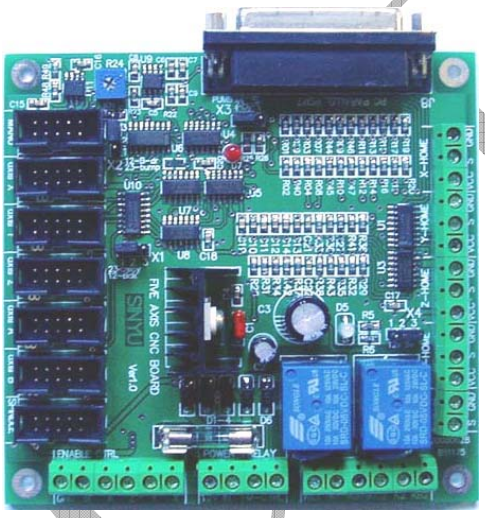
SINYU 5 Axis CNC interface board Ver 1.0

Instruction



Please read thid instruction before you use the interface board

【Characters and Features】

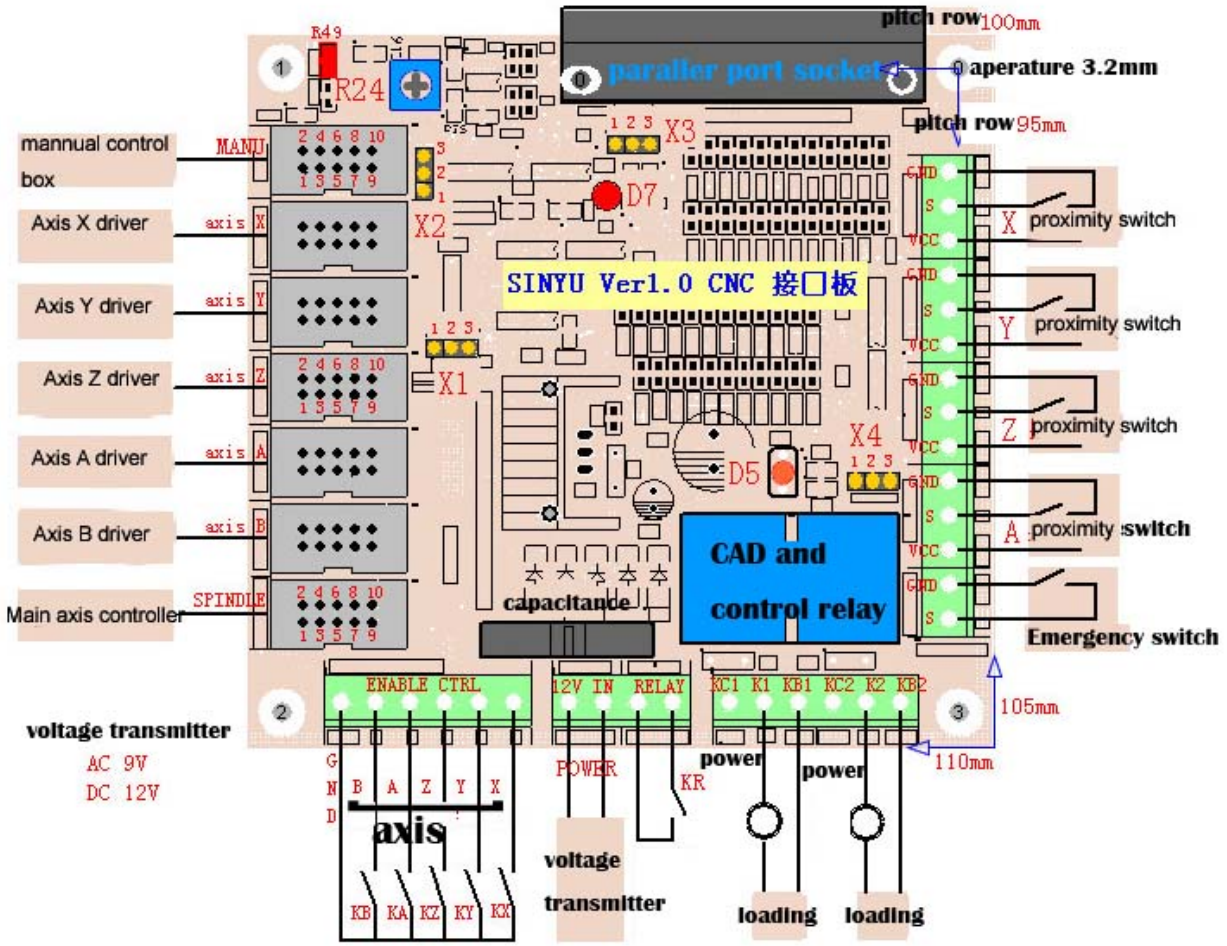
5 Axis CNC interface board (Ver1.0) with perfect design can satisfy CNC softwar through computer parallel port connection and control numerical control device and mutual function of I/O . It is much more made by patch element and grounding typographic block design with large acreage copper on it. It makes sure the stability of the electric property, and the independent power supply interface circuit separate the back degree and computer parallel port to make sure the security of the computer. It is very convenient to install the interface board and electric connection adopt to socket connector. It adopts to connect computer parallel port and photoelectrical isolated electric motor driver and auxiliary equipment, signal test element and so on.

◎ Support directly parallel port PC software just as KCAM4、MACH、NINOS and so on
◎ Can matching use with the stepper motor which with photoelectrical isolated and with standard positive end connection.
◎ Can external connect main axis control board (just as transducer or DC electric motor speed governor, output PWM and direction signal, need software support)
◎ Can deloy the function of the auxiliary equipment signal output to use on the cooling fluid, the tightness of the chuck (double wires output, can ‘open’ and ‘off’ at the same time)
◎ 4 wire origin /mechanical limit signal input, can externally connect mechanical switch, groove model light coupled, approximate switch and so on
◎ Through enbale control interface can externally connect unit corrector to realize the 5 axis unit correction operation
◎ Can externally connect dead-stop push button. If it has some emergency, you can stop the software immediately
◎ All the input and output signals are changed by Simt, and it has no limitation for the rising and trailing edage.
◎ Interface board PCB adopt double-sided wiring, grounding with large acreage copper on it to make sure all the signals integrity
◎ Can break away the computer parallel port to realize the stepper motor operate by manul (stepper motor pulse signal generator on board)
◎ Building whole current filter circuit in the interface board to let the power supply choose flexible
◎ CHARGE PUMP security protection function to avoid the operation chaos when the whole series CNC system can not nomally output indicating signal

【Connect line and useness】

Can choose the suitable function and set the corresponding software according to your actual need, socket connector function instruction mark on the typographic board, the function does not use and you can leave unused.

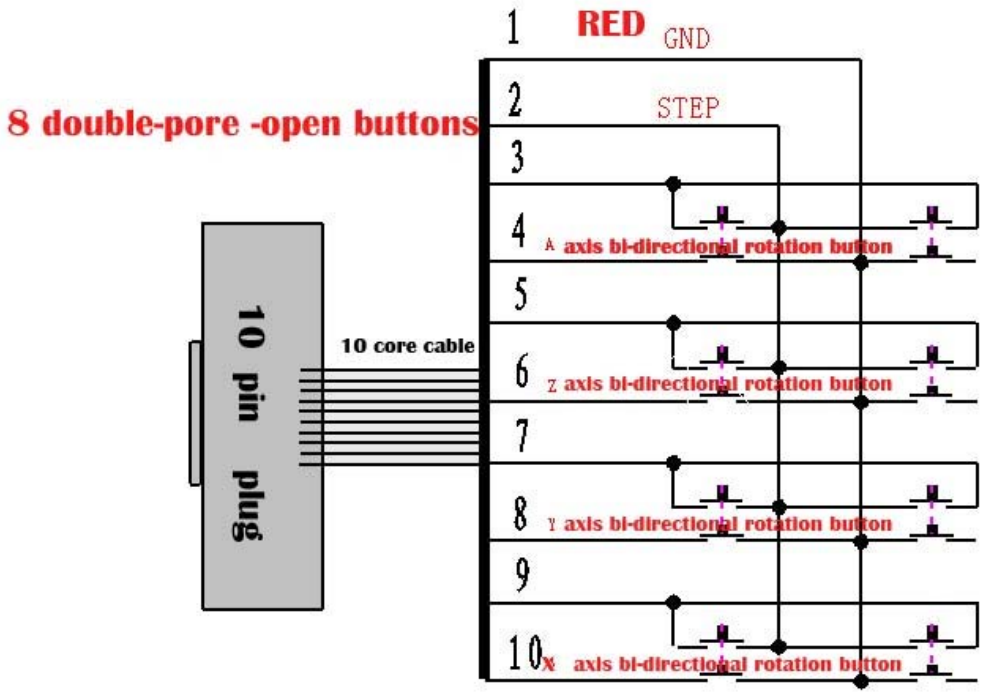
1) Port POWER 12V IN is voltage convertor which support power for the interface board should choose photoelectrical isolated voltage convertor. It is the convertor that can switch in about 500MA output current, AC9V voltage or DC12V voltage convertor, and do not need to differentiate the polarity。
2) The approximate switch which port VCC S GND limit/origin test should choose: power supply voltage DC5V or DC 12V, output model is NPN collector open circuit output nomal open model. Can also choose nomal open mechanical limit switch, then it need not to connect VCC wire.(the meaning to nomal open is that when executed program do not exceed or the mechanical position do not reach the zero point, the switch if off.)。
3) Port KC K KB The maximum load of the relay which is controlled by cooling fluid, the tightness of chuck and the auxiliary equipment is AC250V2A, K is the sharing wire, KC is nomal open, KB is nomal close. Considering security and obstruction elements,we suggest that you can use safely voltage control under 60v or use relay on board as intermediate relay.
4) Port MANU Manual control push button interface through corresponding 10 cores winding displacement connect externally double-pole nomal open push button, and can realize X,Y,Z,A axis' s operation when break away the computer' s parallel port(every axis use 2 push buttons to control the corotation/rollback). When the rotate speed can not satisfy the need can change R49 resistance value(pretermission:10k)
5) Port axis X(or Y/Z/A/B) is 5 axis anode end, single pulse mode stepper drive signal interface.Insrt pin definition: pin 1, 3, 5 is +5VDC; Pin 2 is stepper CLK pulse; Pin 6 is enable(off-line) EN pulse;Pin 7, 8 is power supply cathode GND; Pin 9, 10 is empty
6) Port SPINDLE Main axis control interface can externally connect main axis controller(just as transducer or DC electric motor speed governor, output PWM and direction signal, and it need software support).Insert pin definition: pin 1, 2, is +12VDC; pin 3、4 is +5VDC; pin 5、6 is PWM signal; pin 7、8 is DIR signal; pin 9、10 is power supply cathode GND。



CNC 接口板 连线示意图

7) Port PC PARALLEL PORT SOCKET, through corresponding parallel port wire connect with the parallel port of the computer and fix it.
8) Port M-CTRL relay's manual control interface. When bridle wire X1's 1, 2, pin connect, 2 relay on board are controlled by switch KR which connect this port.
9) Port S GND dead-stop switch interface。
10) Bridle wire X1 is the choice of parallel port 3 feet signal as B axis's pulse signal; when pin 2、3 connect , parallel port 3 feet signal as cooling pump and auxiliary equipment's signal. (when use B axis, shoule let the bridle wire jump to pin 1, 2 connect, at the same time the cooling pump and the auxiliary equipment's control relay is controlled by external swirch by manual, meanwhile, the computer software should do some corresponding setting)。
11) Bridle wire X2 makes the functional choice for the parallel port 9 feet signal. When pin 1, 2, connect, parallel port 9 feet signal as B axis's direction signal; when pin 2, 3 connect, parallel port 9 feet signal as CHARGE PUMP's control signal. (when use B axis, need let bridle wire jump to pin 1, 2 connect and let X3 jump to CHARGE PUMP unused condition. Meanwhile, the computer software should do some corresponding setting).
12) Birdle wire X3 makes some function setting for CHARGE PUMP. When pin 1, 2 connect, this function enable; when pin 2, 3 connect, do not use this function(CHARGE PUMP as a system's safety function, when PC does not work nomally, the main axis, cooling pump and stepper motor will be in chaos.)

13) Birdle wire X4 is the approximate switch power supply's choice. When pin 1, 2 connect, approximate switch's power supply voltage VVC is 12 VCD (the same with the power supply voltage of interface board). When pin 2, 3 connect, approximate switch's power supply voltage VCC is 5VDC.
14) Indicator lamp D5 will indicate red when interface board input power; when relay-operating indicate yellow.
15) Indicator lamp D7 is CHARGE PUMP state indicate. When it does not light, all output is closed. When it lights, output signal open and is controlled by the computer software.
16) Regulation resistance R24 use for adjusting CHARGE PUMP signal locking frequency. CHARGE PUMP signal is abaout 12.5KHz pulse signal. However, due to the allocation difference of the computer or the other reason, frequency value is not accuracy, it maybe need adjust R24 again to let the control circuit obtain the signal on the board. When the signal is locked, D7 will light. Interface board has adjust to the proper position. Due to some reason need adjust again, please adjust it under the condition of the computer signal set right and use the proper tool vernier regulation. If the computer and software setting are not right, no matter how to adjust the signal will not be locked (D7 does not light)。
17) When you install this interface board please according to this picture. In this picture, installment size is fixed, the underside of the interface board must leave electric chassis floor above 8mm, peripheric and above also should keep a certain distance with the electric board. This can avoic leading to short circuit.
18) Interface board cannot use under the conditin of metal dust, damp, rusty and strong shock。



MANU socket, connection and manual push button schema

Instruction: usually, the connection of the axis X/Y/Z/A

Interface board 5 axis socket winding displacement	Stepper driver signal input		Interface board 5 axis winding displacement	Stepper driver signal input
1 red +5V	CP+		6 enable/off-line	EN- eligilble
2 stepper pulse	CP-		7 0V GND	impendence
3 +5V	DR+		8 0V GND	impendence
4 direction pulse	DR-		9 NC	impendence
5 +5V	EN+ eligibility		10 NC	impendence

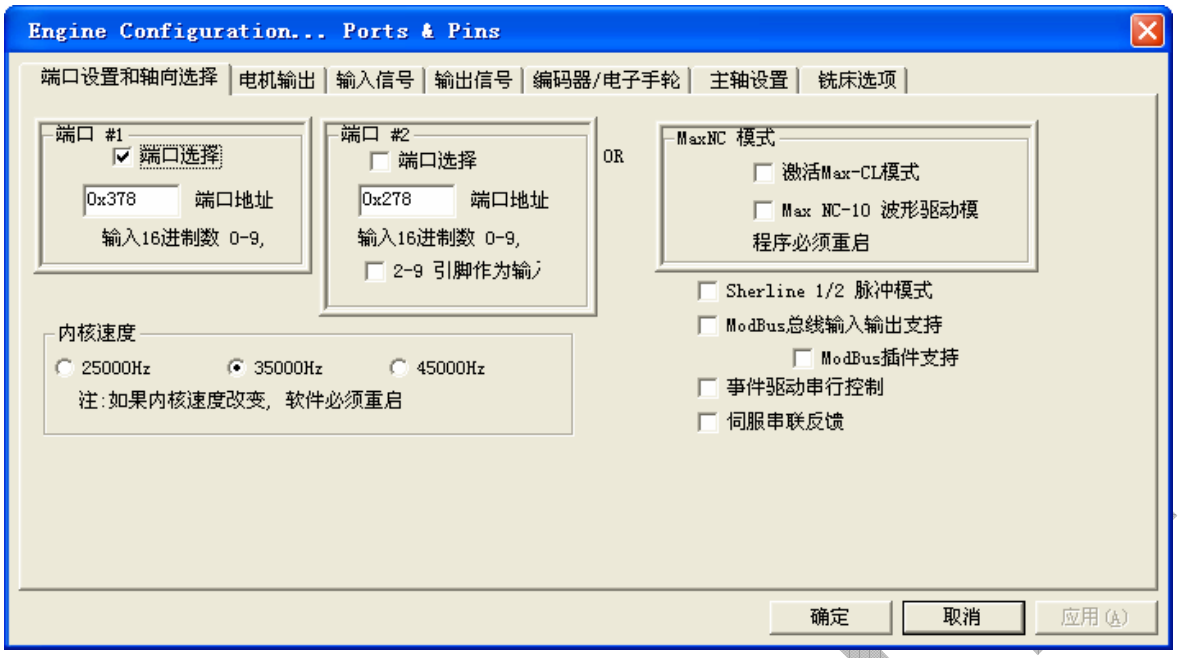
【computer software setting】

Parallel port pin setting

Signal name	Parallel port pin	Signal flow direction	remarks
X-CLK	7	output	X axis stepper pulse
X-DIR	17	output	X axis direction signal
Y-CLK	6	output	Y axis stepper pulse
Y-DIR	8	output	Y axis stepper pulse
Z-CLK	5	output	Z axis stepper pulse
Z-DIR	16	output	Z axis direction signal
A-CLK	4	output	A axis stepper pulse
A-DIR	14	output	A axis direction signal
B-CLK/auxiliary device control	3	output	
B-DIR/charge pump Charge Pump	9	output	Security function
Main axis pulse	2	output	
Main axis direction	1	output	
X limit /origin	12	output	
Y limit /origin	13	output	
Z limit /origin	10	output	
A limit /origin	15	output	
Dead-stop	11	output	

Take MACH3 for example

Parallel port setting



Instruction: interface # 1 is NO.1 parallel port, interface choice mark "√" indicate this parallel is valid, ox378 nether is the address of 1 parallel port; kernel speed is the highest output frequency settign, you can make a choice according to the computer's configuration, when the configuration is good, you can choose 4500Hz to reach higher operating speed, the other option advice you to adopt the default setting

Electric output setting

Instruction

1、*Enable* mark "√" indicates valid

2、*Step pin#* *indicates this axis pulse signal corresponding parallel pin, please set it*

according to the setting of parallel port pin

3、*Dir Pin# indicates this axis direction signal corresponding paralle pin, please set it according to the setting of parallel port pin*

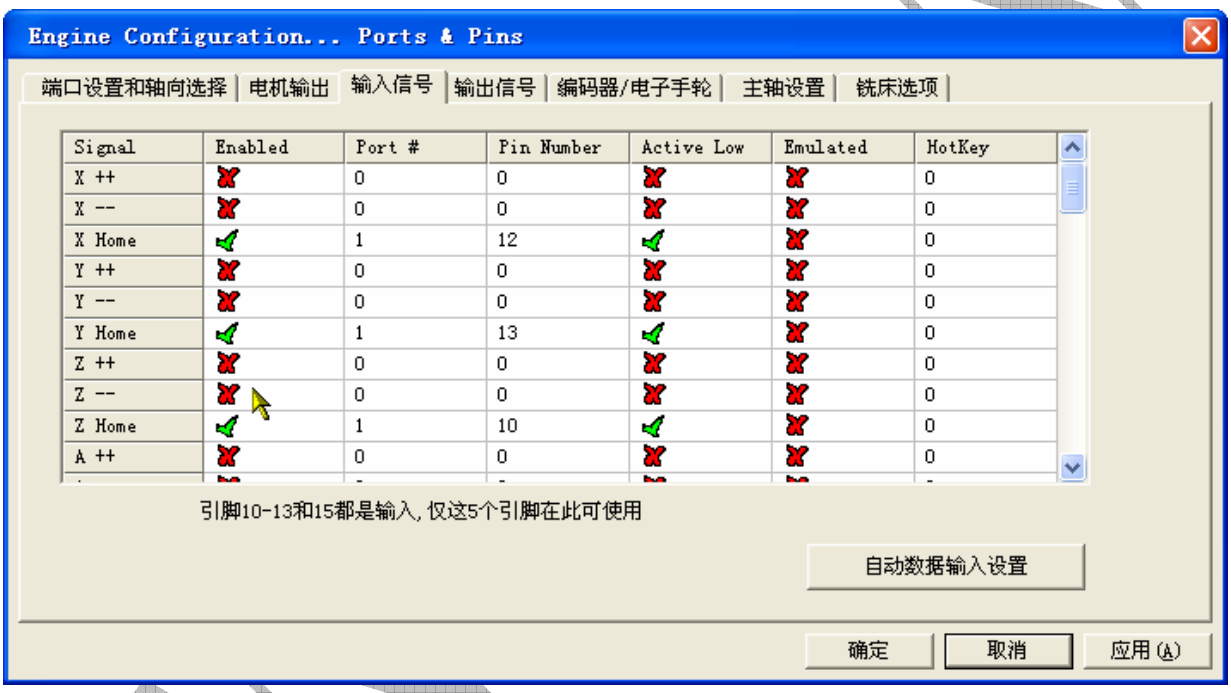
4、*Dir Lowactive mark "√" indicates direction signal low PWL valid, this board is valid when it is low PWL*

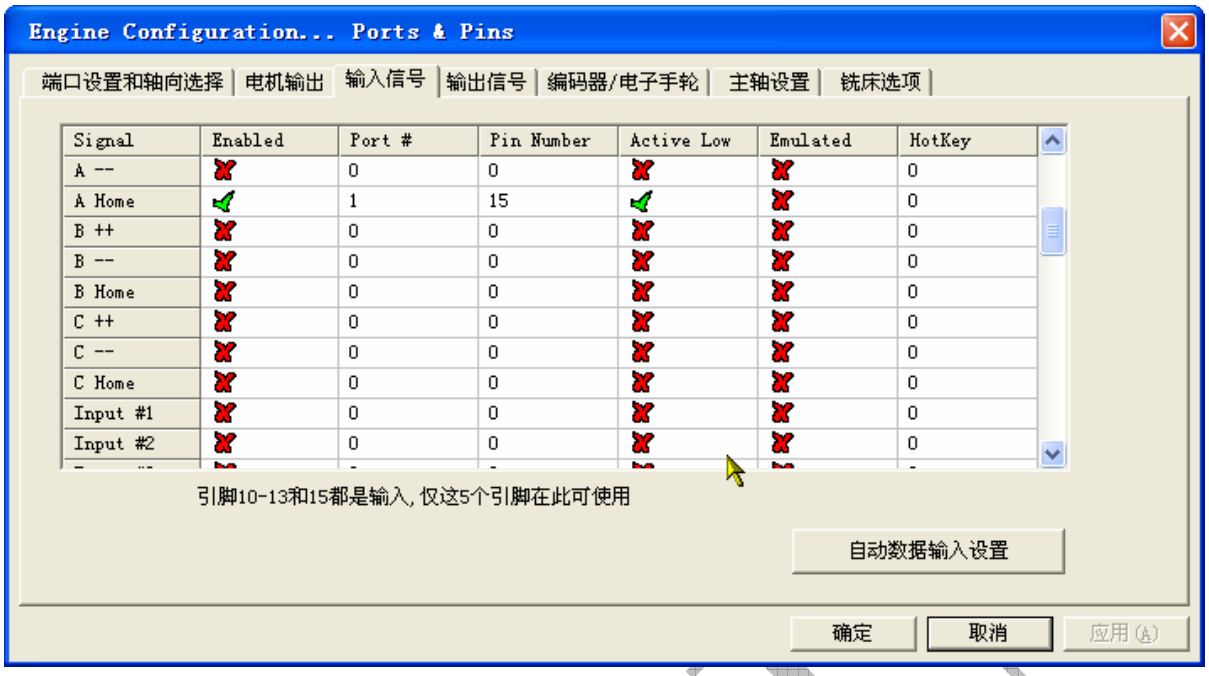
5、*Step Lowactive mark "√" indicates pulse signal low PWL is valid, this board is valid when it is low PWL.*

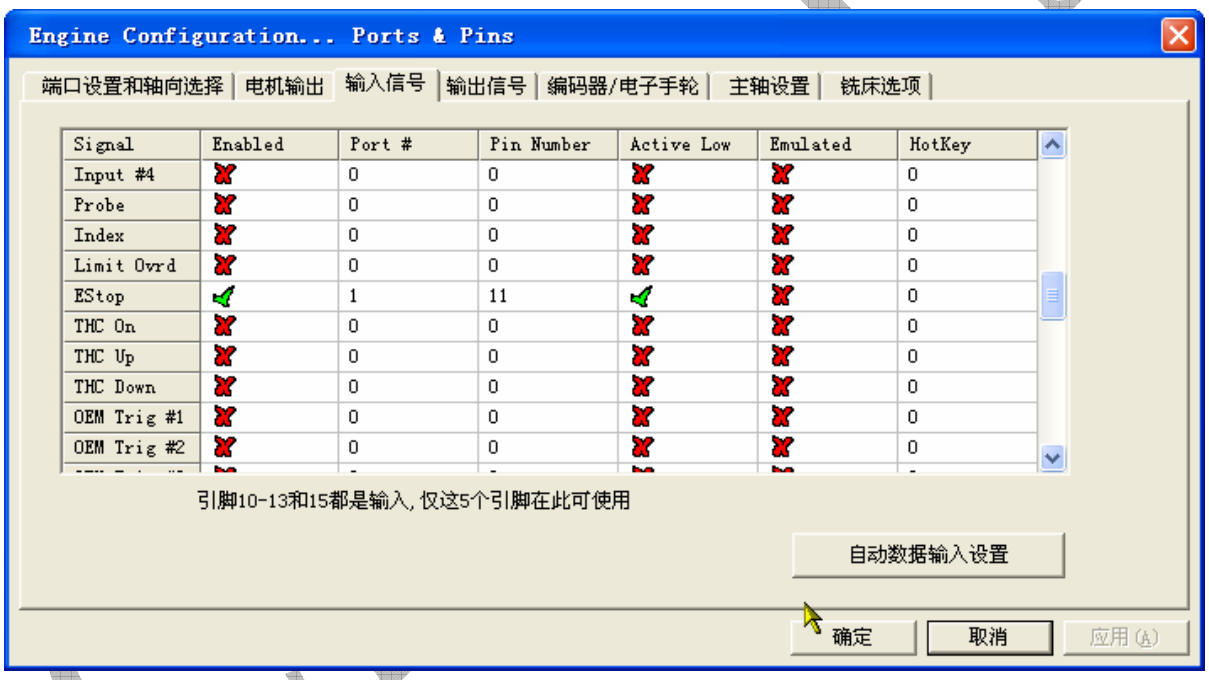
6、*Step Port is pulse signal parallel port setting, in parallel port setting, if use 1 parallel port and connect to the 1 parallel, you shoule set it as 1, if it is 2 parallel and it shoule be 2.*

7、*Dir Port is direction signal's parallel port setting.idem*

Output signal setting







Instruction:

1、 Enabled indicates this signal enable

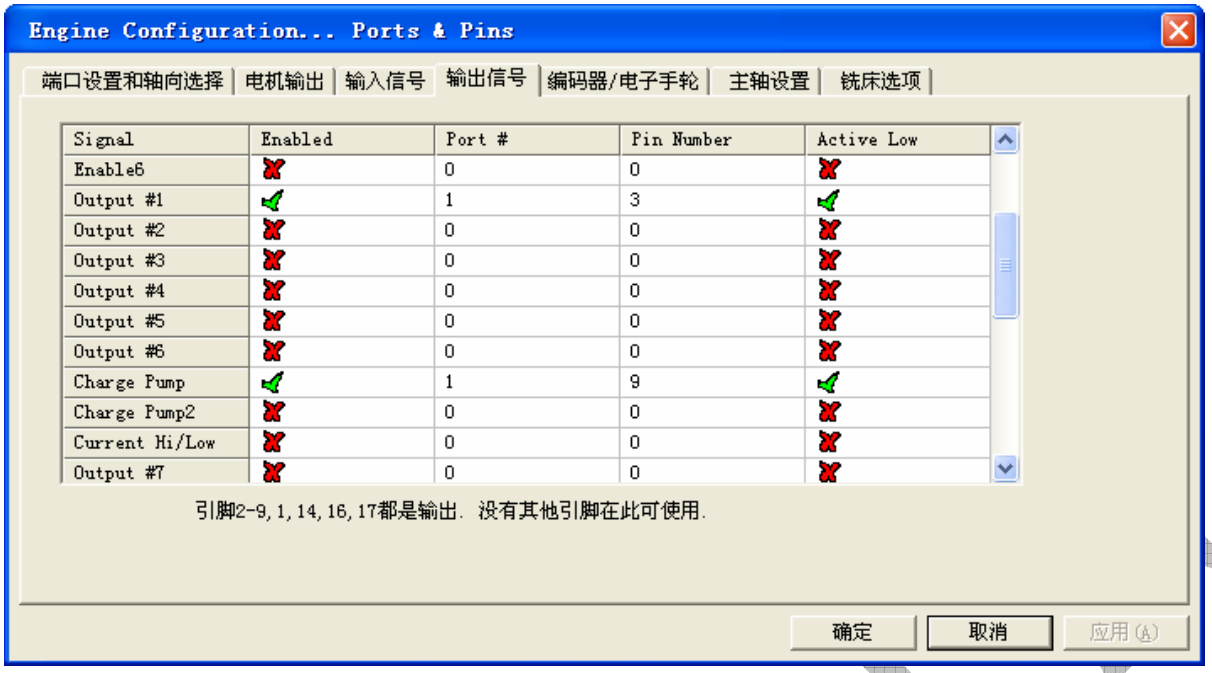
2、 Port# indicates the number of this signal connected

3、 Pin Number indicates the pin number of this signal connected

4、 Active Low is the PWL valid choice, mark "√" is PWL valid, this board is valid when it is Pwl

5、 X Home/Y Home/Z Home/A Home respectively are the limit or origin signal of X/Y/Z/A axis E Stop is external dead-stop switch pin number. The other input signal should be invalid.

Output signal setting



说明:

1、*Output#1 is 1 output pin, after you set the interface, you can take the port as output in the other please's setting, and control the auxiliary equipment (cooling liquid, the tightness of chuck and so on)*

2、*Charge Pump is output pin of the CHARGE PUMP, when this pin does not set proper, and if X3 bridle wire on the interface board set as CHARGE PUMP function, D7 indicator light is not light,meanwhile all the output signals are close.*

【Trouble Clearing】

symptom	Possible reason	method
D5 cannot radiate red light	Does not connect with power supply	Examine the circuit
	fuse on the board burn-out	change the same size fuse with 1A current
	Auxiliary device control ralay has been together	normal , diode radiate yellow liaght
	Interface board damage	Contact supplier
MANU control invalid	does not pluck off the parallel port line which connect the computer	Pluck off the parallel port line which connect with the computer
	manual push button connect error or has some defects	Examine the line or change the invalid push button
	机 electric motor desynchronizing when manual operate	choose higher driver resolution
	Interface damage	Contact supplier
D7does not light （CHARGE PUMP signal is not locked）	Software does not set rightly	reinstall software
	bridle wire on the board is not right	examine the bridle wire setting
	Interface damage	Contace supplier
Stepper motor connected does not work	Software does not set rightly	reinstall software
	the signal line between interface and driver is not right	examine signal line
	driver/controller supply power is not nomal	examine driver/controller supply circuit
	drive/controller damage	change driver/contrller
	Electric motor damage	Change electric motor