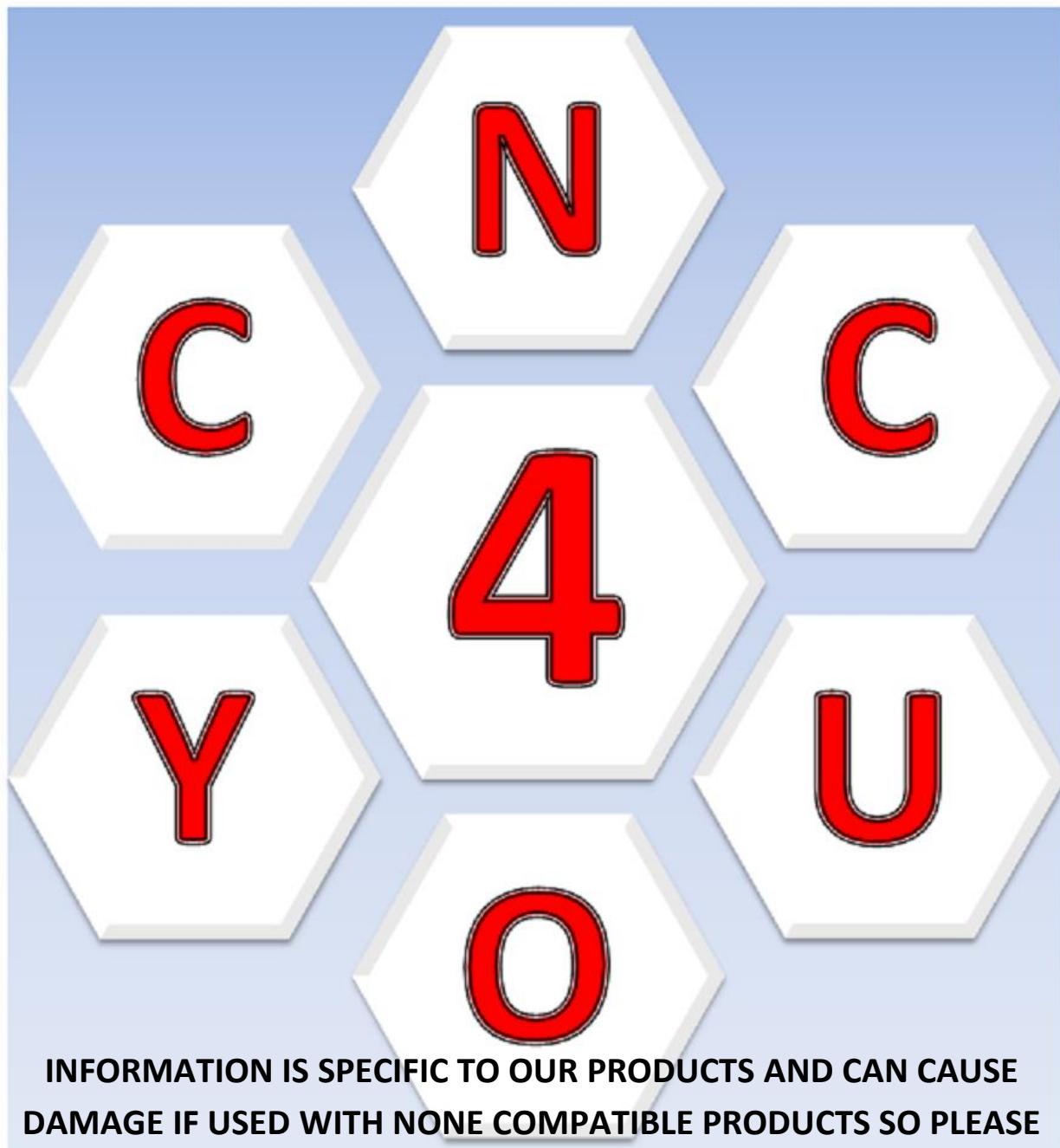


MANUAL FOR BREAKOUT BOARD HG08



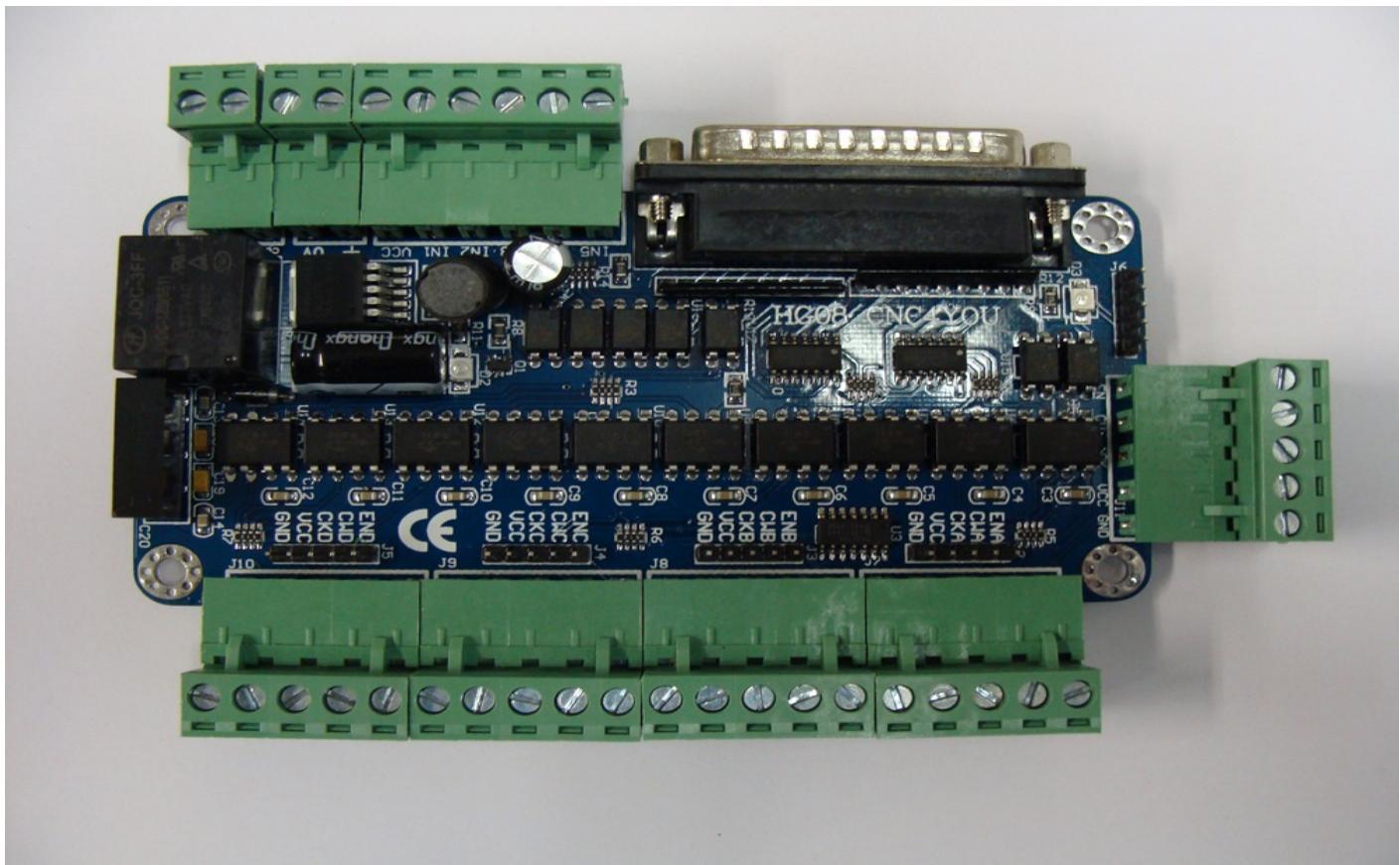
**INFORMATION IS SPECIFIC TO OUR PRODUCTS AND CAN CAUSE
DAMAGE IF USED WITH NONE COMPATIBLE PRODUCTS SO PLEASE
CHECK WITH YOUR SUPPLIER FOR COMPATIBILITY**

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MANUAL FOR BREAKOUT BOARD HG08



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1. FUNCTION INTRODUCTION

Our breakout board can be used to connect up to 5 Stepper Motors, or control 11 control output Lines and 5 input signals and can be powered from a voltage range of 7 to 55 Volts giving a large degree of flexibility and can be directly powered from our range of CNC PSU's consisting of 36 Volt 400Watt to our 48 Volt 500Watt or 600Watt Switchmode power supplies,

If you are using in an industrial or noisy environment or plasma systems we recommend using a front end filter and separate regulated PSU of between 9V and 24Volts.

Standard parallel port with onboard noise suppression and buffering using the 74HC14 high speed CMOS hex Schmitt inverter fabricated with silicon gate C2MOS technology all the inputs have 20% VCC hysteresis level.

This, together with its Schmitt trigger function, allows the device to be used on line receivers with slow rise/fall input signals wide operating range of high input voltage typically about 2.7Volts makes these boards more likely to accommodate new PC output levels but no guarantee can be given or presumed due to large variations in operating environments and design constraints on modern systems.

All inputs are equipped with protection circuits against static discharge and transient excess voltage.

On board power regulation is provided by using the LM2576HV series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (Buck) switching regulator, capable of driving 3A load with excellent line and load regulation. Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The LM2576 series offers a high-efficiency replacement for popular three-terminal linear regulators. It substantially reduces the size of the heat sink, and in some cases no heatsink is required as in our circuit as we are only using 300mA.

Other features include a guaranteed $\pm 4\%$ tolerance on output voltage within specified input voltages and output load conditions, and $\pm 10\%$ on the oscillator frequency. External shutdown is included, featuring 50mA (typical) standby current.

The output switch includes cycle-by-cycle current limiting, as well as thermal shutdown for full protection under fault conditions.

This then feeds a 1Watt isolated DC/DC converter B0505LS-1W with a high Efficiency up to 80% and 1KVDC Isolation to further enhance protection from machine to PC interface.

All outputs with the exception of the Enable line (74HC14 output) use the 6N137 single channel optocouplers consist of a 850 nm AlGaAS LED, optically coupled to a very high speed integrated photo-detector logic gate with a strobeable output. This output features an open collector, thereby permitting wired OR outputs. The coupled parameters are guaranteed over the temperature range of -40°C to $+85^{\circ}\text{C}$. A maximum input signal of 5mA will provide a minimum output sink current of 13mA (fan out of 8).

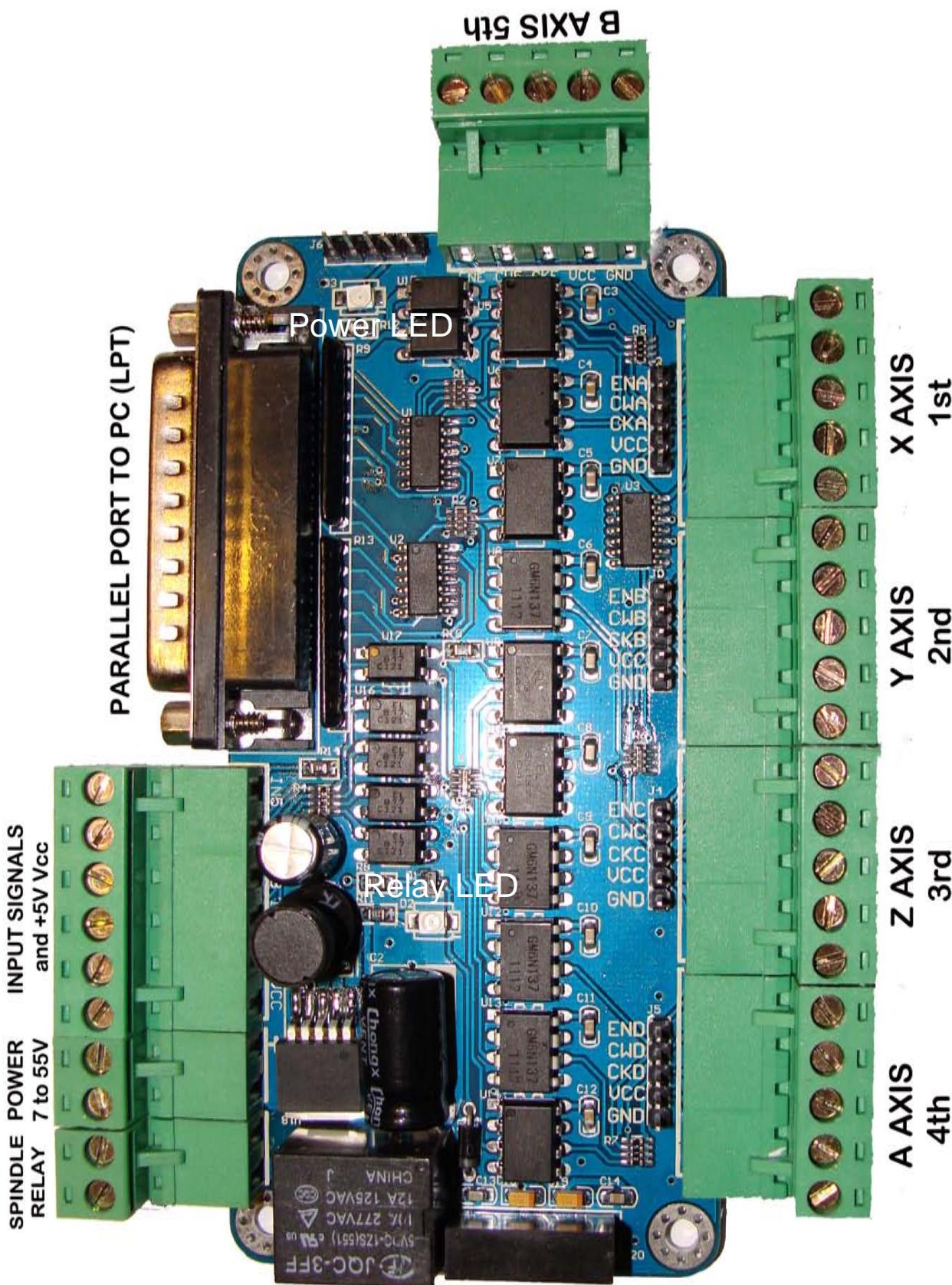
An internal noise shield provides superior common mode rejection of typically 10kV/?s.

Including relay control, it can switch your spindle motor, coolant pump etc.

this is rated at 10Amps at 277VAC and 12Amps at 125VAC which can be used to switch upto 2KWatts non inductive at 240VAC. This is a standard normally open output from this relay which can be used to switch on low voltage 24VDC from our range of VFD's to start spindle automatically under mach3 control upto switching directly our range of Kress spindles.

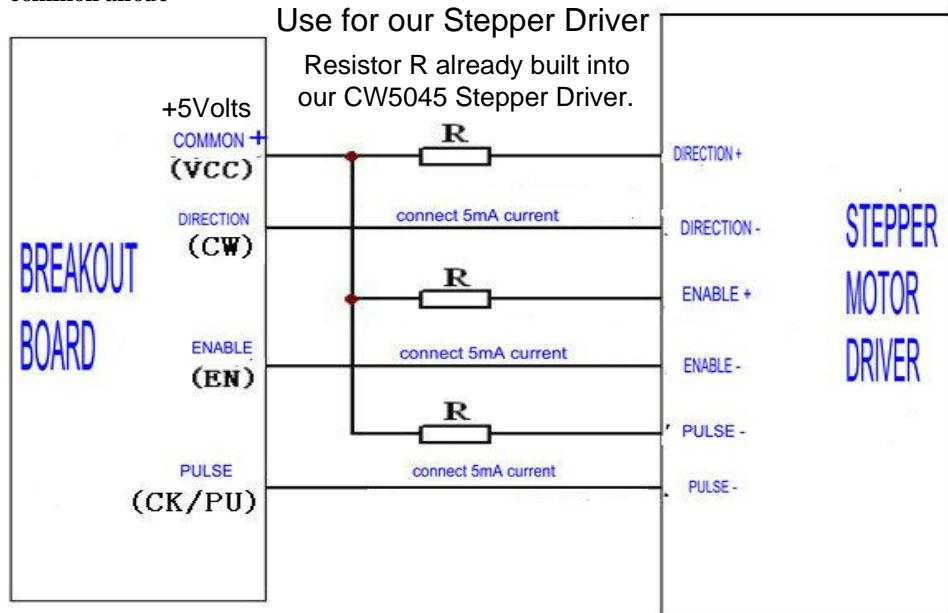
Input power supply voltage can be in the range of 7V - 55V power supply, you can use your regulated DC motor PSU if not exceeding 55 Volts.

2. OVERALL WIRING PINOUT

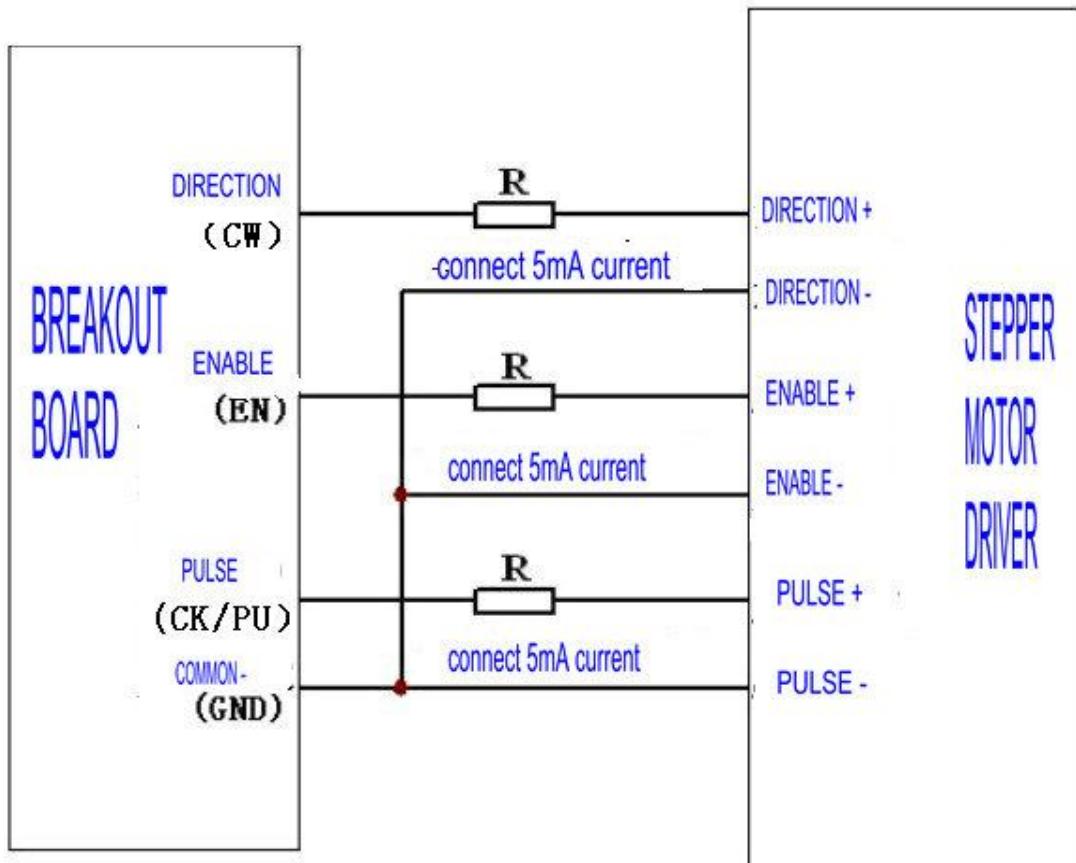


3. CONNECTION WAY FOR BREAKOUT BOARD AND STEPPER DRIVER

common anode



common cathode

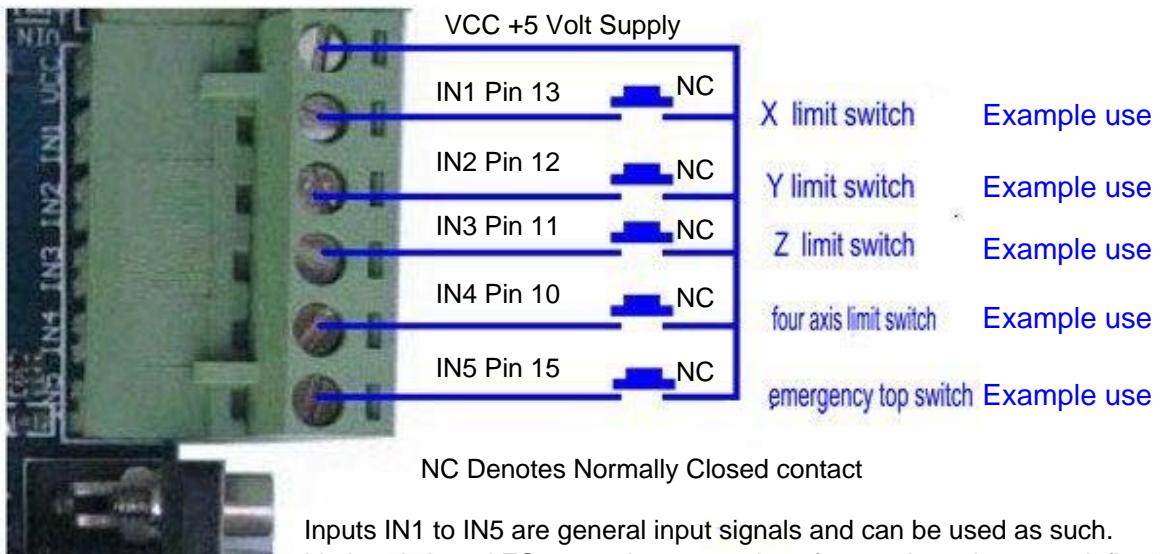


4. CONNECTION DIAGRAM FOR LIMIT SWITCH AND BREAKDOWN SWITCH

Input port pins are opto isolated and use isolated 5 Volts (VCC) for up to 1000V isolation thus helping to protect your PC or control electronics.

You can connect up to 5 lines with limit switches, emergency Stop switch, reset etc. you can connect sensors for robots etc.

This is just an example of connection you can follow it or use your own circuit diagram.



Inputs IN1 to IN5 are general input signals and can be used as such. Limit switch and EStop are just examples of use only and not pre defined. We would normally recommend using one input for all limit switches and wire them through normally closed contacts in series.

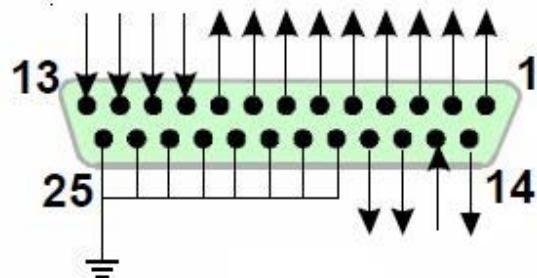
5. CONNECTION WAY FOR RELAY CONTROL PORT



Note: Relay can switch spindle motor or other devices.

A maximum 10A @ 277V AC or 12A @ 125VAC can be switched.

6. OUTPUT DEFINE FOR 25 PINS



View from computer printer port

Breakout board output signal define

PIN1	PIN2	PIN3	PIN4	PIN5	PIN6	PIN7	PIN8	PIN9	PIN10
EN	CKA	CWA	CKB	CWB	CKC	CWC	CKD	CWD	IN4
All axis enable	A axis pulse	A axis direction	B axis pulse	B axis Direction	C axis pulse	C axis Direction	D axis pulse	D axis direction	Limit switch1 example
PIN11	PIN12	PIN13	PIN14	PIN15	PIN16	PIN17	PIN18~25		
IN3	IN2	IN1	RLY	IN5	CKE	CWE	GND		
Limit switch2 example	Limit switch3 example	Limit switch4 example	Relay control	ESTOP switch example	E axis pulse	E axis direction	ground		

Inputs IN1 to IN5 are general input signals and can be used as such.

Limit switch and EStop are just examples of use only and not pre defined.

We would normally recommend using one input for all limit switches and wire them through normally closed contacts in series.

MACH 3 SOFTWARE SETUP

Mach3 software startup

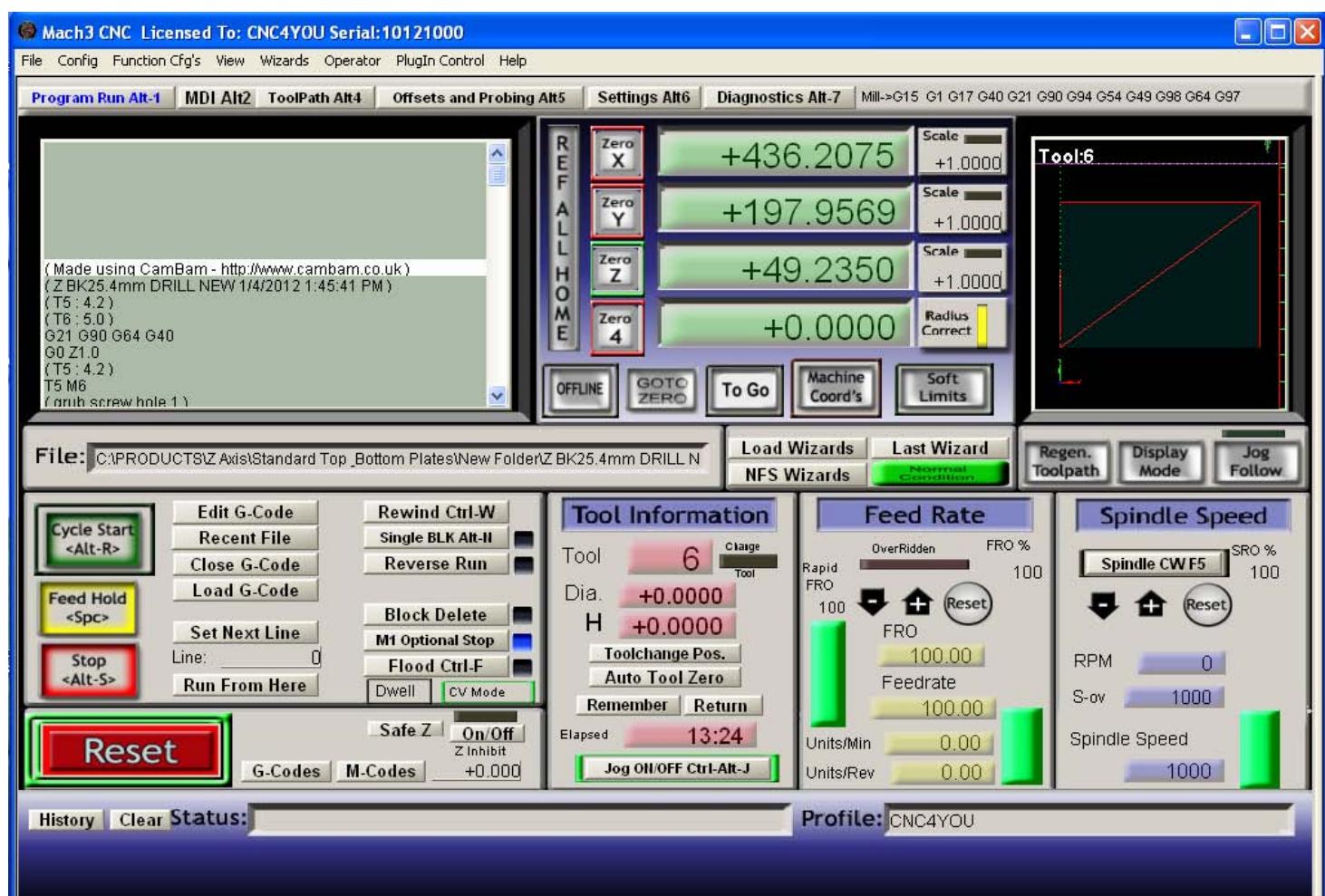
Download and install Mach3 software from the following link

<http://www.machsupport.com/downloads.php>

please select lockdown version if you are unfamiliar with Mach 3.

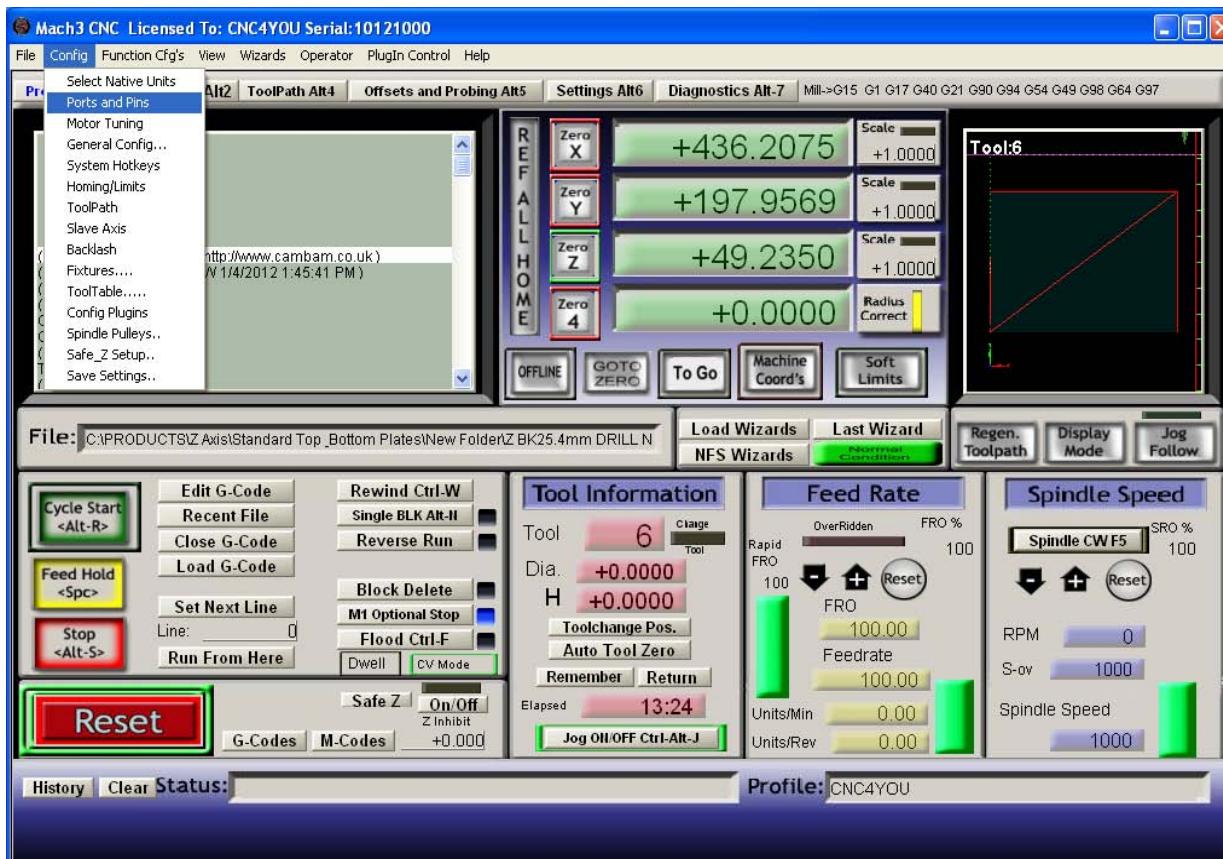
Place your licence file in the following folder if default installation has been used or select folder location you have selected on installation. C:\Mach3

Open Mach 3 software and you should see a screen similar to the one below.



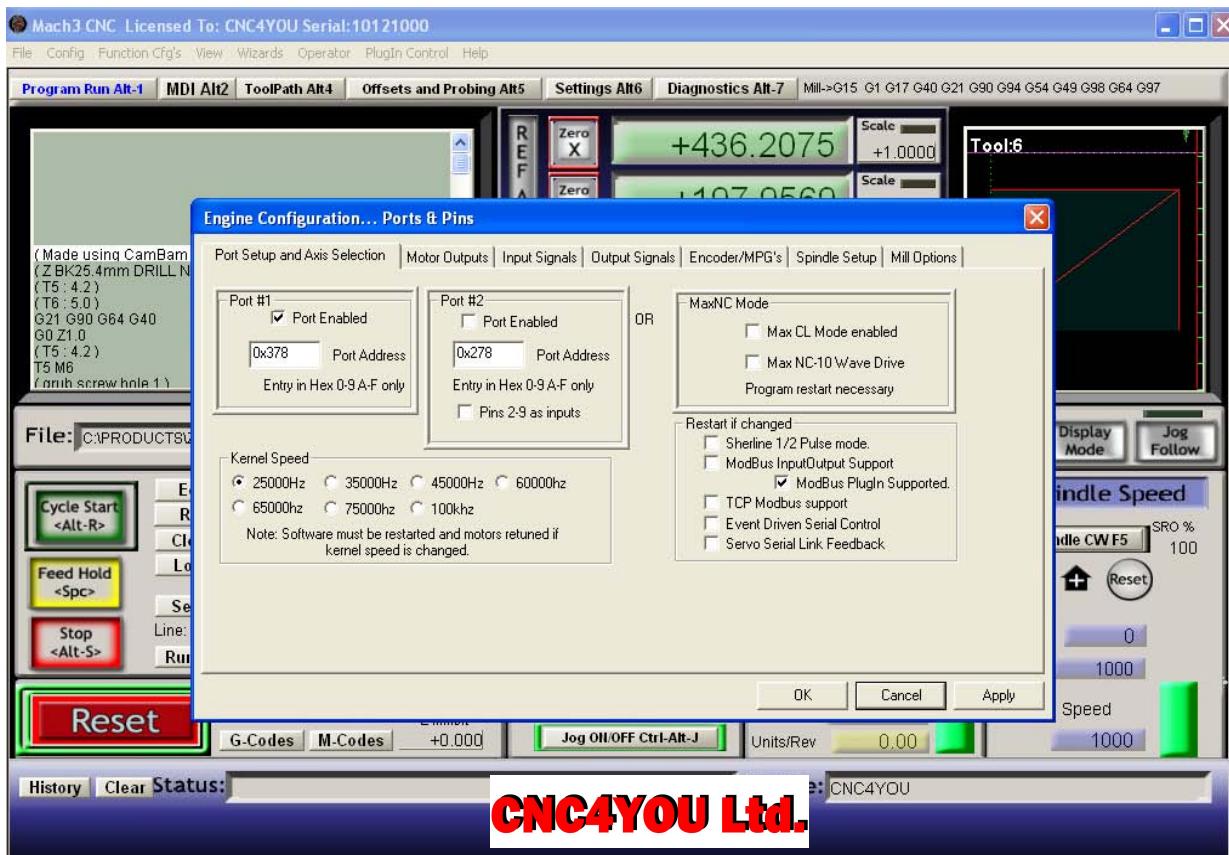
Along the top Menu Bar under Config go to ports and Pins as highlighted in Blue in the dropdown Menu and right click mouse button to select.

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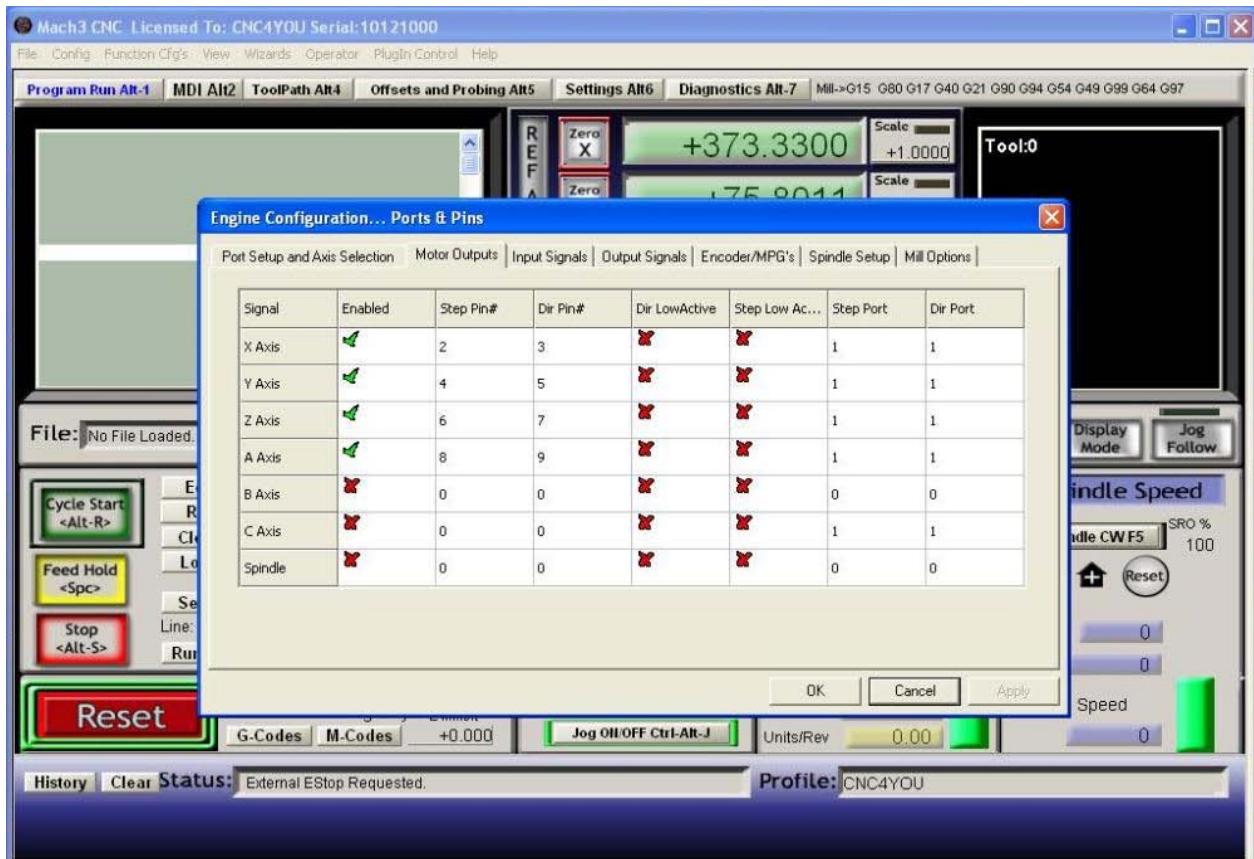


The following screen should appear this has information as to your port address chosen operating frequency etc.

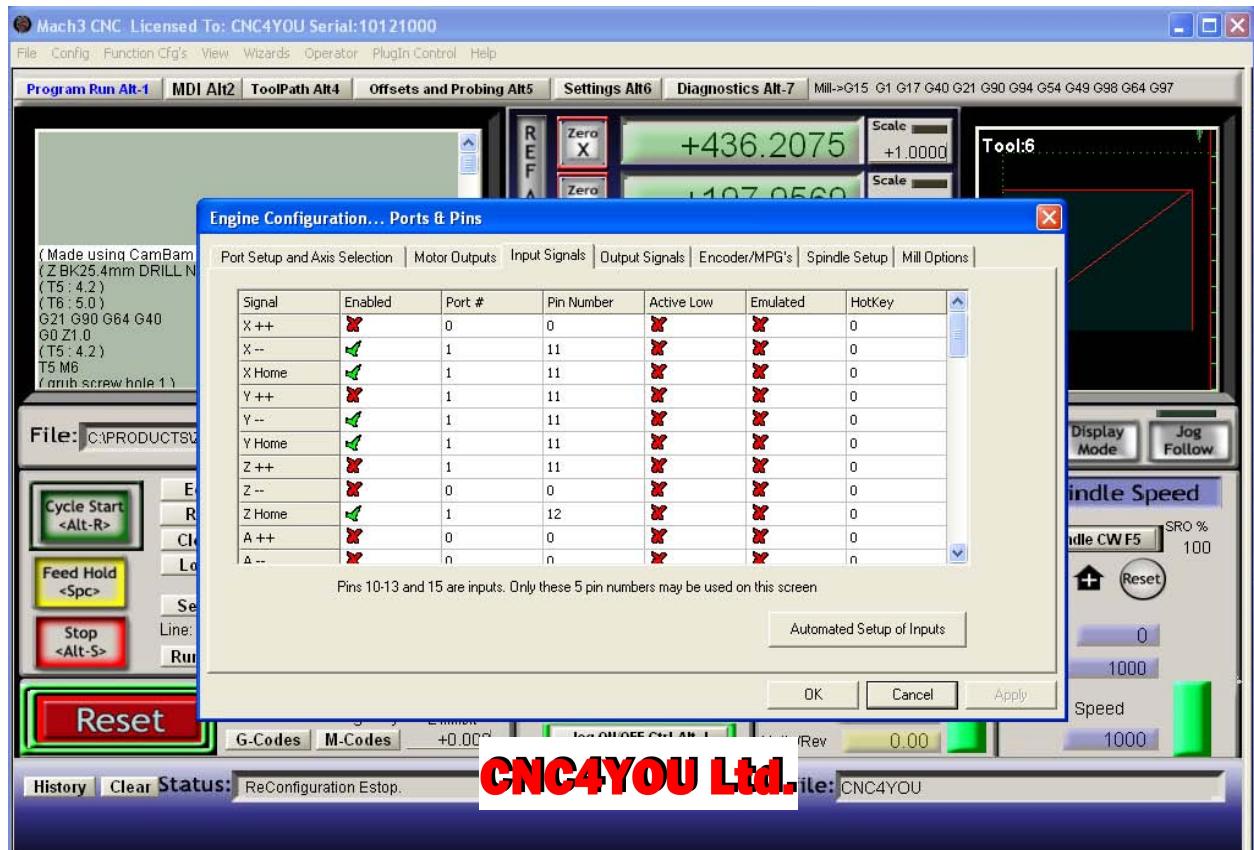
Under most circumstance these default setting are best used unless you have specific requirements or different port address.



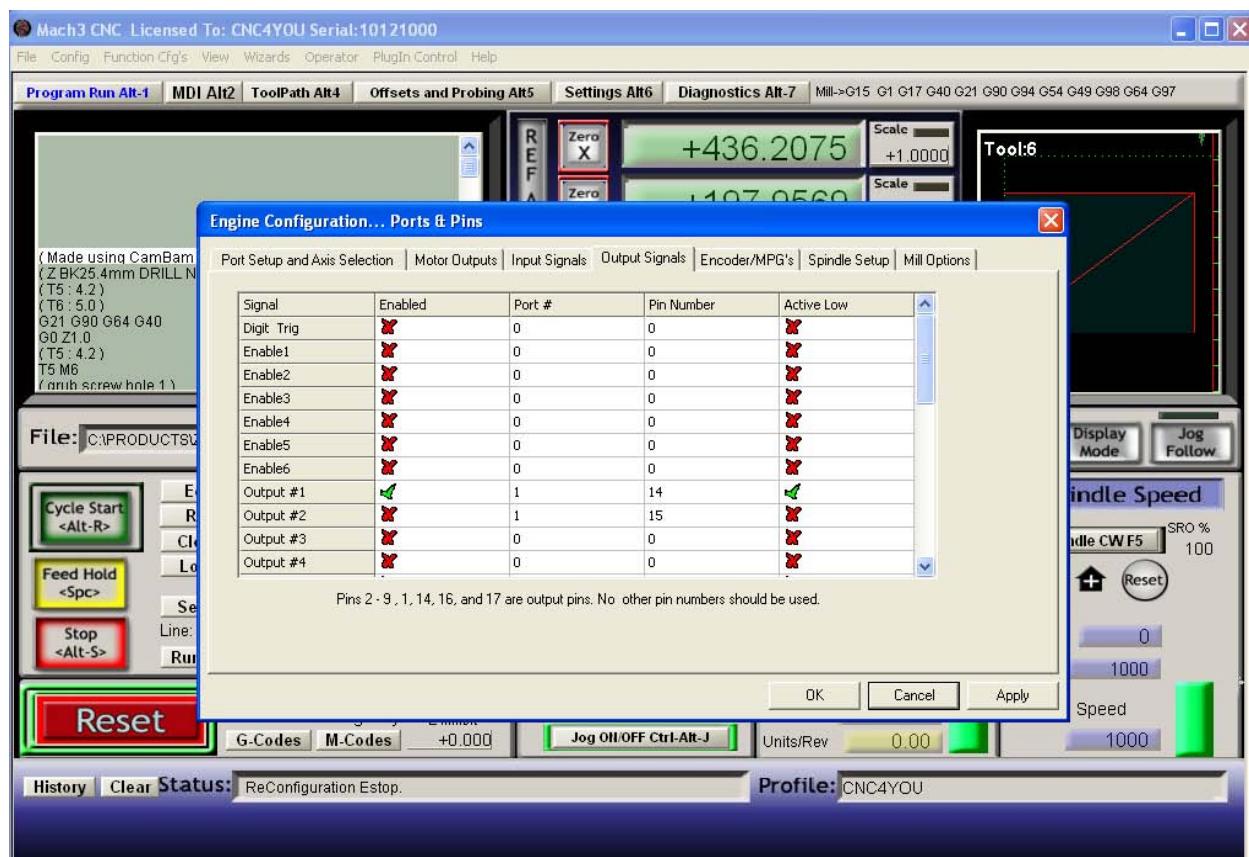
On inset menu along the top menu selection please click on Motor output to set, pin numbers for out put to your drivers. A four axis setup is shown but just populate B Axis with pins 16 and 17 in step and direction, enable axis and set outputs to port 1.



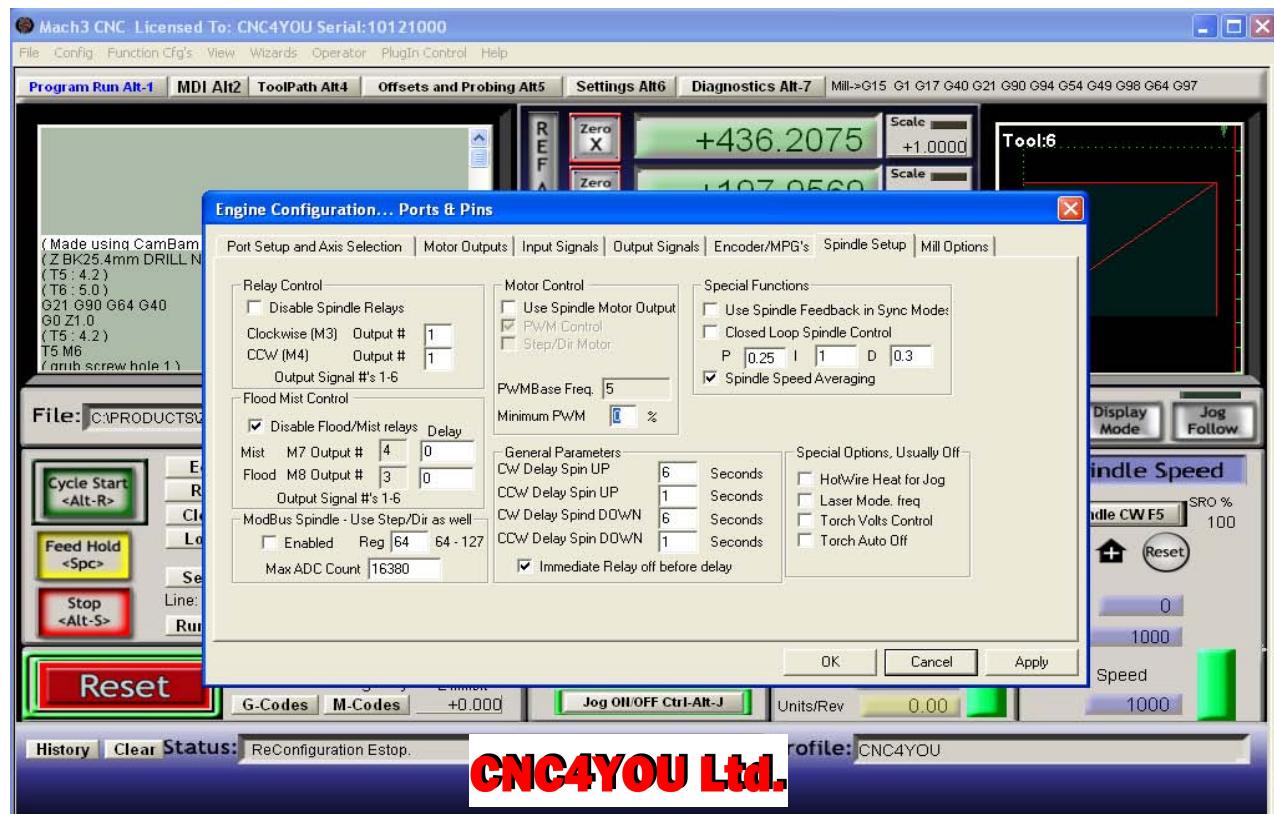
On inset menu along the top menu selection please click on Input Signal to set limit, E-Stop inputs these example are for normally closed contact switches. please note button at bottom of open window Automatic Setup of Inputs this allows for ease of setup automatically by Mach3.



On inset menu along the top menu selection please click on Output Signal to set pin for relay operation.



On inset menu along the top menu selection please click on Spindle Setup to set operation of relay under Mach3 control for automatic switching spindle On and Off. Make sure Disable Spindle Relays is unchecked and at least M3 Clockwise is set to output 1.



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