



USER'S MANUAL

CNC Stepper motor Control. CS4EV12-1 Rev. 1

December, 2012

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1.0 FEATURES

- Ethernet controlled CNC Stepper motor Control Box.
- 4 Stepper motors.
- Suitable for a wide range of stepping motors of Nema 17, 23 and 34.
- Relay Controlled Aux 1 AC Plug.
- 1 Remote Pendant Input. (Pendant not included)
- 1 External E-Stop input.
- 1 Probe input.
- RJ45 interface for easy Limits and encoder connection.
- U V W Motor terminals (VFD Controller).
- Works directly with Mach3.

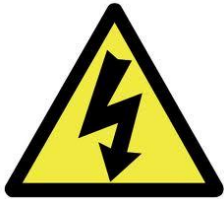
2.0 SPECIFICATIONS

Main Voltage Input (VAC)	220V
Main voltage for motors (VDC)	60V
Logic supply voltage (VDC)	5V and 12V
Peak Current per axis (A)	20
Step input frequency	0-400KHz
Digital inputs (LOW)	-0.5V - 0.8V
Digital inputs (HIGH)	2V-5V
Aux 1 Output	110VAC@15A
Cooling	2 DC fan
Dimensions (cm)	40x50x25
Weight (lbs) / (kg)	

3.0 SYSTEM REQUIREMENTS

Processor	1Ghz CPU
Memory	512
Ethernet	
Operating System	Windows 2000, Windows XP, Windows Vista, or Windows 7
Software	Mach3 Version R3.043.066

4.0 WARNING



Electrical shock or serious physical injury could result due to misuse Control BOX.

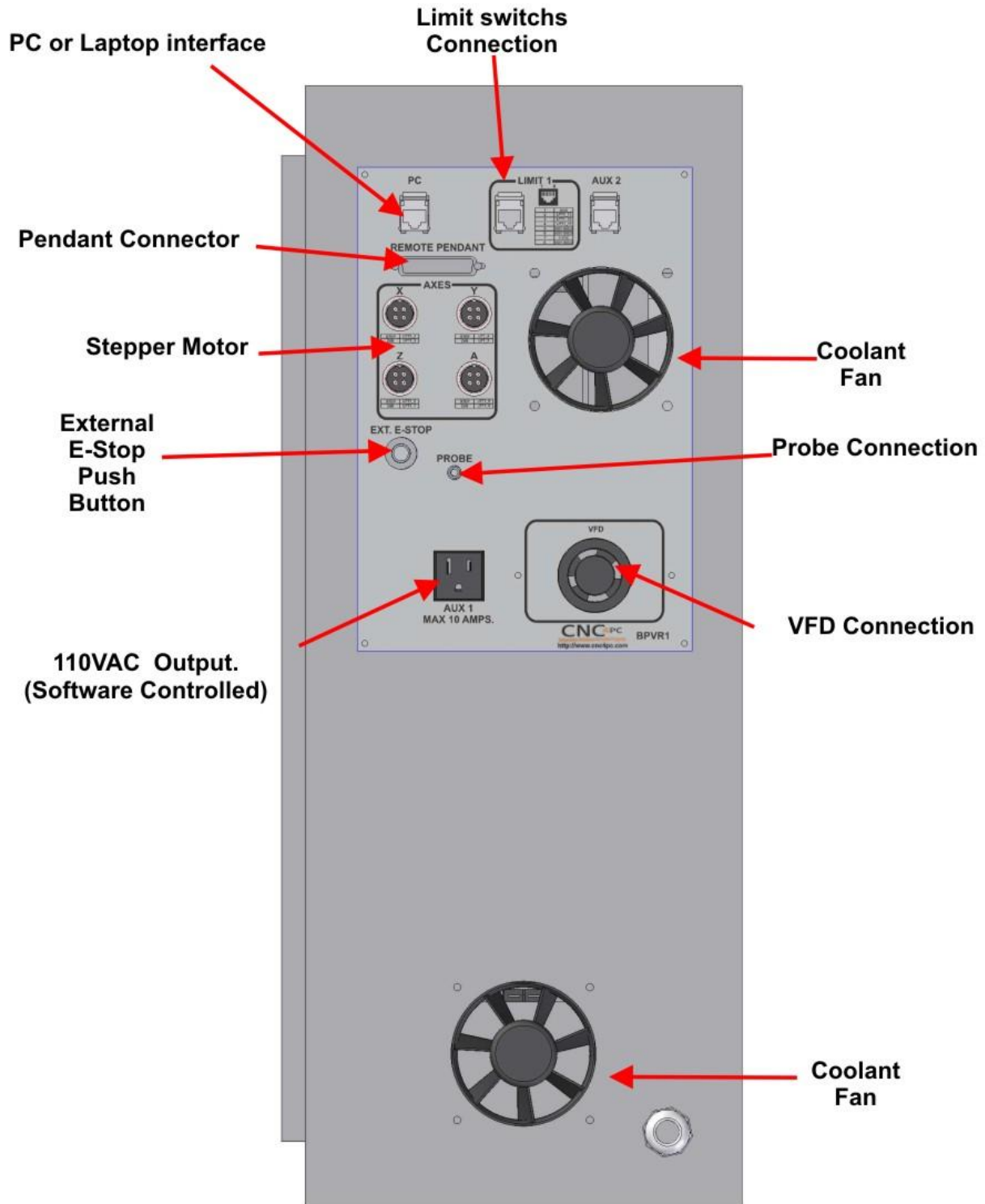
Disconnect power cables while installing the Control Box.



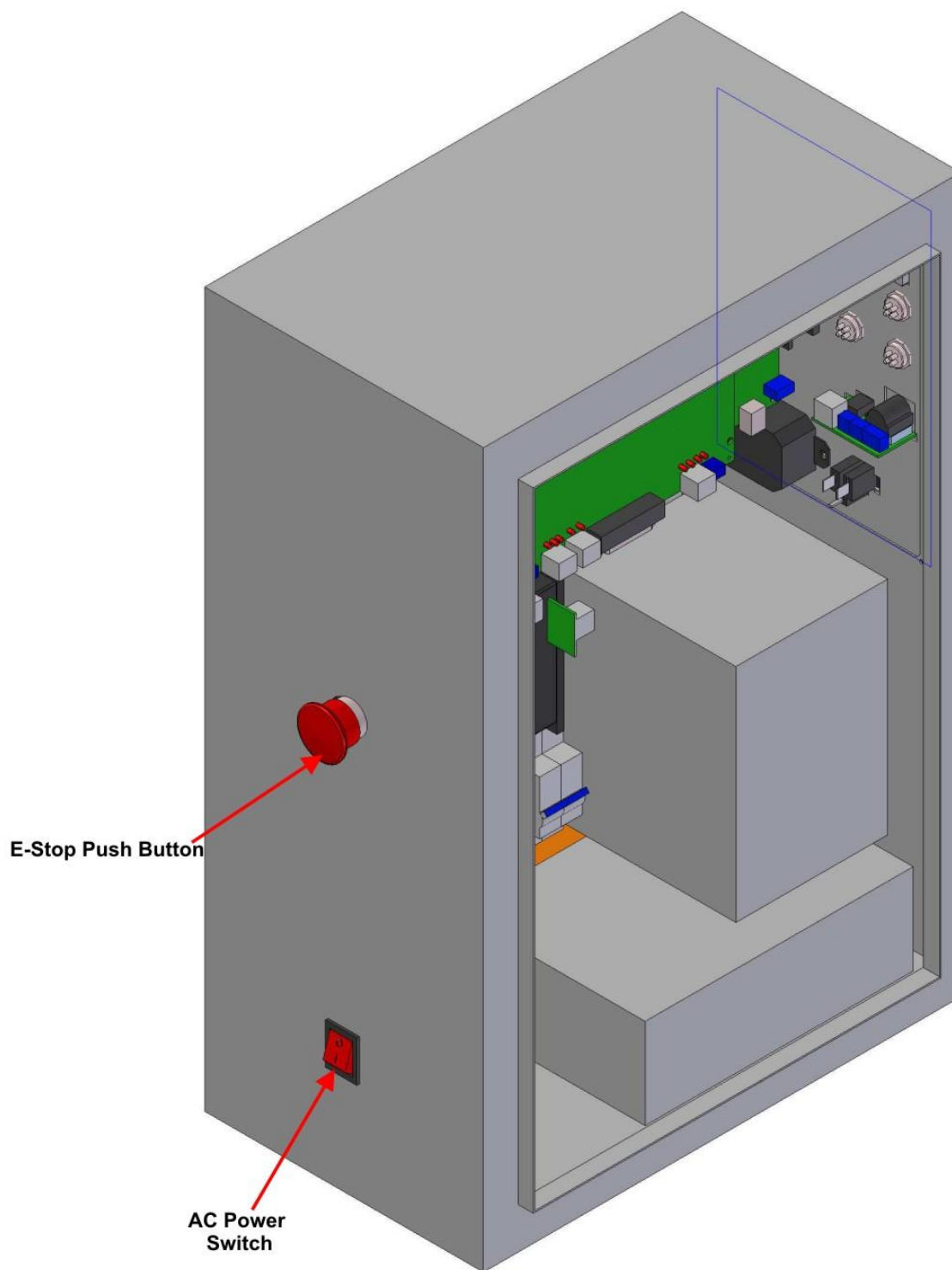
Read and follow instructions on the manual.

5.0 CONTROL BOX DESCRIPTION

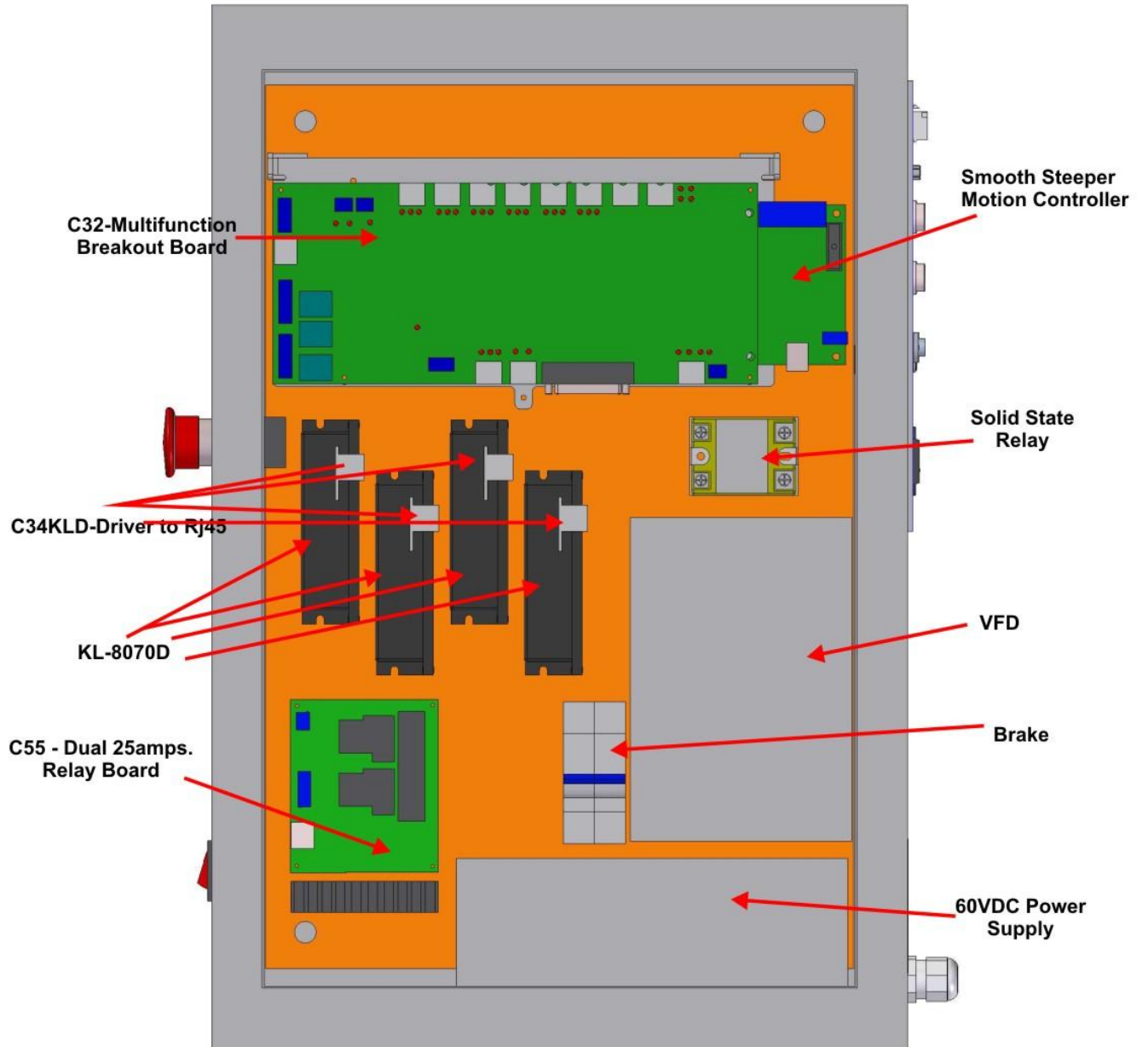
5.1 Back Panel Description



5.2 Front Panel Description



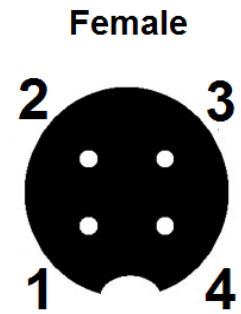
5.3 Internal Layout



6.0 QUICK START (STEP BY STEP)

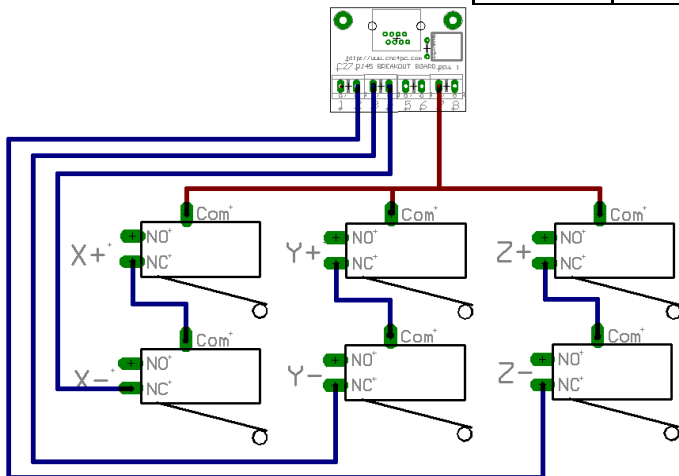
6.1 Step 1. Connecting Motor cables.

STEPPER MOTOR CABLE		
PIN	DESCRIPTION	WIRE COLOR
1	A+	RED
2	A-	WHITE
3	B+	BLACK
4	B-	GREEN

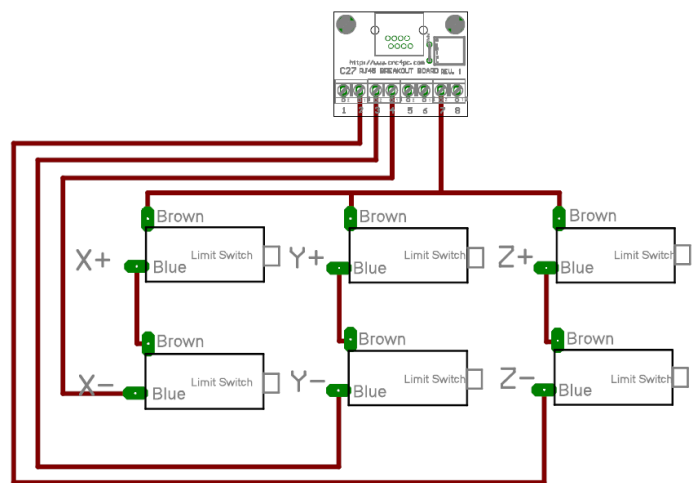


6.2 Step 2. Connecting Limit switches Board.

LIMIT SWITCHES CONNECTOR	
RJ45 PIN	DESCRIPTION
1	GND
2	LPT1_13
3	LPT1_12
4	LPT1_11
5	NOT_USED
6	NOT_USED
7	5 VDC
8	LPT2_16



Sample Wiring with mechanical switches.



Sample Wiring with limit switches OMRON DSA-8514

Wiring is made to work with an [A32 Switch Assembly, C16 – Photo and Limit Board](#), a [C45 LIMIT AND HOME UNIVERSAL](#), [A61 – Inductive Switch Assembly](#) or a C27- Ethernet RJ45 Breakout Board, which could take any kind of switches, including inductive, capacitive, hall effect, optical, or mechanical.

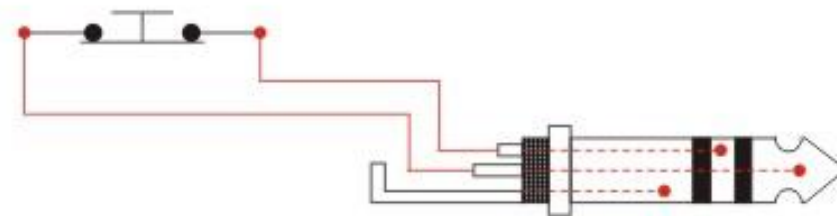
6.3 Step 3. Aux 1 (AC Plug).

110 – 220 VAC outputs controlled by Solid State Relays.

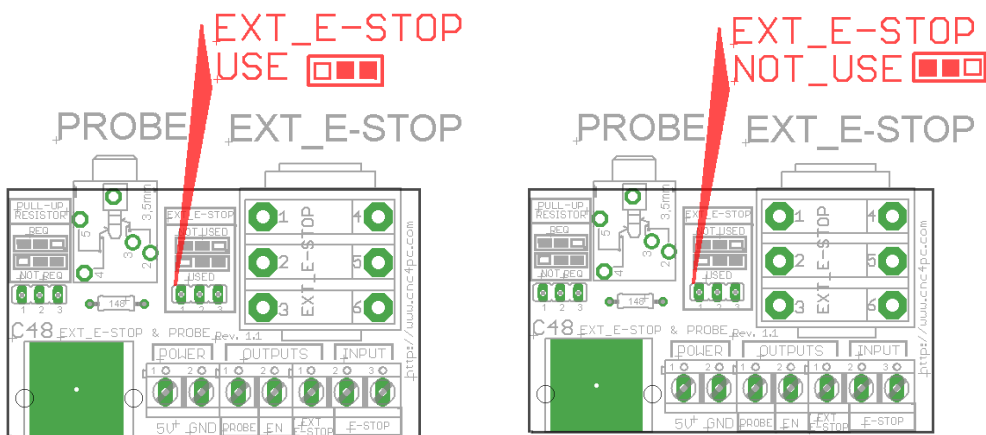
6.4 Step 4. Connecting External E-Stop.

The external e-stop is optional. If the plug is not present, the e-stop circuit will get closed. If the plug is put in place, a NC e-stop switch must be used.

Latch Twist - Release
E-Stop Button



Note: in the case of not using the external e-stop, change the position of the jumper according prevention image:



Use the external stop

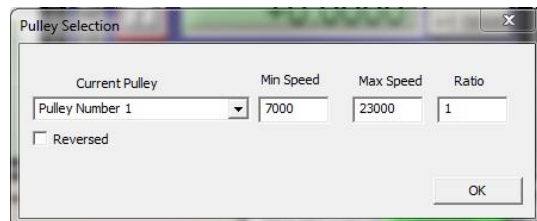
Do not use the external stop

6.5 Step 5. Connecting VFD:



The box is prewired for US VFD Mode, if using on INTERNATIONAL mode, open the box and move the jumper on the C32.

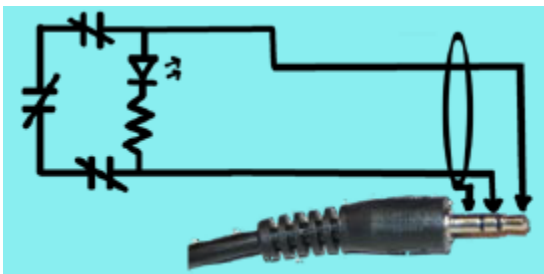
The true max and min speeds of the spindle must be set:



6.6 Step 6. Connecting Probe.

Touch probes are wired and preconfigured and just needs to be connected to the back panel. CNC4PC offers this unit:

http://www.cnc4pc.com/Store/osc/product_info.php?cPath=69&products_id=323, but other may be used as long as the wiring is compatible,



3.5mm Jack

Refer to the product's documentation for additional information:

http://cnc4pc.com/Tech_Docs/TP1.pdf

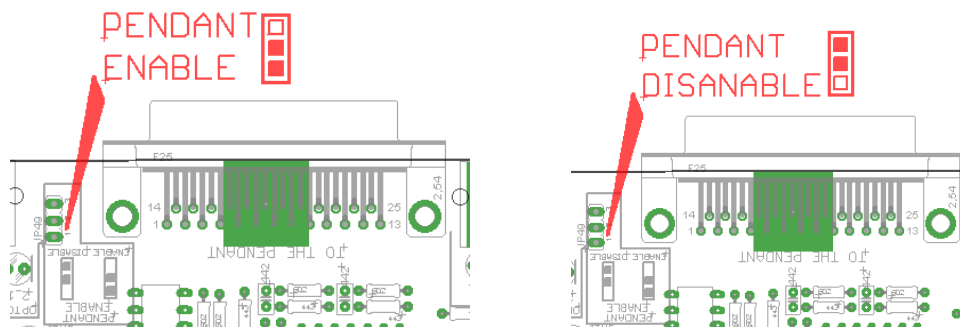
6.7 Step 7. Software Installation:

Before connecting the box to power install the basic software and configuration files:

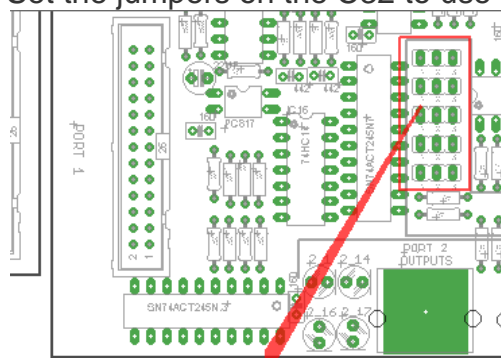
1. Download and install Mach3:
<ftp://machsupport.com/Mach/Mach3Version3.043.066.exe>.
2. Download and install the Ethernet Smooth Stepper Plugin:
<http://warp9td.com/downloads.htm>
3. Install the Mach3 License.
4. Download and copy XML and configuration files: http://cnc4pc.com/Files/CS4EV12-1_rev1.zip. Make sure to copy each file in the specific directory.

6.8 Step 8. Configuring the Pendant.

In the case of not using the external e-stop, change the position of the jumper according prevention image:



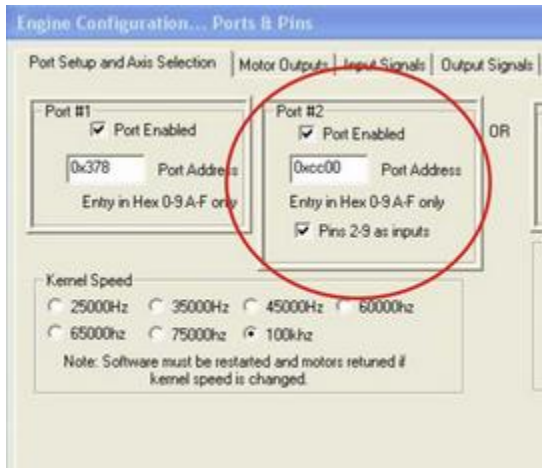
Set the jumpers on the C32 to use the inputs coming from the DB25 for the pendant:



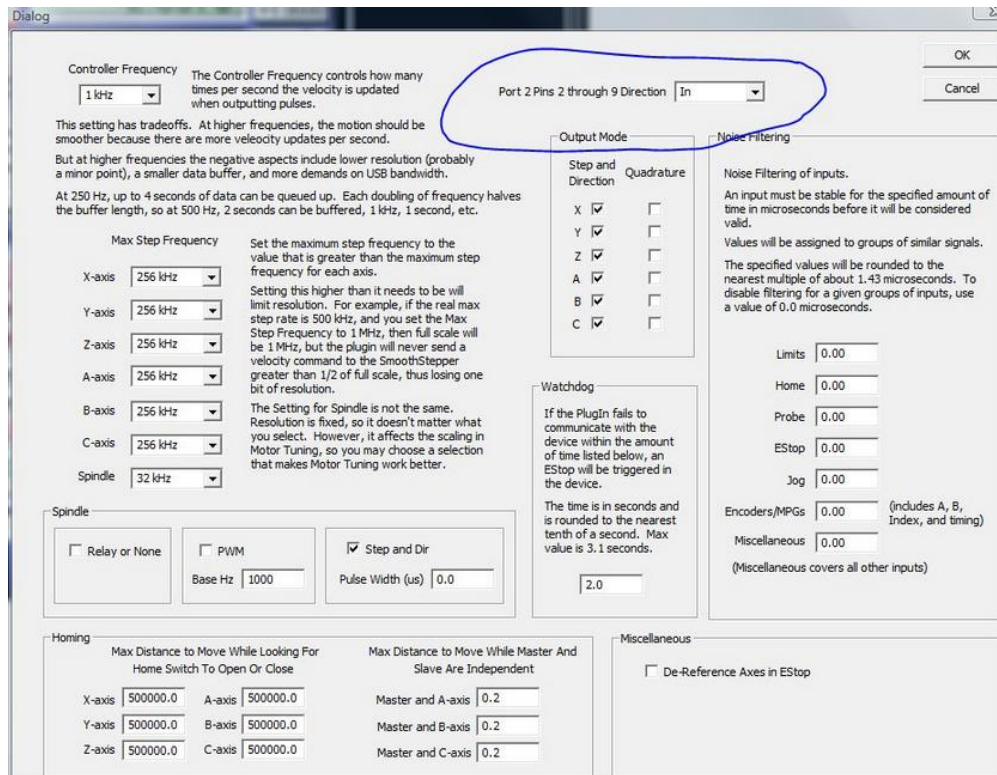
PENDANT ON



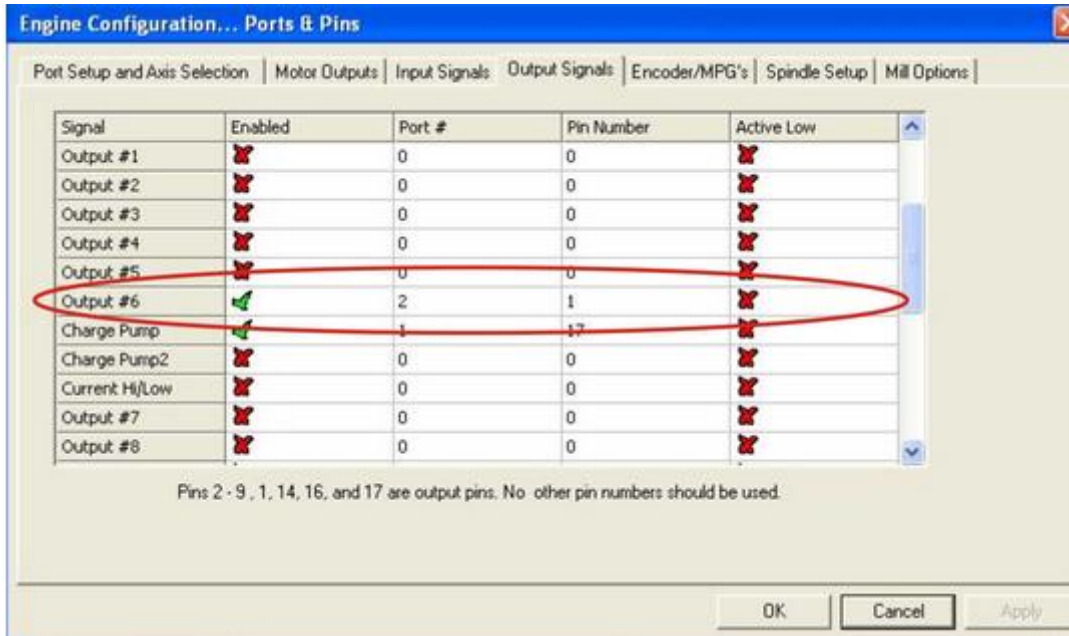
1. Configure Ports & Pins to use port 2 and pins 2-9 as inputs.



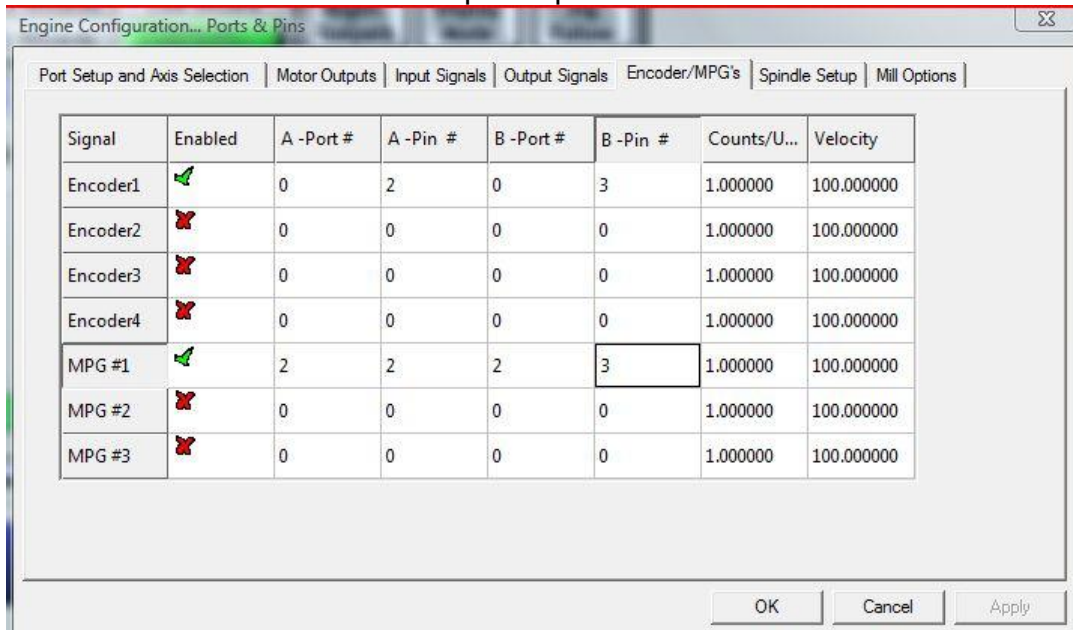
Configure the Smooth Stepper Plugin to use pins 2-9 on port 2 as inputs:



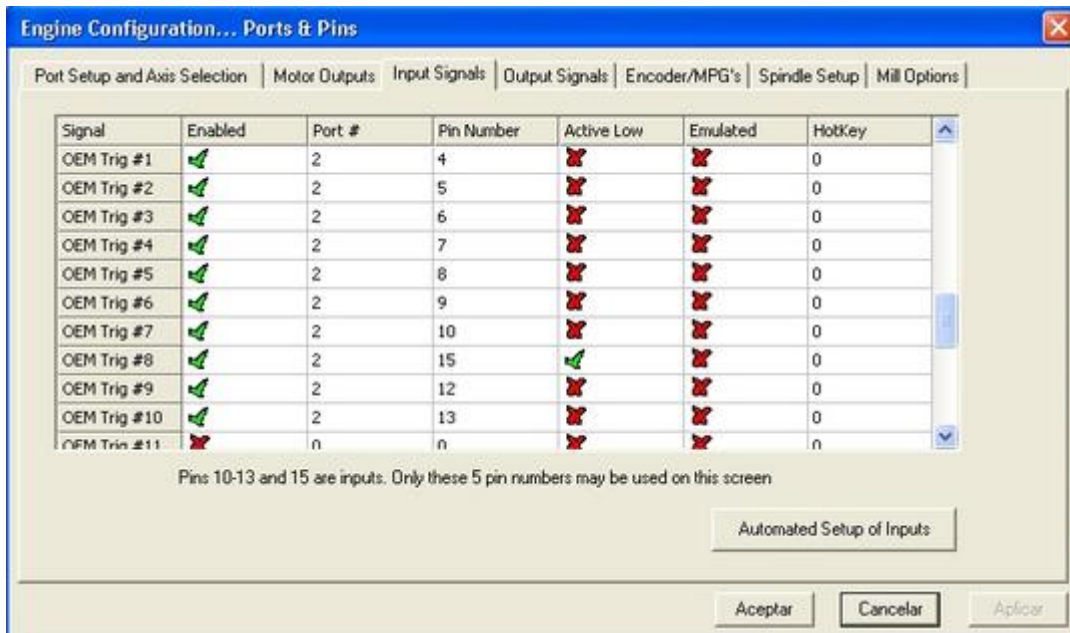
2. Enable Output 6 on port 2 pin 1.



Configure the MPG and ENCODER on port 2 pins 2 and 3 for channels A and B.



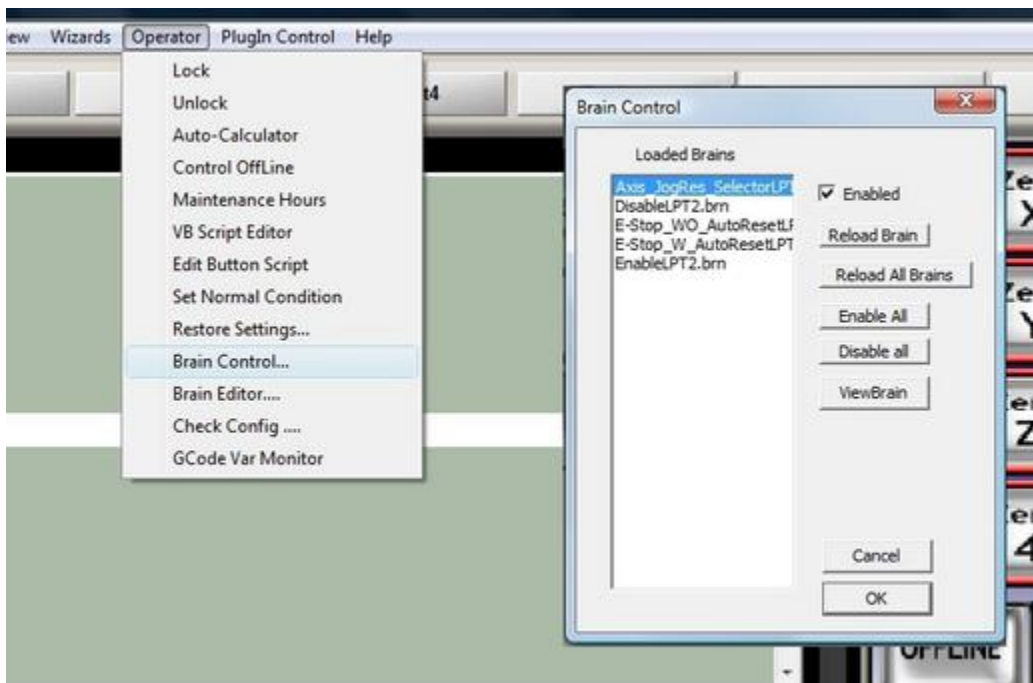
- Configure the OEM Triggers as described in the image:



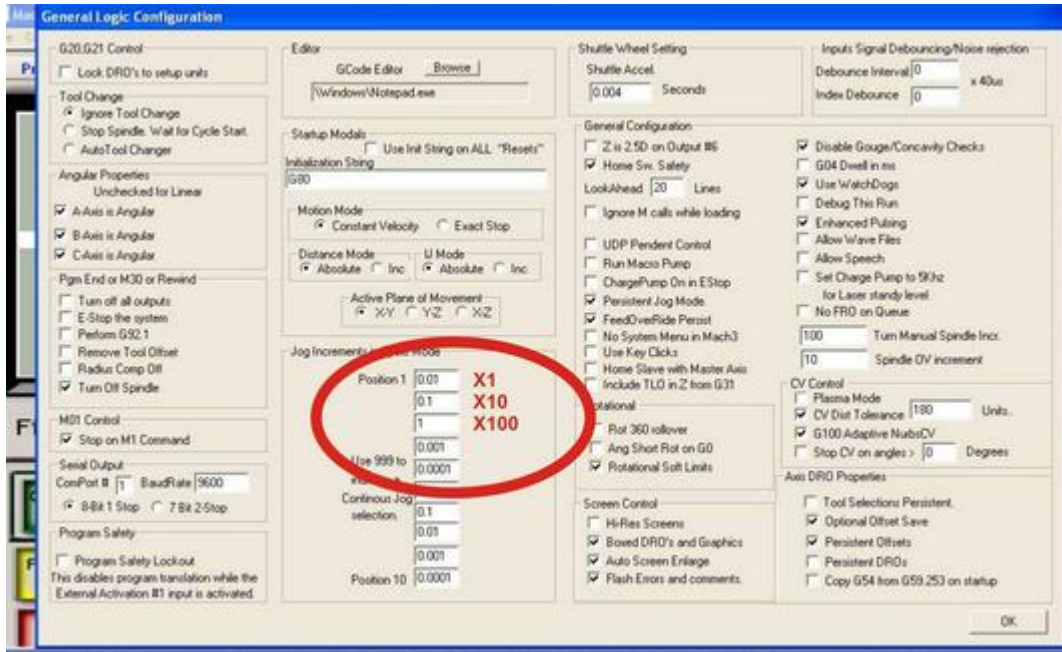
- There are two sets of brains. One is for regular 1-6 axes, and the other one is for 1-4 and using axes 5 and 6 for SSO (Spindle Speed Override) and FRO (Feedrate Override).
Brains for 1-6 axes: http://cnc4pc.com/Files/MPG4_LPT2Brain_V4.zip

Brains with SSO and FRO http://cnc4pc.com/Files/MPG4_LPT2_FRO_SSO_v6.zip

Download, copy in to the Brains Directory and enable the following brains found [HERE](#).



5. Set the Step Jog resolution:



7.0 PINOUT

PORT	PIN	CONTROL BOX FUNCTION	MACH FUNCTION
1	1	NOT USED	NOT USED
1	2	STEP X	STEP PIN#
1	3	DIR X	DIR PIN#
1	4	STEP Y	STEP PIN#
1	5	DIR Y	DIR PIN#
1	6	STEP Z	STEP PIN#
1	7	DIR Z	DIR PIN#
1	8	STEP A	STEP PIN#
1	9	DIR A	DIR PIN#
1	10	MACH E-STOP FUNTION	ESTOP
1	11	LIMIT X	X++
1	12	LIMIT Y	Y++
1	13	LIMIT Z	Z++
1	14	STEP SPINDLE (PWM)	STEP PIN#
1	15	PROBE	PROBE
1	16	DIR SPINDLE	DIR PIN#
1	17	NOT USED	NOT USED
2	1	NOT USED	NOT USED
2	2	ENCODER A	ENCODER 1 AND MPG#1
2	3	ENCODER B	ENCODER 1 AND MPG#1
2	4	SELECT X (MPG)	OEM TRIG #1
2	5	SELECT Y (MPG)	OEM TRIG #2
2	6	SELECT Z (MPG)	OEM TRIG #3
2	7	SELECT A (MPG)	OEM TRIG #4
2	8	SELECT 1 (MPG)	OEM TRIG #5
2	9	SELECT 10 (MPG)	OEM TRIG #6
2	10	SELECT 100 (MPG)	OEM TRIG #7
2	11	NOT USED	NOT USED
2	12	SELECT 5(MPG)	OEM TRIG #9
2	13	SELECT 6 (MPG)	OEM TRIG #10
2	14	NOT USED	NOT USED
2	15	E-STOP (MPG)	OEM TRIG #8
2	16	AUX 1	OUTPUT #1
2	17	CHARGE PUMP	CHARGE PUMP

8.0 DISCLAIMER

Use caution. CNC machines could be dangerous machines. DUNCAN USA, LLC or Arturo Duncan are not liable for any accidents resulting from the improper use of these devices. This product is not fail-safe device, and it should not be used in life support systems or in other devices where its failure or possible erratic operation could cause property damage, bodily injury or loss of life.