



BCAMCNC

series

Machining Center Machine Operation Manual

**OSAI WINNBI Ver.4.0.1
BCAMCNC operate panel Ver.ENG_1_0**

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A. INSTALLATION

1. INSTALLATION

1-1 Environment

1-1-1 Ambient Temperature

- (1) In Operation : 0°C ~ 40°C
- (2) While shutting down or transporting : -20°C ~ 60°C

1-1-2 Temperature Variance

- (1) Max: 1.1°C / minute

1-1-3 Humidity

- (1) Max: 7.5% (Relative humidity)
- (2) Short time: 95 % (In a month)

1-1-4 Vibration

- (1) In Operation: Max 0.5g
- (2) Transporting: Max 3.5g

1-2 Power supply source

1-2-1 Capacity: Marked on machine plate.

1-2-2 Voltage: Customer request.

1-2-3 Circuit breaker: Must be equal to main circuit breaker.

1-2-4 Frequency: 50 / 60 HZ ± HZ

1-2-5 Grounding: Please connect yellow and green cable to electrical pane, inside it input PE on one side and connect the ground on another.

1-3 Direction of the motor

Must confirm the of the motor when install or reinstall electrical cable.

- (1) SPINDLE MOTOR.
- (2) VACUUM PUMP.
- (3) COOLING BY AIR.
- (4) BORING HEAD MOTOR.

1-4 Air pressure source

Operating pressure: 6 bar

1-5 Vacuum

Operating pressure: AT LEAST 0.25 MPa

2. CAUTION

2-1 Operation

2-1-1 Assign professional operator.

2-1-2 Do not put anything irrelevant on the working table.

2-1-3 All operators are not allowed to stand on the working table unless switching to manual mode or repairing the machine.

2-1-4 Before starting the machine, please confirm there's no operator or other irrelevant stuff.

2-1-5 Helmet and protection glasses are necessary and do not operate the machine with gloves.

2-1-6 Keep clean around the machine and working table.

2-1-7 When the warning appears, operators must stop everything to solve the problem. And operate the machine again.

2-2 Operating spindle

2-2-1 Before tool change, please check below the actions done.

◆ Please check if the spindle stops.

❖ Press E-STOP button or spindle lock to prevent operators harmed due to neglect or abnormal start.

◆ Please mount with the collet chuck, nut, pull stud of the shank.

☒ Please correct the number of spindles after manual tool change, or difference between tool and memory may happen and cause crash of the machine.

2-2-2 Balance of the cutting tools must be made, especially the tool with bigger diameter. TO reduce the life of the spindle.

2-2-3 Please make sure the spindle reaches its working speed. Then operators can start processing.

2-2-4 Due to safety and smooth working concern, please brush down to clean the dust and wood.

2-3 Automatic tool change

- 2-3-1 Geneva type magazine, the tool number should be the same as the tool magazine. Tool number should be the same the parameter, or here may occur abnormal condition when executing ATC.
- 2-3-2 No manual push button for magazine in/out, operators can only execute under MDI mode.
- 2-3-3 Manual operating magazine CW and CCW. Please make sure nobody beside the tool magazine to avoid danger.

2-4 Vacuum suction

- 2-4-1 After starting vacuum pump, should switch on vacuum suction or start M103.
- 2-4-2 When executing the program, the vacuum suction will automatically start. When the program stops, the vacuum suction will automatically switch off.
- 2-4-3 Above M code should be added in the program, or you should manual start it.

2-5 Maintenance

- 2-5-1 Please do not modify the machine without understanding, or the machine will run out of order or cause damage.
- 2-5-2 Please switch off main power before maintenance.
- 2-5-3 Turn off main power before opening the electrical panel. Close the electrical panel before switch on main power.
- 2-5-4 Check E-STOP push button on schedule if it functions well.
- 2-5-5 Please repair according to documents.

2-6 Maintenance-lubrication

- 2-6-1 **3 point air pressure grease 10#, refill when reach certain low level.**
- 2-6-2 **Please use appointed oil to vacuum pump every 1000~1500 hours.**
- 2-6-3 **Cooling water should be changed every six months and must use appointed water.**
- 2-6-4 **Add once a week the grease on ball screw.**
- 2-6-5 **SPINDLE LUBRICATING, PLEASE ADD ESSO-325 ONCE A WEEK. (NON-ATC SPINDLE)**

2-7 Other maintenance

2-7-1 Vacuum filter needs cleaned everyday to prevent wood dust into the vacuum pump.

2-7-2 Clean the electrical panel and operating panel once a week whit air to prevent the interference from dust.

2-7-3 Vacuum filter needs cleaned once a week.

2-7-4 Keep the machine rolling rail smoothly without dust interference.

2-7-5 To avoid cooling effect, the filter of cooler needs cleaned everyday.

2-7-6 Keep clean the operating panel and computer screen everyday.

2-7-7 From time to time, please keep clean the cooling fan of the electrical panel to prevent dust in electrical panel and lower the performance of cooling.

2-7-8 Clearance of magazine, please pay attention to the dust to prevent the tool changing.

2-7-9 Pay attention to nitrogen pressure if it's lower than standard and if so, please add more nitrogen.

B. OPERATION

1. OPERATING PANEL

CONTROL PANEL ON SCREEN

The screenshot shows the OSAI ProcessController software interface. The main control area is divided into several sections:

- Top Left:** FULLTEK PROFESSIONAL CNC logo and OSAI logo.
- Top Center:** Mag. Pocket 1, Tool in Spindle 1.
- Top Right:** A table showing Work, Programmed, and Origin values for X, Y, Z, W, and C axes.
- Middle Left:** CNC PROCESS (NLOAD, D1), MODE STATUS (HANDWHEEL, IDLE), and Feed/Speed/Rapid/Jog settings.
- Middle Right:** A table showing G and M codes and their values.
- Bottom Left:** Selected PP and Program Message area.
- Bottom Center:** A row of control buttons: START, HOLD, RESET, AUTO, BLOCK, JOG, RAPID, MDI, BR1UD, BR2UD, Auto, Return to Profile, Manual Screen, and a power button.
- Bottom Right:** A row of function buttons: O Stop, Dry R, Auto J, Retr, Blk Del, Rap O, F Byp, Mem S, SEARCH, MINUS, and PLUS.

A yellow banner at the top of the main control area displays "001 EMERGENCY STOP ACTIVE".

The screenshot shows a detailed view of the OSAI ProcessController software interface. The main control area is divided into several sections:

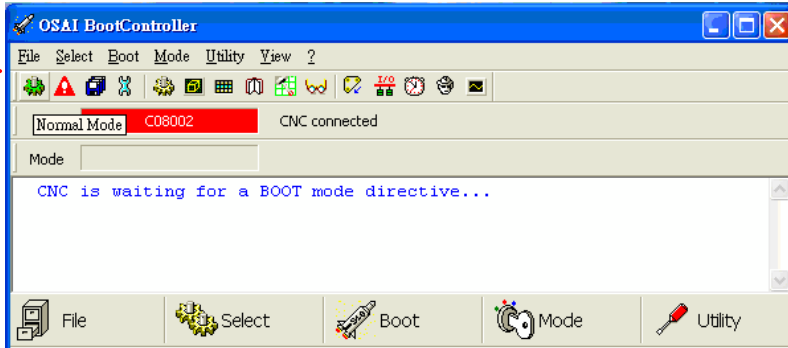
- Top Left:** FULLTEK PROFESSIONAL CNC logo and OSAI logo.
- Top Center:** 001 EMERGENCY STOP ACTIVE banner.
- Top Right:** A row of function buttons: SP.CW, SP.CCW, THOME, SP.OFF, BOR.ON, ALL BOR.DH, ALL BOR.UP, L.SUCT, R.SUCT, RST SUCT, L.PIN, R.PIN, VAC PUMP, HOME, JOG, Tool Preset, Dust Extract On, Exit, and LampTest.
- Middle:** A 3D coordinate system showing X, Y, and Z axes with various tool positions and values.
- Bottom:** A row of control buttons: Select, Set Up, Origin/Tool, Part Program, and Utility.

Turn on the controller

When you turn on the machine power, please press turn on the computer.

(1) You must press **【Normal mode】** push button on the screen.

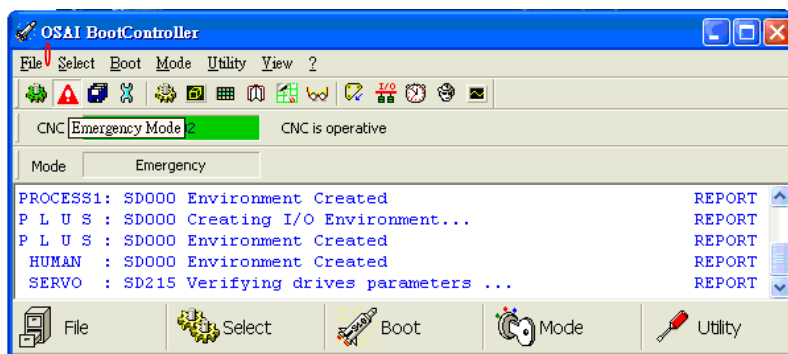
The computer will be automatic to connect with the controller.



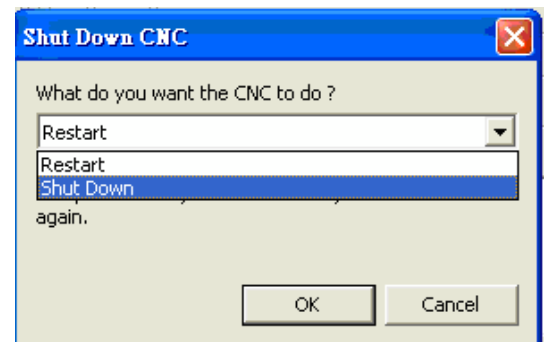
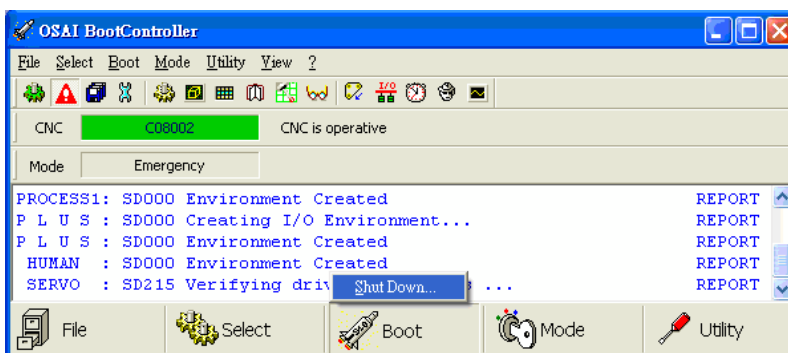
Turn off the controller

When you turn off the machine power, you must turn off the controller.

(1) Press **【Emergency mode】** push button.



(2) Press **【boot】** push button and select **【shut down】** .

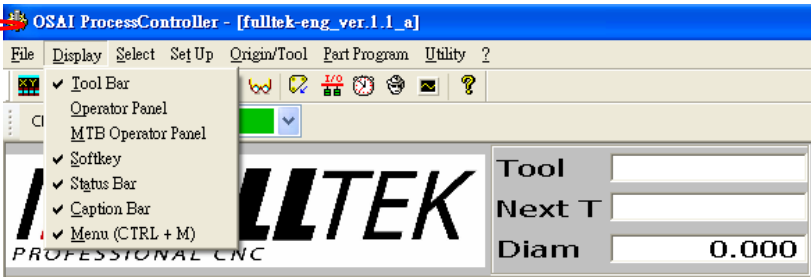


(3) When the message appear on the screen, you can turn off the computer and turn off the machine power.

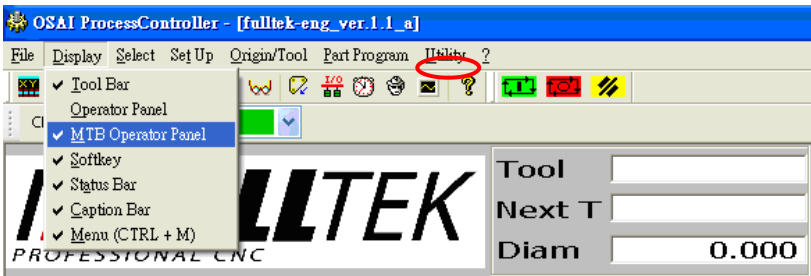


Display MTB Operator Panel and Operator Panel (Password : OEM)

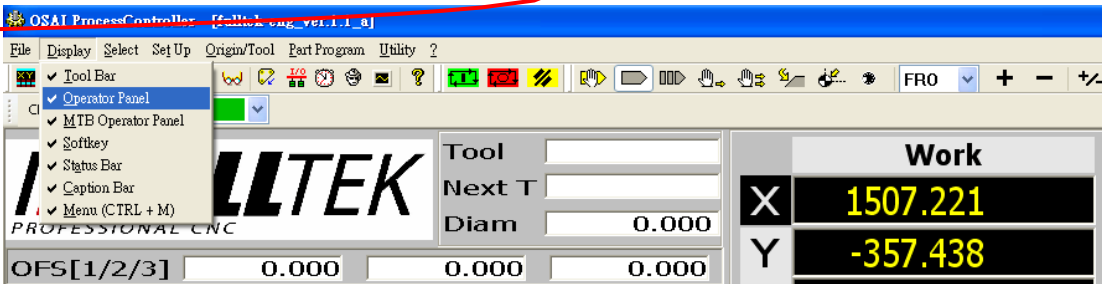
Step1 : press [Display] button. (red circle)



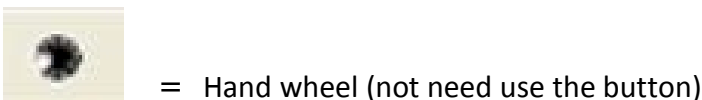
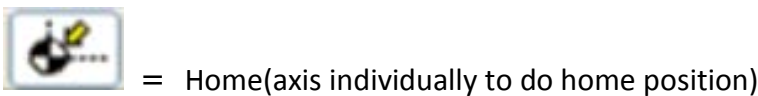
Step2 : select [MTB Operator Panel] will display it. (red circle)



Step3 : select [Operator Panel] will display it. (red circle)



=



EMERGENCY STOPS switch (on console)

Red button with yellow panel is so called e-stop. When it's pressed. NC and servo system will be in e-stop condition. All spindles will be locked except some other concerns. To restart. You need to undo the e-stop switch and restart.



START switch (on console)

Execute program on auto or MDI mode.



HOLD switch (on console)

Hold program on auto or MDI mode.



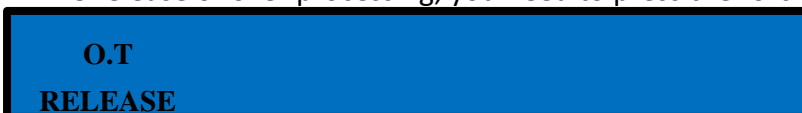
RESET switch (on PC screen)

Reset program on auto or MDI mode.



O.T RELEASE switch (on console)

While release of over processing, you need to press the forcing button move axis.



JOG / CUT FEED OVERRIDE switch (on console)

The percentage of the command of the program [0 - 150 %] .

Program feed percent on auto or MDI mode.

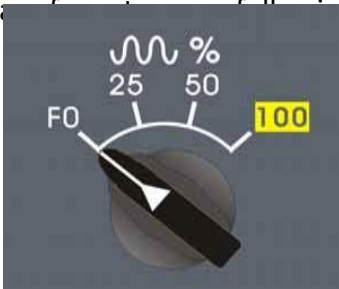
Manual move axis up to 8m/min.



RAPID FEED OVERRIDE switch (on console)

Rapid feed-in speed [G00] on auto or MDI mode,

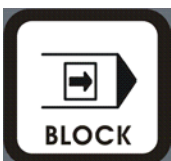
and manual move axis up to 8m/min.



EXECUTE SINGLE BLOCK switch (on PC screen)

Under auto mode, press this button, and program's first single block continuous executing

When switch on, the single nod stops, and then pause; that is, one start signal executes one single block.



AUTO switch (on PC screen)

Execute the program in the memory.



MDI switch (on PC screen)

Execute the program in the temporary memory.



HANDWHEEL mode (to control X,Y,Z,W axes by handwheel)

Manual controls the movement of axis. Select any one can use handwheel.



JOG switch (on PC screen)

Control axis to jog moving.



HOME switch (on PC screen)

Do first reference home positions. (only one axis do home position)



VACUUM ON switch (Press Manual Screen button to change PC screen)

Vacuum pump turns on by manual mode.



VACUUM OFF switch (Press Manual Screen button to change PC screen)
Vacuum pump turn off by manual mode.



VACUUM SUCTION switch (Press Manual Screen button to change PC screen)

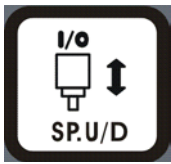


O. SUCT

NEGLECT WARNING switch (Press Manual Screen button to change PC screen)
This is used neglect the warning while vacuum pressure is not enough.



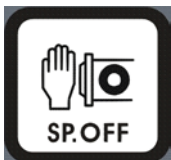
SPINDLE UP/DOWN switch (Press Manual Screen button to change PC screen)
Manual mode, control spindle up/ down. Only one spindle of machine not have this function.



SPINDLE CW switch (Press Manual Screen button to change PC screen)
Under manual mode, spindle CW button.



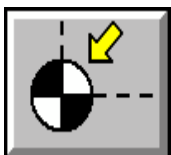
SPINDLE OFF switch (Press Manual Screen button to change PC screen)
Under manual mode, spindle off button.



SPINDLE CCW switch (Press Manual Screen button to change PC screen)
Under manual mode, spindle CCW button.

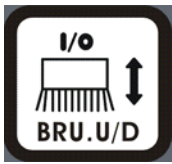


AUTO HOME switch (on PC screen)
Under home mode, call servo axis X,Y,Z and W go to home position together.



BRUSH UP/DOWN switch (on PC screen)

Manual mode, control brush up/ down.



BORING ON switch (Press Manual Screen button to change PC screen)

Under manual mode, boring turn on button. Only boring system of machine have this function.



BORING OFF switch (Press Manual Screen button to change PC screen)

Under manual mode, boring turn off button. Only boring system of machine have this function.



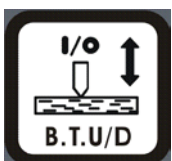
BORING UP/DOWN switch (Press Manual Screen button to change PC screen)

Manual mode, control boring up/ down. Only boring system of machine have this function.



BORING ALL TOOL UP/DOWN switch (Press Manual Screen button to change PC screen)

Manual mode, control boring tool up/ down. Only boring system of machine have this function.



HANDWHEEL UNIT



A. SELECTION OF AXIS

Select the axis needs moving.

B. SPEED OF HANDWHEEL

Select the speed of hand wheel one block [pulse] Unit $\times 1$ 、 $\times 10$ 、 $\times 100$
(unit: 0.001mm)

C. HANDWHEEL

It's a pulse generator, one block of handwheel is a pulse sent to NC controller.

Alarm

Flash of red light : it means the error occurs and needs solving.

Flash of yellow light : it means the program off or pause.

Flash of green light : it means the machine is working.



2. OPERATION

2-1 Jog mode

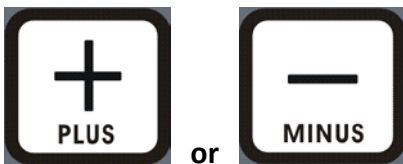


Step1 : Check right picture and press **JOG** button on PC screen.

Step2 : Use mouse to select axis.

	Work	Programmed
X	689.708	0.000
Y	-992.889	0.000
Z	-153.986	0.000
C	0.001	0.000

Step3 : Then choose positive or negative direction and press buttons.



2-2 Handwheel mode

Step1 : Select X,Y,Z axis by hand wheel. **[A]** **Step2** :

Select feed by hand wheel. **[B]** **Step3** : Rotation positive or negative direction. **[C]**

Step4 : As you don't use Hand Wheel to fasten and turn back to OFF, close Hand Wheel.



2-3 How to solve over travel

Step1 : First, found out which axis is over travel.

Step2 : Keep press right picture button.



**O.T
RELEASE**

Step3 : Select axis and feed by handwheel.



Step4 : Rotation positive or negative direction. Until 【O.T.RELEASE】 lamp become light.

2-4 Home

Step1 : Check right picture by mouse.



Step2 : Select axis.

	Work	Programmed
X	689.708	0.000
Y	-992.889	0.000
Z	-153.986	0.000
C	0.001	0.000

Step3 : Press right picture button.



or

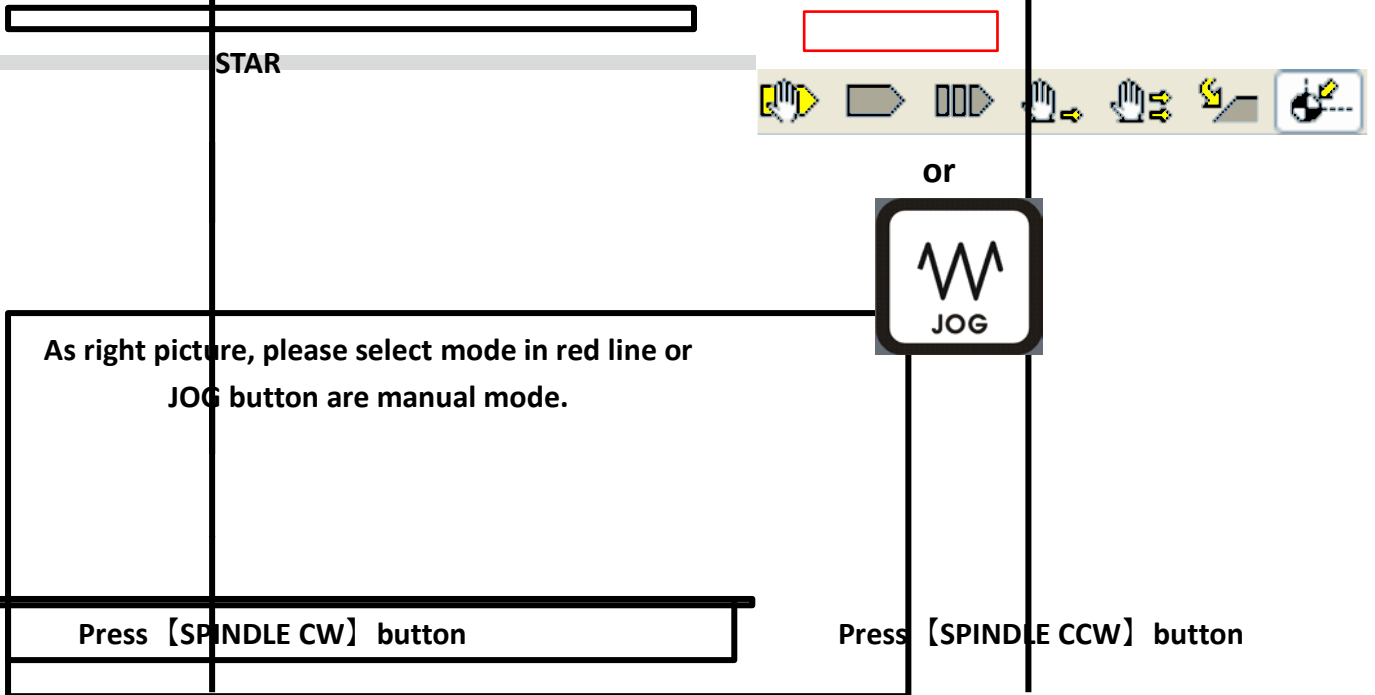


Step1 : Press right picture by mouse.

First time Z axis will move to home position, then X and Y move to home position together.

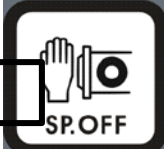
1. This action is a must after starting the machine, or the mechanical coordinates cannot be confirmed and the program cannot be executed.
2. If press reset during home adjust, it'll terminate home adjust.
3. Before the axis home, the warning will appear until the home adjustment finishes.

2-5 Manual spindle

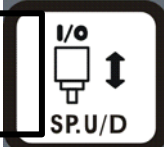


Spindle speed is shown on inverter screen.
Speed = 3000 R.P.M

Press [SPINDLE OFF] button, spindle stop.



Match up [SPINDLE DOWN] , can control spindle up & down.



2-6 Start vacuum suction and release

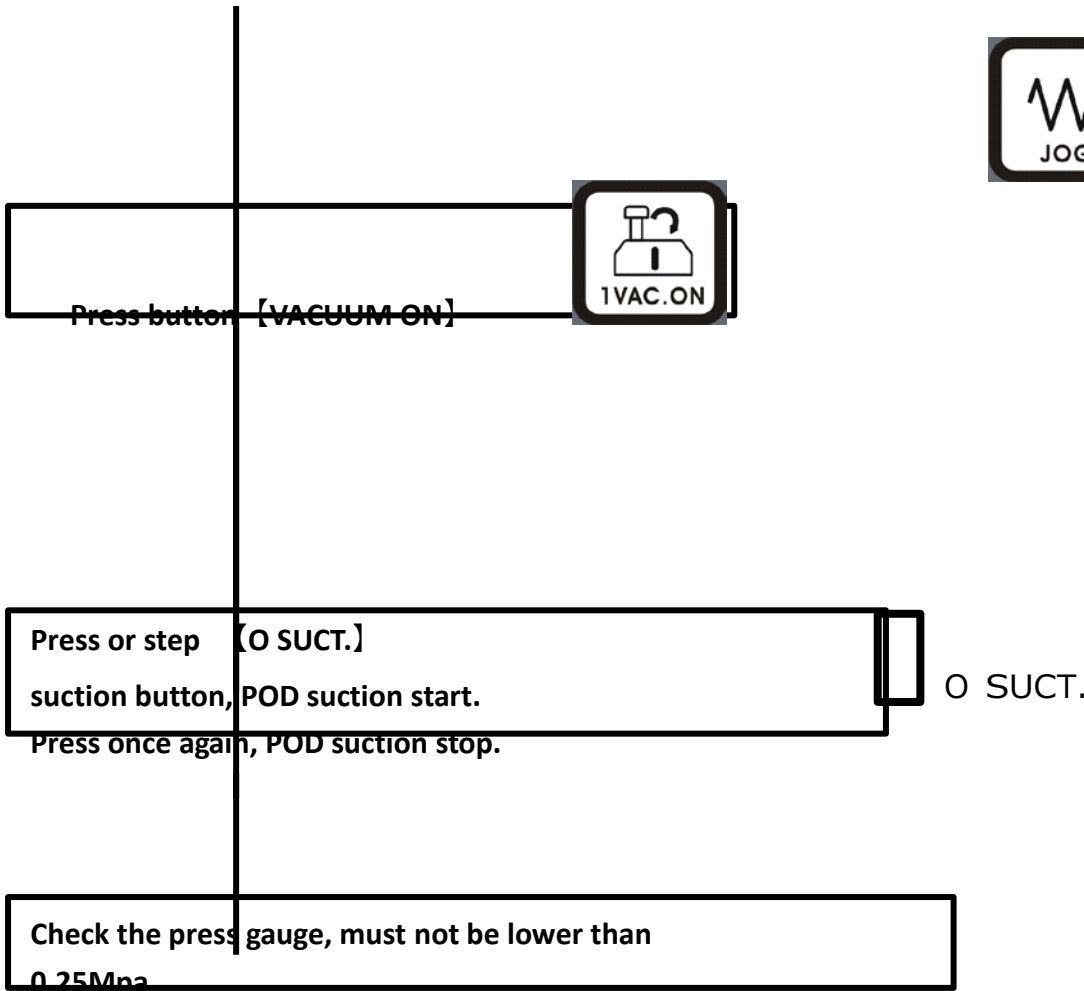
Before execute program, should make sure vacuum pump turn on.

As right picture, please select mode in red line or

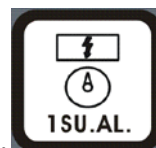
JOG button are manual mode.



or



1. If vacuum suction pressure less than 350 mm-Hg, the alarm of vacuum pressure insufficient, Appears and can not run the program. You need touch RESET button. Run program again.
2. Before execute program, you already know suction pressure is low state. You need touch 【SU.AL.】 button.



Neglect the alarm of vacuum pressure insufficient.

- ※ 3. Whine suction is turn on. Orient pin and orient board will go down.
Whine suction is turn off. Orient pin and orient board will go up.

2-7 How to set tool length offset

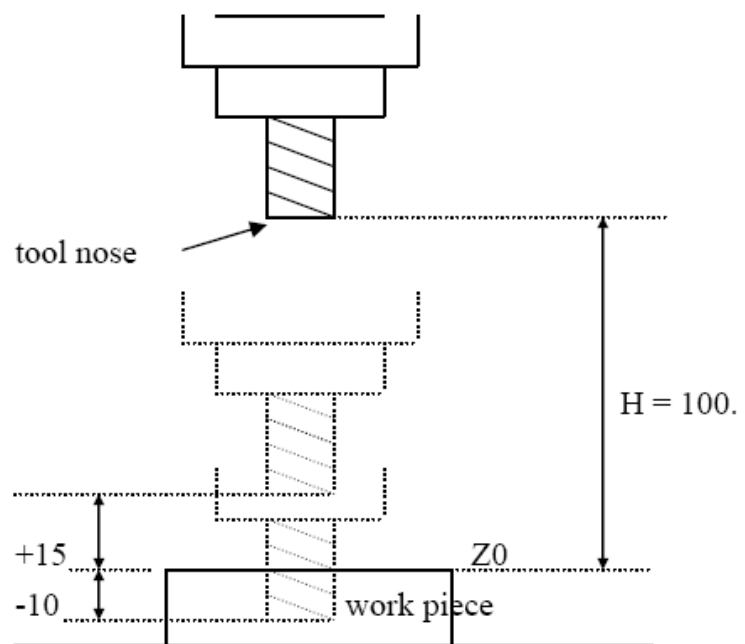
Explain:

Every work piece might uses different tool, thus to take every tool length's error as a reference Parameter, and input the parameter into controller, this is called "TOOL LENGTH OFFSET" Insert the necessary tools in the spindle which will process the work piece, at the situation of Z axis in "0" also the spindle head is lowered down, moving Z axis by hand wheel from spindle's tool nose end to the top of upper work piece, the distance of Z moving will show on monitor of controller. This Z axis coordinate value is the offset value we will set. If the program is using no.1 tool, the controller will auto. catch the offset number corresponding to no.1 tool , please refer to drawing A.

Example:

N1 T1 ;

N2 G1 Z-10. F2000 ;



drawing A

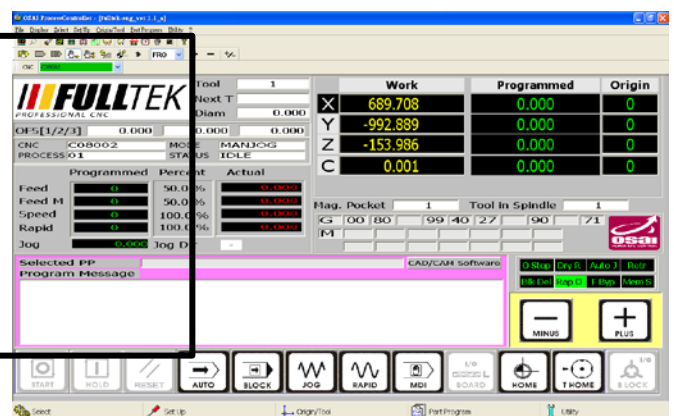
The steps of operating and setting.

STAR

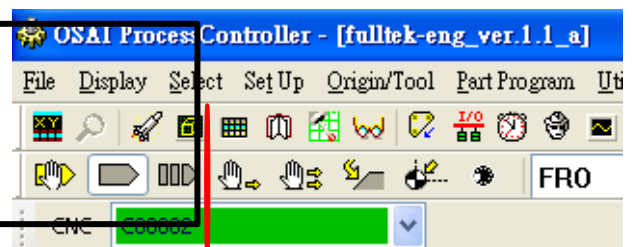
First, take the jog or handwheel moving to move the spindle move to upper of the work piece to be top side. Then lower the spindle which will process the work piece.

Refer to right side frame:

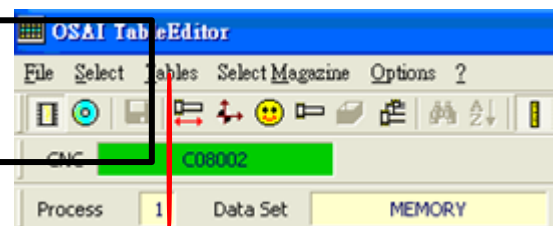
By means of hand wheel to move Z axis, let spindle's tool nose slowly move to exact upper of work piece to be processed, then write down the Z axis's mechanical coordinate value, input the value to NC controller according to the steps following.



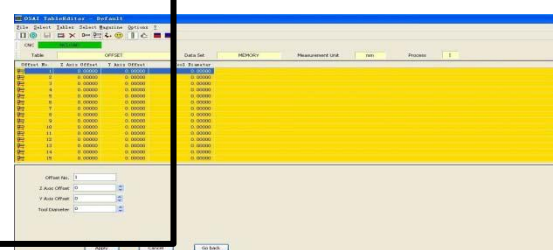
Use computer's mouse to select where with red circle mark as right frame. (press left key of mouse 2 times)



The monitor will appear right side frame. Then use computer's mouse to select where with red circle mark (press left key of mouse 2 times)



The monitor appears side frame. See the situations on the frame, if we want set tool length offset for No.1 tool, then move cursor to No.1 column, the blue color column on left side on screen.



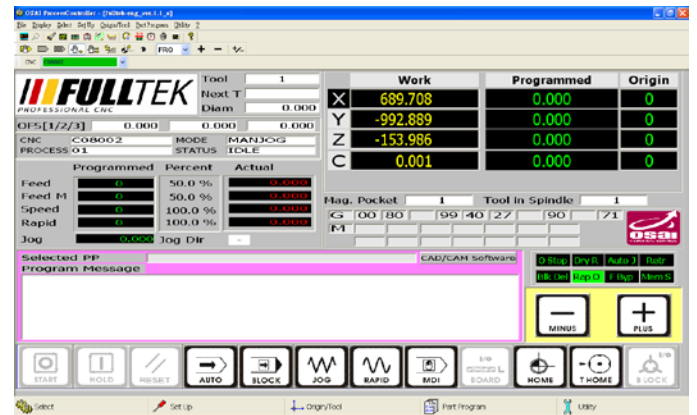
2-8 How to set work piece coordinates

When the machine is HOME returned.

The current position is called “work” (machine origin)

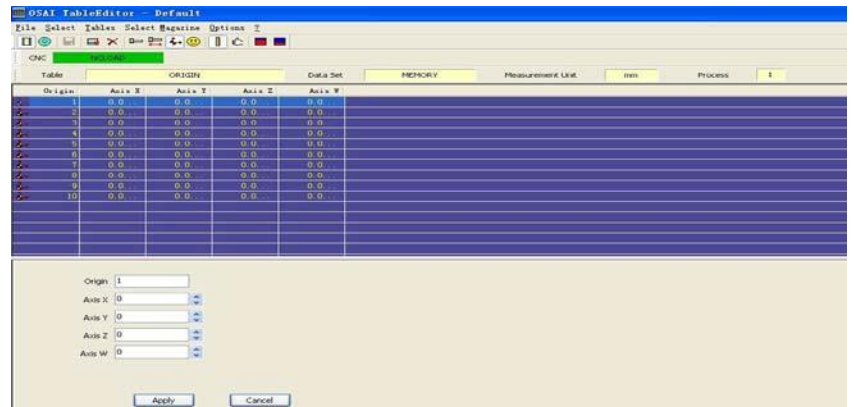
When the program appears any code between. (UAO,1) and (UAO,10), we have to set a Reference position for program’s starting processing.

Thus the program will start processing since from this reference position.



The distance between work (machine original) and program reference position is just the value we will set.

We are used to set XY axis only, we do not set Z axis.

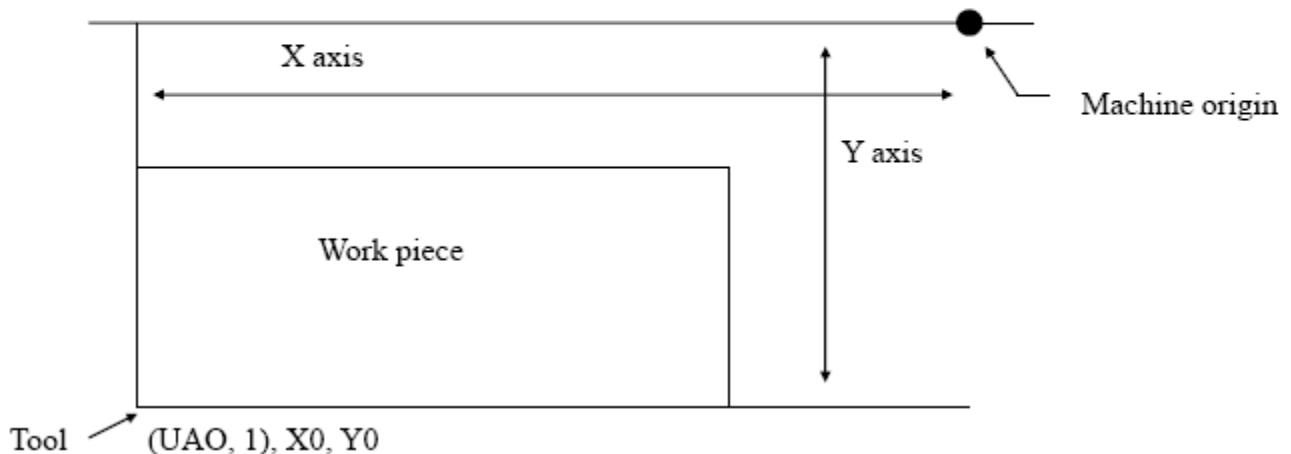


Example :

N1 (UAO,1) ;

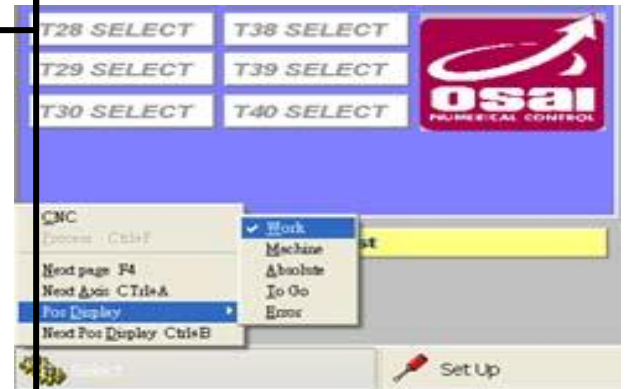
N2 G0 X0. Y0. ;

Reference drawing a:



How to operate and set

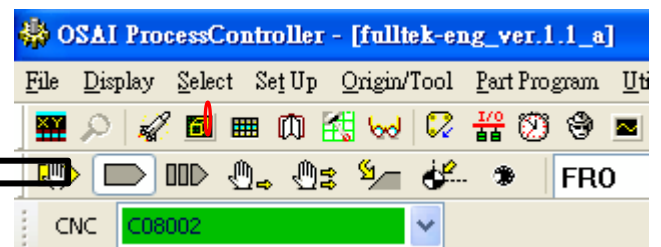
Start: See right frame. Shift to the coordinate named [Work], insert a cutter with tip into spindle. Use Rapid moving function to move X,Y axis to upper part of work piece. Then lower spindle.



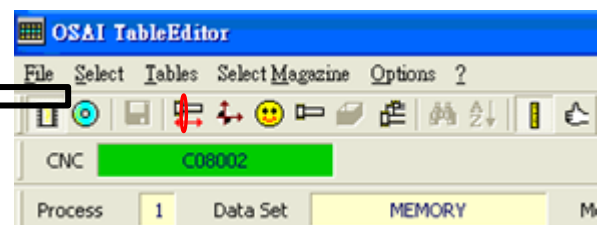
Move Z axis by hand wheel, let the spindle's cutter tip move slowly to the top of right lower corner of working table, then adjust X and Y axis by hand wheel until cutter tip exactly points against working table's angle corner. This moment, the coordinate's value of XY axes are shown on screen. Write down these values on paper, prepare to input values to NC controller.

	Work	Programmed
X	689.708	0.000
Y	-992.889	0.000
Z	-153.986	0.000
C	0.001	0.000

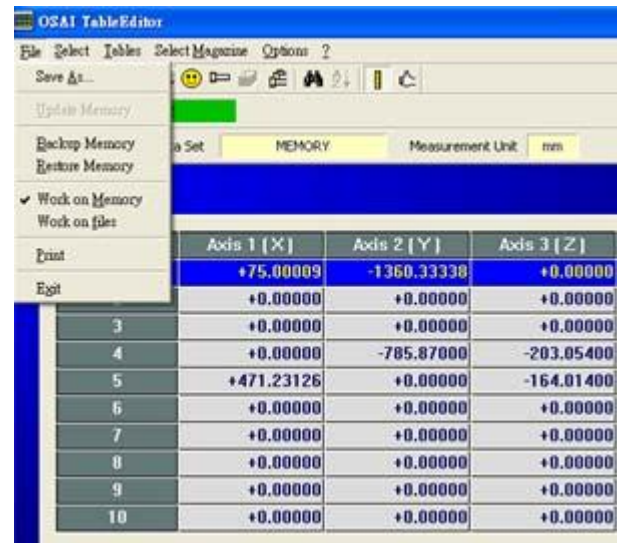
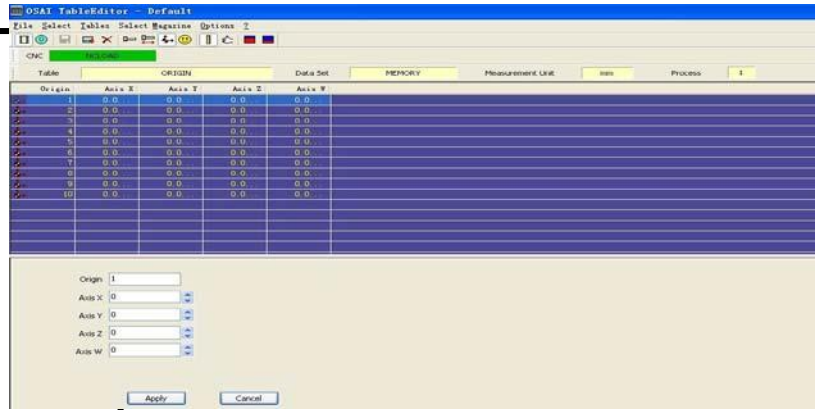
See right frame, use computer's mouse to select where with red circle mark.



See right frame, use computer's mouse to select where with red circle mark.

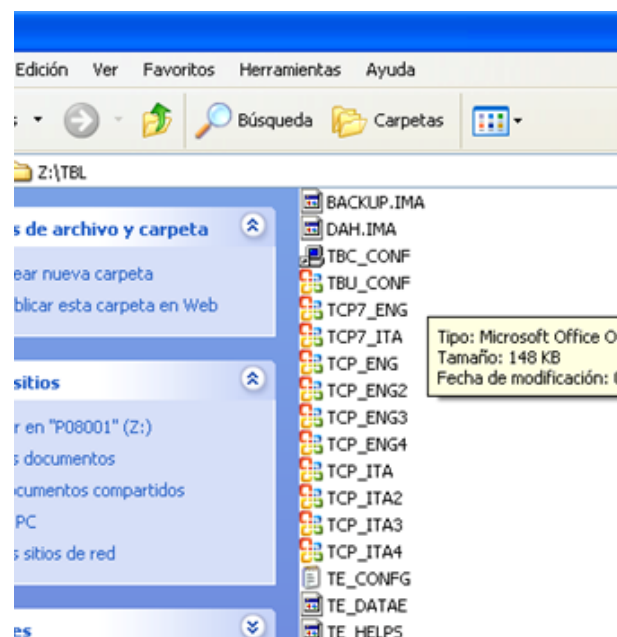


See right frame, if the program is (UAO,1), move cursor to column of Origin `1` ,press key board `ENTER` , input the required coordinates value to X,Y axes. Normally, Z and C axis do not set any value.



Drawing A1

See right frame A1 and A2, either tool length offset or work piece coordinates value may be saved as a file for application according to real situation.




Drawing A2

2-9 Single block program input and execute


To input program to MDI operation buffer area, each time only a single block can be input. Changing tool program may be executed here, but don't press single block start.

START:
See right frame, press where with red circle.



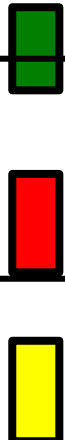
| or

A small window appears on screen, provided the single block program to be input is X axis rapid moving 500 mm. Please input 500 to the small window. Then touch enter key by keyboard.



MDI | X500.

See right frame, press green color program start button, the machine will start moving. To press red color key can pause the running program. To press yellow color key can delete the running program.



START
HOLD
RESET

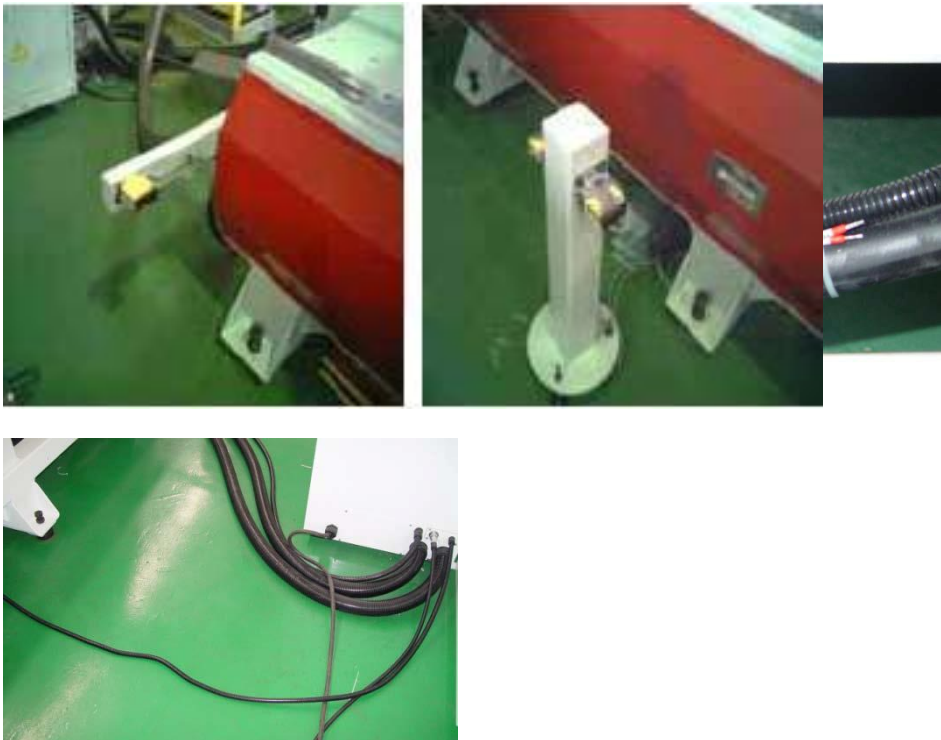
2-10 Solve safe zone alarm (option)

When the program already running. The operate people enters safe protection zone. The machine will stop moving temporarily. The spindle and saw and drill will stop temporarily. Console Hold lamp change is on. Please accord with the way below while removing the way.

Light Curtain Release

Step1 :

Leave the safe protection domain.



Step2 : Press LIGHT CURTAIN RELEASE of console.

Until the light is bright.

Step3 : Press Hold of console. The light will off and press 【Fault Reset】 on screen.



HOLD



Step4 : Press START of console.



START

Mat Release

Step1 :

Leave the safe protection domain.



Electric wire location.



Step2 : Press SAFETY MAT RELEASE of console.

Until the light is bright.

Step3 : Press Hold of console. The light will off and press 【Fault Reset】 on screen.



HOLD



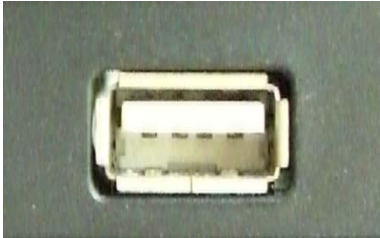
Step4 : Press START of console.



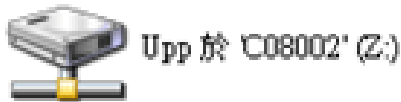
START

2-11 Outside program input or output to controller

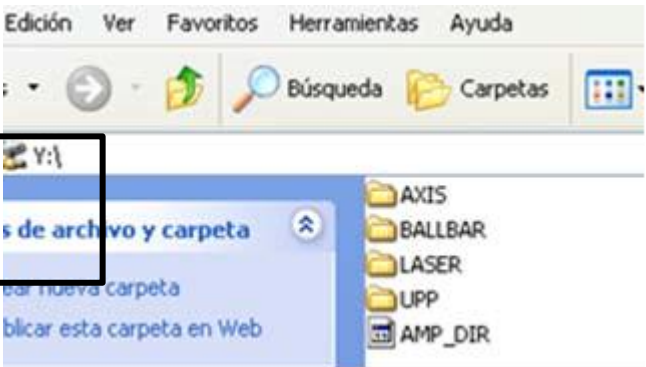
See right picture, insert flash card to USB post.





See right picture, use computer's mouse to select [UPP] position.
You can look at 2-19 that How to set up Map Network Driver.

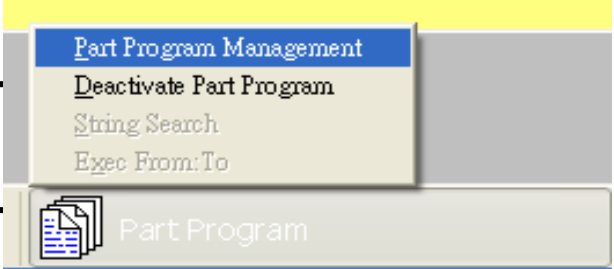


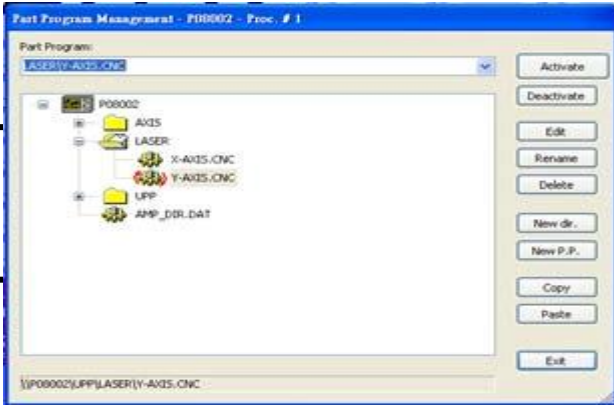
See right picture, use computer's mouse to select [UPP] position. Save the program in flash card or disk to file 'UPP'.







2-12 Program executing

See right frame, select [AUTO] mode.  or 


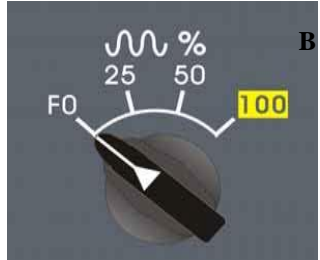
See right frame, use mouse to select [Part Program] mode. Then select [Activate] mode. 


See right frame, use mouse to select the required program name, and select 'OK'. 

See right frame, the program name selected will appear on the left lower side of screen. 

See right frame, press green color button, program starts Running.  **START**  **HOLD**  **RESET**

Adjust picture [C], if you will change spindle speed. Adjust picture [A], if you will change G01 FEED. Adjust picture [B], if you will change G00 FEED. Press red color button, if you will pause the program. Press yellow color button, if you will delete the running program.

 **A: G01 FEED**  **B: G00 FEED**

 **C: SPINDLE SPEED**

2-13 Program explanation

Following examples is only simply explain the basic demand on the program contents, When as to G CODE of OSAI controller, there is no detail explanation. As to the application of G CODE, please refer to PROGRAM on E_BOOK.

The black color words is program code, **//red color is the explanation:**

;(4_DRILL35MM) **// program name.**

N1 (UAO,1) **//N1is single block #1, (UAO,1) is the ORIGIN 1 setting coordinates of reading controller.**

N20 G79 Z0 **//Z axis return HOME.**

N40 M31 S6800 **// spindle rotates clockwise direction , at speed 6800RPM.**

N50 M81 **// spindle head descend.**

N70 G0 X100. Y100. **//XY axes rapid move to coordinates position X100, Y100 set by ORINIG 1.**

N90 Z5. **//Z axis rapid move to 5 inches far from work piece's top.**

N100 G81 Z-3. R5. F2000 **//start boring, boring depth 3 mm.**

N105 X100. Y100. **//boring 2nd hole's position.**

N110 X250. Y100. **// boring 3rd hole's position.**

N2500 G80 **//delete boring circulation.**

N2510 M5 **//spindle stops.**

N2520 M7 **//spindle head ascend.**

N2530 G79 Z0 **//Z axis return to machine origin.**

N2540 G79 Y0 **//Y axis return to machine origin.**

N2550 M30 **//program close.**

2-14 G code list

ITEM	DESCRIPTION	REMARK	ITEM	DESCRIPTION	REMARK
G00	VERTICAL RAPID POSTIONING		G65	SINGLE CALL OF MACRO	*
G01	VERTICAL COMPENSATION, CUTTING FEED-IN		G66	CALL OF MODULE PROGRAM	*
G02	AN ARC COMPENSATION (CW)		G67	CANCEL CALL OF MODULE PROGRAM	*
G03	AN ARC COMPENSATION (CCW)		G68	START SPIRAL COORDINATES	
G04	PAUSE APPOINTED TIME		G69	CANCEL START SPIRAL COORDINATES	
G09	EXACT STOP TEST		G70	BRITISH SYSTEM UNIT PROCESSING	
G10	DATA INPUT		G71	METRIC SYSTEM UNIT PROCESSING	
G15	CANCEL POLE COORDINATES		G73	HIGH SPEED DRILLING CIRCULATION	
G16	INSERT POLE COORDINATES		G74	LEFT HAND DRILLING CIRCULATION	
G17	SET X-Y WORKING SURFACE		G76	PRECISE HOLE CIRCULATION	
G18	SET Z-X WORKING SURFACE		G80	CANCEL CIRCULATION	
G19	SET Y-Z WORKING SURFACE		G81	DRLLING CIRCULATION	
G28	HOME OF REFERENCE POINT		G82	BOTTOM PAUSE DRILLING CIRCULATION	
G29	FROM REFERENCE HOME		G83	DRILLING CIRCULATION	
G30	ANY POINT HOME		G84	TOOTH ATTACKING CIRCULATION	
G31	JUMP		G85	BORING CIRCULATION	
G33	SPIRAL CUTTING		G86	HIGH SPEED BORING CIRCULATION	
ITEM	DESCRIPTION	REMARK	ITEM	DESCRIPTION	REMARK
G41	CANCEL TOOL RADIUS COMPENSATION: LEFT		G88	SEMI-AUTO BORING CIRCULATION	
G42	CANCEL TOOL RADIUS COMPENSATION: RIGHT		G89	BOTTOM PAUSE BORING CIRCULATION	

G43	CANCEL LENGTH POSITIVE COMPENSATION		G90	ABSOLUTE POSITION INPUT	
G44	CANCEL LENGTH NEGATIVE COMPENSATION		G91	RELATIVE POSITION INPUT	
G49	CANCEL CANCEL LENGTH POSITIVE COMPENSATION		G92	ABSOLUTE HOME COORDINATES SETTING	
G50	START ENLARGE/ DIMINISH		G94	INFEEED(mm/minmin.)	
G51	CANCEL ENLARGE/ DIMINISH		G95	INFEEED PER REVOLUTION(mm/minmin.)	
G50.1	MIRROR INVALID		G96	SURFACE CUTTING SPEED	
G51.1	MIRROR VALID		G97	CANCEL SURFACE CUTTING SPEED	
G52	PARTIAL SETTING OF COORDINATES		G98	HOME TO START POINT	
G53	SETTING OF MACHINE SYSTEM COORDINATES		G99	HOME TO R POINT	
G54	SETTING OF WORKING COORDINATES		G134	CIRCUMFERENCE CIRCULATION	
G59	SETTING OF WORKING COORDINATES SYSTEM		G135	ANGLE VERTICAL DRILLING CIRCULATION	
G61	EXACT STOP TEST		G136	AN ARC CIRCULATION	
G64	CUTTING MODE		G137.1	CHESS HOLE CIRCULATION	

2-15 M code list

M-code	Description
M00	Program Stop
M01	Conditional Program Stop
M02	End of Program
M30	End of Program (Reset & Rewind)
M12	Tool magazine in
M13	Tool magazine out
M03 or M31	Spindle head CW
M33	Boring head On
M04	Spindle head CCW
M45	Spindle Brush up
M40	All Brush up
M46	Spindle Brush down
M50	All Brush down
M55	Boring head Brush up
M56	Boring head Brush down
M91	Spindle tool unclamp
M96	Spindle tool clamp
M98	Tool protection cover down
M99	Tool protection cover up
M101	All Suction On
M103	Left Zone Suction On
M104	Right Suction Zone On
M105	Right Wood Pin Orient On
M106	Left Wood Pin Orient On
M111	All Suction Off
M113	Left Zone Suction Off
M114	Right Zone Suction Off
M115	Right Wood Pin Orient Off
M116	Left Wood Pin Orient Off
M131	Right Wood Board Orient On
M132	Right Wood Board Orient Off
M133	Left Wood Board Orient On
M134	Left Wood Board Orient Off

2-15 M code list

M-code	Description
M420	Dust Extractor On
M421	Dust Extractor Off
T21	Boring tool T21 down
T22	Boring tool T22 down
T23	Boring tool T23 down
T24	Boring tool T24 down
T25	Boring tool T25 down
T26	Boring tool T26 down
T27	Boring tool T27 down
T28	Boring tool T28 down
T29	Boring tool T29 down
T30	Boring tool T30 down
T31	Boring tool T31 down
T32	Boring tool T32 down
T70	Boring tool T70 down
T71	Boring tool T71 down
T72	Boring tool T72 down
T73	Boring tool T73 down
T91	Boring tool T91 down (X-SAW)
T92	Boring tool T92 down (Y-SAW)
M6T0	Clean tool in spindle
M6T1	Auto change No.1 tool
M6T2	Auto change No.2 tool
M6T3	Auto change No.3 tool
M6T4	Auto change No.4 tool
M6T5	Auto change No.5 tool
M6T6	Auto change No.6 tool
M6T7	Auto change No.7 tool
M6T8	Auto change No.8 tool

2-16 Tool magazine operation (DRUM TYPE)



The steps of manual operation tool magazine

Press mode of red square or press JOG mode push button. The controller in manual mode.

If take out tool in the spindle, press TOOL UNCLAMP push button.


If want rotatory position tool magazine, press MAG.CW or MAG.CCW push button to rotate tool magazine.

2-17 To solve tool change mistake

Usually it happen when tool change program start, somebody press E-STOP or RESET push button or machine electrical power off. The tool change movement not finish, but controller to award it finish. Cause the computer to judge the tool change program mistake. This is very dangerous. So we must to solve the wrong movement to avoid the operator to hurt.


The steps of to solve

Press mode of red square or press JOG mode push button. The controller in manual mode.




or

Press **【MAG.CW】** or **【MAG.CCW】** push button change to No.1 tool pocket aim at the spindle. Please look at tool magazine number mark.



Select **【HOME】** mode.



Press **【T HOME】** push button. The controller will to award No.1 tool in the spindle. The mistake will to solve.

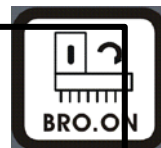
2-18 Boring operation and offset tools

(Only boring system of machine have this function.)

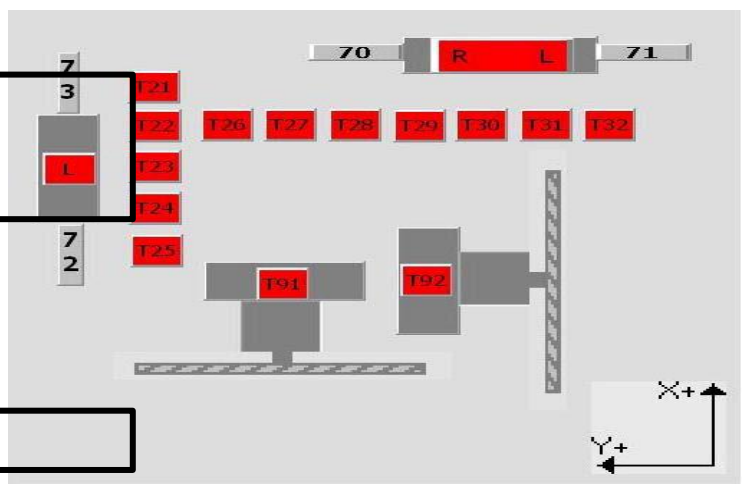
Press mode of red square or press JOG mode push button. The controller in manual mode.



Press 【BRO.ON】 push button, the boring tools will start. Because boring is the transmission of the gear wheel, so all boring tool will roll.



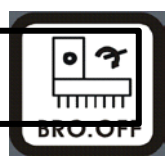
Press 【T】 push button, the boring head will down. Press again it will up.



Select boring tool number. (P1)

P1

Press 【T】 push button, the boring tool will down



Press 【BRO.OFF】 push button, the boring tools will stop.

Boring tool offset with spindle

(Only boring system of machine have this function.)

OSAI TableEditor - Default

File Select Tables Select Magazine Options ?

CNC **UNLOAD**

Table **OFFSET** Data Set **MEMORY** Measurement Unit **mm** Process **1**

Offset No.	Z Axis Offset	Y Axis Offset	Tool Diameter
1	0.00000	0.00000	0.00000
2	0.00000	0.00000	0.00000
3	0.00000	0.00000	0.00000
4	0.00000	0.00000	0.00000
5	0.00000	0.00000	0.00000
6	0.00000	0.00000	0.00000
7	0.00000	0.00000	0.00000
8	0.00000	0.00000	0.00000
9	0.00000	0.00000	0.00000
10	0.00000	0.00000	0.00000
11	0.00000	0.00000	0.00000
12	0.00000	0.00000	0.00000
13	0.00000	0.00000	0.00000
14	0.00000	0.00000	0.00000
15	0.00000	0.00000	0.00000

Offset No.

Z Axis Offset

Y Axis Offset

Tool Diameter

OSAI TableEditor - Default

File Select Tables Select Magazine Options ?

CNC **UNLOAD**

Table **TOOL** Data Set **MEMORY** Measurement Unit **mm** Process **1**

Tool Code	Offset No.	X Axis Offset
1	0	0.00000
2	0	0.00000
3	0	0.00000
4	0	0.00000
5	0	0.00000
6	0	0.00000
7	0	0.00000
8	0	0.00000
21	21	0.00000
22	22	0.00000
23	23	0.00000
24	24	0.00000
25	25	0.00000
26	26	0.00000
27	27	0.00000

Tool Code

Offset No.

X Axis Offset

Z axis offset : Boring bits length offset

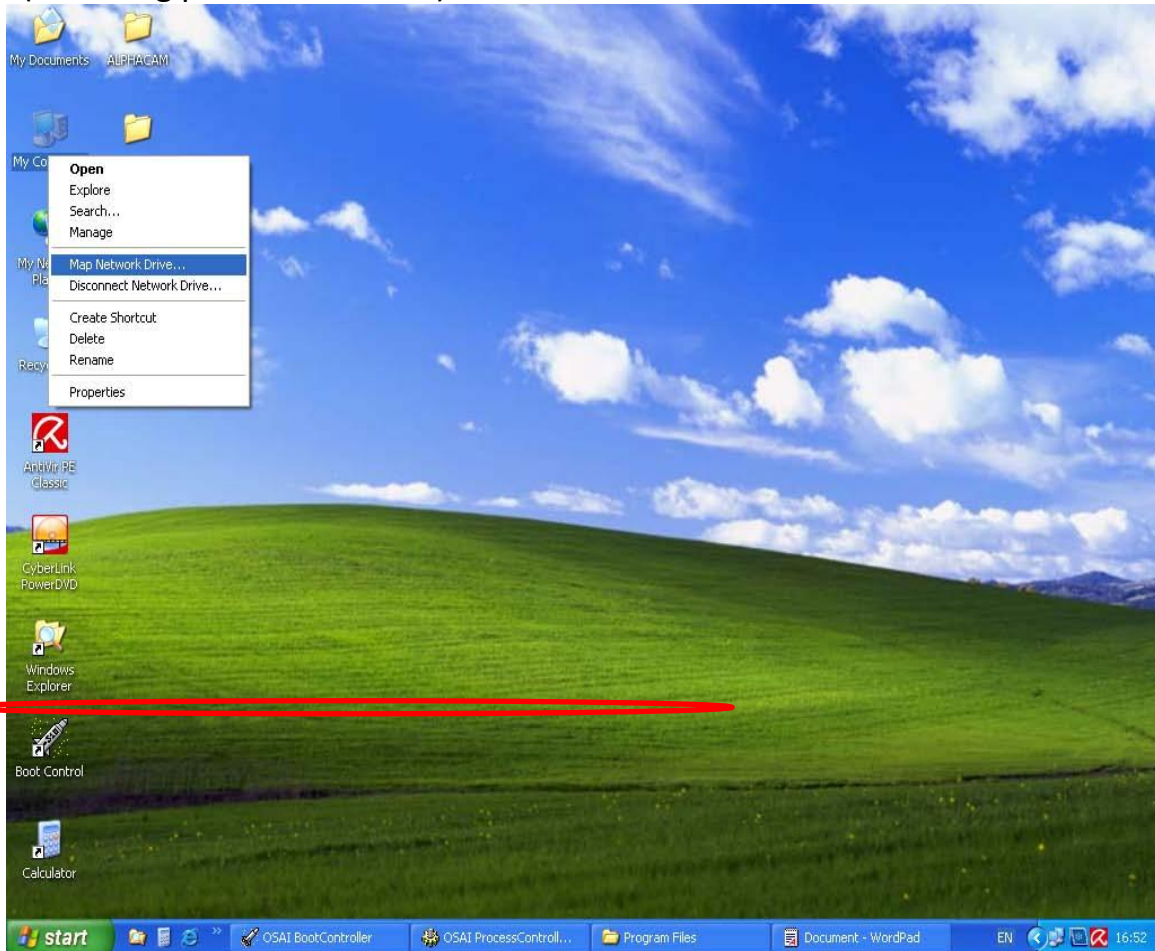
X axis offset : Boring bits between with spindle of X offset

Y axis offset : Boring bits between with spindle of Y offset

So all of the drill coordinates are the basis of the spindle.

2-19 How to set up Map Network Driver

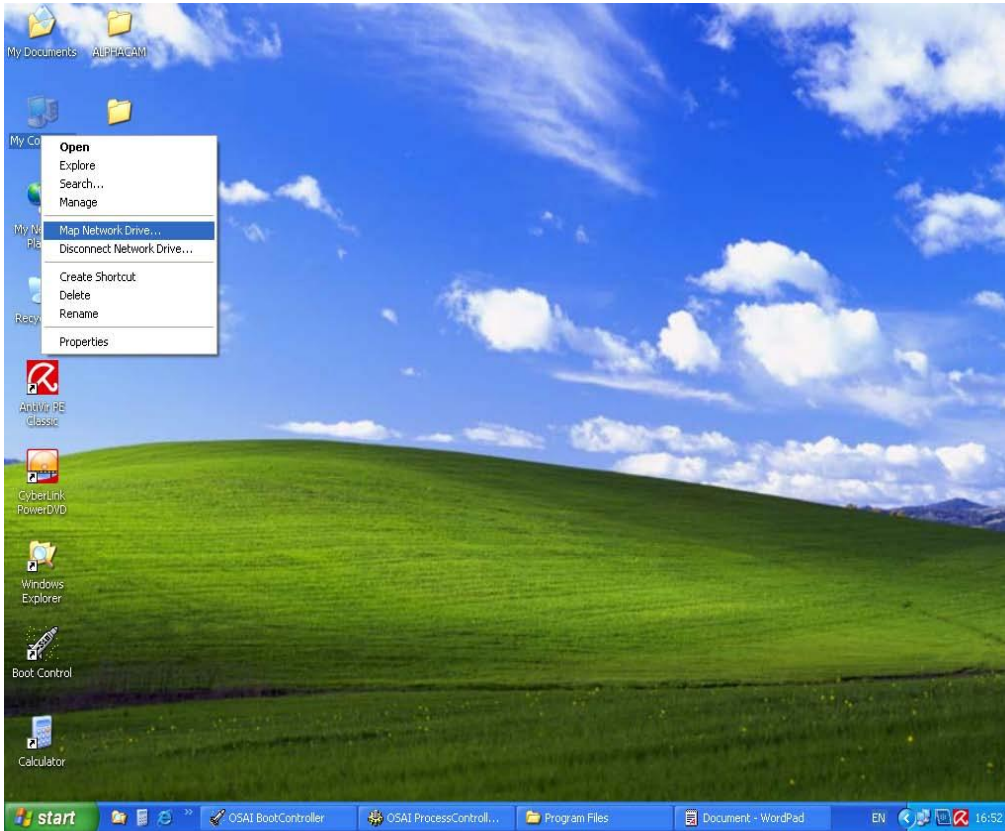
1. First, you must install OSAI WINNBI VER.4.0.1 software.
2. After finishing installing, the tabletop will present the shortcut of OSAI. (following picture red circle)



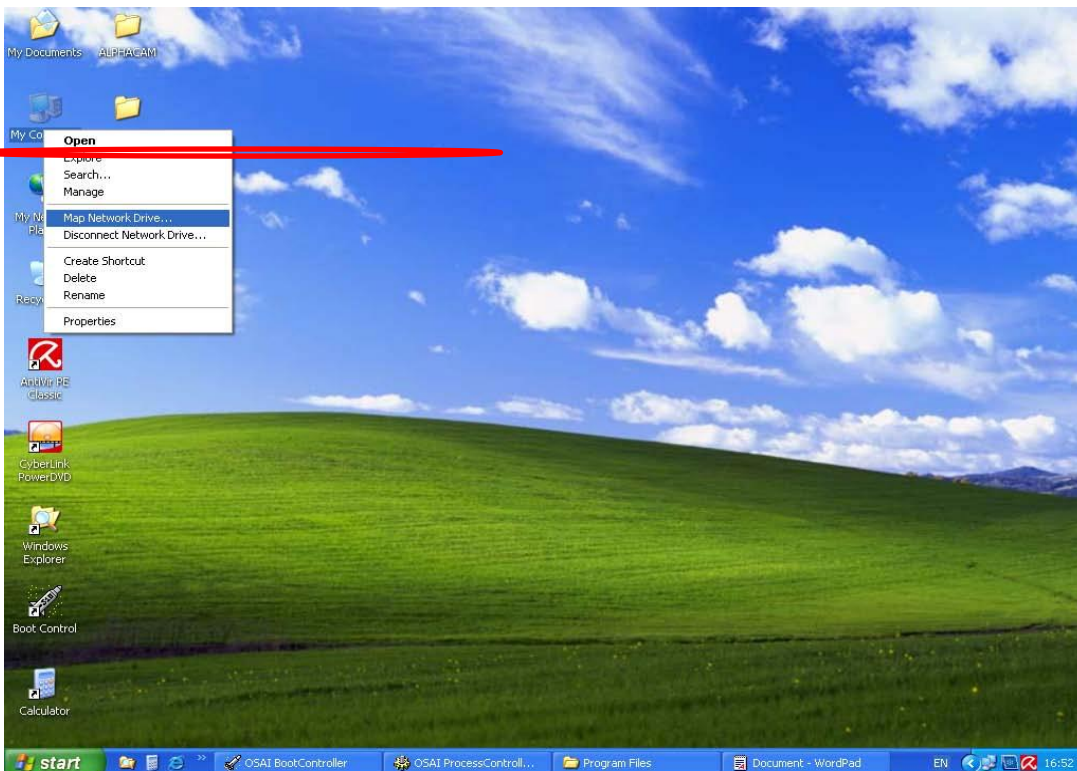
3. Connect the network line to transmitting the network hole closed. (following picture red circle)



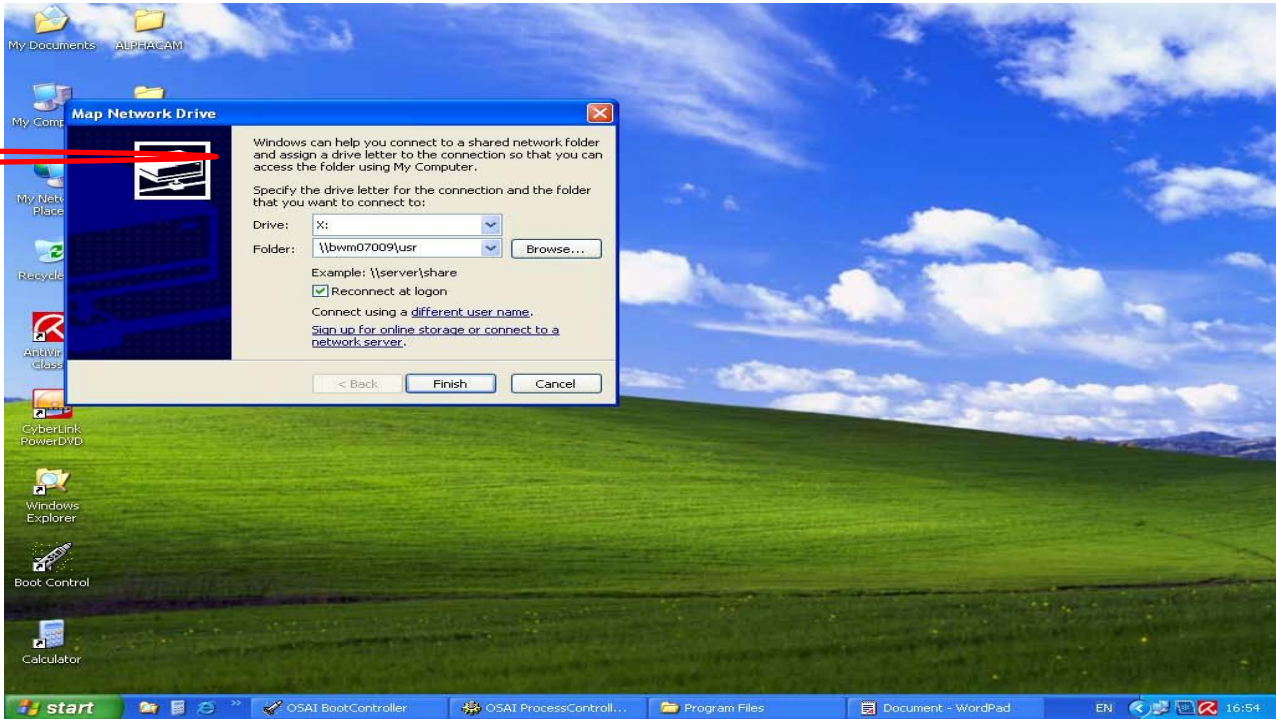
4. Press two times of mouse left key start OSAI controller.
(following picture red circle)



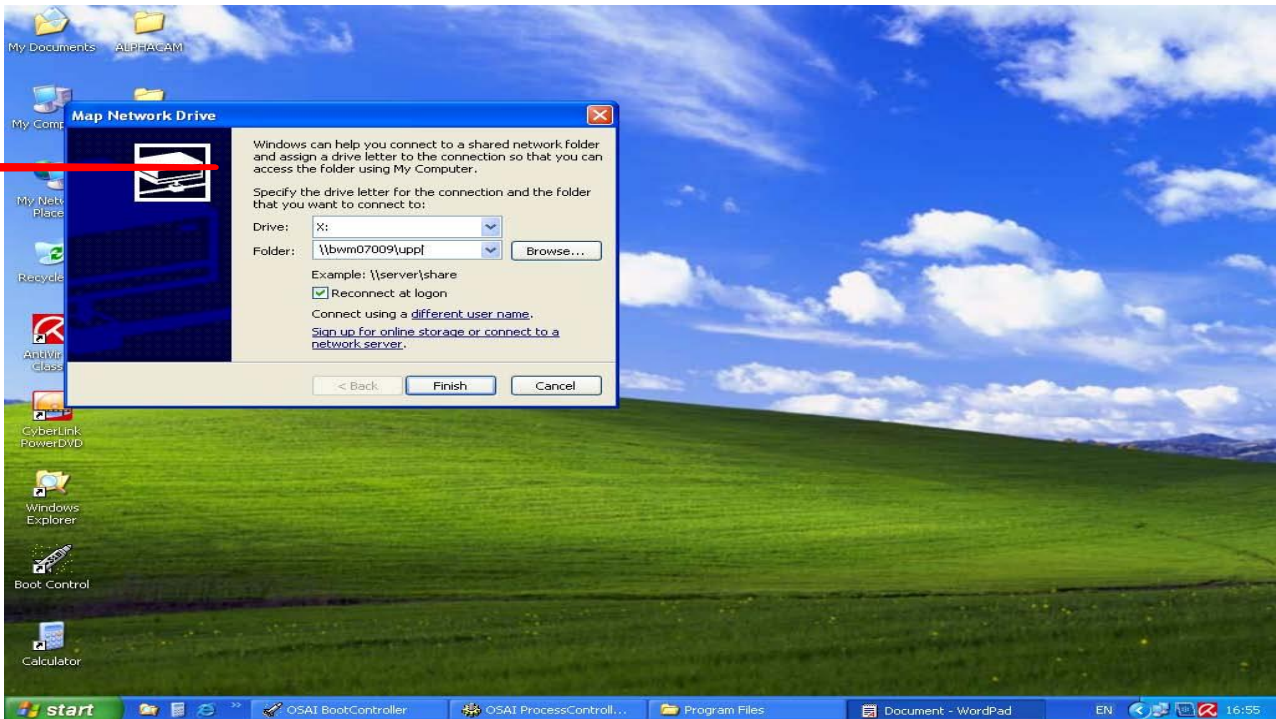
5. Select my computer press mouse right key. Select "Map Network Driver".
(following picture red circle)



6. First set up \\FKC0925\USR. This is parameter and PLC file.
(Because the controller name is FKC0925)



7. Second set up \\FKC0925\UPP. This is NC program file.
(Because the controller name is FKC0925)



8. The network set up is finished. Your NC program files all put into UPP file that controller to work.

C. PARAMETER SETTINGS

Parameter of YASKAWA settings

Parameter number PN100~PN103.

According to the of the machine.

Need changing slightly.

The data of other parameters in the following forms are the standard value.

Not the parameter data in the following forms.

According to the establishment of the original factory.

The 1st values is original of YASKAWA, the 2nd values is setting by BCAMCNC.

NUMBER	NAME	X	Y	Z	x	W
Pn000	Function selection basic switches	0000	0000	0000	0000	0000
Pn100	Speed loop gain	40 50	40	40	40 50	40
Pn101	Speed loop integral time constant	2000	2000	2000	2000	2000
Pn102	Position loop gain	40 50	40	40	40 50	40
Pn103	Inertia ratio	100	100	100	100	100
Pn170	Online autotuning switches	1401 1400	1401 1400	1401 1400	1401 1400	1401 1400
Pn212	Electronic gear ratio	16384	16384	16384	16384	16384
Pn300	Speed reference input gain	600 475	600 475	600 713	600 475	600 713
Pn401	Torque reference filter time constant	100	100	100	100	100
Pn50A	Input signal selections 1	8000	8000	8000	8000	8000
Pn50B	Input signal selections 2	6548	6548	6548	6548	6548
Pn600	Regenerative resistor capacity	8	8	0	8	0

Parameter of inverter settings

The data of other parameters in the following forms are the standard value.

Not the parameter data in the following forms.

According to the establishment of the original factory.

Parameters	Explanation	Setting
00-09	Control Methods	2
01-00	Maximum Output Freq (Fo,max)	800
01-01	Maximum Voltage Frequency (Base Freq)(Fmax)	800
01-02	Maximum Output Voltage (Vmax)	380
01-03	Mid-Point Frequency (Fmid)	400
01-04	Mid-Point Voltage (Vmid)	190
01-09	Accel Time 1*	4
01-10	Decel Time 1*	4
02-00	Source of Frequency Command	1
02-01	Source of Operation Command	2
02-02	Stop Method	0
02-03	PWM Carrier Frequency	5
02-04	Reverse Operation	0
03-00	Multi-Function Output 1 (Relay output)	8
03-01	Multi-Function Output 2 (Photo coupler output)	2
03-02	Multi-Function Output 3	1
04-04	Multi-Function Input Terminal 1 (MI0,MI1)	01
05-00	1 st Step Speed Freq	100
06-00	Over-Voltage Stall Prevention	0
07-04	Number of Motor Poles	4
08-00	DC Breaking Current Level	50
08-02	DC Breaking Time during Stopping	1