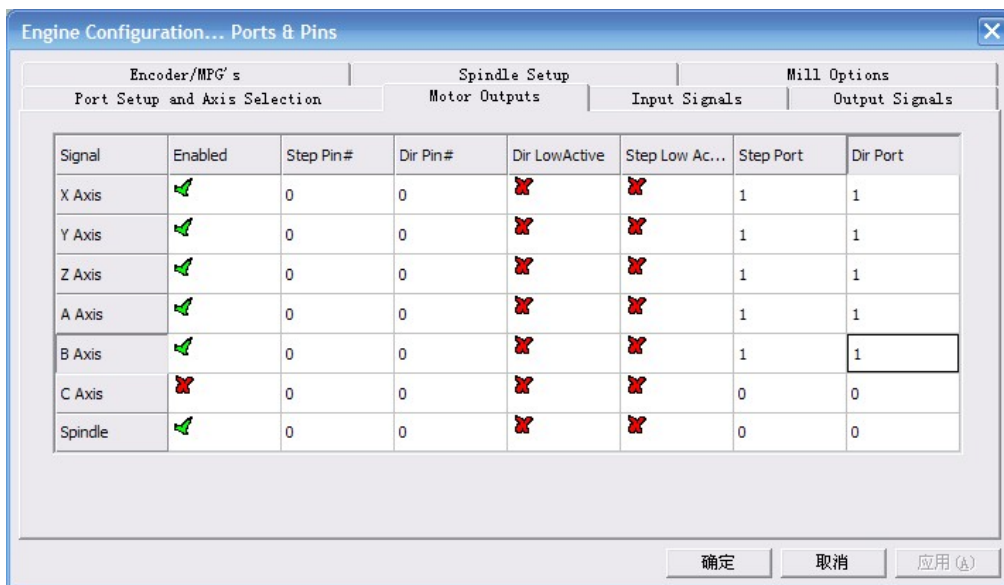

Figure 4-7. Stepper motor port settings dialog

Click "Input Signals" Into the input signal settings page. See as Figure4-8
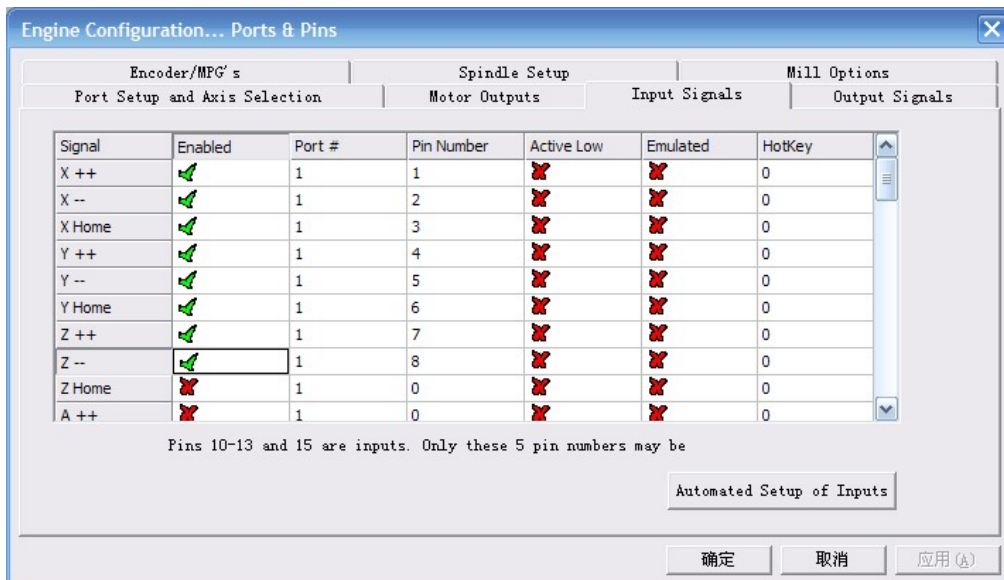
Chapter 3 Software Installation

Figure 4-8.   IO Input Settings dialog box

Here you can configure according to your actual needs the corresponding function. Optional Function include XYZAB5axis's Upper and lower limit、XYZAB5axis's HOME point、PROBE、ESTOP, etc. The board has 20 input signals in total，Numbers followed 1-20, Customers can choose according to their needs, in accordance with the pin numbers, define the corresponding function.

Click "Output Signals" to enter the Output signal setting page. See as Figure 4-9
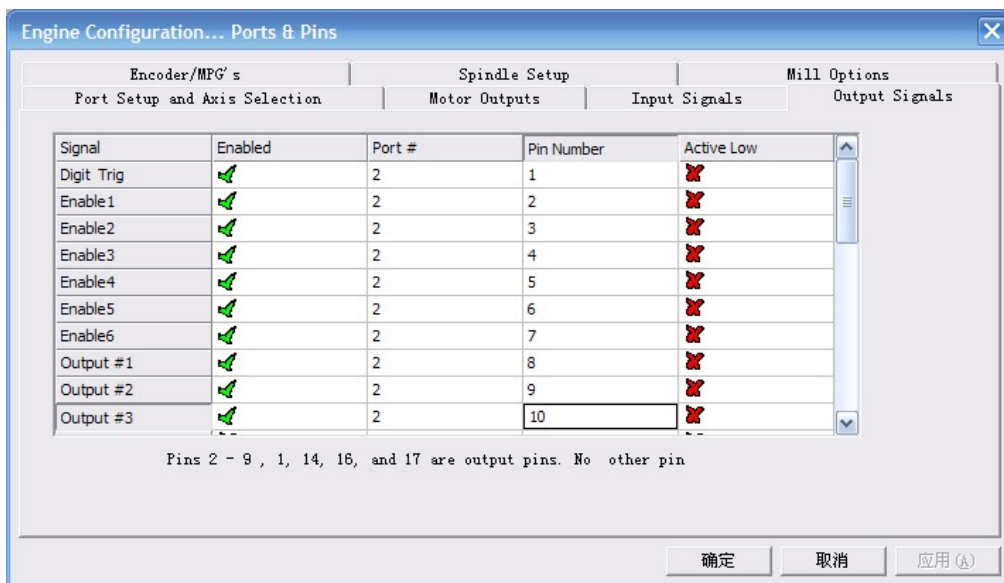

Figure 4-9.   Output Signal Setup dialog

Note that the output signal number from 1-16. Because there is an overlap with the input signal, We set output signals to the port 2.See as Figure4-9, PORT # All output signal is set to 2.Please put Output signal to the corresponding options as you need.

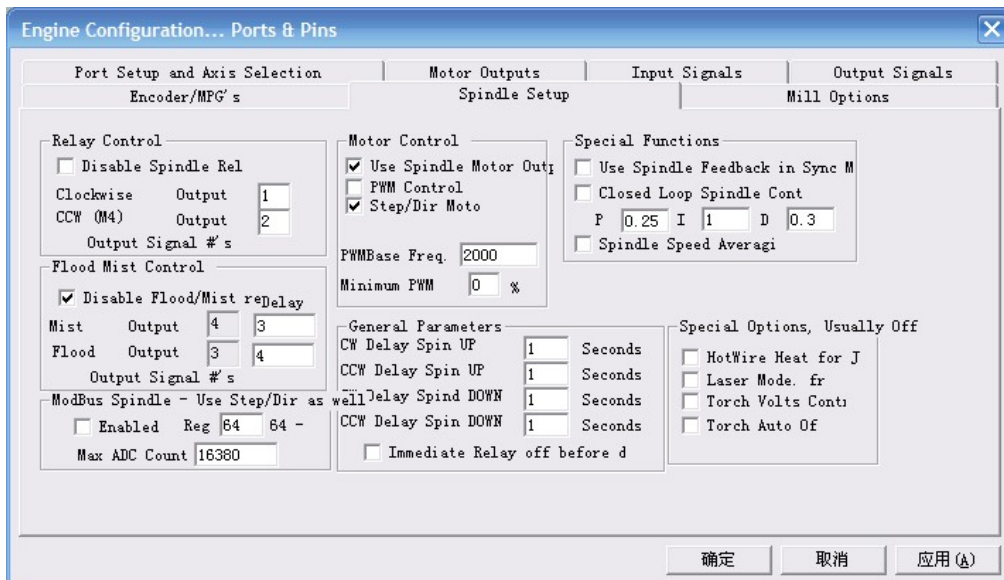Click "Spindle Setup" switch to the spindle settings page. See as Figure4-10.

Chapter 3 Software Installation

Figure 4-10.　Spindle Settings dialog box

Here we can configure the spindle rotates CW、Reverse CCW、Mist、Flood pin, See as Figure4-10，They have been configured as 1、2、3、4. Corresponding to output#1~output#4 in Figure4-11.output#1~output#6 in Output Signal Setup dialog can be Configured into these 4 signals. Here we note correspondence between 2 page. Please select "use spindle motor output" if required PWM speed spindle.And select " PWM Control". Our PWM pin fixedly arranged on board OUTPUT16 pin.
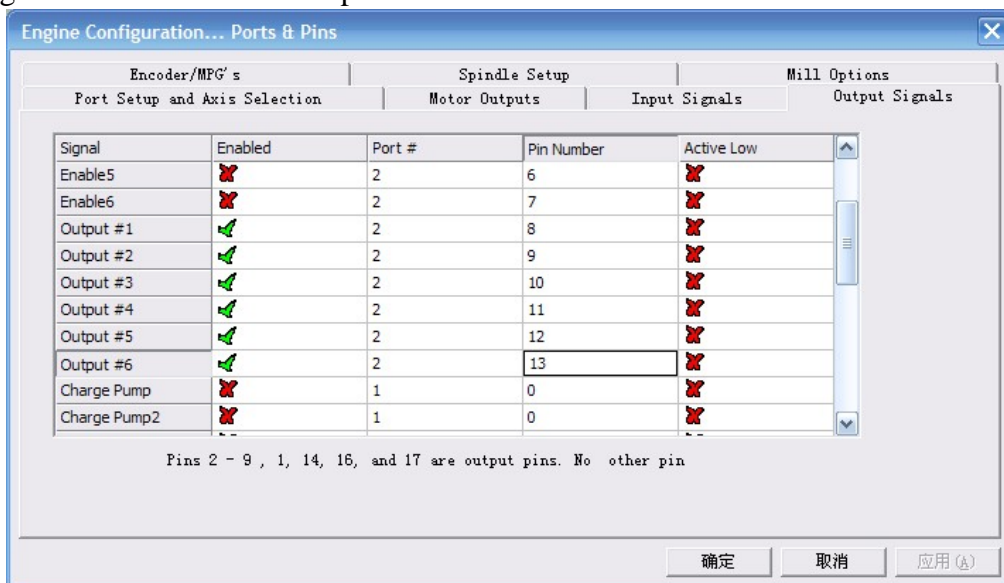

Figure 4-11.　Spindle setting corresponds to the output configuration

Chapter 5　Q& A

→　Company Website：ddcnc.com；

→　Technical Support email：649631655@qq.com；

→　Technical Support qq：649631655；