

CNC

3-AXIS Stepping Motor Driver Board

Advanced version



Model No.: MD3AXIS8435

User Guide

System Requirements

- Windows 98, XP, 2000 or Vista.
- CD-ROM drive.
- Parallel Port.
- MACH2 software.

Hardware Connection

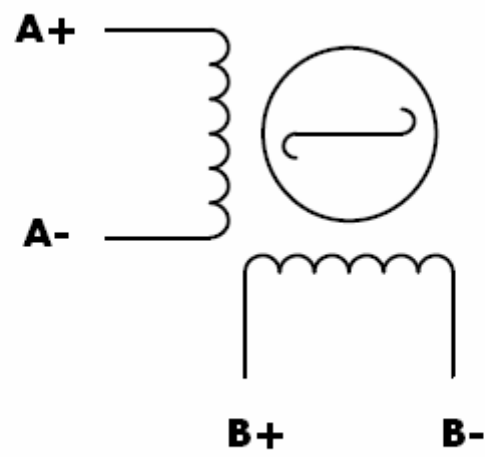
- 1 Connect the DB25 parallel cable from your computer's LPT1 port to the DB25 connector on the 3-axis stepping motor driver board.
- 2 Attach a 24V DC (12V-32V) power supply to the P3 connector on the board. Please make sure the positive position and negative position. Power LED (LED3) will be lit.



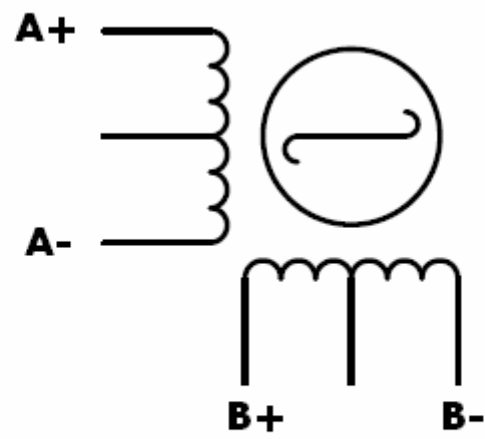
- 3 Attach the stepping motor to each axis (X-axis: 1P2 connector, Y-axis: 2P2 connector, Z-axis: 3P2 connector). Warning: **2.5A@32V DC Max**



No.	Signals	Pin
1	A+	1
2	A-	2
3	B+	3
4	B-	4



2 Phase 4 Wire Stepping Motor



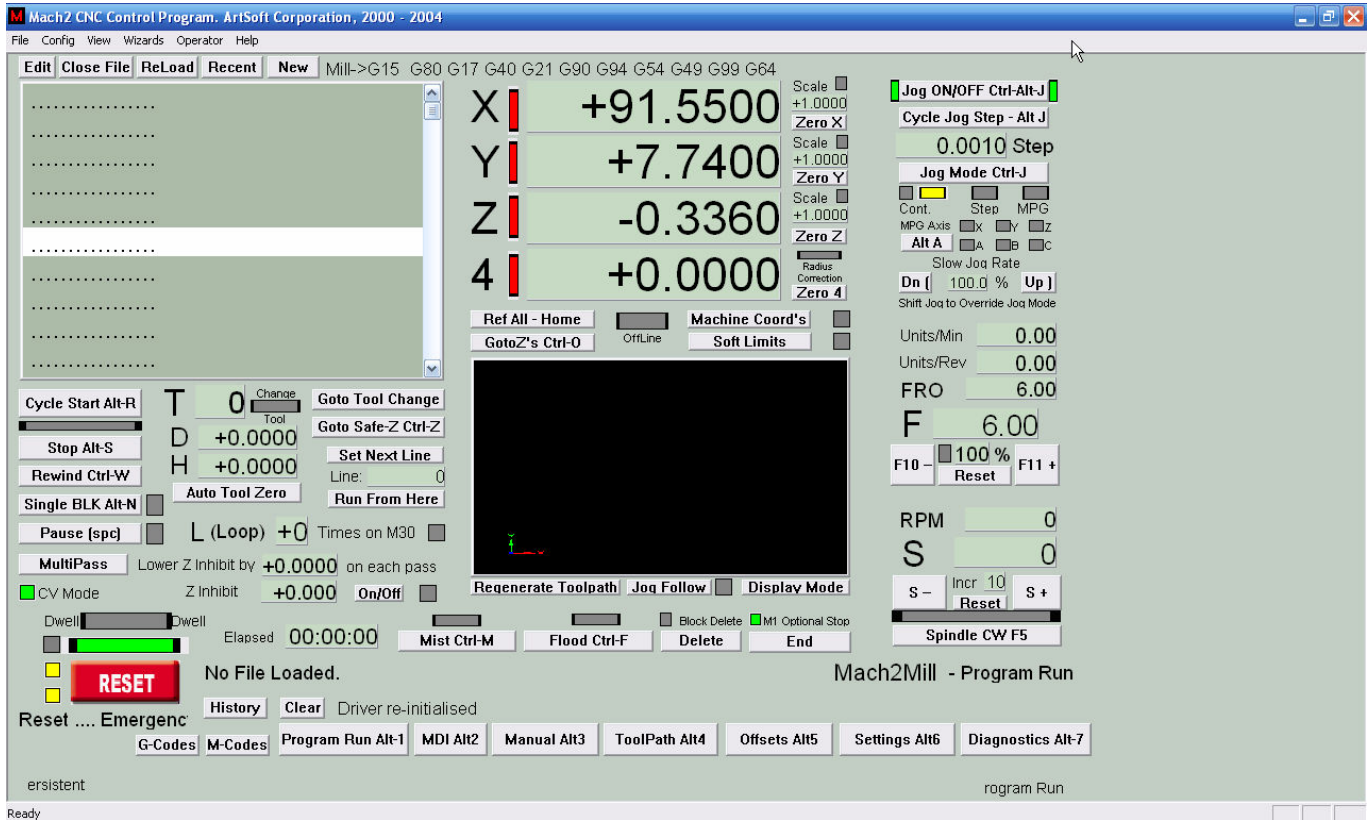
2 Phase 6 Wire Stepping Motor

Software Configuration (MACH2)

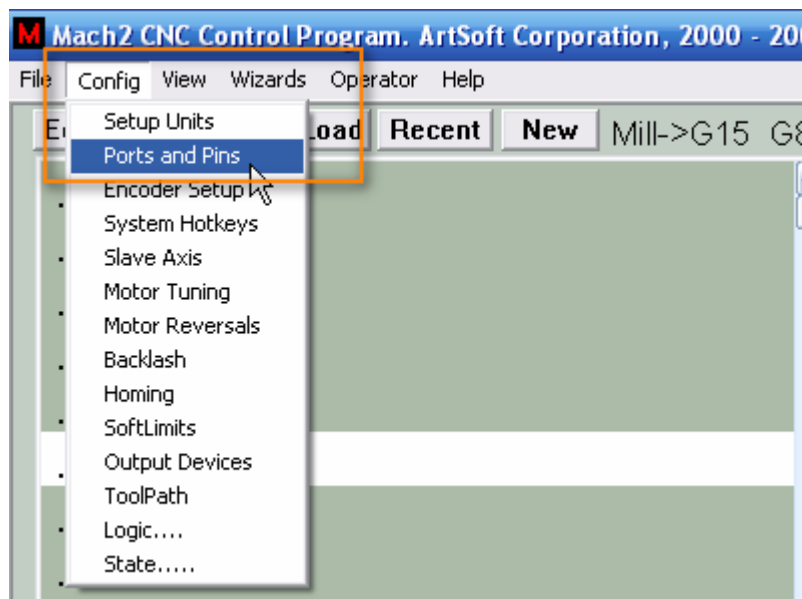
You can download the MACH2 CNC software on ARTSOFT website.

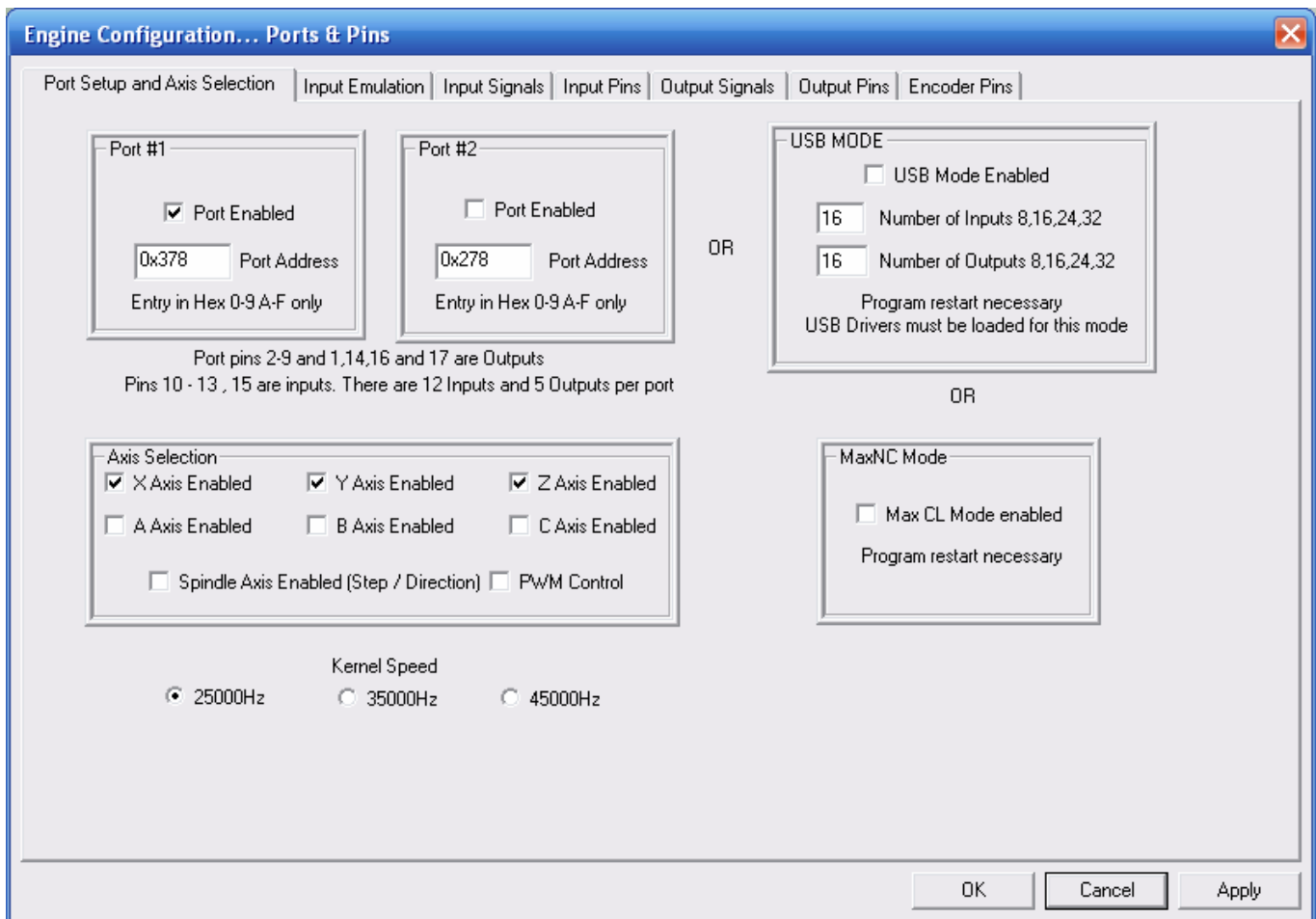
(<http://www.artsoftcontrols.com>)

1 Run the Mach2Mill software:



2 Now click on “Config – Port and Pins”. This should display the “Engine Configuration” window.

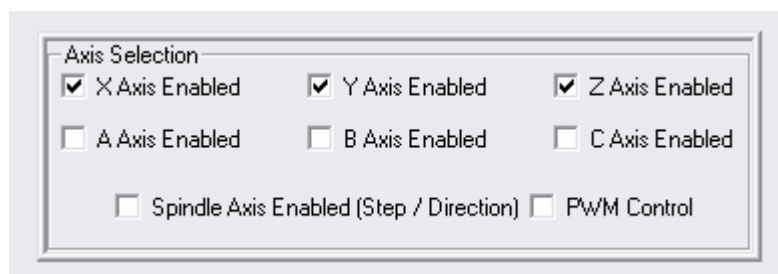




Enable the correct parallel port of your computer.



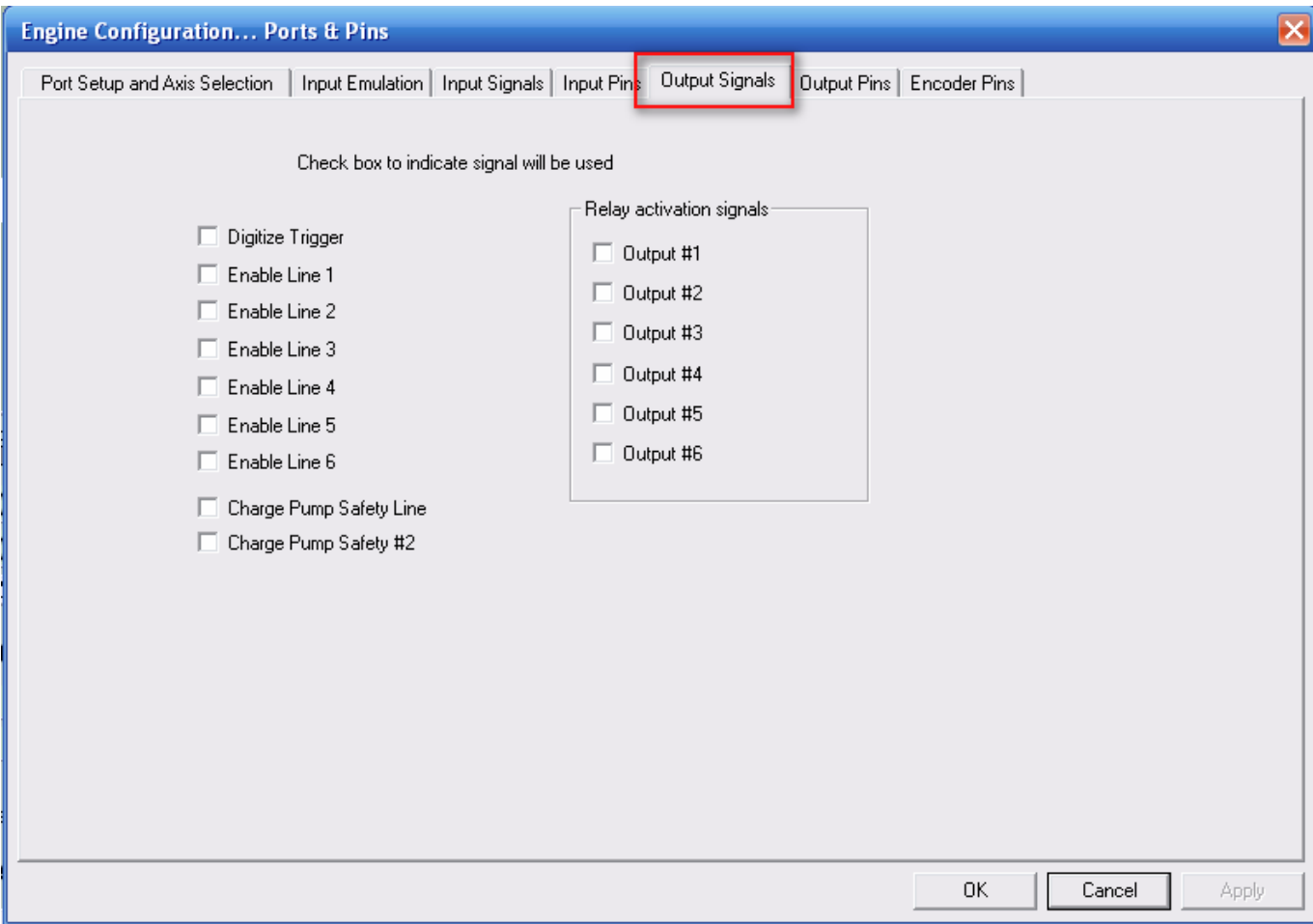
Enable the axis that you would like to use.



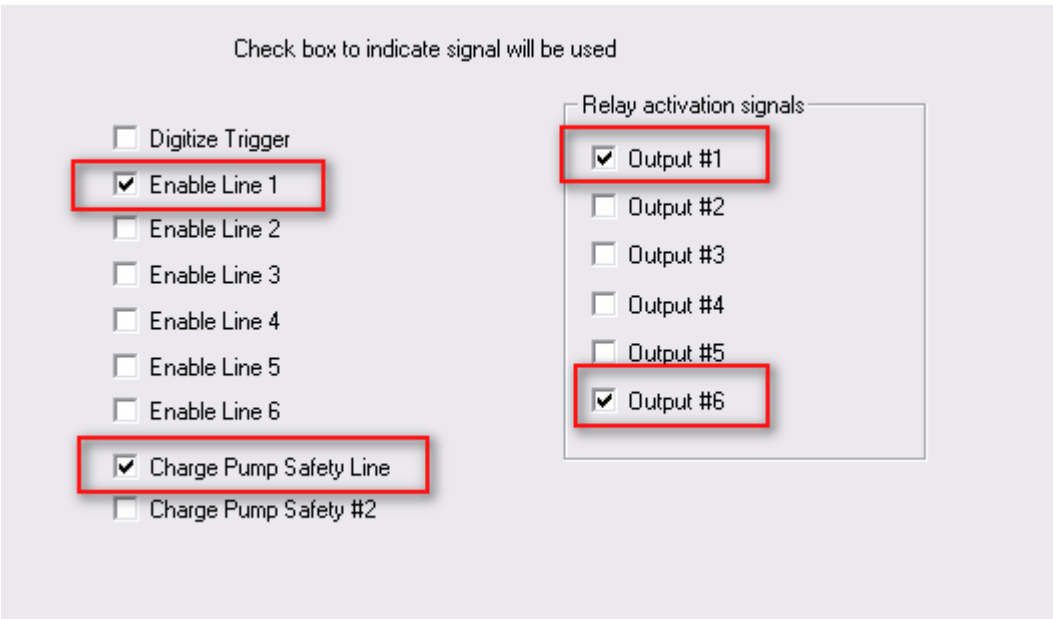
Click on “Apply” button to apply setting.



3 Click on “Output Signals” tab.



Enable “Enable Line1” “Charge Pump safety Line” “Output #1” and “Output #6”



Click on “Apply” button to apply setting.



4 Click on “Output Pins” tab.

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Input Emulation | Input Signals | Input Pins | Output Signals | **Output Pins** | Encoder Pins

Note: Signals not selected in the "Output Signals" tab are greyed out.

Active Low	Port #	Pin #	Active Low	Port#	Pin#	Active Low	Port#	Pin#
<input checked="" type="checkbox"/> Enable line 1	1	16	<input checked="" type="checkbox"/> X Axis Step	1	2	<input type="checkbox"/> Digitize Trigger	0	0
<input type="checkbox"/> Enable line 2	0	0	<input checked="" type="checkbox"/> X Axis Direction	1	3	Charge Pump Safety	0	0
<input type="checkbox"/> Enable line 3	0	0	<input checked="" type="checkbox"/> Y Axis Step	1	4	Charge Pump #2	0	0
<input type="checkbox"/> Enable line 4	0	0	<input checked="" type="checkbox"/> Y Axis Direction	1	5			
<input type="checkbox"/> Enable line 5	0	0	<input checked="" type="checkbox"/> Z Axis Step	1	6			
<input type="checkbox"/> Enable line 6	0	0	<input checked="" type="checkbox"/> Z Axis Direction	1	7			
<input type="checkbox"/> Output #1	1	1	<input type="checkbox"/> A Axis Step	0	0			
<input type="checkbox"/> Output #2	1	14	<input type="checkbox"/> A Axis Direction	0	0			
<input type="checkbox"/> Output #3	1	16	<input type="checkbox"/> B Axis Step	0	0			
<input type="checkbox"/> Output #4	1	1	<input type="checkbox"/> B Axis Direction	0	0			
<input type="checkbox"/> Output #5	1	14	<input type="checkbox"/> C Axis Step	0	0			
<input type="checkbox"/> Output #6	1	16	<input type="checkbox"/> C Axis Direction	0	0			
<input type="checkbox"/> Spindle Step	0	0						
<input type="checkbox"/> Spindle Dir	0	0						

Checking an "Active Low" box indicates the signal is active when low. (0VDC)

Printer Ports
Pin numbers must be one of 1,2,3,4,5,6,7,8,9,14,16,17

USB
If using USB Mode , Enter the Input number in the Pin# data box. Port numbers will be ignored.

OK Cancel Apply

Enable the signals and Pin# as show below:

Note: Signals not selected in the "Output Signals" tab are greyed out.

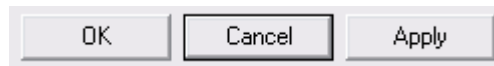
Active Low	Port #	Pin #	Active Low	Port#	Pin#	Active Low	Port#	Pin#
<input checked="" type="checkbox"/> Enable line 1	1	16	<input checked="" type="checkbox"/> X Axis Step	1	2	<input type="checkbox"/> Digitize Trigger	0	0
<input type="checkbox"/> Enable line 2	0	0	<input checked="" type="checkbox"/> X Axis Direction	1	3	Charge Pump Safety	1	17
<input type="checkbox"/> Enable line 3	0	0	<input checked="" type="checkbox"/> Y Axis Step	1	4	Charge Pump #2	0	0
<input type="checkbox"/> Enable line 4	0	0	<input checked="" type="checkbox"/> Y Axis Direction	1	5			
<input type="checkbox"/> Enable line 5	0	0	<input checked="" type="checkbox"/> Z Axis Step	1	6			
<input type="checkbox"/> Enable line 6	0	0	<input checked="" type="checkbox"/> Z Axis Direction	1	7			
<input checked="" type="checkbox"/> Output #1	1	1	<input type="checkbox"/> A Axis Step	0	0			
<input type="checkbox"/> Output #2	1	14	<input type="checkbox"/> A Axis Direction	0	0			
<input type="checkbox"/> Output #3	1	16	<input type="checkbox"/> B Axis Step	0	0			
<input type="checkbox"/> Output #4	1	1	<input type="checkbox"/> B Axis Direction	0	0			
<input type="checkbox"/> Output #5	1	14	<input type="checkbox"/> C Axis Step	0	0			
<input checked="" type="checkbox"/> Output #6	1	16	<input type="checkbox"/> C Axis Direction	0	0			
<input type="checkbox"/> Spindle Step	0	0						
<input type="checkbox"/> Spindle Dir	0	0						

Checking an "Active Low" box indicates the signal is active when low. (0VDC)

Printer Ports
Pin numbers must be one of 1,2,3,4,5,6,7,8,9,14,16,17

USB
If using USB Mode , Enter the Input number in the Pin# data box. Port numbers will be ignored.

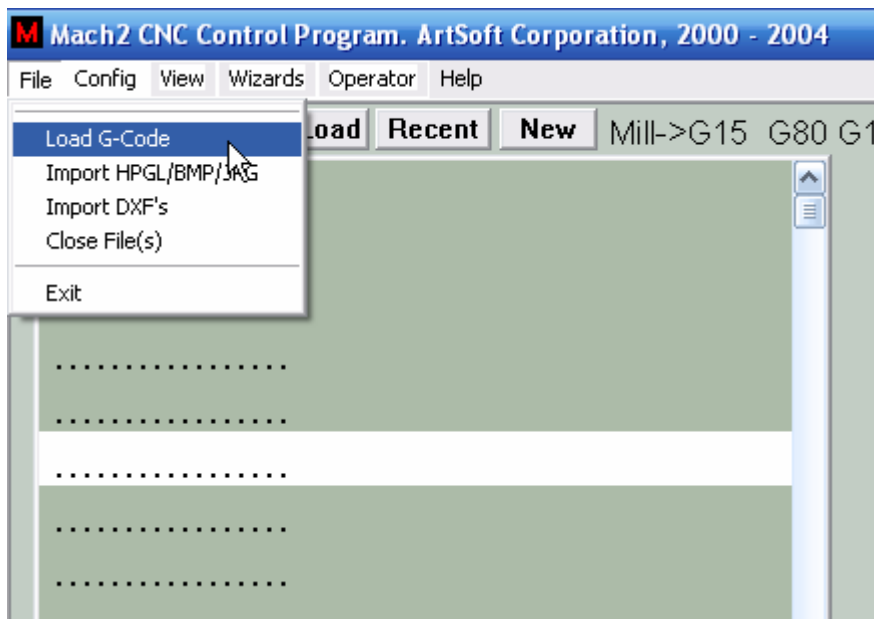
Click on “OK” button to finish.



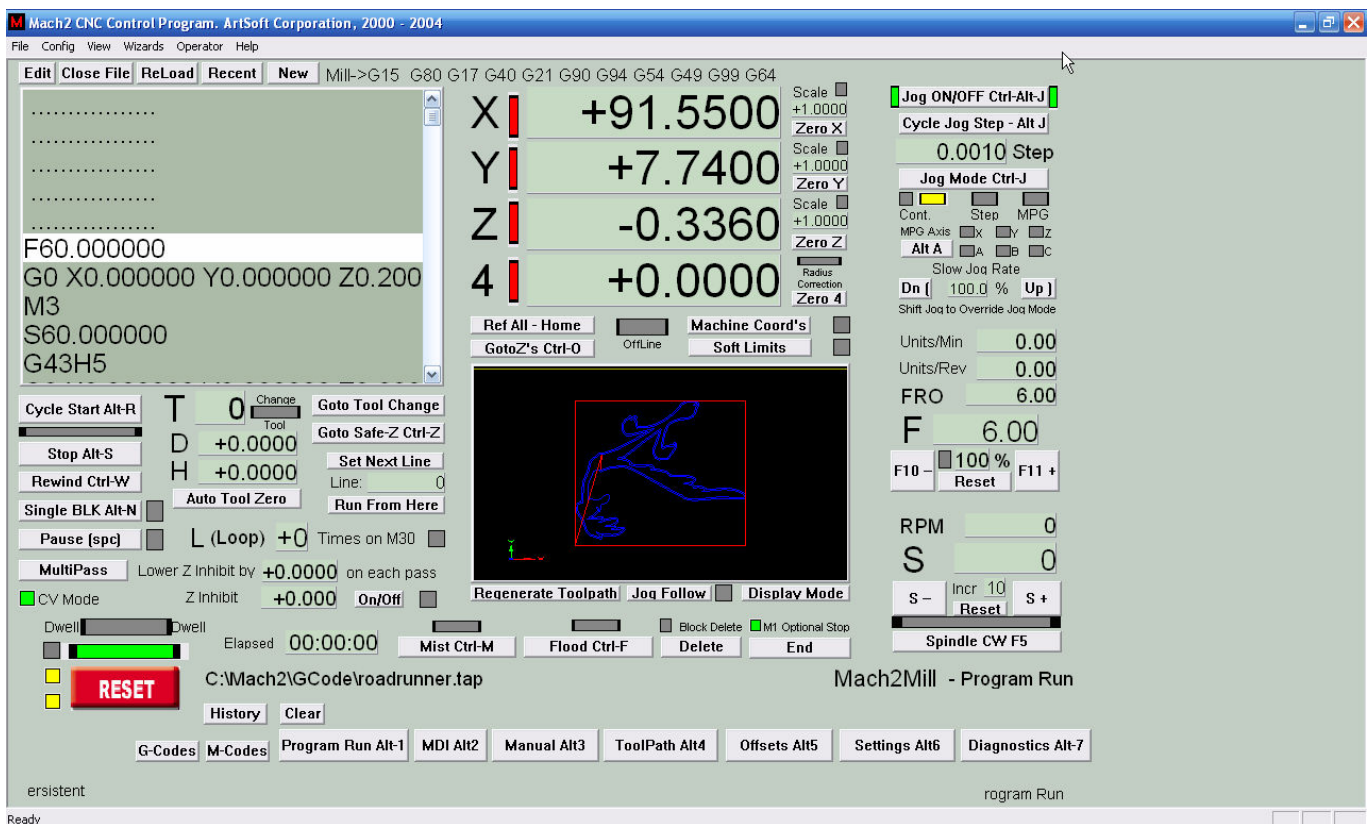
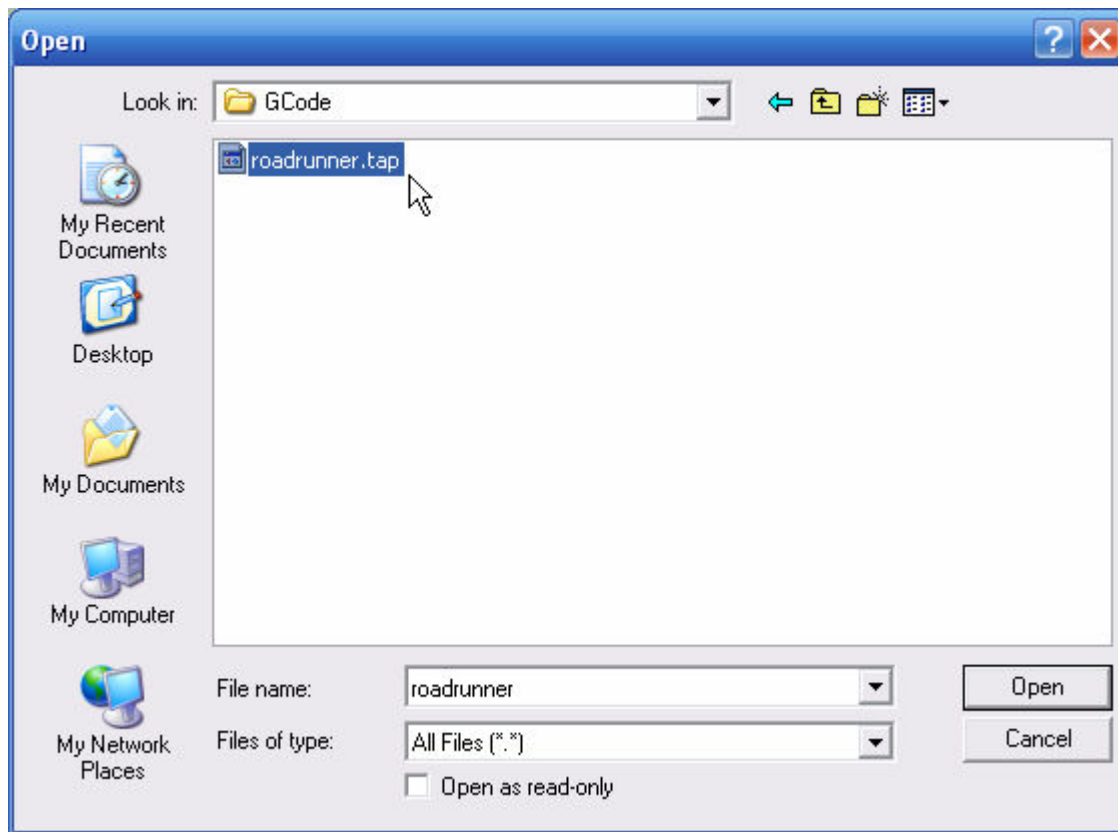
Sometimes the parallel signals are reversed, this will cause the motor stop working, you might need to disable the ‘Active Low’ options:

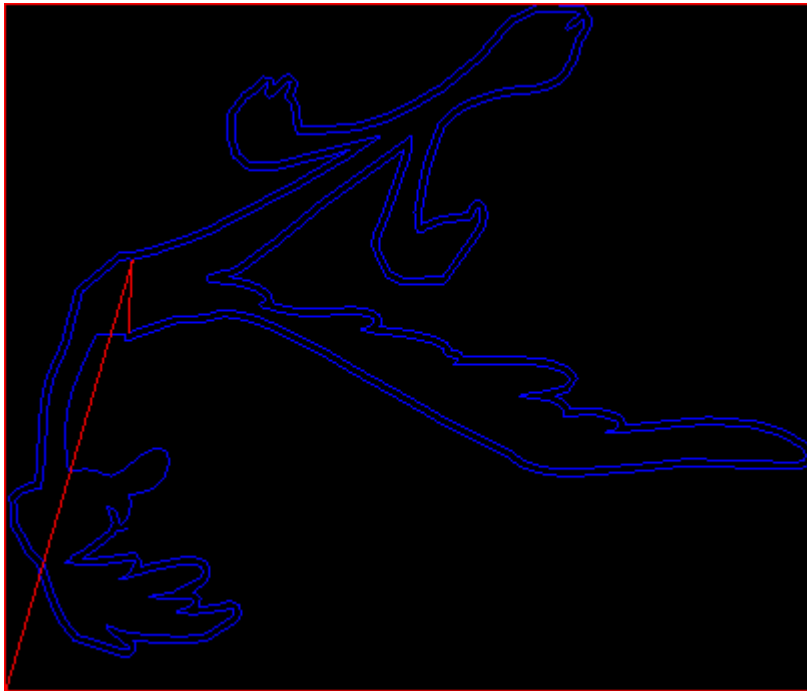
Active Low	Port#	Pin#
<input type="checkbox"/> X Axis Step	1	2
<input type="checkbox"/> X Axis Direction	1	3
<input type="checkbox"/> Y Axis Step	1	4
<input type="checkbox"/> Y Axis Direction	1	5
<input type="checkbox"/> Z Axis Step	1	6
<input type="checkbox"/> Z Axis Direction	1	7
<input checked="" type="checkbox"/> A Axis Step	0	8

- 5 Load the G-Code. Click on the “File – Load G-Code”.



This should display the “Open” window, locate the “GCode” folder and select the “roadrunner.tap” project.





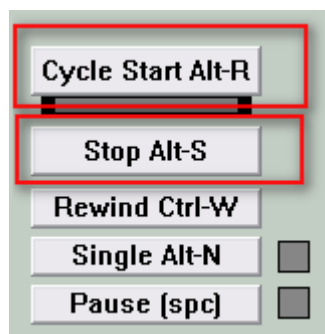
6 To run the G-Code, click on the “RESET” button first.



The color bar will keep green after reset.

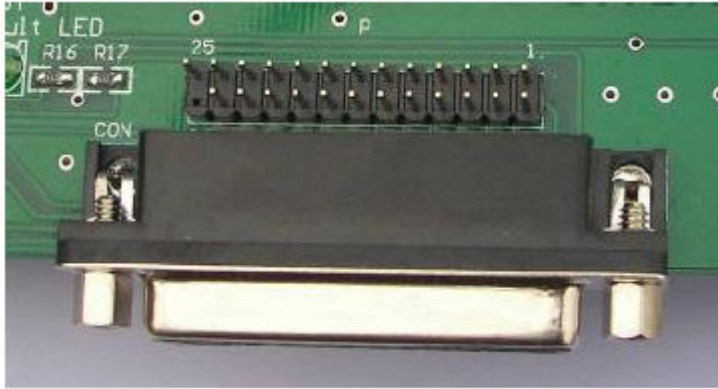


Now you can click on “Cycle Start Alt-R” button to start or click on “Stop Alt-S” to stop the cycle.



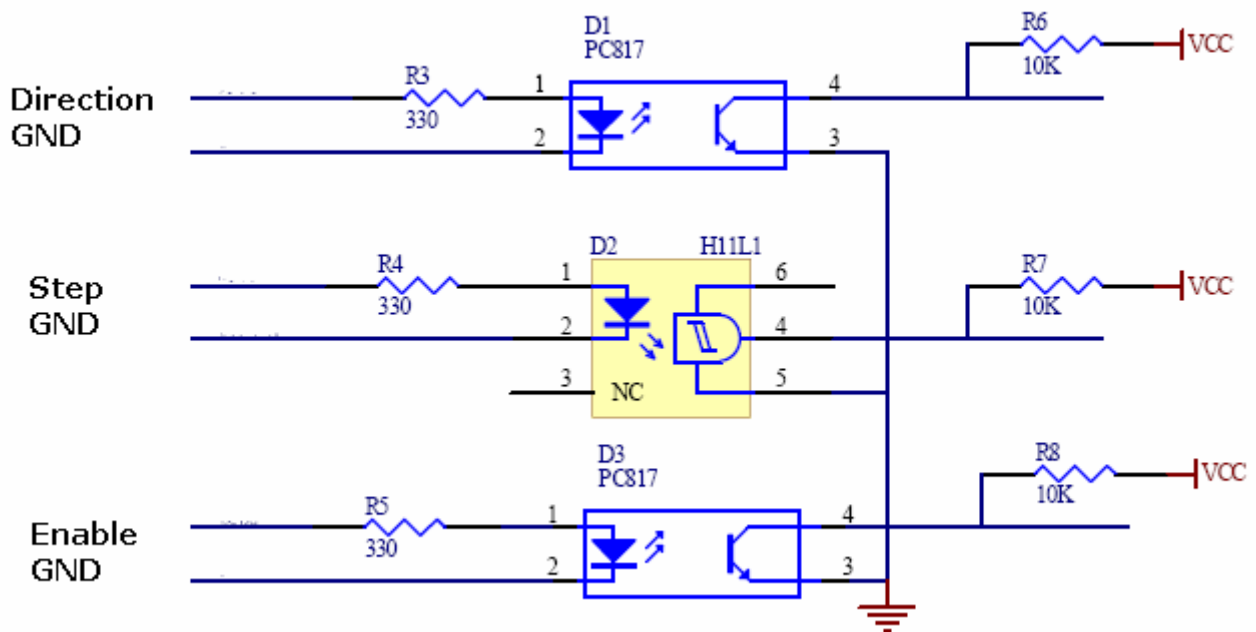
Signals Definition

1 DB25 Parallel Connector. (CON DB25 connector and P connector)



No.	Signals	CON	P	Comment
1	Relay Control	1	1	Active Low
2	X axis Step	2	3	
3	X axis Direction	3	5	
4	Y axis Step	4	7	
5	Y axis Direction	5	9	
6	Z axis Step	6	11	
7	Z axis Direction	7	13	
8	A axis Step	8	15	
9	A axis Direction	9	17	
10	Emergency Stop	10	19	Active Low
11	X axis Limit	11	21	
12	Y axis Limit	12	23	
13	Z axis Limit	13	25	
14	Output	14	2	Active Low

15	A axis Limit	15	4	
16	En	16	6	Active High
17	Charge Pump	17	8	
18	GND	18-25	10,12,14,16, 18,20,22,14	



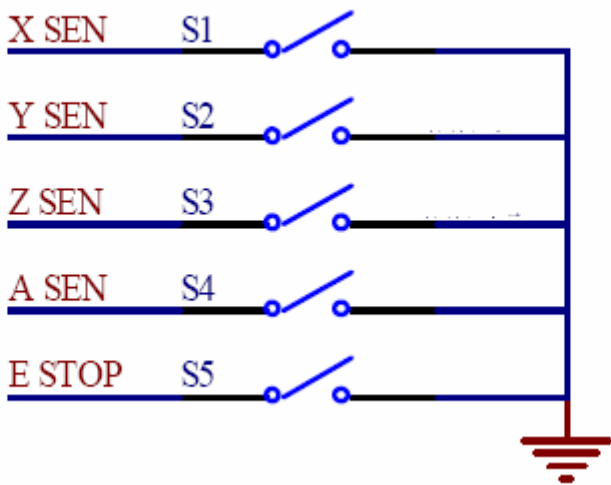
2 Limit Control Connector (P5).



No.	Signals	Pin#	Comment
1	GND	1,2	
2	Output	3	Active Low
3	Emergency Stop	4	Active Low
4	X axis Limit	5	Active Low
5	Y axis Limit	6	Active Low
6	Z axis Limit	7	Active Low
7	A axis Limit	8	Active Low
8	+5V	9,10	Supplied by driver board*

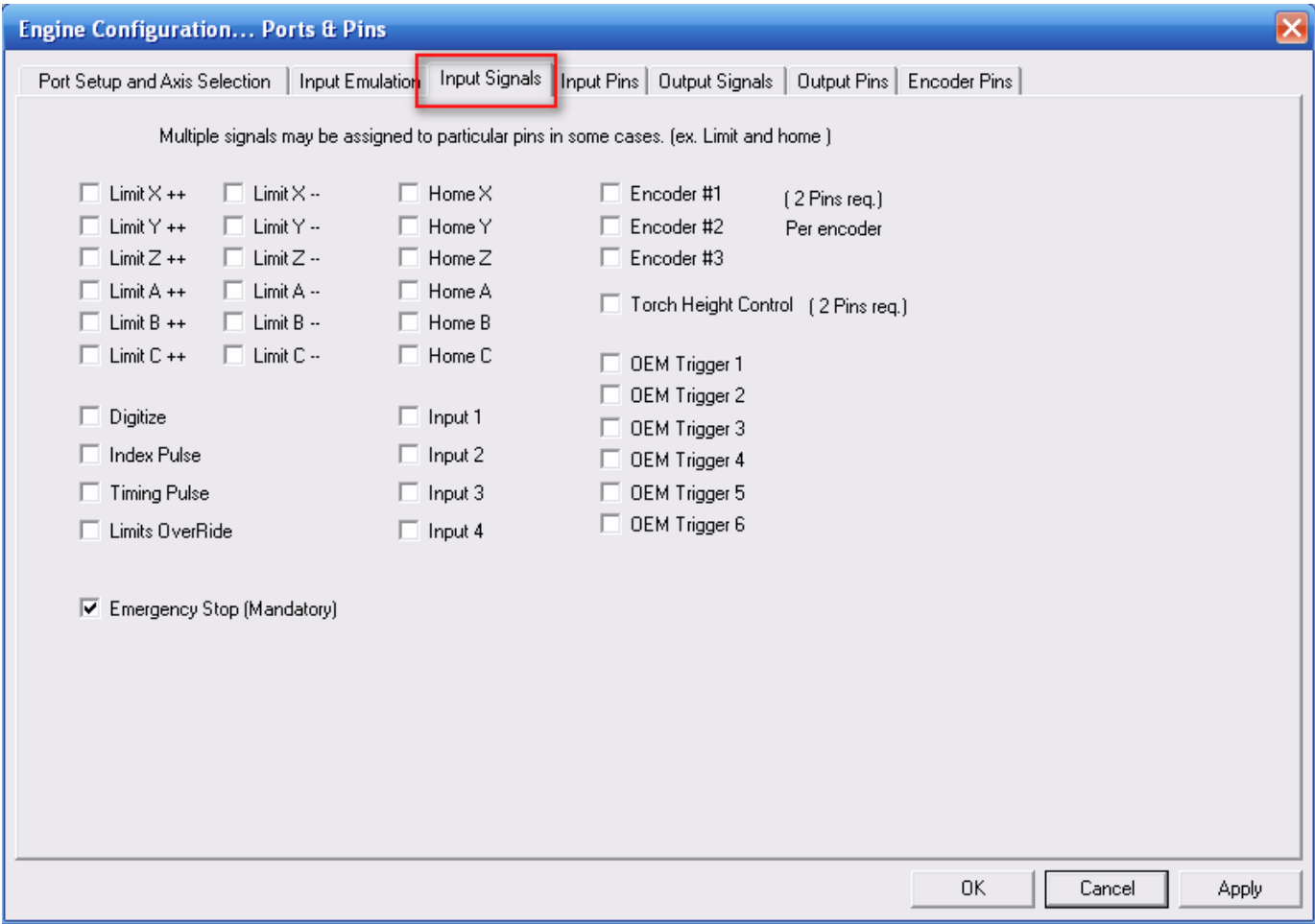
* Current <300mAH

2.1 Connection Diagram: (Active Low)

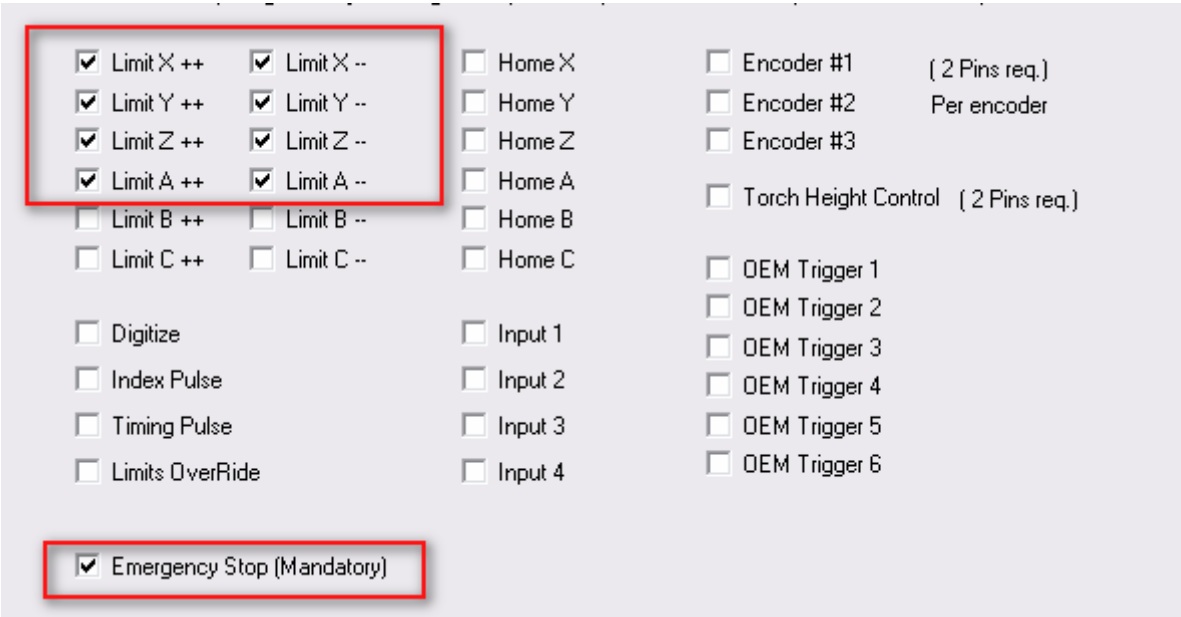


2.2 Mach2 Configuration:

Click on “Input Signals” tab.



Enable signals as show below:



Click on “Apply” button to apply setting.



Click on “Input Pins” tab.

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Input Emulation | Input Signals | **Input Pins** | Output Signals | Output Pins | Encoder Pins

Note: Signals not selected in the Input Signals tab are greyed out.

Active Low

☐ Limits OverRide

Port #

Pin #

☐ Limit X Plus

☐ Limit X Minus

☐ Limit Y Plus

☐ Limit Y Minus

☐ Limit Z Plus

☐ Limit Z Minus

☐ Limit A Plus

☐ Limit A Minus

☐ Limit B Plus

☐ Limit B Minus

☐ Limit C Plus

☐ Limit C Minus

☒ Digitize/ Skip

Active Low

☐ Home X

Port #

Pin #

☐ Home Y

☐ Home Z

☐ Home A

☐ Home B

☐ Home C

☐ Input #1

☐ Input #2

☐ Input #3

☐ Input #4

☐ Index

☐ Timing Mark

Active Low

☐ Emergency Stop

Port #

Pin #

☐ OEM Trigger1

☐ OEM Trigger 2

☐ OEM Trigger 3

☐ OEM Trigger4

☐ OEM Trigger 5

☐ OEM Trigger 5

☐ Torch height On

☐ Torch up

☐ Torch Down

Printer Ports

Enter the Port and Pin number of your signals

Pin numbers must be 10,11,12,13, and 15 only!!

Port numbers must be 1 or 2 only!!!

USB

If using USB Mode , Enter the Input number in the Pin# data box. Port numbers will be ignored.

OK

Cancel

Apply

Enable signals as show below:

Note: Signals not selected in the Input Signals tab are greyed out.

Active Low

☐ Limits OverRide

Port #

Pin #

☒ Limit X Plus

☒ Limit X Minus

☒ Limit Y Plus

☒ Limit Y Minus

☒ Limit Z Plus

☒ Limit Z Minus

☒ Limit A Plus

☒ Limit A Minus

☐ Limit B Plus

☐ Limit B Minus

☐ Limit C Plus

☐ Limit C Minus

☒ Digitize/ Skip

Active Low

☐ Home X

Port #

Pin #

☐ Home Y

☐ Home Z

☐ Home A

☐ Home B

☐ Home C

☐ Input #1

☐ Input #2

☐ Input #3

☐ Input #4

☐ Index

☐ Timing Mark

Active Low

☒ Emergency Stop

Port #

Pin #

☐ OEM Trigger1

☐ OEM Trigger 2

☐ OEM Trigger 3

☐ OEM Trigger4

☐ OEM Trigger 5

☐ OEM Trigger 5

☐ Torch height On

☐ Torch up

☐ Torch Down

Printer Ports

Enter the Port and Pin number of your signals

Pin numbers must be 10,11,12,13, and 15 only!!

Port numbers must be 1 or 2 only!!!

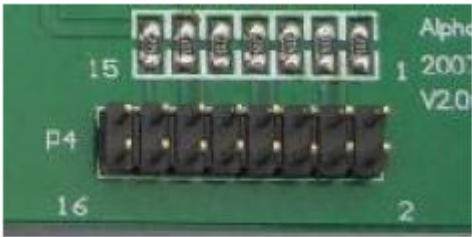
Click on “OK” button to finish.

OK

Cancel

Apply

3 Manual Control Connector. (P4)

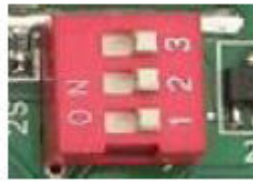


No.	Signals	Pin#	Comment
1	+5V	1,2	Supplied by driver board*
2	X axis Step	3	
3	X axis Direction	4	
4	GND	5	
5	GND	6	
6	Y axis Step	7	
7	Y axis Direction	8	
8	En	9	Active High
9	Emergency Stop	10	Active Low
10	Z axis Step	11	
11	Z axis Direction	12	
12	Manual/Auto	13	Manual Active Low
13	GND	14	

14	A axis Step	15	
15	A axis Direction	16	

*Current <300mAh

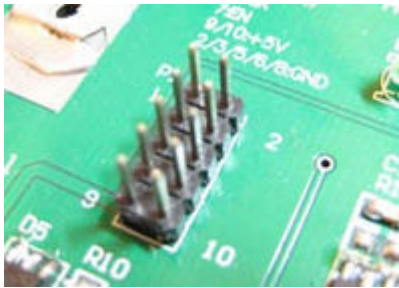
4 Steps Resolution.



Dec	Switch Position			Steps Resolution
	1	2	3	
Steps Control	ON	ON	ON	NOT Recommend*
	OFF	ON		2
	ON	OFF		4
	OFF	OFF		8
1/2 Current Control			ON	Auto
			OFF	Half

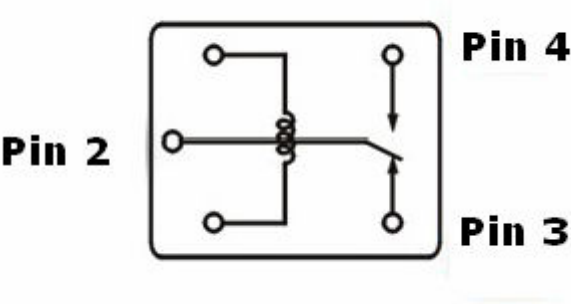
* Current may exceed the Maximum and cause device damage.

5. A axis Connector. (P1)



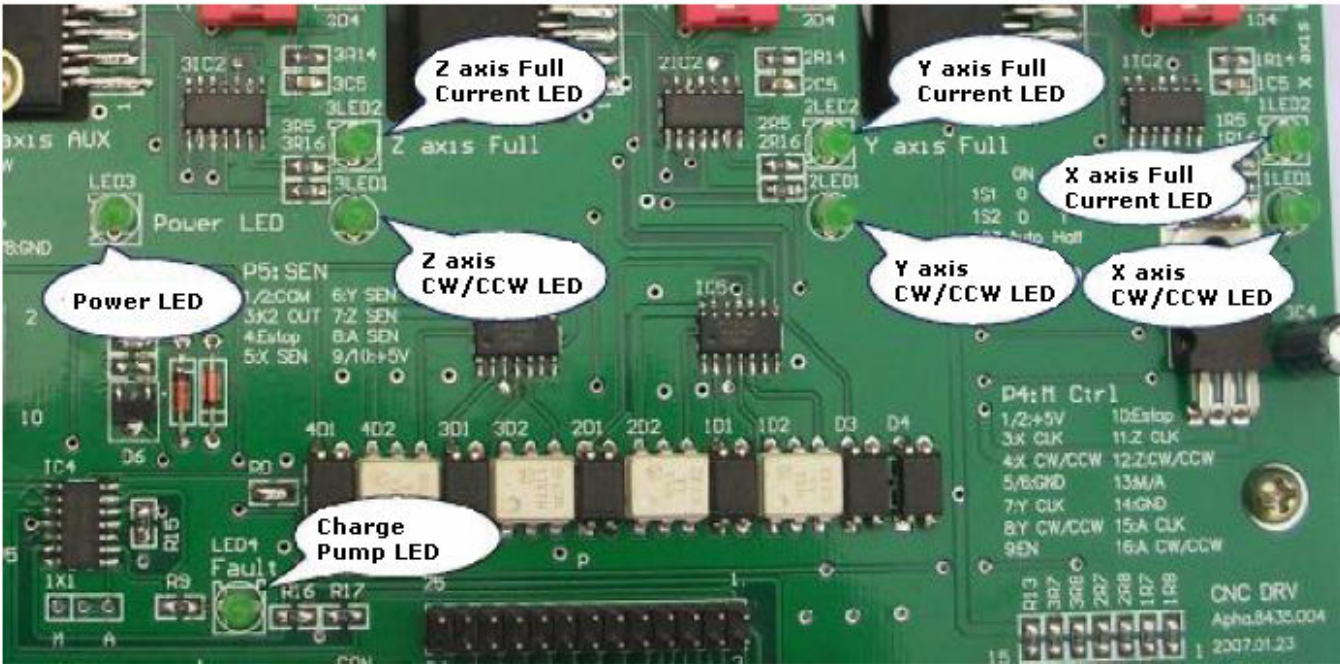
No.	Signals	Pin#	Comment
1	A axis Direction	1	
2	A axis Step	4	
3	En	7	Active high
4	+5V	9,10	
5	GND	2,3,5,6,8	

6. Relay Control Connector. (P6)

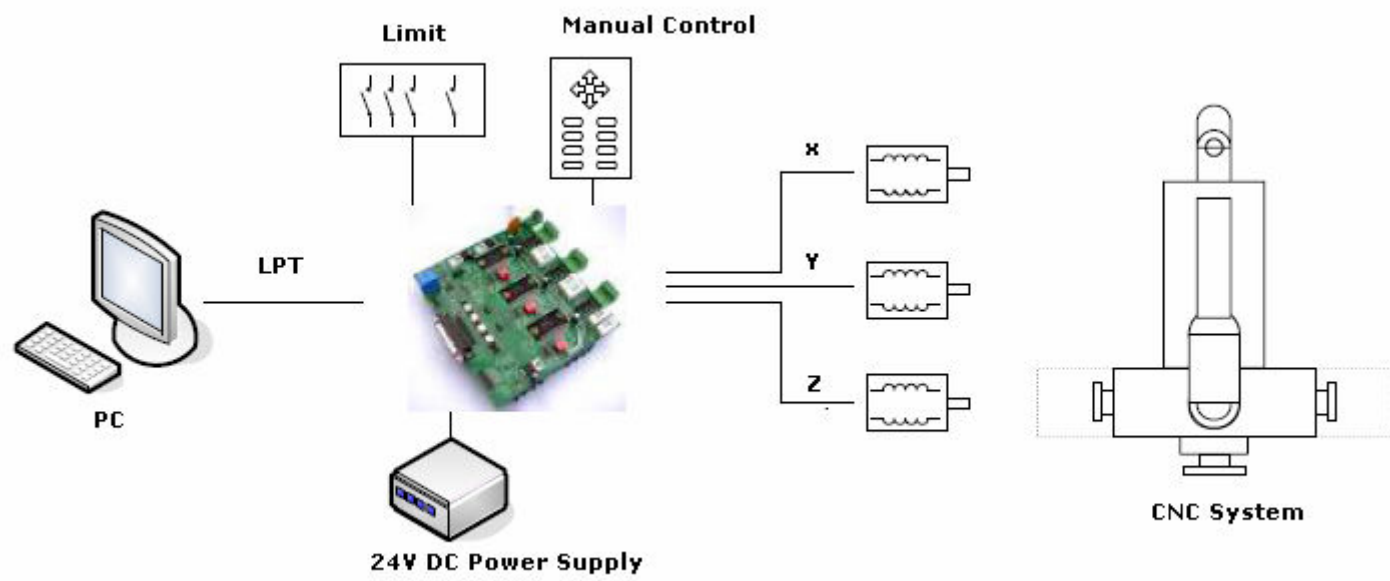


P6 Pin#

7. LED Indicator.



CNC SYSTEM APPLICATION





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