



# **6 Series Mill Controller**

# **Operation Manual**

**Date: 2013/10/25**

**Version: 1.1**



# Contents

1	Function Key and System Configuration.....	4
1.1	Main Screen Sections.....	4
1.2	CNC System Configuration .....	5
1.3	Coordinate.....	6
1.3.1	Explanation of Function.....	7
1.3.2	Switch Coordinate.....	8
1.3.3	Half Coordinate.....	8
1.3.4	Clear Rel. Coord. ....	9
1.3.5	Clear All Rel. Coord. ....	9
1.4	Program.....	10
1.4.1	Execute.....	11
1.4.2	Delete Line.....	11
1.4.3	Search/Replace.....	12
1.4.4	File Manager .....	15
1.4.5	Simulation .....	23
1.4.6	Can Cycle.....	29
1.4.7	Block Copy .....	31
1.4.8	Teach.....	34
1.5	Offset/Setting .....	37
1.5.1	Workpiece Cord. ....	38
1.5.2	Tool Set.....	46
1.5.3	Tool Tip Measurement.....	48
1.5.4	User Parameter Setting .....	48
1.6	Monitor .....	49
1.6.1	Monitor Area of Machining Information.....	50
1.6.2	Open File to Edit.....	53
1.6.3	Simulation Switch.....	53
1.6.4	MDI Input .....	54
1.6.5	Parameter Set .....	54
1.6.6	Tool Wear Set .....	55
1.6.7	Start MPG Coordinate.....	55
1.6.8	Work Record.....	56
1.6.9	Clear Accum Cycle Time .....	56
1.6.10	Graph Adjust.....	56
1.7	Maintain .....	57
1.7.1	Alarm .....	58

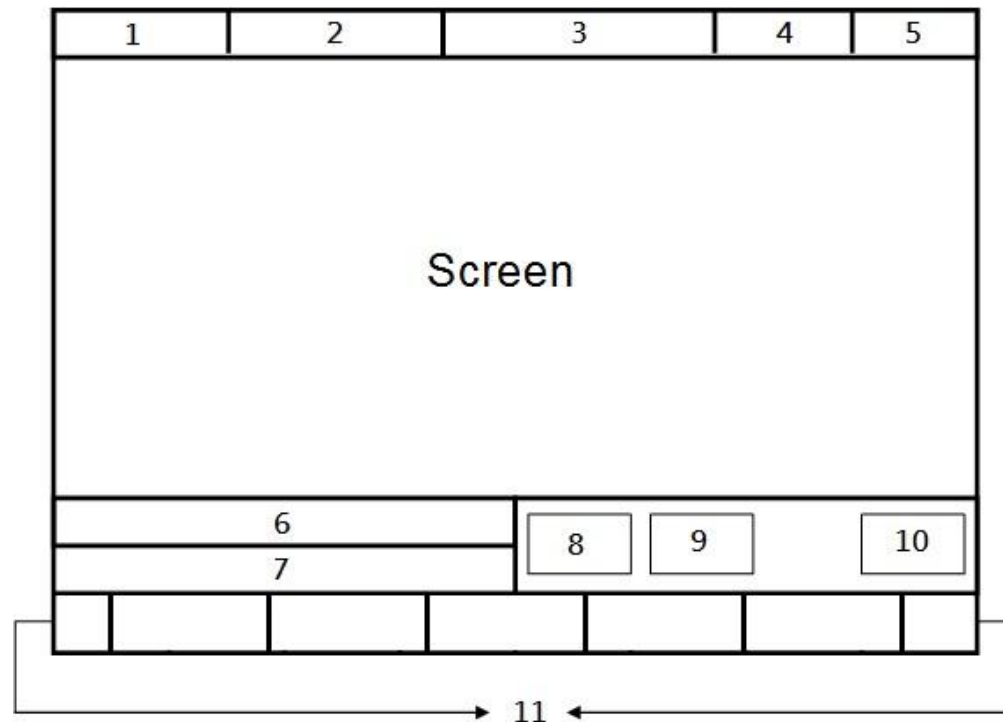
1.7.2	Network Setting .....	60
1.7.3	Fast Diagnostic.....	64
1.7.4	PLC Param Setting.....	67
1.7.5	System Setting .....	68
1.7.6	Backup System.....	70
1.7.7	About.....	70
2	Machine Operation Panel.....	71
2.1	Operation Panel.....	71
2.2	Text Key Description .....	75
3	How to Operate 6 Series Controller .....	78
3.1	System Status .....	78
3.1.1	Not Ready .....	78
3.1.2	Ready .....	78
3.1.3	Busy .....	78
3.1.4	Pause .....	79
3.1.5	B-stop.....	79
3.2	Machine Preparation .....	80
3.2.1	Manual Function .....	80
3.2.2	Machining Process .....	83
3.3	Workpiece Preparation.....	85
3.3.1	Workpiece Cord Set.....	85
3.3.2	Middle Func. ....	86
3.3.3	Tool Prepare.....	93
3.4	Program Preparation and Execute Machining .....	106
3.4.1	Specifies the machining Program .....	106
3.4.2	Simu. Setting.....	107
3.4.3	Machining Test .....	108
3.4.4	Machining Monitor .....	111
3.4.5	Alarm Processing .....	112
3.4.6	Network Setting .....	114
3.4.7	PC Setting .....	115
3.5	File Transfer.....	130
3.5.1	File Import .....	130
3.5.2	File Export .....	131
4	Appendix.....	132
4.1	Release Note .....	132

4.2	Contact Window .....	132
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# 1 Function Key and System Configuration

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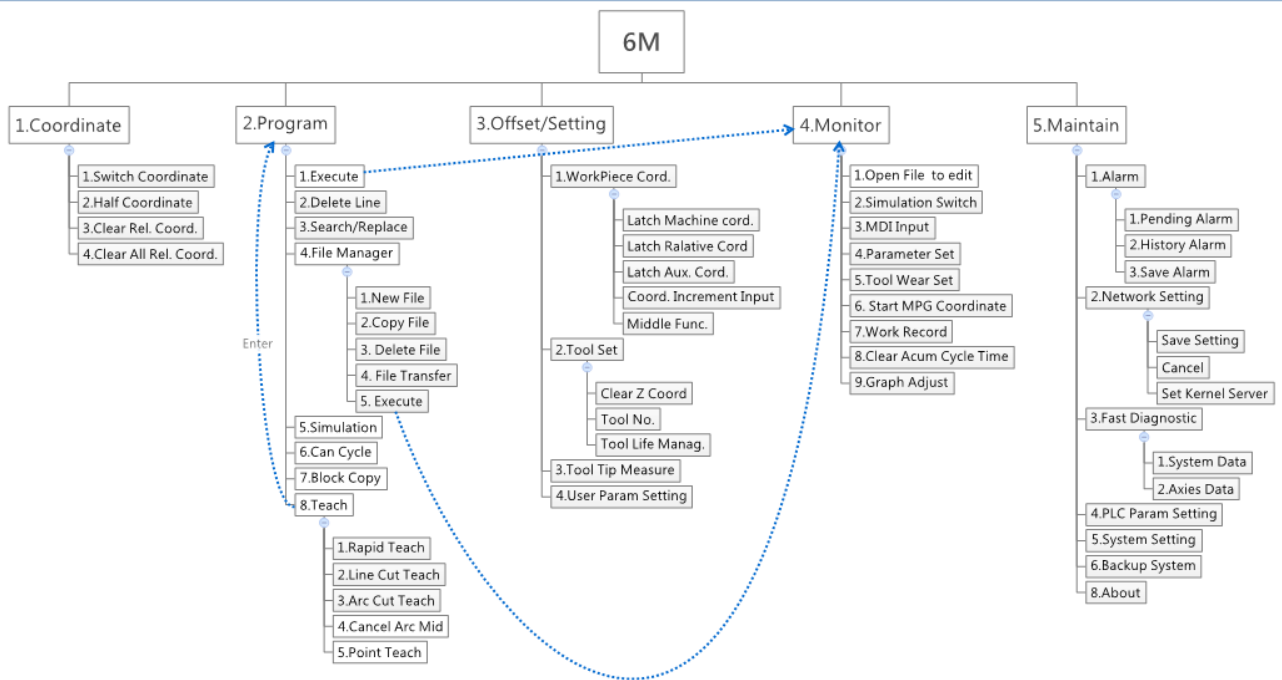
## 1.1 Main Screen Sections



◆ Meanings for Sections on the Display:

1. Present coordinate system
2. Working file name and machining command line
3. Title of interface (Current interface)
4. Date
5. Time
6. Data input
7. Display(Hint)
8. Status
9. Mode
10. Alarm
11. Function Key

## 1.2 CNC System Configuration



## 1.3 Coordinate

054	ATEST-161 N0 L1	Coordinate	2013/7/2	15:08:47
Machine			Relative	
X			X	0.000
Y			Y	0.000
Z			Z	0.000
			Absolute	
			X	0.000
			Y	0.000
			Z	0.000
			Dist. To Go	
			X	0.000
			Y	0.000
			Z	0.000
F	1000.000 mm/min 100 %	S	0 RPM 0 %	
	0.0 mm/min (Actual)		0 RPM (Actual)	
Run Time	0 : 0 : 0	PartCou	0	T 0
			Ready	Auto
			Alarm	

- Command
  - ✧ F1 Coordinate
- Function
  - ✧ Switch current coordinate system on the screen.
  - ✧ Display the frequently use machining information.
  - ✧ Use the function key **【POS】** , can switch to the current page quickly.

PS: By pressing **【POS】** Key, you may jump from other page to this page interface.



## **1.3.1 Explanation of Function**

### **1.3.1.1 Coordinate Display**

- ✧ Current screen can display 4 kind of coordinate system.
- ✧ Whenever users press F1 「 Switch Coordinate 」 function key, the coordinate on the screen will switch between four different kinds of coordinates.

### **1.3.1.2 F (Feedrate)**

- ✧ User input Feedrate (mm/min).
- ✧ Actual Feedrate of cutting tool (mm/min).
- ✧ Percentages of Feedrate

### **1.3.1.3 S(Rotating Speed of Spindle )**

- ✧ User input Spindle speed (RPM).
- ✧ Actual speed of spindle (mm/min).
- ✧ Percentages of Spindle speed.

### **1.3.1.4 Run Time**

- ✧ Machining Duration.

### **1.3.1.5 Part counter**

- ✧ Number of parts that had been finished.

### **1.3.1.6 T (Tool No.)**

- ✧ Current Tool no. and Tool compensation no.

### 1.3.2 Switch Coordinate

- Command
  - ✧ F1 Coordinate→F1 switch coordinate
- Function
  - ✧ When users press F1 「Switch Coordinate」 function key, the coordinate display on the screen will switch between four different kinds of coordinates.

### 1.3.3 Half Coordinate

- Command
  - ✧ F1 Coordinate→F2 Half Coordinate
- Function
  - ✧ Relative coordinate divided by 2.
  - ✧ Combined with 「Clear Rel. Coord.」 function , this function will calculate the middle point of the object.
- Operation Method
  - ✧ Key in the axis that you want to calculate and then press 「Half Coordinate」 .
- Example
  - ✧ Current Rel. Coord. of X axis is 10.000.
  - ✧ Key in 「X」 ,and then press 「half coordinate」 .
  - ✧ Current Rel. Coord. of X axis Will become 5.000.

### 1.3.4 Clear Rel. Coord.

- Command
  - ✧ F1 Coordinate→F3 Clear Rel. Coord.
- Function
  - ✧ Set the Relative Coordinate to zero.
- Operation Method
  - ✧ Key in the axis that you want to calculate and then press 「Clear Rel. Coord.」
- Example
  - ✧ Current Rel.Coord.of X axis is 10.000.
  - ✧ Press 「X」,and then press 「Clear Rel. Coord.」.
  - ✧ Current Rel. Coord. of X axis Will be set to 0.000.

### 1.3.5 Clear All Rel. Coord.

- Command
  - ✧ F1 Coordinate→F4 Clear All Rel. Coord.
- Function
  - ✧ Clear all Relative Coordinate.
- Example
  - ✧ Current X axis of relative coordinate is 10.000, Y axis is 5.000.
  - ✧ Press 「Clear All Rel. Coord.」 function key.
  - ✧ Relative Coordinate of X and Y will be set to 0.000.

## 1.4 Program



- Command
  - ✧ F2 Program
- Function
  - ✧ This function provides users program management and editing functions.
- Operation Method
  - ✧ Users can use 【↑】 【↓】 【←】 【→】 on the key pad to move the cursor to anywhere on the screen for editing purpose.
  - ✧ With 【Page Up】 【Page Down】 to switch the pages.
  - ✧ With 【Home】 【End】 can let the cursor jump between the top and end of the line.
  - ✧ With the function key 【Prog/File】 can quickly switch between 「Program」 and 「File Manager」.

### **1.4.1 Execute**

- Command

- ✧ F2 Program→F1 Execute

- Function

- ✧ Execute current program and also change the screen to 「Monitor」 page.

- Note

- ✧ This function will be disabled during machining.

### **1.4.2 Delete Line**

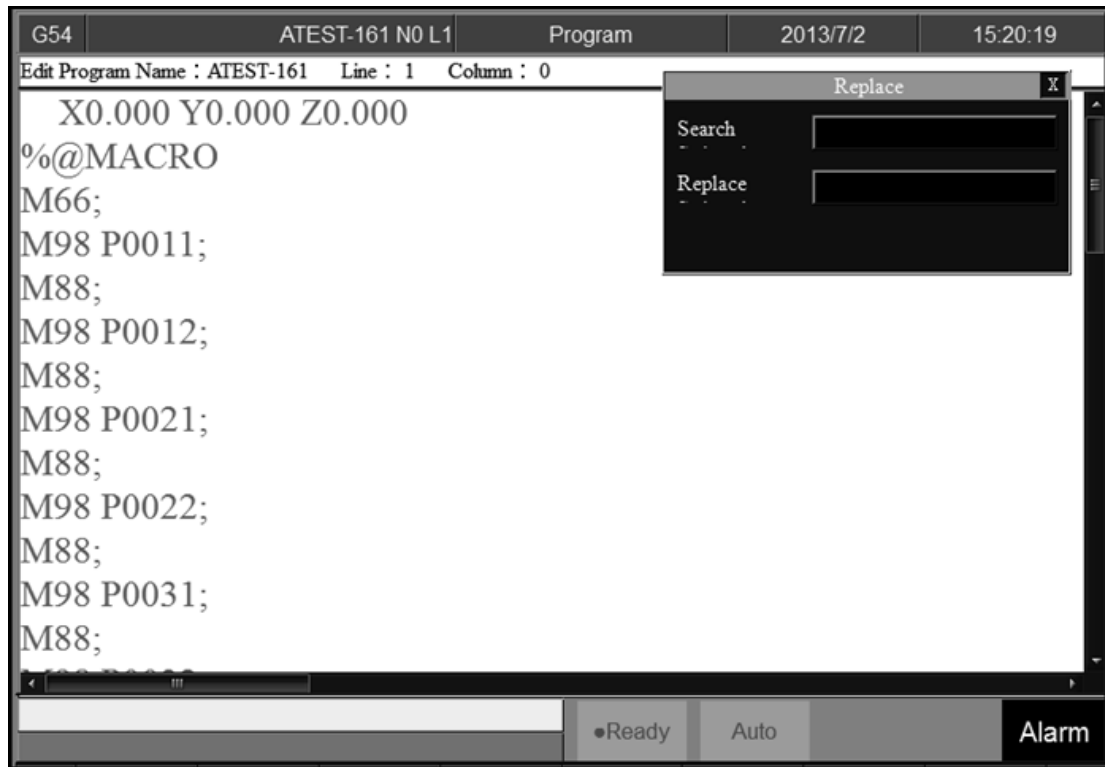
- Command

- ✧ F2 Program→F2 Delete Line

- Function

- ✧ Delete a line where the cursor is located.

## 1.4.3 Search/Replace



- Command
  - ✧ F2 Program→F3 Search/Replace
- Function
  - ✧ Quick search for every occurrence of a specific word or phrase and automatically replace text.
- Operation Method
  - ✧ Press 「Search/Replace」 function key, then Replace box will appear, just enter the text that you want to search and replace for.

### **1.4.3.1 Find Next**

- Command

- ✧ F2 Program→F3 Search/Replace→F1 Find Next

- Function

- Find Next

### **1.4.3.2 Replace**

- Command

- ✧ F2 Program→F3 Search/Replace→F2 Replace

- Function

- ✧ Replace with input text

- Operation Method

- ✧ Press F2 「Replace」 to replace highlight string with new string.

- ✧ If you want to skip the current highlighted string, press F1「Find Next」.

## 1.4.3.3 Replace All

- Command

- ✧ F2 Program→F3 Search/Replace→F3 Replace All

- Function

- ✧ Replace all search text with input text.

## 1.4.3.4 Modify Setting

- Command

- ✧ F2 Program→F3 Search/Replace→F4 Modify Setting

- Function

- ✧ Reset 「Search/Replace」 input.

- Operation Method

- ✧ Press F4 「Modify Setting」 to reset the 「Search/Replace」 content.



## 1.4.4 File Manager

G54	ATEST-161 N0 L1	File Manager	2013/7/2	15:52:57
DiskC2\OpenCNC\NcFiles Free Space: 144506093KB				
Name	Size	Modified	Comment	
0318-lathe	215	2013/03/19 14:33:09	G00 X20.0 Z5.0;	
0318-Lesson	269	2013/03/18 16:24:18	G90 G00 X0. Y0. Z10.;	
0318-Lesson-polar	212	2013/04/18 17:18:39	G90 G00 X11.76. Y16.18. Z10.;	
ATEST-161	421	2013/06/28 18:57:17	X0.000 Y0.000 Z0.000	
Bug-0411	61	2013/04/11 21:11:37	G00 A10. Y10. Z0.	
G0201	86	2013/03/29 15:18:18	%@MACRO	
G0300	855	2013/04/01 11:35:53	%@MACRO	
kfp-c d6r0.nc	241657	2011/05/16 15:02:32	%//Bottle Base Rough Cut	
M0066	376	2013/06/14 17:30:11	%@MACRO	
M0088	471	2013/06/14 17:30:49	%@MACRO	
Marco_hw1	288	2013/04/02 10:56:15	%@MACRO	
Marco_hw3	61	2013/03/28 22:10:58	%@MACRO	
Marco_hw4	34	2013/04/01 11:37:16	G54 G90	
MDIBlock	2	2013/04/16 15:45:51		
O0003	23	2013/04/02 21:19:24	%@MARCO	
O0010	210	2013/04/18 14:52:17	% @MACRO	
O0011	26	2013/06/14 17:20:27	%@MACRO	
O0012	25	2013/06/14 17:21:10	%@MACRO	
O0900	177	2012/06/08 10:38:26	% @MACRO	
O1234	32	2013/03/27 21:39:19	O1234;	
O5555 NC	226	2013/03/29 11:03:43		
			●Ready	Auto Alarm

- Command

- ✧ F2 Program→F4 File Manager

- Function

- ✧ This function key can manage all of the NC files within the data storage device. The device can be setting with Pr3213.

- Operation Method

- ✧ Use 【↑】 【↓】 on the key pad to move the cursor to anywhere on the screen for editing purpose.
  - ✧ With 【Page Up】 【Page Down】 to switch the cursor between pages.
  - ✧ Press 【ENTER】 on the key pad, to assign the current cursor file as the execute file, screen will show up with the program content and can enable to edit the program.

## 1.4.4.1 New File

- Command

- ✧ F2 Program→F4 File Manager→F1 New File

- Function

- ✧ Open a new file, that file will be the current edit file.

- Operation Method

- ✧ Press 「New File」function key, a dialog box will appear, enter the new file name and press **【ENTER】** .

- Note

- ✧ Default file name has no file extension. If user want to create a new file with file extension such as \*.NC, just enter the extension (\*.NC) as well.

- ✧ The length of file name cannot be longer than 32 characters(include file extension)

## 1.4.4.2 Copy File

- Command

- ✧ F2 Program→F4 File Manager→F2 Copy File

- Function

- ✧ Copy the file that remarked by cursor.

- Operation Method

- ✧ Use **【↑】** **【↓】** to move the cursor to the file that want to copy.

- ✧ Press 「Copy File」 function key.

- ✧ A dialog box will appear, enter the new file name.

- Note
  - ✧ Default file name has no file extension. If user want to create a new file with file extension such as \*.NC, just enter the extension (\*.NC) as well.
  - ✧ The length of file name cannot be longer than 32 characters(include file extension)

#### 1.4.4.3 Delete File

- Command
  - ✧ F2 Program→F4 File Manager→F3 Delete File
- Function
  - ✧ Delete file that remarked by cursor.
- Operation Method
  - ✧ Press F3 「Delete File」, checkbox will show up in front of the NC file within the 「File Manager」 monitor page. Use 【↑】 【↓】 to select the delete file.
- Sub-function Key
  - ✧ Select: Select file, can select more than one file and also can cancel the selection of one file.
  - ✧ Select All: Select all files.
  - ✧ Cancel Select: Deselect all files.
  - ✧ Delete File: Delete all of the selected files.
  - ✧ Delete All: Delete all file within the data storage device.
- Note
  - ✧ Current Programming and machining file cannot be deleted.

## 1.4.4.4 File Transfer

- Command
  - ✧ F2 Program→F4 File Manager→F4 File Transfer
- Function
  - ✧ Transmit data between controller and outer device.

#### 1.4.4.4.1 File Import

- Command
  - ✧ F2 Program→F4 File Manager→F4 File Transfer→F1 File Import
- Function
  - ✧ Import outer file into controller
- Function Page Explanation
  - ✧ The upper block shows the outer devices selection with the following choice.
    - USBDisk
    - DiskA
    - Network
    - USBDisk2
  - ✧ Left column shows data structure of the outer device.
  - ✧ Right column shows data structure of the inner storage of the controller.
- Sub-function Explanation
  - ✧ Copy: Copy the remarked file from the outer device to the controller.
  - ✧ Select: Select or deselect each file. (Not available for folder)
  - ✧ Select All: Select all files.
  - ✧ Cancel Select: Deselect all files.
  - ✧ Device Change: Change outer device selection.
- Operation Method
  - ✧ Press F1 「File Import」, a dialog box will appear.
  - ✧ Default outer device is USBDisk.
  - ✧ If you want to change the outer device, press F5 「Device Change」, switch the cursor to the desire device and press **【Enter】**,

then the left column will change and show the data structure of selected device.

- ✧ Use **【 ↑ 】** **【 ↓ 】** to select file.
- ✧ Move the cursor to the import file and press F2 「 Select 」 or **【 Space 】** to remark file.
- ✧ After remarked all of the import file, press F1 「 Copy 」 then all of the remarked file will import into controller.

#### 1.4.4.4.2 File Export

- Command
  - ✧ F2 Program→F4 File Manager→F4 File Transfer→F2 File Export
- Function
  - ✧ Export files within controller to outer device.
- Function Page Explanation
  - ✧ The upper block shows the outer devices selection with the following choice.
    - USBDisk
    - DiskA
    - Network
    - USBDisk2
  - ✧ Left column shows data structure of the outer device.
  - ✧ Right column shows data structure of the inner storage of the controller.
- Sub-function Explanation
  - ✧ Copy: Copy the remarked file from the outer device to the controller.
  - ✧ Select: Select or deselect each file. (Not available for folder)
  - ✧ Select All: Select all files.
  - ✧ Cancel Select: Deselect all files.
  - ✧ Device Change: Change outer device selection.
- Operation Method
  - ✧ Press 「File Export」, a dialog box will appear.
  - ✧ Default outer device is USBDisk.
  - ✧ If you want to change the destination device, press F5 「Device Change」, switch the cursor to the desire device and press 【Enter】.

then the left column will change and show the data structure of selected device.

- ✧ Use 【 ↑ 】 【 ↓ 】 to select file.
- ✧ Move the cursor to the export file and press F2 「 Select 」 or 【 Space 】 to remark file.
- ✧ After remarked all of the export file, press F1 「 Copy 」 then all of the remarked file will export from controller to outer device.

#### 1.4.4.5 Execute

- Command

- ✧ F2 Program→F4 File Manager→F5 Execute

- Function

- ✧ Execute current program. and also change the screen to the 「 monitor 」 page.

- Operation Method

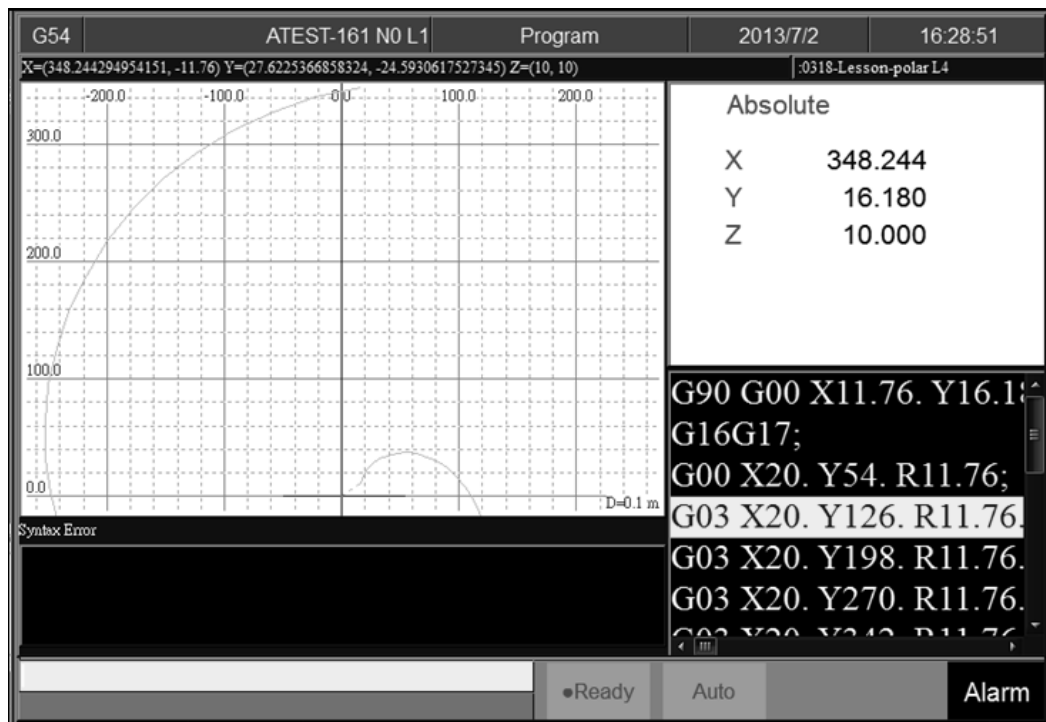
- ✧ Use 【 ↑ 】 【 ↓ 】 to select file, and then press 「 Execute 」 the selected file will be the executive file.

- Note

- ✧ This function is invalid when machining.



## 1.4.5 Simulation



- Command
  - ✧ F2 Program→F5 Simulation
- Function
  - ✧ Program simulation for the actual machining route.
  - ✧ Capability of debug.
  - ✧ Default display range will be the span of the full program.
  - ✧ Simulation setting can be modified by F5 「simulate Setting」.

## 1.4.5.1 Step

- Command

- ✧ F2 Program→F5 Simulation→F1 Step

- Function

- ✧ Simulate the program block by block.

- ✧ Monitor the variation of the coordinate for single block.

## 1.4.5.2 Continue

- Command

- ✧ F2 Program→F5 Simulation→F2 Continue

- Function

- ✧ System will scan all of the programs and then do the simulation.

## 1.4.5.3 Zoom

- Command

- ✧ F2 Program→F5 Simulation→F3 Zoom

- Function

- ✧ Zoom in/out the simulation window.

- Operation Method

- ✧ Press F3「Zoom」,there will be a block show up. Use【↑】【↓】【←】

- 【→】 to move the window up, down, left and right.

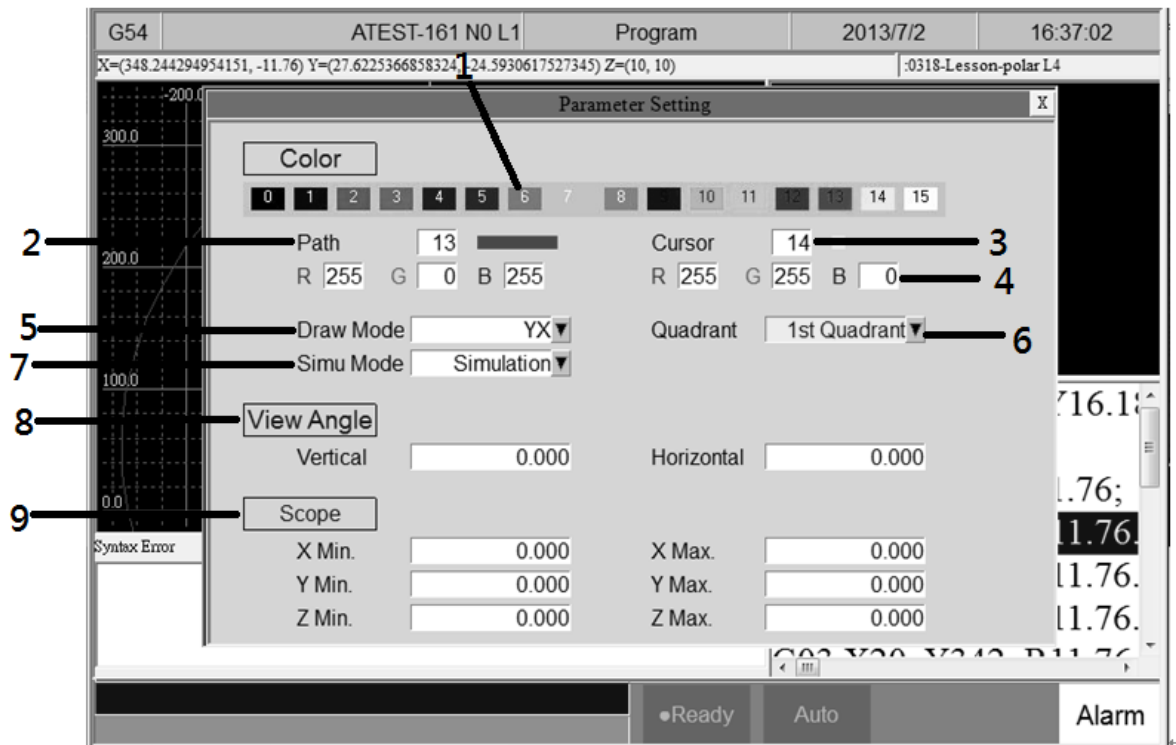
- ✧ Use 【Page Up】 【Page Down】 to change the zooming area.

- ✧ Press 【ENTER】 to check the result.

#### 1.4.5.4 Graph Reset

- Command
  - ✧ F2 Program→F5 Simulation→F4 Graph Reset
- Function
  - ✧ Reset the simulation result to default.

#### 1.4.5.5 Simu. Setting



- Command
  - ✧ F2 Program→F5 Simulation→F5 Simu. Setting
- Function
  - ✧ Setting the relative simulation item.
- Simulation Parameter
  1. Color
    - ✧ Provide 16 different colors(Setting 0~15).
  2. Path Color
    - ✧ Simulation path color.
    - ✧ Provide 16 different colors(Setting 0~15).
  3. Cursor Color

✧ Color of cursor point

✧ Provide 16 different colors(Setting 0~15).

## 4. RGB Value

✧ Except the 16 default color, user can define the color themself.

## 5. Draw Mode

✧ User can define the profile simulate plane.

● Plane can define are as below.

◆ XYZ

◆ YX

◆ XY

◆ ZY

◆ YZ

◆ XZ

◆ ZX

◆

## 6. Setting quadrant

◆ User can define the quadrant of simulate plane.

◆ Quadrant can define are as below.

◆ First

◆ Second

◆ Third

◆ Fourth

## 7. Simulate Mode

### ◆ Setting profile simulate method.

- Simulation

- ✧ When user go to the 『Monitor』 page, simulation will show up automatically.

- ✧ System will scan the whole program and detect the simulation boundary, and then simulation will execute.

No need to define the simulate boundary.

- Direct Draw

- ✧ When user go to the 『Monitor』page, cursor will show up but simulation will not execute automatically.

- ✧ User need to define the simulation boundary first.

- ✧ When the machining starts, cursor will follow up as well.

- Not Simulation

- ✧ Close the simulation function.

## 8. View Angle Setting

- ✧ Under XYZ draw mode, by setting this parameter, simulation will show up with 3D.

- View angle can define are as below.

- ◆ Vertical

- ◆ Horizontal

## 9. Scope

- Scope can define are as below.

- Minimum

- ◆ X-Axis

- ◆ Y-Axis

- ◆ Z-Axis

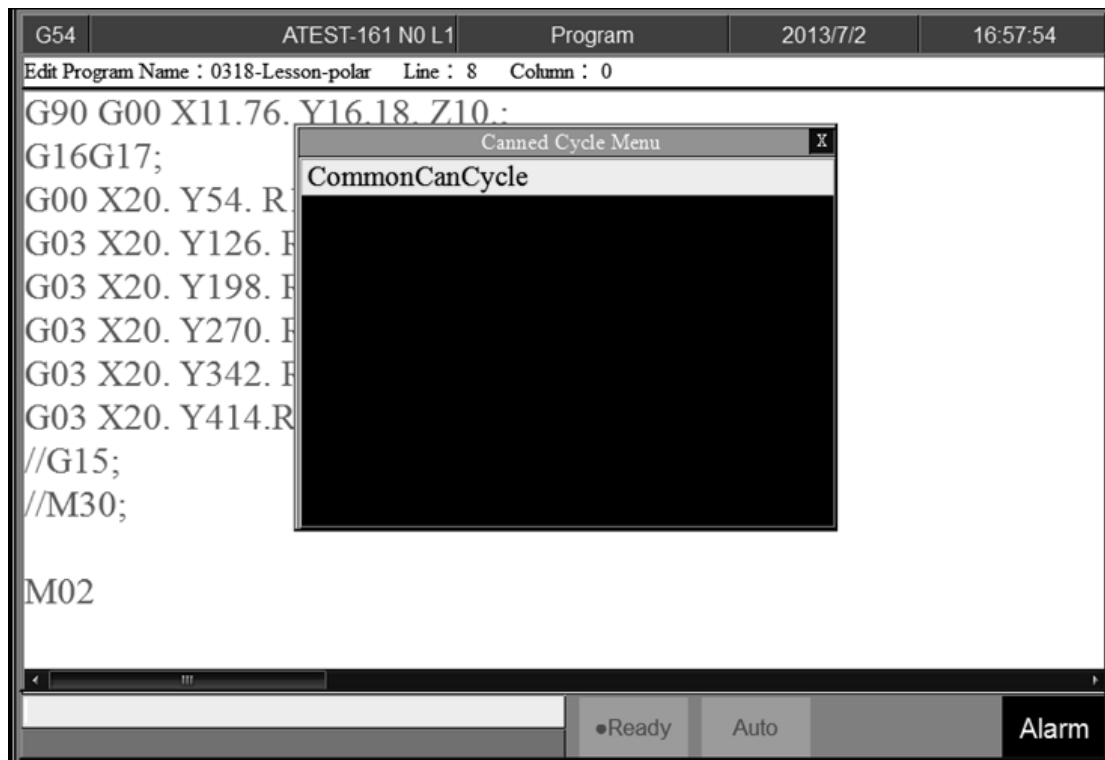
- Maximum

- ◆ X-Axis

- ◆ Y-Axis

- ◆ Z-Axis

### 1.4.6 Can Cycle



- Command
  - ✧ F2 Program→Next→F1 Can Cycle
- Function
  - ✧ Because Syntec system provides many G codes and different G code has each function. When editing the program, this function can help user to edit G code easily.

## 1.4.6.1 Insert Cycle

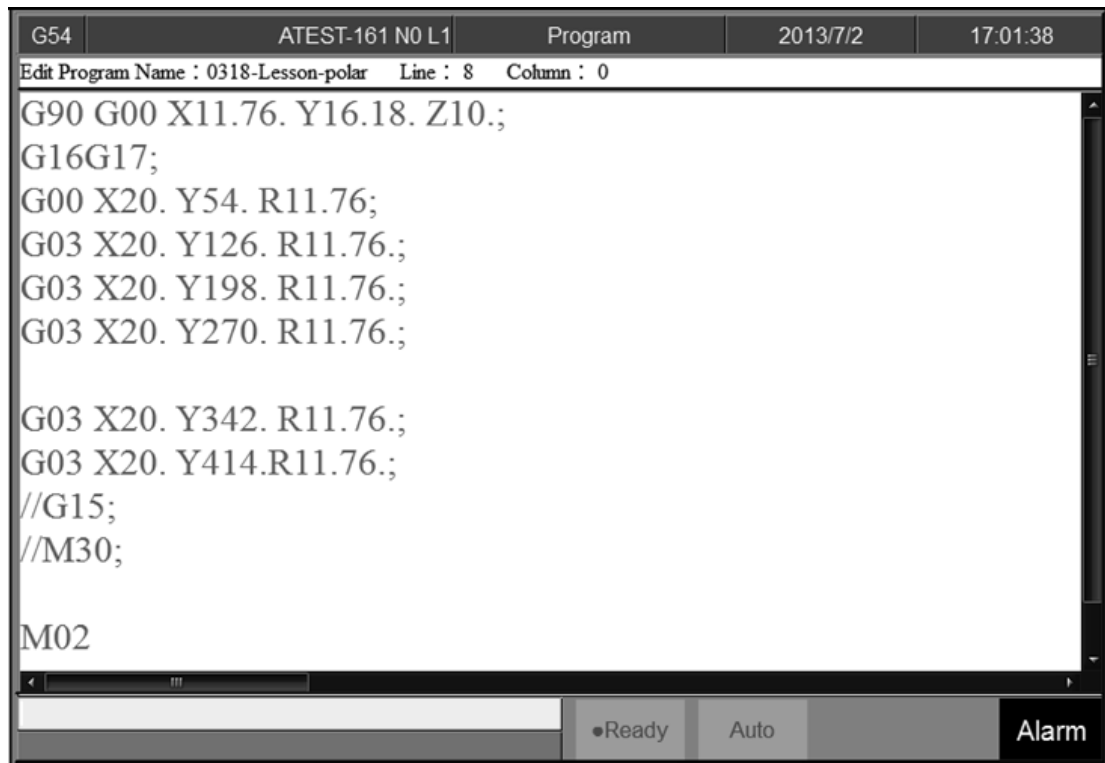
- Command
  - ✧ F2 Program→Next→F1 Can Cycle→F1 Insert Cycle
- Function
  - ✧ Insert the required G code.
- Operation Method
  - ✧ Under the program edit mode, move the cursor to the desired location and press 「Insert Cycle」.
  - ✧ Follow the instruction and press 「OK」, the desired G code will insert into the next line of current cursor.

## 1.4.6.2 Edit Cycle

- Command
  - ✧ F2 Program→Next→F1 Can Cycle→F2 Edit Cycle
- Function
  - ✧ Edit the current cycle.
- Operation Method
  - ✧ Move the cursor to the cycle and press 「Edit Cycle」, a modify page will show up. Modify the contents and press 「OK」, the contents of the current cycle will change.



## 1.4.7 Block Copy



- Command
  - ✧ F2 Program→Next→F2 Block Copy
- Function
  - ✧ Select, cut, copy and paste more than one line of programs.

## 1.4.7.1 Start Line

- Command

- ✧ F2 Program→Next→F2 Block Copy→F1 Start Line

- Function

- ✧ Define the start line of block.

## 1.4.7.2 End Line

- Command

- ✧ F2 Program→Next→F2 Block Copy→F2 End Line

- Function

- ✧ Define the end line of block.

## 1.4.7.3 Block Cut

- Command

- ✧ F2 Program→Next→F2 Block Copy→F3 Block Cut

- Function

- ✧ Cut the block that had been selected.

## 1.4.7.4 Block Copy

- Command

- ✧ F2 Program→Next→F2 Block Copy→F4 Block Copy

- Function

- ✧ Copy the block that had been selected.

## 1.4.7.5 Block Paste

- Command

- ✧ F2 Program→Next→F2 Block Copy→F5 Block Paste

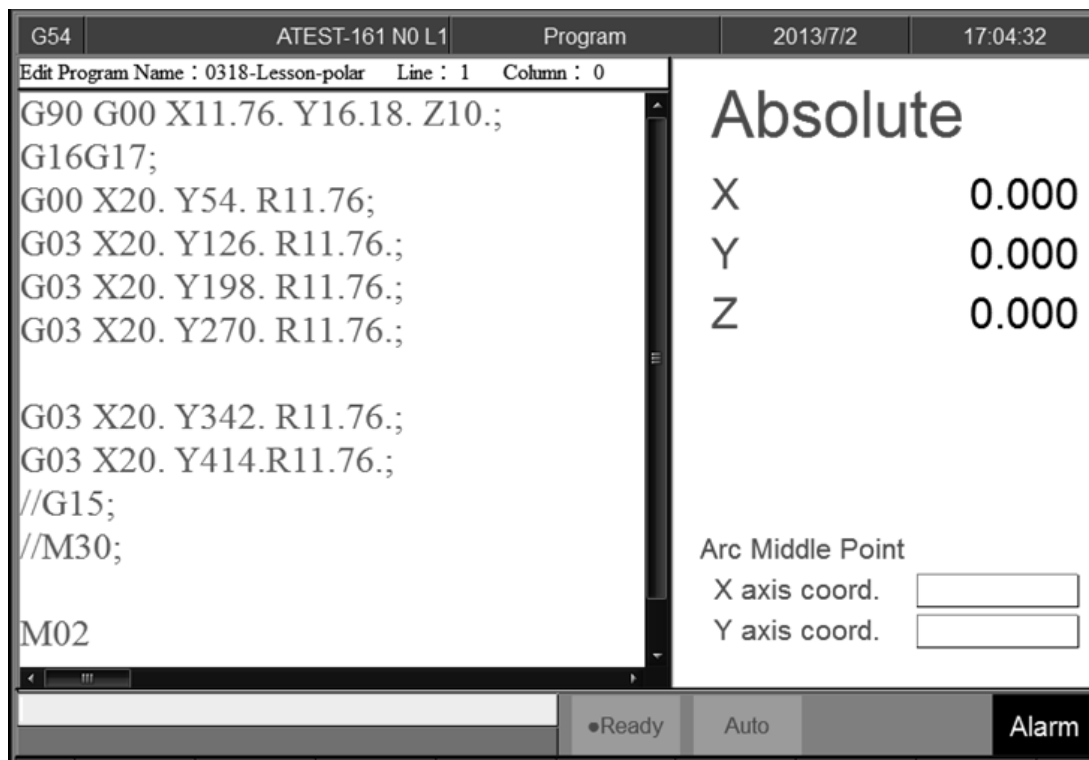
- Function

- ✧ Paste the block that had been 「Block Cut」 and 「Block Copy」.

#### 1.4.7.6 Operation Method

- ✧ Move the cursor to the desire line and press 「Start Line」 and function key 「End Line」 enable.
  - ✧ Press 【↑】 【↓】 【Page Up】 【Page Down】 to select desired area.
  - ✧ Press 「End Line」, block between 「Start Line」 and 「End Line」 will be selected.
    1. →Function key 「End Line」 disable.
    2. →Function key 「Block Copy」 enable.
    3. →Function key 「Block Cut」 enable.
    4. →If 「Block Cut」 being use, the whole block that had been highlight will be cut off.
    5. →Function key 「Block Copy」 / 「Block Cut」 disable.
    6. →Function key 「Block Paste」 enable.
  - ✧ Move the cursor to the desire location and press 「Block Paste」, the content that had been cut or copied will paste at the cursor location.
  - ✧ If 「Block Copy」 is used, the block that had been selected will not disappear.
- Note
- ✧ If 「Block Cut」 is use, and do not paste the content immediately, the cut program will disappear.
  - ✧ The contents of 「Block Cut」 can be pasted for only one time but the contents of 「Block Copy」 can be pasted for many times.

## 1.4.8 Teach



- Command
  - ✧ F2 Program→F6 Teach
- Function
  - ✧ Move the machine table with 『MPG』 / 『JOG』 / 『INJOG』 to the destination and use 『Teach』 function, input the current absolute coordinate value to NC program.
  - ✧ Omit the manual input problem.

### 1.4.8.1 Rapid Teach

- Command
  - ✧ F2 Program→F6 Teach→F1 Rapid Teach
- Function
  - ✧ Add the current absolute coordinate as the value of 「G00 Rapid Traverse」 function in current program.

### 1.4.8.2 Line Cut Teach

- Command
  - ✧ F2 Program→F6 Teach→F2 Line Cut Teach

- Function

- ✧ Add the current absolute coordinate as the input value of 「G01 Linear Cutting」 function in current program.

### **1.4.8.3 Arc Cut Teach**

- Command

- ✧ F2 Program→F6 Teach→F3 Arc Cut Teach

- Function

- ✧ Add current absolute coordinate as the input value of 「G02/G03 Circular Cutting」 function in current program.

- Operation Method

- ✧ Move the worktable to the arc center and press 「Arc Cut Teach」 , current absolute coordinate will be define as the arc center.
- ✧ Move the worktable to the ending of the arc and press「Arc Cut Teach」, current absolute coordinate will be define as the ending of the arc.  
Controller will automatically calculate the relation between middle and end point and determine whether to use G02 or G03. The calculation result will be regarded as the input value of 「G02/G03 Circular Cutting」 function.

### **1.4.8.4 Cancel Arc Middle**

- Command

- ✧ F2 Program→Next→F3 Teach→F4 Cancel Arc Middle

- Function

- ✧ Clear the arc middle that had been set.
- ✧ If the arc middle are not being set, this function will not enable.

## 1.4.8.5 Point Teach

- Command

- ✧ F2 Program→Next→F3 Teach→F5 Point Teach

- Function

- ✧ Move the worktable to the arc center and press 「Point Teach」, current absolute coordinate will be input into the cursor location.

## 1.5 Offset/Setting

G54	N0 L1		Offset/Setting		2013/8/22	17:05:42
External Shift		G54P1(G54)		G54P2(G55)		Machine
X	0.000	X	0.000	X	0.000	X 0.000
Y	0.000	Y	0.000	Y	0.000	Y 0.000
Z	0.000	Z	0.000	Z	0.000	Z 0.000
A	0.000	A	0.000	A	0.000	A 4.158
MPG Shift		G54P3(G56)		G54P4(G57)		Relative
X	0.000	X	0.000	X	0.000	X 0.000
Y	0.000	Y	0.000	Y	0.000	Y 0.000
Z	0.000	Z	0.000	Z	0.000	Z 0.000
A	0.000	A	0.000	A	0.000	A 4.158
						Aux. Coord
						X 0.000
						Y 0.000
						Z 0.000

- Command

- ✧ F3 Offset/Setting

- Function

- ✧ User can set up the coordinate system and tool offsets with this function.

- ✧ With the function key **【Offset/Setting】** can switch the page quickly to the Offset/Setting page.

## 1.5.1 Workpiece Cord.

G54	N0 L1		Offset/Setting		2013/8/22	17:12:48
External Shift		G54P1(G54)		G54P2(G55)		Machine
X	0.000	X	0.000	X	0.000	X 0.000
Y	0.000	Y	0.000	Y	0.000	Y 0.000
Z	0.000	Z	0.000	Z	0.000	Z 0.000
A	0.000	A	0.000	A	0.000	A 4.158
MPG Shift		G54P3(G56)		G54P4(G57)		Relative
X	0.000	X	0.000	X	0.000	X 0.000
Y	0.000	Y	0.000	Y	0.000	Y 0.000
Z	0.000	Z	0.000	Z	0.000	Z 0.000
A	0.000	A	0.000	A	0.000	A 4.158
						Aux. Coord
						X 0.000
						Y 0.000
						Z 0.000

- Command
  - ✧ F3 Offset/Setting→F1 Workpiece Cord.
- Function
  - ✧ For workpiece coordinate setting purpose.
  - ✧ System default will be G54 if there are no specific declaration with G54~G59.10 in the NC code.
  - ✧ The External Shift will include into all the workpiece coordinate.
- Operation Method:
  - ✧ Move the cursor with 【↑】 【↓】 【←】 【→】 .
  - ✧ Use 【PageUp】 【PageDown】 to switch the pages.
- Note
  - ✧ After setting the workpiece coordinate, user need to check the tool length again.



### 1.5.1.1 Latch Machine Cord.

- Command
  - ✧ F3 Offset/Setting→F1 Work Piece Cord.→F1 Latch Machine Cord.
- Function
  - ✧ Set current mechanical coordinate value into work piece coordinate.
- Operation Method
  - ✧ Move the worktable to the target location.
  - ✧ Move the cursor to the relate work piece coordinate and press 「Latch Machine Cord.」
  - ✧ Original value of workpiece coordinate will be replaced by the corresponding mechanical coordinate.
- Example
  - ✧ Current mechanical coordinate of X axis is 5.000
  - ✧ Current value of X axis of G54 is 0.000
  - ✧ Move the cursor to G54 X axis.
  - ✧ Press 「Latch Machine Cord.」, the value of X axis of G54 becomes  
5.000

## 1.5.1.2 Latch Relative Cord.

- Command
  - ✧ F3 Offset/Setting→F1 Work Piece Cord.→F2 Latch Relative Cord.
- Function
  - ✧ Set current relative coordinate value into work piece coordinate.
- Operation Method
  - ✧ Move the worktable to the target location.
  - ✧ Move the cursor to the related work piece coordinate and press 「Latch Relative Cord.」
  - ✧ Original value of workpiece coordinate will be replaced by the corresponding relative coordinate.
- Example
  - ✧ Current relative coordinate of X axis is 5.000
  - ✧ Current value of X axis of G54 is 0.000
  - ✧ Move the cursor to G54 X axis.
  - ✧ Press 「Latch Relative Cord.」, the value of X axis of G54 become 5.000

### 1.5.1.3 Latch Aux. Cord.

- Command
  - ✧ F3 Offset/Setting→F1 Work Piece Cord.→F3 Latch Aux. Cord.
- Function
  - ✧ Set the current cursor located work piece coordinate value as the aux. coordinate value.
  - ✧ Aux. value appears after using middle function.
- Operation Method
  - ✧ Using middle function to calculate the aux. coordinate value.
  - ✧ Move the cursor to the desired work piece coordinate and press 「Latch Aux. Cord.」
  - ✧ Original value of workpiece coordinate will be replaced by the corresponding Aux. coordinate.
- Example
  - ✧ Current mechanical coordinate of X axis is 5.000
  - ✧ Current value of X axis of G54 is 0.000
  - ✧ Move the cursor to G54 X axis.
  - ✧ Press 「Latch Aux. Cord.」, the value of X axis of G54 become 5.000

### 1.5.1.4 Coord. Increment Input

- Command
  - ✧ F3 Offset/Setting→F1 Work Piece Cord.→F4 Coord. Increment Input
- Function
  - ✧ Add the work piece coordinate value with the manual input value and restore into work piece coordinate again.
- Operation Method
  - ✧ Move worktable to the target location.
  - ✧ Input increment value.

- ✧ Move the cursor to the work piece coordinate and press 「Coord. Increment Input.」

- ✧ Work piece coordinate will be replaced by the cursor located coordinate +input value.

- Example

- ✧ Current mechanical coordinate of X axis is 5.000

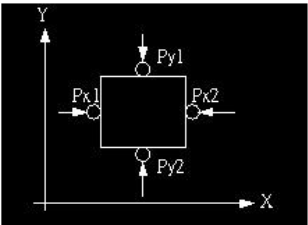
- ✧ Move cursor to the workpiece coordinate G54 of X axis

- ✧ Key in 10.000

- ✧ Press 「Coord. Increment Input.」

- ✧ The coordinate of G54 X axis become 15.000

### 1.5.1.5 Middle Func.

G54	N0 L1	Offset/Setting	2013/8/22	17:39:23
Manual Center <b>0</b> (0:Manual, 1:Auto) <b>0</b> (0:4Pts, 1:3Pts)		<b>Machine Coord</b> Px1 0.000 Px2 0.000 Pxm 0.000 Py1 0.000 Py2 0.000 Pym 0.000		<b>Machine</b> X 0.000 Y 0.000 Z 0.000 A 4.158  <b>Relative</b> X 0.000 Y 0.000 Z 0.000 A 4.158  <b>Aux. Coord</b> X 0.000 Y 0.000 Z 0.000
 <p>Manual Center Operation SI</p> <p>Step1 : take the tool to the point Px1 and press Px1 to set</p> <p>Step2 : take the tool to the point Px2 and press Px2 to set</p> <p>Step3 : take the tool to the point Py1 and press Py1 to set</p> <p>Step4 : take the tool to the point Py2 and press Py2 to set</p> <p>Step5 : back to Workpiece screen to do Auxiliary point set</p>				
		●Ready    Auto	Alarm	

- Command
  - ✧ F3 Offset/Setting→F1 Work Piece Cord.→F5 Middle Func.
- Function
  - ✧ Calibrate the middle point of the work piece before machining.
- Operation method
  - ✧ Input the Middle Func calculated result into G54~G59 work piece coordinate.
  - ✧ There are two kind of operation method for the Middle Func, one is manual and another is automatic.

## 1.5.1.5.1 Manual

- Function

- ✧ Mode of Middle Func. is 0.
- ✧ Move the tool with MPG to the edge of the workpiece XY axis. Record the machine coordinate and system will calculate the center point of the workpiece automatically.

- Operation method

- ✧ Move the measurement tool with MPG to Px1 point according to the figure and then press PX1 set. The system will input the current machine Coord. into PX1.
- ✧ Measure PX2 with the same method. Combine with PX1, system will compute the center point of PX1 and PX2 and set the result into Pxm and Aux. X Coord.
- ✧ Move the measurement tool with MPG to PY1 point according to the figure and then press PY1 set. The system will input the current machine Coord. into PY1.
- ✧ Measure PY2 with the same method. Combine with PX2, system will compute the middle point of PY1 and PY2 and set the result into Pym and Aux. Y Coord.
- ✧ The values of Pxm and Pym are the center point of the workpiece.
- ✧ In the WorkPiece Cord setting page, move the cursor to the relative coord, press F3 「insert the Aux. Coord」 then system will set the Aux Coord value into relate work piece coordinate.

### 1.5.1.5.2 Auto

- Function

- ✧ Mode of Middle Func. is 1.
- ✧ Auto middle func. is different from Manual func. User only needs to enter the dimension of the workpiece and enter the boundary coordinate. Move the tool to the start point, system will find out the center point of work piece automatically.

- Parameter Description

- ✧ Length I: length of Workpiece in X dimension
- ✧ Width J: width of Workpiece in Y dimension
- ✧ Safe Distance H: The distance between start point P2 and workpiece, in X or Y direction.
- ✧ Feedrate F: Auto detection speed.
- ✧ Safe altitude of Z Coordinate: safety distance for tool when moving as the P1 on the figure.

- Operation Method

- ✧ Move the tool to the safe altitude, as P1 point on the figure, press 「Z Coordinate Set」, then system will record the present Z coordinate value as the safe distance.
- ✧ Move the tool down to P2 point, that point will be the starting point of 「Auto Center」.
- ✧ Press 「Auto Center Start」, system will move the tool to touch the work piece according to the setting data and show the coordinate on the screen. It will also calculate the X Y center point of workpiece.
- ✧ Go back to WorkPiece Cord. setting page, move the cursor to the workpiece coordinate, press F3 「Insert the Aux. Coord」 then the system will set the coordinate with relate Aux.Coord value.

## 1.5.2 Tool Set

G54	N0 L1		Offset/Setting		2013/8/22	17:42:01
Input Mode(Absolute (I)Increment (Z)Measure					Machine	
Absolute						
Diameter(D)		Length(H)				
Geometry	Wear	Geometry	Wear			
1	0.000	0.000	0.000			
2	0.000	0.000	0.000			
3	0.000	0.000	0.000			
4	0.000	0.000	0.000			
5	0.000	0.000	0.000			
6	0.000	0.000	0.000			
7	0.000	0.000	0.000			
8	0.000	0.000	0.000			
					Dist. To Go	
					X 0.000	
					Y 0.000	
					Z 0.000	
					A 0.000	
					Relative	
					X 0.000	
					Y 0.000	
					Z 0.000	
					A 4.158	
					●Ready	
					Auto	
					Alarm	

- Command
  - ✧ F3 Offset/Setting→F2 Tool Set
- Function
  - ✧ Switch to compensate setting page.
  - ✧ Actual G41/G42 compensation value = Geometry + Wear diameter
  - ✧ Actual G43/G44 compensation value = Geometry + Wear length
- Function of Parameter
  - ✧ Geometry: G41/G42 tool radius Dn compensation setting(not diameter)
  - ✧ Wear of geometry: Tiny geometry modification of tool.
  - ✧ Length: G43/G44 tool lengths Hn compensation.
  - ✧ Length wear: Tiny length modification of tool.
- Operation method
  - ✧ With 【↑】 【↓】 【←】 【→】 key to move the cursor.
  - ✧ 【PageUp】 【PageDown】 to switch the page.



- Key in method: Absolute, Increment, Measure method
  - ✧ Absolute method:
    - Press 「A」 and press 「Enter」
    - The value where the cursor is will be set as the input value.
  - ✧ Increment method
    - Press 「I」 and then press 「Enter」.
    - The value where the cursor is will be set as input value + cursor value.
  - ✧ Measure method
    - Press 「Z」 and then press 「Enter」.
    - The value where the cursor is will be set as current Z coord relative coord value.
- Note
  - ✧ When the tool length had been set, related tool wear will become zero.
  - ✧ This Setting is disabled during machining condition.

### **1.5.2.1 Clean Z relative coordinate**

- Command
  - ✧ F3 Offset/Setting→F2 Tool Set.→F1 Clear Z Coord
- Function
  - ✧ Clean the relative value of Z coord.

## 1.5.2.2 Tool No

- Command

- ✧ F3 Offset/Setting→F2 Tool Set→F4 Tool No.

- Function

- ✧ Refer the chapter 3.3.3.5

## 1.5.2.3 Tool Life Manag.

- Command

- ✧ F3 Offset/Setting→F2 Tool Set→F5 Tool Life Manag.

- Function

- ✧ Refer the chapter 3.3.3.6.

## 1.5.3 Tool Tip Measurement

- Command

- ✧ F3 Offset/Setting→F3 Tool Tip Measurement

- Function

- ✧ User can key in different tool No. tip position into workpiece coordinate for the tool length offset setting, with tool alignment equipment.

- ✧ Detail Description please refer the chapter 3.3.3.3.

## 1.5.4 User Parameter Setting

- Command

- ✧ F3 Offset/Setting→F4 User Parameter Setting

- Function

- ✧ Syntec controller provided user to set the related machining parameter by them self.

- Function of parameter

- ✧ Detail explanation please reference 「 Mill Parameter Manual 」 .

## 1.6 Monitor

G54		TEST NO L1		Monitor		2013/7/2		20:05:46	
Absolute		Dist. To Go		G Code G1		Run Time		0 : 0 : 0	
X	-20.000	X	0.000	G18 G90 G95		Accum		0 : 0	
Z	100.000	Z	0.000	G71 G40 G49		Run Time			
Y	100.000	Y	0.000			G00 Over		100 %	
						G01 Over		100 %	
						Spd Over		100 %	
Feedrate 0.0mm/min				T 0000		TotalAcumPar 0			
Spindle 1000RPM				Start Block No. 1		Part Count 0			
G00 X100.000 Y100.000 Z100.000									
G0X100.Y100.Z100.C100.									
G00 X0.000 Z100.000;									
G04X5.S1000									
G00 X100.000									
<div> <div>Ready</div> <div>Not Select</div> <div>Alarm</div> </div>									

- Command:
  - ✧ F4 Monitor
- Function
  - ✧ This page monitors key machining information during machining process.

## 1.6.1 Monitor Area of Machining Information

G54	TEST N0 L1	Monitor	2013/7/2	20:05.46
Absolute	Dist. To Go	1 G Code G1	Run Time 0 : 0 : 0	2
X -20.000	X 0.000	G18 G90 G95	Accum 0 : 0	
Z 100.000	Z 0.000	G71 G40 G49	Run Time 0 : 0	3
Y 100.000	Y 0.000		G00 Over 100 %	
			G01 Over 100 %	
			Spd Over 100 %	
Feedrate 0.0mm/min		T 0000	5 TotalAcumPar 0	4
Spindle 1000RPM		Start Block No. 1	Part Count 0	
G00 X100.000 Y100.000 Z100.000				
G0X100.Y100.Z100.C100.				
G00 X0.000 Z100.000;				
G04X5.S1000				
G00 X100.000				
<div> <div>Ready</div> <div>Not Select</div> <div>Alarm</div> </div>				

### 1.6.1.1 Machine Status Monitor

- Machine Information
- Absolute coordinate
- Distance to go
- Feed rate
- Spindle

### 1.6.1.2 Program Monitor Block

- ✧ This block will display current machining program
- ✧ Yellow bar indicate to the current running block.

### 1.6.1.3 Machining Information

- Function
  - ✧ It is overlap with 「Process Setting」.
  - ✧ Press 「Parameter Set」 can switch display information.
- Description
  - G Code
    - It will show the G code under machining

2. Run Time Accum
  - Time accumulated for current single workpiece
3. Run Time
  - Total accumulated machining time
4. Percentage ratio
  - G00 percentage
  - G01 percentage
  - Spindle speed percentage
5. Total Accum Par
  - Total work pieces that had been finished.
  - System won't do any initialized action automatically.
  - If you want to do the initialization by manual, press  
     「Parameter Set」 switch to 「Part count」, set the 「Total  
     Acum Par」 as 0.
6. Part Count
  - Count no. will begin from zero when the program is running.
  - Total work pieces number machined by CNC
7. Start Block
  - We can set the start block of machining process.
  - n: Set the start line number as n. (Ex. 20)
  - L+n: Set the start line number as n. (Ex.L20)
  - N+n: Search N+n located line number and then assign that line as the start line (Ex. N3).
  - T+n: Search T+n located line number and assign it as the start line (Ex. T01).
  - If line number is out of max line number, then it will assign to the last line.
  - Please refer to 3.4.3.4 break point initialization about start block go back.

## 8. Tool data

- T
- 4 numbers
- The first two code are the tool no..
- The last two code are the tool compensate no.

### 1.6.1.4 Display Area of Machining Setting

#### ● Description

- ✧ This area is overlap with 「Machining Information」, press F4  
「Parameter Set」 to change the displays.

#### ● Explanation of Display:

##### 1. Interrupt Line No.

- ✧ Display the last interrupted serial number (N)

##### 2. Interrupt Colum No.

- ✧ Display the last interrupted line number (L)

##### 3. Spindle speed

- ✧ Speed of spindle.

- ✧ It is allow to setting when system is busy. Moreover, it will be enabled immediately

#### ● Feedrate

- ✧ Set the speed of the feed rate. °
- ✧ It is allow to setting when system is busy, but the value will be updated after completely executing processing block.

#### ● Total AcumPar

- ✧ Total work pieces number machined by CNC  
System cannot automatically reset this value to zero

#### ● Part count

- ✧ Setting current work pieces no.
- ✧ Count no. will begin from zero when the running program is change.

- ✧ When CNC executes M code defined by parameter 3804, part count would be added 1 and run time will be reset to 0. When required part number is reached, system will change to halt status.

- Required part

- ✧ Set the upper limit of part count number.
- ✧ Once part count number is reached, an alarm will be pop up and system will change to halt status.

### **1.6.1.5 Simulation Area**

- Description

- ✧ Display the tool trajectory of current program.
- ✧ Related setting, please see F2-program→F5-simulaiton→F5- Simu. Setting.
- ✧ Use F2 「Simulation Switch」 to change the display content

## **1.6.2 Open File to Edit**

- Command:

- ✧ F4 Monitor→F1 Open File to Edit

- Description

- ✧ Load and edit the current machining program, also switch to “F2-program” interface.

- Note:

- ✧ Once system is on running state, edit function will be disabled.

## **1.6.3 Simulation Switch**

- Command:

- ✧ F4 Monitor→F2 Simulation Switch

- Description

- ✧ Display or hide simulation display
- ✧ 「Graph Adjust」 will enable under 「Simulation Switch」 conditions.

## 1.6.4 MDI Input

- Command:
  - ✧ F4 Monitor→F3 MDI Input
- Description
  - ✧ Manual Data Input. Using for simple NC program or testing purpose.
- Operation:
  - ✧ Select MDI mode
  - ✧ MDI function is enabled after finishing HOME search action.
  - ✧ Press F3 「MDI」, edit the program.
  - ✧ Press F1 (OK) to confirm the input command.
  - ✧ The command line will show up on the right upper corner of screen.
  - ✧ Press **【CYCLE START】** to execute the command.
- Note:
  - ✧ This function is enables under MDI mode.

## 1.6.5 Parameter Set

- Command:
  - ✧ F4 Monitor → F4 Parameter set
- Description
  - ✧ Switch the screen between 「Machining Setting」 and 「machining information」.



### **1.6.6 Tool Wear Set**

- Command:
  - ✧ F4 Monitor→F5 Tool Wear Set
- Description
  - ✧ Display the tool wear setting interface, user can setting tool wear here.
  - ✧ Actual Tool length= Tool length +Tool wear
- Parameter Setting
  - ✧ Tool Wear Set: Tiny tool length modification.
- Note
  - ✧ If the tool length is setting by measure method tool wear setting will become 0 after the tool length is set.

### **1.6.7 Start MPG Coordinate**

- Command:
  - ✧ F4 Monitor→Next→ F1 Start MPG Coordinate
- Description
  - ✧ Detail descriptions please refer to 3.4.3.3.

### **1.6.8 Work Record**

- Command:
  - ✧ F4 Monitor→ Next→F2 Work Record
- Description
  - ✧ Check current machining record and export to external storage device.

### **1.6.9 Clear Acum Cycle Time**

- Command:
  - ✧ F4 Monitor→ Next→F3 Clear Acum Cycle Time
- Description
  - ✧ Clear the accumulative time

### **1.6.10 Graph Adjust**

- Command:
  - ✧ F4 Monitor→ Next→F4 Graph Adjust
- Description
  - ✧ Zoom in/out simulation graph, this function will enable under 「Simulation Switch」 is open.
- Operation
  - ✧ Please refer to 1.4.5 「simulation」.

## **1.7 Maintain**

- Command:
  - ✧ F5 Maintain
- Description
  - ✧ Screen displays alarm, network setting, fast diagnostic, PLC param  
setting, system setting

## 1.7.1 Alarm

G54	TEST NO L1			Alarm	2013/7/2	20:06:11
No.	Module	ID	Issue Time	Content		
				●Ready	Not Select	Alarm

- Command:
  - ✧ F5 Maintain→F1 Alarm
- Description
  - ✧ Display alarm messages on the screen.

### **1.7.1.1 Pending alarm**

- Command:
  - ✧ F5 Maintain→F1 Alarm→ F1 Pending Alarm
- Description
  - ✧ Display current system alarm.

### **1.7.1.2 History alarm**

- Command:
  - ✧ F5 Maintain→F1 Alarm→ F2 History Alarm
- Description
  - ✧ Show all the alarm history of the system.
- Note:
  - ✧ Some alarm were not displayed here, ex: MACRO alarm

### **1.7.1.3 Save Alarm**

- Command:
  - ✧ F5 Maintain→F1 Alarm→ F3 Save alarm
- Description
  - ✧ Save Alarm History to external device according to the current display content.
  - ✧ Export file name are default :
  - ✧ Actual alarm: actalm.txt.
  - ✧ History: histalm.txt.

## 1.7.2 Network Setting

G54	TEST NO L1	Network Setting	2013/7/2	20:12:22
IP Address Parameter				
IP Address Setting		Specify an IP Address ▼		
IP Address	210.20.98.21	Name Server Parameter		
Subnet Mask	255.255.255.0	Primary DNS		
Default Gateway	210.20.98.1	Primary WINS		
Network DiskRemote Host Path				
PC Name	NCYANG	Dir Name	123	
User Name		Password		
Net Status	Code : -1 Unknown Error			
Resource Shared				
Shared Folder Path	\\DiskA\\OpenCNC\\NcFiles			
		●Ready	Not Select	Alarm

- Command:
  - ✧ F5 Maintain→F2 Network setting
- Description
  - ✧ System network setting
- Related information
  - ✧ IP address setting
  - ✧ Select 「Obtain an IP address automatically」 when network cable(with HUB) is used.
  - ✧ For jumper (without HUB), select “use the following IP address” and enter IP address(the last IP no. must different from controller setting) and Subnet mask(same with controller setting)
- IP Address
  - ✧ Enter IP address that can be used.

- Subnet Mask
  - ✧ Enter the IP address for subnet mask (the same with PC setting).
- PC name
  - ✧ Enter the same full computer name of PC.
- Dir name
  - ✧ Enter the sharing folder name (same with PC sharing folder)
  - ✧ User name and password
  - ✧ If the shared folder is not setting the user and password name, user do not need to enter user name, if yes, please enter the same user name and password.

## 1.7.2.1 Set Kernel Server

G54	TEST N0 L1	Network Setting	2013/7/2	20:45:58
-----	------------	-----------------	----------	----------

Kernel Server Setting

Start server while boot ☐

TimeOut (milisec)

	●Ready	Not Select	Alarm
--	--------	------------	-------

- Command:
  - ✧ F5 Maintain→F2 Network Setting→ F5 Set Kernel Server
- Description
  - ✧ Setting related function to kernel server
- Related infor.
  - ✧ Start server and kernel or not when power on.
  - ✧ Timeout(ms)
  - ✧ Set the acceptable time out when connecting to Kernel server unsuccessfully.



**1.7.2.1.1 Start Server**

- Command:
  - ✧ F5 Maintain→F2 Network setting→ F5 Set Kernel Server→ F1 Start Server
- Description
  - ✧ Start server immediately

## 1.7.3 Fast Diagnostic

G54	TEST NO L1		Fast Diagnostic		2013/7/2	20:13:35
Browser::Tal						
FastSysData1	7067	FastSysData7	99	FastSysData11	-1	
FastSysData2	360596	FastSysData12	0	FastSysData22	0	
FastSysData3	72119	FastSysData14	5000	FastSysData23	0	
FastSysData4	300495	FastSysData13	1000	FastSysData19	0	
FastSysData5	2000	FastSysData15	0	FastSysData20	0	
FastSysData6	10000	FastSysData16	0	FastSysData21	0	
FastSysData10	23	FastSysData17	0	FastSysData24	0	
FastSysData8	153358336	FastSysData18	0	FastSysData25	0	
FastSysData9	153358336	FastSysData27	0.0.11	FastSysData26	6B	
			●Ready	Not Select		
						Alarm

- Command:
  - ✧ F5 Maintain→F3 Fast diagnostic
- Description
  - ✧ Display simple diagnostic information of system and axes

### 1.7.3.1 System Data

G54	TEST NO L1		Fast Diagnostic		2013/7/2	20:13:35
Browser::Tal						
FastSysData1	7067	FastSysData7	99	FastSysData11	-1	
FastSysData2	360596	FastSysData12	0	FastSysData22	0	
FastSysData3	72119	FastSysData14	5000	FastSysData23	0	
FastSysData4	300495	FastSysData13	1000	FastSysData19	0	
FastSysData5	2000	FastSysData15	0	FastSysData20	0	
FastSysData6	10000	FastSysData16	0	FastSysData21	0	
FastSysData10	23	FastSysData17	0	FastSysData24	0	
FastSysData8	153358336	FastSysData18	0	FastSysData25	0	
FastSysData9	153358336	FastSysData27	0.0.11	FastSysData26	6B	
			●Ready	Not Select		
			Alarm			

- Command:
  - ✧ F5 Maintain→F3 Fast Diagnostic→ F1 System Data
- Description
  - ✧ Display simple diagnostic information of system

## 1.7.3.2 Axes Data

G54	TEST N0 L1	Fast Diagnostic	2013/7/2	20:14:27
Browser::Tab				
	X	Y	Z	
FastAxesData1	-20000	100000	100000	
FastAxesData1	100000	100000	100000	
FastAxesData3	100000	100000	100000	
FastAxesData4	100000	100000	100000	
FastAxesData5	0	0	0	
FastAxesData6	0	0	0	
FastAxesData7	5556	5556	5556	
FastAxesData8	0	0	0	
FastAxesData9	0	0	0	
FastAxesData10	0	0	0	
FastAxesData11	0	0	0	
FastAxesData12	0	0	0	
FastAxesData13	0	0	0	
		●Ready	Not Select	Alarm

- Command:
  - ✧ F5 Maintain→F3 Fast Diagnostic→ F2 Axes Data
- Description
  - ✧ Display simple diagnostic information of Axes

## 1.7.4 PLC Param Setting

G54	TEST NO L1				Offset/Setting				2013/7/2				20:14:56					
Index	Item	Value	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
3401	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3402	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3403	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3404	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3405	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3406	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3407	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3408	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3409	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3410	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3411	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3412	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3413	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3414	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3415	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3416	Extension Parameter(R	0x0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Comment Extension Parameter Bit R81.1																		
0~1																		
●Ready Not Select Alarm																		

- Command:
  - ✧ F5 Maintain→ F4 PLC param setting
- Description
  - ✧ SYNTEC's controller provides R81 ~ R100, totally 20 sets of registers for machine manufacture use, each register have 16 Bits.
  - ✧ Machine manufacture can use those 20 sets of registers provide user to control the flag of PLC specific functions.
- Operation
  - ✧ Press【 ↑ 】【 ↓ 】【 ← 】【 → 】 to move cursor and 【PageUp】【PageDown】 go to next/previous page
  - ✧ Users are able to input [0] or [1] and also add comment for every bits.
  - ✧ Corresponding file name for comment: ParamExt\_RBit\_(L).xml
  - ✧ (L)=COM/CHT/CHS/language

## 1.7.5 System Setting

G54	TEST N0 L1	Offset/Setting	2013/7/2	20:15:32
-----	------------	----------------	----------	----------

Operator Mode Setting

Input/Display Unit(0:mm, 1:inch) **0**

System Time Setting

Date

Time

Program file font size setting

Size

(0~1)	●Ready	Not Select	Alarm
-------	--------	------------	-------

- Command:
  - ✧ F5 Maintain → F5 System setting
- Description
  - ✧ This page is used to set system environment
- Operation
  - ✧ Press【↑】【↓】【←】【→】to move cursor and 【PageUp】【PageDown】  
go to next/previous page

### **1.7.5.1 Operator Mode Setting**

✧ Setting system unit

■ 0 : mm (Metric unit)

■ 1 : Inch (British unit)

✧ Note: reboot to enable setting

### **1.7.5.2 System Time Setting**

✧ Date: input format YYYY/MM/DD

◆ YYYY: year

◆ MM: month

◆ DD: day

✧ Time: input format HH/MM/SS

◆ HH: hours

◆ MM: minute

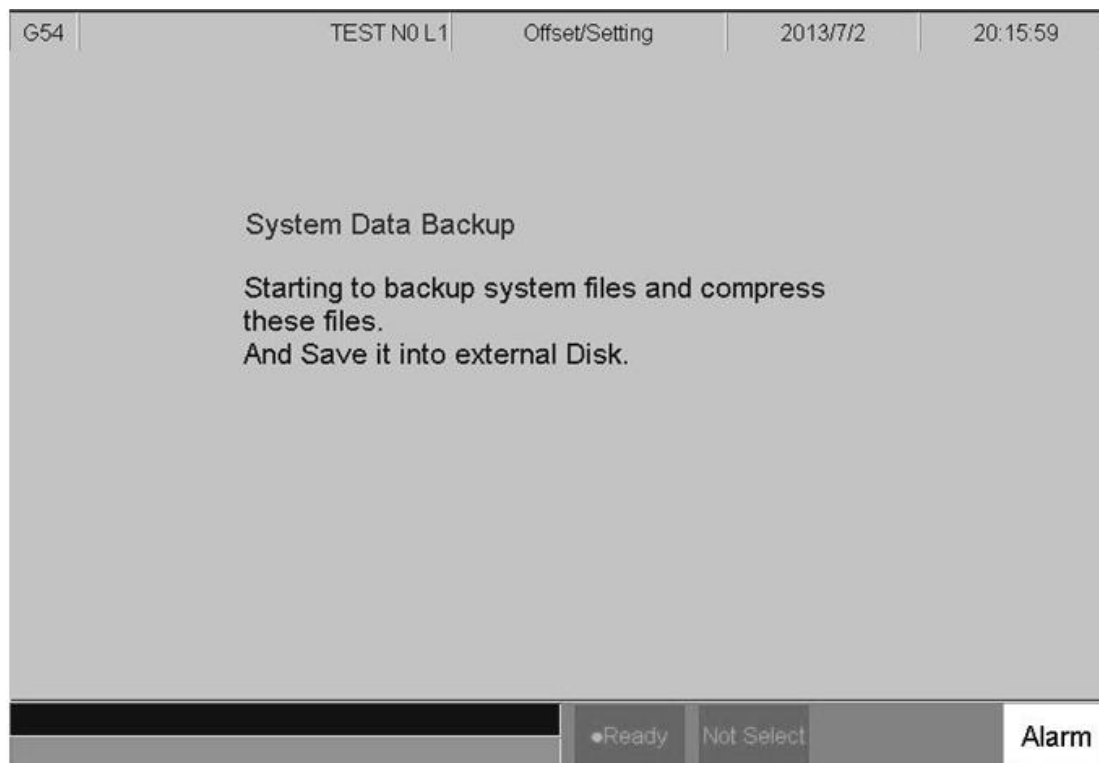
◆ SS: second

### **1.7.5.3 Program File Font Size Setting**

✧ Setting display of font size in program

✧ Note: reboot to enable setting

## 1.7.6 Backup System



- Command:
  - ✧ F5 Maintain → Next → F1 Backup System
- Description
  - ✧ Compress backup system data and save it into external device.

## 1.7.7 About

- Command:
  - ✧ F5 Maintain → Next → F5 About
- Description
  - ✧ Provide controller software version



## 2 Machine Operation Panel

---

### 2.1 Operation Panel

- POWER ON

- ✧ Turn on controller's power

- POWER OFF

- ✧ Turn off controller's power

- Emergency Stop

- ✧ For safety reason of user and machine in case of unusual phenomenon, after this button is pressed, CNC would stop all motion, and all main power. Therefore safety of people and machine will be guaranteed.

- Home Mode



- When CNC power is on, please implement home search

- JOG Mode (Rapid JOG)



- Operators can use JOG to control axis movement with

「X+/X-/Y+/Y-/Z+/Z-」 on panel.

- Incremental JOG (IN JOG)



- Operators can use JOG to control axis movement.

- MPG Mode



- User can use MPG (Manual Pulse Generator) mode to control axis movement.

## ■ AUTO Mode



- Users use this function to execute machining NC file

## ■ MDI Mode



- Users use this function to execute a block without NC file

## ■ MPG Simulation



- Enable this function under 「AUTO」 and 「MDI」 Mode, the percentage of moving speed is depend on the MPG turning speed . This function used to check NC file.

## ■ Single Block



- Enable this function under 「AUTO」 and 「MDI」 Mode, after finished one block action hold on the 「B-STOP」 mode. To continue, users need to do the 「Cycle start」 action again. This function used to check NC file.

## ■ Optional Stop



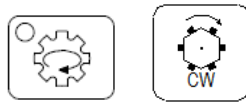
- Users can use this function to decide whether CNC is stop or not when encounter with 「M01」 within NC (Numerical Control) program, while executing NC program.

## ■ Optional Skip



- ◆ Users can use this function to decide whether program skips or not when program is encountered with 「/」 sign in NC file.

■ **Auto Tool Change in clock wise direction**



■ **Auto Tool Change ATC in counter clock wise direction**



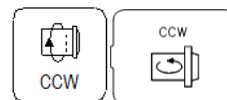
■ **Spindle Control**



Spindle CW rotation



Spindle stop



Spindle CCW rotation



Spindle rate deceleration: Spindle speed will decelerate 10%.

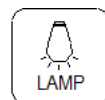


Spindle rate 100%: Spindle will rotate with 100%.



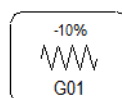
Spindle rate acceleration: Spindle speed will accelerate 10%.

■ **Working LED**

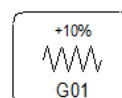


● **Turn ON/OFF working LED**

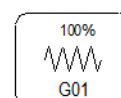
■ **G01 Rank**



Decrease G01 rate 10%



Increase G01 rate 10%

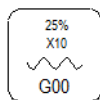


G01 rate 100%

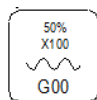
■ **G00 Rank**



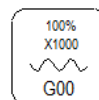
G00 rate x1



G00 rate x10



G00 rate x100



G00 rate x1000

- Those function key can be regard as G00, MPG or INJOG rank.

## ■ Blowing



- ON/OFF blowing air.

## ■ Cutting coolant system



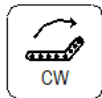
- Turn ON/OFF working liquid.

## ■ Auto cutting coolant system



- This function will be enable, when encounter with relate coolant on/off M code in NC program.

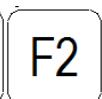
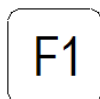
## ■ Chip conveyor machine move in clockwise direction



## ■ Chip conveyor machine move in counter clockwise direction

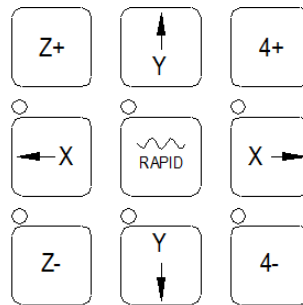


## ■ Augment key(User define)



- Machine builder augment key, combine with PLC ladder.













■ **Direction of linear Axes & Rotation Axes & fast travel key**



- Move the axes with fast travel speed key when press the axes and fast travel key at the same time.

## 2.2 Text Key Description

	~		:	Place key : total 26 English character keys
	~		:	Numerical keys
			:	Delete key
			:	Insert /replace key
			:	Switch keyboard to use subscript key on keyboard
			:	Space key
			:	While working with text, use this key to delete characters to the left of the insertion point.
			:	”RESET “CNC status, only use this key if necessary

	:	To input current data to input box
	:	show Help function/message on screen
	:	For optional skip of program
	:	End of block
	:	Decimal fraction
	:	Change to program edit page.
	:	Change to monitor page.
	:	Change to customize teach page. (Disable function key with no customize action)
	:	Insert word when edit program.
	:	Delete word when edit program.
	:	PAGE UP
	:	PAGE DOWN

“(, “), “[, “], “[, “!”, “&”, “\$”, “#”, “<”, “>”, “=”, “%”, “@”, “\*”, “:”, “,”, “+”, “-“

All above symbols are used for “Program Edit” mode.



Page Up / Page Down key

Directional of cursor key

## **3 How to Operate 6 Series Controller**

---

### **3.1 System Status**

SYNTEC controller will display different status corresponding to different conditions as below:

#### **3.1.1 Not Ready**

Under not Ready status, system cannot do any action

Conditions:

- ✧ Emergency stop button is pressed
- ✧ Serious alarm appears
- ✧ System will switched to “Not Ready” status and stop all operations to ensure the safety of machine and human

#### **3.1.2 Ready**

On “Ready” status, system can do any action

Conditions:

- ✧ “Emergency stop” button is released and no alarm exists, system will switch from “Not Ready” to “Ready” status.
- ✧ Under “Busy”/ “Pause”/ “B-stop” status, if user presses “Reset” key; system will switch to “Ready” status.

#### **3.1.3 Busy**

System is running program

Conditions:

- ✧ Under “Busy”/ “Pause”/ “B-stop” status, if the system is running; system will switched to “Busy” status.



### **3.1.4 Pause**

In running process, system pause the axis movement

Conditions:

- ✧ Once Feed hold button is pressed when system is on “Busy” status, system will be switched from “Busy” to “Pause” status

**Note:**

On “Pause” status, Spindle is still rotating

### **3.1.5 B-stop**

System will temporary stop at the end of single block.

Conditions:

- ✧ Encounter M0 during program running process when system is on “Busy” status.
- ✧ Single block function is triggered when system is on “Busy” status.

**Note:**

On “B-Stop” status, Spindle is still rotating

## **3.2 Machine Preparation**

### **3.2.1 Manual Function**

SYNTEC controller provides 4 kinds of manual input functions used to control axis movement including JOG, INC JOG, MPG and Rapid JOG

#### **3.2.1.1 JOG**

● Function:

- ✧ Control the axis continuous move to one direction
- ✧ Can trigger more than one axis at the same time

● Condition:

- ✧ System is on “Ready” status
- ✧ JOG mode is selected

● Operation:

- ✧ Press axis direction key (X+,X-,Y+,Y-,Z+...)
- ✧ Movement will keep going whenever the axis direction key is trigger.
- ✧ JOG speed can be adjusted by G01%

#### **3.2.1.2 Rapid JOG**

● Function:

- ✧ Control the axis continuous move to one direction with G00 speed
- ✧ Can control more than one axis at the same time

● Condition:

- ✧ System is on “Ready” status
- ✧ JOG mode is selected

- Operation:

- ✧ Press axis direction key (X+,X-,Y+,Y-,Z+...) and rapid key 「 ~ 」 at the same time ,machine will move with G00 speed
- ✧ Movement will keep going whenever the axis direction key is trigger.
- ✧ Rapid JOG speed can be adjusted by G00%

- Note:

- ✧ Usually Rapid JOG is much faster than JOG, so when operating, please confirm the position of each axes to ensure human and machine safety.

## 3.2.1.3 INC JOG (incremental JOG)

- Function:

- ✧ Move the axis to certain distance with G00 speed

- Condition:

- ✧ System is on “Ready” status
- ✧ INC JOG mode is selected

- Operation:

- ✧ Press axis direction key (X+, X-, Y+, Y-, Z+...)
- ✧ Cannot continuously triggered like JOG or rapid JOG mode, INC JOG mode only moves once time with a fixed distance whenever axis direction key is triggered.
- ✧ The fixed distance in INC JOG mode can be selected by percentage movements as below:
  - ✧ X1 : Distance 0.001mm
  - ✧ X10 : Distance 0.010mm
  - ✧ X100 : Distance 0.100mm
- ✧ Those percentage movements is shared with MPG mode

### **3.2.1.4 MPG**

● **Function:**

- ✧ Control the axis continuous move to one direction

● **Condition:**

- ✧ System is on “Ready” status
- ✧ MPG mode is selected

● **Operation:**

- ✧ Change the axis on MPG or press the text key of relate axis.
- ✧ Turn around MPG can move the axis.
- ✧ The moving distance under MPG mode can be selected as below:
  - X1 : Distance 0.001mm
  - X10 : Distance 0.010mm
  - X100 : Distance 0.100mm
- ✧ Those percentage movements is shared with INC JOG mode

## **3.2.2 Machining Process**

### **3.2.2.1 AUTO**

● **Condition:**

- ✧ System is on “Ready” status
- ✧ AUTO mode is selected

● **Operation:**

- ✧ Press 「CYCLE START」 button
- ✧ System will machine the current machining program
- ✧ System status will be switched from “Ready” to “busy” and backs to “Ready” when machining is finished

## 3.2.2.2 Single Block

- Function:
  - ✧ Execute each single block in program
- Condition:
  - ✧ System is on “Ready” status
  - ✧ Single block mode is selected
- Operation:
  - ✧ Press 「 CYCLE START 」 button
  - ✧ System will execute process the current single block in program
  - ✧ System status will be switched from “Ready” to “busy” and return to “Ready” when machining is finished

## 3.2.2.3 Home

Because tool and workpiece coordinate setting is based on machine initial point, it is necessary to check the initial point again for every time the machine is power on. Therefore, when CNC restarts, HOME search action need to do again. Otherwise, CNC will not allow execute AUTO NC files.

- Condition:
  - ✧ Release emergency stop button, CNC status will change “NOT READY” to “ READY ”
  - ✧ Select HOME mode
- Operation
  - ✧ Press axis direction key(X+,X-,Y+,Y-,Z+...) ,each axis will start HOME search action.
  - ✧ Stop on Home and initialization the coordinate value.
- Note
  - ✧ Software stroke limit are enable after the HOME search action finished.

### 3.3 Workpiece Preparation

### 3.3.1 Workpiece Cord Set

G54		N0 L1		Offset/Setting		2013/8/22		17:59:33	
External Shift		G54P1(G54)		G54P2(G55)		Machine			
X	0.000	X	0.000	X	0.000	X	0.000		
Y	0.000	Y	0.000	Y	0.000	Y	0.000		
Z	0.000	Z	0.000	Z	0.000	Z	0.000		
A	0.000	A	0.000	A	0.000	A	4.158		
MPG Shift		G54P3(G56)		G54P4(G57)		Relative			
X	0.000	X	0.000	X	0.000	X	0.000		
Y	0.000	Y	0.000	Y	0.000	Y	0.000		
Z	0.000	Z	0.000	Z	0.000	Z	0.000		
A	0.000	A	0.000	A	0.000	A	4.158		
						Aux. Coord			
						X	0.000		
						Y	0.000		
						Z	0.000		

- Command:

- ✧ F3 Offset/Setting → F1 Workpiece Cord Set
- ✧ Switch the cursor to the coordinate by using page up/down and left/right keys
- ✧ Insert Latch Machine Cord into cursor location.
- ✧ Insert Relative Machine Cord into cursor location.
- ✧ Insert Aux. Cord into cursor location.

### 3.3.2 Middle Func.

● Function:

Middle function is used for finding center point of the workpiece. Use the middle point as the start point. As a result, we need to touch the edge of the workpiece by tool or detector. After controller gets the coordinate, it will automatically calculate its center point. We only need to set this point as the machining start point. Please confirm that your machine has automatic alignment tool and then you can use this function.

● Operation:

In the 8 button system, user can use this function by press F3 Offset/Setting → F1 Workpiece Cord. → F6 Middle Func.

G54	N0 L1	Offset/Setting	2013/8/22	18:03:28
<div> <div>Manual Center 0 (0:Manual, 1:Auto)</div> <div>0 (0:4Pts, 1:3Pts)</div> <div> </div> <div>Manual Center Operation SI</div> <div> Step1 : take the tool to the point Px1 and press Px1 to set  Step2 : take the tool to the point Px2 and press Px2 to set  Step3 : take the tool to the point Py1 and press Py1 to set  Step4 : take the tool to the point Py2 and press Py2 to set  Step5 : back to Workpiece screen to do Auxiliary point set </div> </div>				
<div>Machine Coorc</div> <div> Px1 0.000  Px2 0.000  Pxm 0.000  Py1 0.000  Py2 0.000  Pym 0.000 </div>				
<div>Machine</div> <div> X 0.000  Y 0.000  Z 0.000  A 4.158 </div>				
<div>Relative</div> <div> X 0.000  Y 0.000  Z 0.000  A 4.158 </div>				
<div>Aux. Coord</div> <div> X 0.000  Y 0.000  Z 0.000 </div>				
<div>●Ready Auto Alarm</div>				

#### 3.3.2.1 Manual 4Pts Center

● Function

✧ Set the Middle Function value = 0 (MANUAL mode)

✧ User controls the machine by MPG, and then moves the tip of 3D

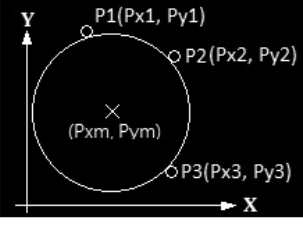
measurement tool to X&Y side of the workpiece. This system will calculate the center point of the workpiece automatically.



- Operation method


- ✧ Move the machine by MPG, touching Px1 point in this figure and then press PX1 Set. The system will record the current mechanical coordinate to Px1. It will also compute the middle point of Px1 and Px2 and puts the result on Pxm and Aux. X position.
- ✧ Move the machine by MPG, touching Px2 point in this figure and then press PX2 Set. The system will record the current mechanical coordinated to Px2. It will also compute the middle point of Px1 and Px2 and puts the result on Pxm and Aux. X position.
- ✧ Move the machine by MPG, touching Py1 point in this figure and press PY1 Set. The system will record the current mechanical coordinate to Py1. It will also compute the middle point of Py1 and Py2 and puts the result on Pym and Aux. Y position.
- ✧ Move the machine by MPG, touching Py2 point in this figure and then press PY2 Set. The system will record the current mechanical coordinate to Py2. It will also compute the middle point of Py1 and Py2 and puts the result on Pym and Aux. Y position.
- ✧ Now, the values of Pxm and Pym are the center point of the workpiece.
- ✧ In the WorkPiece Cord. Screen, move the cursor to the coordinate you want to set, press F3 insert the Aux. Coord value then this system will set the value according to the Aux Coord.

### 3.3.2.2 Manual 3Pts Center

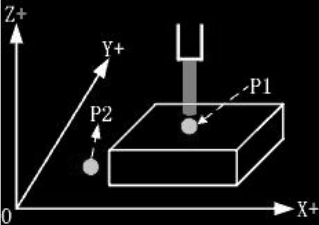
G54	N0 L1	Offset/Setting	2013/8/22	18:07:10
<b>Manual 3Pts Center</b> <div style="border: 1px solid black; padding: 5px; margin: 5px;"> <div style="display: flex; justify-content: space-between;"> <span><b>1</b></span> <span>(0:4Pts, 1:3Pts)</span> </div>  </div> <p>Manual Center Operation Step:            Step1: take the tool to the point P1 and pr            Step2: take the tool to the point P2 and pr            Step3: take the tool to the point P3 and pr            Step4: Press 'Calculate the Center'            Step5: back to Workpiece screen to do A            Point set</p>		<b>Machine Coorc</b> Px1 0.000 Py1 0.000 Px2 0.000 Py2 0.000 Px3 0.000 Py3 0.000 Pxm 0.000 Pym 0.000 R 0.000		
		<b>Machine</b> X 0.000 Y 0.000 Z 0.000 A 4.158  <b>Relative</b> X 0.000 Y 0.000 Z 0.000 A 4.158  <b>Aux. Coordinate</b> X 0.000 Y 0.000 Z 0.000		
		<div style="display: flex; justify-content: space-between; align-items: center;"> <span>●Ready</span> <span>Auto</span> <span>Alarm</span> </div>		

● Operation:

- ✧ Set the Middle function = 0 (MANUAL mode), then upper left side in the screen will show Manual Center
- ✧ Set the second line, the middle method = 1 (3 points). As shown in image.
- ✧ Move the tool or detector to the round workpiece edge.
- ✧ Press P1 set, system will record the current X and Y coordinates to Px1 and Py1.
- ✧ Move to another edge point, press P2 set. System will record the current X and Y coordinates to Px2 and Py2.
- ✧ Move to another edge point, press P3 set. System will record the current X and Y coordinates to Px3 and Py3.
- ✧ After setting these, press Calculate the Center. System will calculate the center point Pxm, Pym and R.

- ✧ The Aux. Coordinate will become Pxm and Pym.
- ✧ If you set the same point or this three point is inline, it will have a warning window pop out.
- ✧ Now you can press  return to previous page to reset the coordinate.
- ✧ In the WorkPiece Cord. Screen, move the cursor to the coordinate you want to set, press F3 insert the Aux. Coordinate value then this system will set the value according to the Aux Coord.


### 3.3.2.3 OUTAutoCenter

G54	N0 L1	Offset/Setting	2013/8/22	18:09:41
Auto Center <b>1</b> (0:Manual,1:Auto) <b>0</b> (0:OUTAutoCenter,1:INAutoCenter)		Machine Coordinate		Machine
 <p>Auto Center Operation Step:</p> <p>Step1 : Parameter Input</p> <p>Step2 : take the tool to the P2 and set Z height</p> <p>Step3 : take the tool to the start point P1</p> <p>Step4 : press the start center button</p> <p>Step5 : back to Workpiece screen to do Auxiliary point set</p>		Px1	0.000	X 0.000
		Px2	0.000	Y 0.000
		Pxm	0.000	Z 0.000
		Py1	0.000	A 4.158
		Py2	0.000	Relative
		Pym	0.000	X 0.000
Please Input Parameter		Relative		Y 0.000
Lenght I 0.000		Z 0.000		A 4.158
Width J 0.000		Aux. Coord		
Safe Distance 0.000		X 0.000		
Feedrate F 0.000		Y 0.000		
Z Coordinate 0.000		Z 0.000		
(0~1)		●Ready	Auto	Alarm

● Operation:

- ✧ Set the Middle func. = 1 (Auto Mode), then upper left side screen will show Auto Center.
- ✧ Set the second line, the middle method = 0 (OUTautocenter), as shown in image.
- ✧ Key in Length I and Width J for workpiece real length and width.
- ✧ Set Z coordinate, this value is for the automatically measurement that tool can touch the workpiece edge plane
- ✧ Set Safe Distance H, this distance is that the tool will not hit with workpiece.
- ✧ Set Feedrate F, this Feedrate is the measuring tool velocity during auto center process.
- ✧ Press Auto center start, system will move the tool according to the setting data to contact with workpiece and show the coordinate on

the screen. It will also calculate the X Y center point of the workpiece.

- ✧ The center point will be saved at Pxm and Pym.
- ✧ After setting these, press Calculate the Center. System will calculate the center point Pxm, Pym and R.
- ✧ The Aux. Coordinate will become Pxm and Pym.
- ✧ Now you can press  go back to previous page to set the coordinate.
- ✧ In the Workpiece Cord. Screen, move the cursor to the coordinate you want to set, press F3 insert the Aux. coordinate value then this system will set the value according to the Aux Coord.

### 3.3.2.4 INAutoCenter

Auto Center	1 (0:Manual,1:Auto)	Machine Coordinate	Machine
1 (0:OUTAutoCenter,1:INAutoCenter)		Px1	X 0.000
		Px2	Y 0.000
		Pxm	Z 0.000
		Py1	A 4.158
		Py2	Relative
		Pym	X 0.000
			Y 0.000
			Z 0.000
			A 4.158
Auto Center Operation Step:	Please Input Parameter		Aux. Coord
Step1 : Parameter Input	Length I 0.000		X 0.000
Step2 : take the tool to the P2 and set Z height	Width J 0.000		Y 0.000
Step3 : take the tool to the start point P1	Safe Distance 0.000		Z 0.000
Step4 : press the start center button	Feedrate F 0.000		
Step5 : back to Workpiece screen to do	Z Coordinate 0.000		
Auxiliary point set			
	●Ready	Auto	Alarm

- Operation:

- ✧ Set the Middle func. = 1, then upper left side screen will show Manual Center.
- ✧ Set the second line, the middle method = 1. As shown in image.
- ✧ Key in Length I and Width J for workpiece real length and width.
- ✧ Set Z coordinate, this value is for the the automatical measurement that tool can touch the workpiece edge plane
- ✧ Set Safe Distance H, this distance is that the tool will not hit with workpiece.
- ✧ Set Feedrate F, this Feedrate is the measuring tool velocity during auto center process.
- ✧ Press Auto center start

### 3.3.3 Tool Prepare

#### 3.3.3.1 Tool Set

##### ● Purpose

- ✧ We can set the length and the diameter geometry and wear
- ✧ Operation condition
  - Can be used at Manual or Auto mode
  - Max. input of Wear increment is 1.0, warning message will pop up if input is greater than 1.0.

##### ● Operation method

- ✧ Press 【↑】 【↓】 【←】 【→】 key to move the cursor.
- ✧ Press 【PageUp】 【PageDown】 key to switch the page.
- ✧ Key in method: Absolute, Increment, Measure method
- ✧ Absolute: for radius and length compensate.
- ✧ Increment: for radius wear and length wear.
- ✧ Radius compensate + radius wear = G41/G42 compensate.
- ✧ Length compensate + length wear = G43/G44 compensate.

#### 3.3.3.2 Manual Measurement of Tool Length

##### ● Purpose

- ✧ Describe how to use manual measurement to set tool length and workpiece coordinate in order to set the machining tool.

##### ● Function

- ✧ We usually set the tool length and offset in the External Shift if we only use one tool in this machine.
- ✧ If we have more than one tool, we need to set every tool length, we can use relative length or absolute length.

##### ● Operation condition

- ✧ Manual mode.

- Manual Operation method

- Relative method.

- ✧ Use manual function moving the reference tool to the Z-coordinate code zero position of the workpiece (Ex. surface), set the value at G54.
    - ✧ Clean all the relative coordinate value.
    - ✧ Install the measured tool, move the tool to the same position as before (reference surface).
    - ✧ The tool length is the different between measured tool and reference tool.
    - ✧ Input this number to the corresponding tool number.
    - ✧ If tool break during machining and replace a new tool, we need to change to a new tool. If the Z-cord 0 position already disappear, we can use the standard tool to touch anywhere of the machine and then use new tool to touch the same position. Then the relative cord. is tool length.

- Absolute method

- ✧ Use manual function moving the measuring tool to a reference point (Ex. Work piece table).
    - ✧ Measure every tool repeatedly.
    - ✧ Move the machining tool to the reference position, and clean all relative coordinate.
    - ✧ Move the tool to the Z-coord code 0 position, set it to G54.
    - ✧ If tool is breaking during machining so we need to change a new tool, we must touch the reference position first, then the Z coordinate value is tool length.



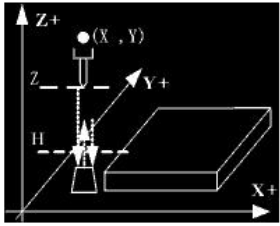
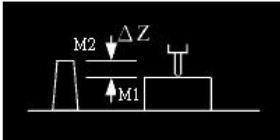
### 3.3.3.3 Tool Tip Measure

#### ● Function

- ✧ Measuring different tool No. tip position. Because the trigger position of tool alignment equipment is fixed, user can use different tool tip position key in the workpiece coordinate system for the reference of tool length offset. You must check this machine has tool alignment equipment.

#### ● Operation Method

- ✧ Offset/Setting→Tool Tip Measure

G54	N0 L1	Offset/Setting	2013/8/22	18:12:45
Auto Tool Function		WorkPiece No. P	0	Machine
AutoTool <b>1</b>		Feedrate F	0.000	X 0.000
1:One Tool One Workpiece,2:On		Use Reference	0	Y 0.000
3:Many Tools Many Workpie		Ref Coord. X	0.000	Z 0.000
		Ref Coord. Y	0.000	A 4.158
		Start Coord. Z	0.000	
		Min. Z Mach. H	0.000	
		Select if use Ref Point		
Delta Z Set		Delta Z Set	0.000	Relative
		1:Set All measure parameter		X 0.000
		2:If not use Ref, Take tool tip to upper of measurement		Y 0.000
		3:Press F1, Measure Start		Z 0.000
		Do tool tip measure before do Delt		A 4.158
		1:Take tool tip to top of good		Aux. Coord
		2:Press F3, Delta Z Set		X 0.000
				Y 0.000
				Z 0.000
(1~3)		●Ready	Auto	Alarm

## 3.3.3.4 Auto Tool Function

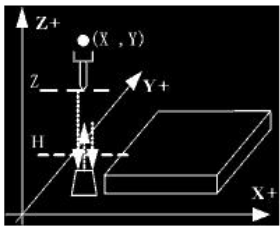
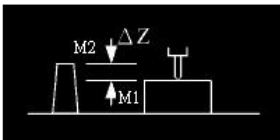
### ● Function

Z coordinate Auto Tool Function is to measure different tool number by tool alignment equipment. Because the trigger position of the tool alignment equipment is almost the same. User can key in different tool No. tip position into workpiece coordinate for the tool length offset setting, and this machine must be equipped with tool alignment equipment.

### ● Operation description

Offset/Setting→Tool Tip Measure

### ● One Tool One Workpiece

G54	N0 L1	Offset/Setting	2013/8/22	18:12:45
<div> <div> <div>Auto Tool Function</div> <div>AutoTool <b>1</b></div> <div>1:One Tool One Workpiece,2:On</div> <div>3:Many Tools Many Workpie</div> <div>  </div> <div>Delta Z Set</div> <div>  </div> </div> <div> <div>WorkPie No. P</div> <div>Feedrate F</div> <div>Use Reference</div> <div>Ref Coord. X</div> <div>Ref Coord. Y</div> <div>Start Coord. Z</div> <div>Min. Z Mach. H</div> <div>Select if use Ref Point</div> <div>1:Set All measure parameter</div> <div>2:If not use Ref, Take tool tip to upper of measurement</div> <div>3:Press F1, Measure Start</div> <div>Delta Z Set</div> <div>Do tool tip measure before do Delt</div> <div>1:Take tool tip to top of good</div> <div>2:Press F3, Delta Z Set</div> </div> <div> <div>Machine</div> <div>X 0.000</div> <div>Y 0.000</div> <div>Z 0.000</div> <div>A 4.158</div> <div>Relative</div> <div>X 0.000</div> <div>Y 0.000</div> <div>Z 0.000</div> <div>A 4.158</div> <div>Aux. Coord</div> <div>X 0.000</div> <div>Y 0.000</div> <div>Z 0.000</div> </div> </div>				
(1~3)			●Ready	Auto
			Alarm	

✧ Input Auto Tool = 1 (upper left corner).

✧ Set the WorkPie No. P as workpiece coordinate.

● Table X- Coordinate table

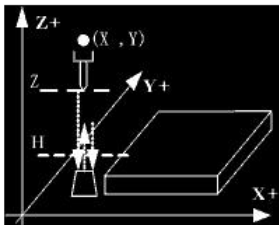
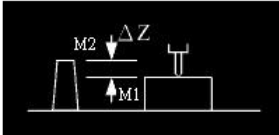
Workpiece coord No. P	Workpiece coord	Workpiece coord No. P	Workpiece coord
0	Aux. Coord	1	G54
2	G55	3	G56
4	G57	5	G58

● Table X- Coordinate table

- ✧ Set the Feedrate F for the first time alignment and pull back every time.
- ✧ Please skip to next step setting XY Ref. Coord. Teach if tool alignment equipment already has fixed mechanical coordinate. If current position is the same with tool alignment equipment, please set use Reference as 0.
- ✧ While setting the XY Ref. Coord. Teach, you will need to enter code by “520”, enter it and choose yes. These values will be entered in to Ref coord.X and Ref coord.Y.
- ✧ Move the cursor to Start Coord. Z, setting the start point for the auto alignment. Press” > “ then press Z Mech. Coord. Teach, you can insert the current Z coord. value into Start Coord. Z.
- ✧ Move the cursor to the Min. Z Mech. H, setting the minimum height for the alignment, then system will automatically pop out warning message and stop if the tool is lower than minimum height.
- ✧ Please switch to auto mode after setting these all and then press Start.
- ✧ After finishing alignment, this tool height will be saved into Aux. Coord. and external Shift.

- ✧ Move the tool tip (Manual) to the surface of workpiece, press Z Delta Set, the distance between alignment tool and workpiece surface will be automatically calculated and set into this workpiece Z coordinate.
- ✧ One Tool One Workpiece is finished

● One Tool Many Workpieces

G54	N0 L1	Offset/Setting	2013/8/22	18:13:59
<b>Auto Tool Function</b> AutoTool <b>2</b> 1:One Tool One Workpiece,2:One Tool Many Workpieces,3:Many Tools Many Workpieces 			<b>Machine</b> X 0.000 Y 0.000 Z 0.000 A 4.158	
<b>Delta Z Set</b> 			<b>Relative</b> X 0.000 Y 0.000 Z 0.000 A 4.158	
Feedrate F 0.000 Use Reference 0 Ref Coord. X 0.000 Ref Coord. Y 0.000 Start Coord. Z 0.000 Min. Z Mach. H 0.000 Select if use Ref Point 1:Set All measure parameter 2:If not use Ref, Take tool tip to upper of measurement 3:Press F1, Measure Start WorkPoiece No. P 0 Do tool tip measure before do Delt 1:Take tool tip to top of good 2:Press F3, Delta Z Set			<b>Aux. Coord</b> X 0.000 Y 0.000 Z 0.000	
(1~3)			Ready	Auto
			Alarm	

- ✧ Input Auto Tool = 2.(upper-left corner)
- ✧ Set the Feedrate F for the first time alignment and pull back every time.
- ✧ Skip to next step setting XY Ref. Coord. teach if tool alignment equipment already has fixed mechanical coordinate. If current position is the same with tool alignment equipment, please set Use Reference as 0.
- ✧ While setting the XY Ref. Coord. Teach, you will need to enter code by “520”, enter it and choose yes. These values will be entered in to Ref coord.X and Ref coord.Y.
- ✧ Move the cursor to Start Coord. Z, setting the start point for the auto alignment. Press F10 and then press Z mech. Coord. Teach, you can insert the current Z coord. value into Start Coord. Z.

- ✧ Move the cursor to the Min. Z Mech. H, setting the minimum height for the alignment. System will pop out warning message and stop if the tool height is lower than it.
- ✧ Please switch to auto mode after setting these and then press Start.
- ✧ After finished alignment, this tool height value will be saved into Aux. Coord. and external shift.
- ✧ Move the tool tip (Manual) to the surface of workpiece, press Z Delta Set, the distance between alignment tool and workpiece surface will be calculate and set into this workpiece Z coordinate.
- ✧ Move the tool tip (Manual) to the surface of next workpiece, press Z Delta Set, the distance between alignment tool and workpiece surface will be calculate and set into this workpiece Z coordinate.

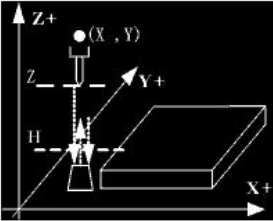
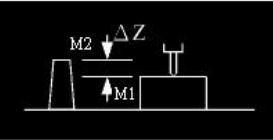
Workpiece coord No. P	Workpiece coord
1	G54
3	G56
5	G58

Workpiece coord No. P	Workpiece coord
2	G55
4	G57

Z Delta set table

- ✧ If you still have any other workpieces which needed to set, please repeat previous step.

● Many Tool Many Workpieces

G54	N0 L1	Offset/Setting	2013/8/22	18:15:00
<b>Auto Tool Function</b> <b>AutoTool 3</b> 1:One Tool One Workpiece,2:On 3:Many Tools Many Workpie		Tool No. T 0 Feedrate F 0.000 Use Reference 0 Ref Coord. X 0.000 Ref Coord. Y 0.000 Start Coord. Z 0.000 Min. Z Mach. H 0.000 Select if use Ref Point 1:Set All measure parameter 2:If not use Ref, Take tool tip to upper of measurement 3:Press F1, Measure Start WorkPoiece No. P 0 Do tool tip measure before do Delt 1:Take tool tip to top of good 2:Press F3, Delta Z Set	<b>Machine</b> X 0.000 Y 0.000 Z 0.000 A 4.158  <b>Relative</b> X 0.000 Y 0.000 Z 0.000 A 4.158  <b>Aux. Coord</b> X 0.000 Y 0.000 Z 0.000	
 <b>Delta Z Set</b> 		<div style="display: flex; justify-content: space-between; align-items: center;"> <span>(1~3)</span> <div> <span>●Ready</span> <span>Auto</span> <span style="background-color: black; color: white;">Alarm</span> </div> </div>		

- ✧ Set the Auto Tool number as 3.(left-upper corner)
- ✧ Set the Tool No. T for the tool you want to align.
- ✧ Set the Feedrate F for the first time alignment and pull back everytime.
- ✧ Please skip to next step setting XY Ref. Coord. Teach if tool alignment equipment already has fixed mechanical coordinate. If current position is the same with tool alignment equipment, please set Use Reference as 0.
- ✧ While setting the XY Ref. Coord. Teach, you will need code “520”, enter it and choose yes. These vaules will be entered in to Ref coord.X and Ref coord.Y.
- ✧ Move the cursor to Start Coord. Z, setting the start point for the auto alignment. Press F10 and then press Z Mach. Coord. Teach, you can insert the current Z coord. value into Start Coord. Z.

- ✧ Move the cursor to the Min. Z Mach. H, setting the minimum height for the alignment. System will pop out warning message and stop if the tool is lower than it.
- ✧ Please switch to auto mode after setting these and then press Start.
- ✧ After finishing alignment, this tool height value will be saved into Aux. Coord. and External Shift.
- ✧ Move the tool tip (Manual) to the surface of workpiece, press Z Delta Set, the distance between alignment tool and workpiece surface will be calculate and set into this workpiece Z coordinate.
- ✧ Move the tool tip (Manual) to the surface of next workpiece, press Z Delta Set, the distance between alignment tool and workpiece surface will be calculate and set into this workpiece Z coordinate.
- ✧ If you have another workpieces and tools need to set do the previous step again.
- ✧ Finish alignment.



### 3.3.3.5 Tool No. Setting

This Chapter will describe how to set the tool No.

● Purpose:

- ✧ We need to confirm the relation between Tool No. and real tool in order to change tool correctly.

● Condition:

- ✧ Both Auto mode or Manual mode are OK..

● Operation Method

- ✧ Tool Set→Tool No.
- ✧ You will see the table about Tool No. and Tool MG.
- ✧ MG5—T = 7 means we install tool No.7 at Tool case No.5

G54	N0 L1		Offset/Setting		2013/8/22		18:16:09	
MG And Tool No. T Table								
	MG	T		MG	T		MG	T
	1	0		11	0		21	0
	2	0		12	0		22	0
	3	0		13	0		23	0
	4	0		14	0		24	0
	5	0		15	0		25	0
	6	0		16	0		26	0
	7	0		17	0		27	0
	8	0		18	0		28	0
	9	0		19	0		29	0
	10	0		20	0		30	0
Turrent No		0						
Spindle No		0						
			●Ready		Auto		Alarm	

- ✧ This table will renew during change a new tool.

● Time to Modify

- ✧ First initialized when it is made from factory.
- ✧ Need to confirm the MG No. and T No. Manually when it is disordered.

### 3.3.3.6 Tool Life Manager Function

● Purpose:

Record the status of all cutting tool on machine, make users know whether cutting tool reached to Max. Life, avoid machining in case cutting tool is broken. This function needs a related PLC setting. In case, customers need to use this function, please contact to machine maker.

G54

TEST N0 L1

Offset/Setting

2013/7/2

20:18:05

Tool Manager Function

No	Turret group	Information	Cur. Life	Max. Life	Announce	Status
01	0	0	U N C -	0	0	No Managed
02	0	0	U N C -	0	0	No Managed
03	0	0	U N C -	0	0	No Managed
04	0	0	U N C -	0	0	No Managed
05	0	0	U N C -	0	0	No Managed
06	0	0	U N C -	0	0	No Managed
07	0	0	U N C -	0	0	No Managed
08	0	0	U N C -	0	0	No Managed
09	0	0	U N C -	0	0	No Managed
10	0	0	U N C -	0	0	No Managed
11	0	0	U N C -	0	0	No Managed
12	0	0	U N C -	0	0	No Managed

(0~96) Turret tool No.

●Ready

Not Select

Alarm

● Condition

✧ Both auto and manual can be used.

● Operation

✧ Pr.3228 is the on/off control of 「Tool management」

● Description

◆ Turret

✧ Current tool case no. that tool located.

◆ Group

✧ Same kind of tool within in one group, if the first tool of that group is on lock state or 「Tool life」 is end, whenever user use T code to change the tool, system will skip the first tool and use the second tool,

when the second one is locked or 「 Tool life 」 is end, will use the third one, and so on.

◆ Tool information (Status)

✧ L—Lock / U—Unlock

✧ If the status of tool is lock, that tool can't be used and when T code is use to change the tool, system will skip that tool.

✧ B—Large diameter Tool/ N—Normal Diameter Tool

✧ Adjacent side of large diameter tool set is empty (for display)

✧ T—working time T / C—Number of working times

✧ Decide the current life time, the maximum life time, life time prediction, unit of timing and number of time.

✧ R—effective value / - —non effective value.

✧ To check if current tool is using tool management or not.

◆ Current Life time

✧ Current Tool Using Condition

◆ Maximum Life Time

✧ Maximum lifetime of tool.

◆ Lifetime prediction

✧ When lifetime of tool is greater than lifetime prediction, alarm will be show up.

◆ Current Status of Tool

(0) Without management: Set values are not effective.

(1) Without use: Lifetime of tool is zero.

(2) Usable:  $0 < \text{Tool Life Time} < \text{lifetime prediction}$

(3) End prediction:  $\text{Lifetime prediction} < \text{Tool Lifetime} < \text{Maximum Lifetime}$

(4) End of Life:  $\text{Maximum Lifetime} < \text{Tool Lifetime}$

(5) Wear of tool

## **3.4 Program Preparation and Execute Machining**

### **3.4.1 Specifies the machining Program**

- Condition
  - ✧ Besides single block mode
- Operation
  - ✧ Specify current edit program as machining program
  - ✧ Switch to edit page
  - ✧ Select F1-Excute, and the program will be designated as the machining program
  - ✧ Specify machining program in file manager.
  - ✧ Switch to the "File Management" page
  - ✧ Move the cursor to the expected program and press Enter
  - ✧ Select F1-Excute, and the program will be designated as the machining program
- Confirmation:
  - ✧ There are two ways to confirm whether machining program is specified successfully.
  - ✧ The screen displays the correct machining program name
  - ✧ The content of machining program is displayed when pressing F4-Monitor

### 3.4.2 Simu. Setting

SYNTEC controller provides simulation program, after editing program, users can easily simulate the path machining process, this feature also has checking features that help user to quickly verify the syntax error in machining program or unreasonable actions, we suggest users should use this function first to check machining program.

- Condition

- ✧ Besides single block mode

- Operation

- ✧ In the “File Management” page, select the program you want to edit, then press F7-Simulation

- ✧ Screen will switch to the “graphic simulation” page and scan the contents of the program

- Detail description

- Simulation screen

- ✧ The solid line represents the cutting path
  - ✧ The dashed line represents the moving path
  - ✧ In the scanning process, if there is any syntax or content error, then it will be displayed on the screen with corresponding error line number.
  - ✧ F1-step: To simulate tool path corresponding to single block in NC files. It is used for coordinate checking purpose.
  - ✧ F2-Continue: System scans the whole program first before executing simulation.
  - ✧ F3-zoom: To zoom in/out the work piece graph. Users may press “←”, “↑”, “→”, “↓” key to move the frame to determined area, then press “PageUp” “PageDn” to zoom in/out this area. After selecting zoom scales, press “enter” to finish.

- ✧ F5- simu. Setting: To set simulation parameter

### **3.4.3 Machining Test**

#### **3.4.3.1 MPG Simulation**

- Condition

- ✧ Only for single block and auto mode

- Operation

- ✧ Select Auto mode
  - ✧ Press MPG simulation button on operation panel
  - ✧ Turn MPG to execute machining
  - ✧ If MPG is turned in CW direction, Program will run from current NC line to next NC line
  - ✧ If MPG is turned in CCW direction, Program will run from current NC line to previous NC line

- Confirm

- ✧ We can confirm MPG simulation is turned on or not by these two methods.
  - ✧ Before machining, execute MPG simulation function, then in the monitor page try to rotate the MPG. Check if G01 speed is zero before you rotate and has value after you rotate MPG.
  - ✧ While executing MPG simulation function during machining, the machine will stop, until you rotate MPG or cancel MPG function.

### 3.4.3.2 Single Block

- Condition

- ✧ Only for single block and auto mode

- Operation

- ✧ Select Auto mode
- ✧ Press single block button on operation panel
- ✧ After running program for 1 block and decelerating its speed to 0,  
system status changes to B-stop
- ✧ Press CYCLE START again
- ✧ After completing next single block in NC file, system will be on  
B-stop status again

### 3.4.3.3 Start MPG Coordinate Offsets

This section will introduce how to execute the function of part count and work record

- Condition

- ✧ MDI or Auto mode

- Operation Method

- ✧ F4 Monitor → F6 Start MPG Coordinate
- ✧ MPG coordinate system window will pop up
- ✧ Switch to the MPG mode.
- ✧ Rotate the MPG, you may see offset value at this window.

- Confirmation

- ✧ Switch to work piece coordinate screen, confirm the value in MPG  
offsets is correct.

- Relative parameter

Pr. 3201 Set the Lathe Rule, you must set 0 if you want to use  
Start MPG Coordinate function

- Note

- ✧ R606 must be 1
- ✧ Only accept MPG command, JOG or INJOG is invalid.
- ✧ This function still active during Machine Lock

- Time to disable

- Keep the MPG coordinate while starting the machine.
- Don't clear the value while G54/G55 are changed.
- Don't clear the value while change the machining code.
- Don't clear the value after go back to Home.
- Don't clear the value after go back to referent point by G28/G29/G30.

- Restrictions:

- ✧ Use the Start MPG Coordinate function under MPG simulation mode.  
Command will send to MPG coordinate while rotate the MPG until  
you finish the MPG coordinate function, the command will go to  
MPG simulation.

### 3.4.3.4 Break Point

This section will introduce how to execute the function of part count and work record

- Condition

- ✧ Under Auto mode

- Operation Method

- ✧ Move cursor to the Start Block No.
- ✧ Enter the line number you want start from
- ✧ Line number can be referred to break point line number.
- ✧ System will pop out a confirmation window.
- ✧ Press enter, wait the cursor move to the line number you choose.
- ✧ Execute.



### 3.4.4 Machining Monitor

This section will introduce how to use Break Point Return function.

#### 3.4.4.1 Part Count Manager

- Description

1. Total accumulated part
  - ✧ The total accumulative part machined by CNC
2. Number of required work piece
  - ✧ Once machining program specifies the needed work piece number, and CNC continues machining when it meets M99, if the demand work piece number is reached, machining process will be paused and notification message will be displayed.
3. Part counter
  - ✧ Once CNC continues machining when it meets M99, this number will be accumulated until reset
  - ✧ Part count reset (clear to 0) condition
  - ✧ Required part count is reached
  - ✧ Change machining files
  - ✧ Modify required part number, but required part number is smaller than part counter.

#### 3.4.4.2 Work Record Function

- Description

- ✧ When CNC continues machining and it use M99, work record function will automatically record its status

- Work record condition

- ✧ Required part number is reached
- ✧ Change machining files

- ✧ Modify required part number, but required part number is smaller than part counter

### **3.4.5 Alarm Processing**

In order to avoid wrong operation effects on safety of human and machine, the system and PLC have many kinds of protection. When these protection conditions are triggered, the system will issue warning or alarm to users. This section will describe how to view and troubleshooting alarm.

#### **3.4.5.1 Emergency Stop**

Machine failure or unexpected movements may cause unsafely for human and machine. Pressing emergency stop button, then you can stop the machine immediately

#### **3.4.5.2 Alarm Display**

Alarm is basically divided into the pending alarm and history alarm.

#### **3.4.5.3 Pending Alarm**

- ✧ The current status of system alarm
- ✧ Once alarm occurs, the controller will issue alarm message and display its contents on the screen
- ✧ Press ESC to remove this window
- ✧ If the alarm still is not removed, press reset button, then alarm window will disappears.
- ✧ Press 「F8-Maintain」 to display pending alarm contents.

#### **3.4.5.4 History Alarm**

Accessing into this page enables user to see all system alarms which has occurred, so users may find out the alarm reason.

- Command:

✧ F8- maintain→ F1-Alarm→F2 History alarm

● Display history alarm

✧ The smaller no. means the latest alarm

### 3.4.5.5 Save Alarm

In case users need support from machinery manufactory to repair once alarm appears, users can export the alarm contents to an external storage device, and send it to machinery manufactory.

By that way, they could clarify and find out the possible reasons.

● Operation

✧ Connect external storage device into controller, or set the corresponding network folder

✧ Switch to “Alarm” page(F8-maintain→F1-alarm)

✧ To export the pending alarm, press F1-pending alarm→ F3-save alarm

✧ To export the history alarm, press F2-history alarm→ F3-save alarm

✧ External storage device will be displayed on screen, select the destination folder to save

✧ Select OK to complete export alarm content

● File Name

✧ Actual alarm : Actalm.txt

✧ History alarm : Histalm.txt

## 3.4.6 Network Setting

1. On the interface screen, press down “**F8 Maintain**” => “**F2 Network Setting**” to access IP address setting.
2. **IP Address Setting:** select “Specify an IP Address” when the PC connects with controller directly. And select “Obtain an IP Address via DHCP” if using network connection via Dynamic Host Configuration Protocol
3. **IP Address:** if you select “Specify an IP Address”, enter the free IP address

The screenshot shows a 'Network Setting' window with the following fields and sections:

- IP Address Parameter:**
  - IP Address Setting: A dropdown menu currently showing 'Specify an IP Address' (highlighted) and 'Obtain an IP Address via DHCP'.
  - IP Address: An empty text input field.
  - Subnet Mask: An empty text input field.
  - Default Gateway: An empty text input field.
  - Primary DNS: An empty text input field.
  - Primary WINS: An empty text input field.
- Network DiskRemote Host Path:**
  - PC Name: An empty text input field.
  - Dir Name: An empty text input field.
  - User Name: An empty text input field.
  - Password: An empty text input field.
- Net Status:** A text box displaying 'Code : -1'.
- Resource Shared:**
  - Shared Folder Path: An empty text input field.

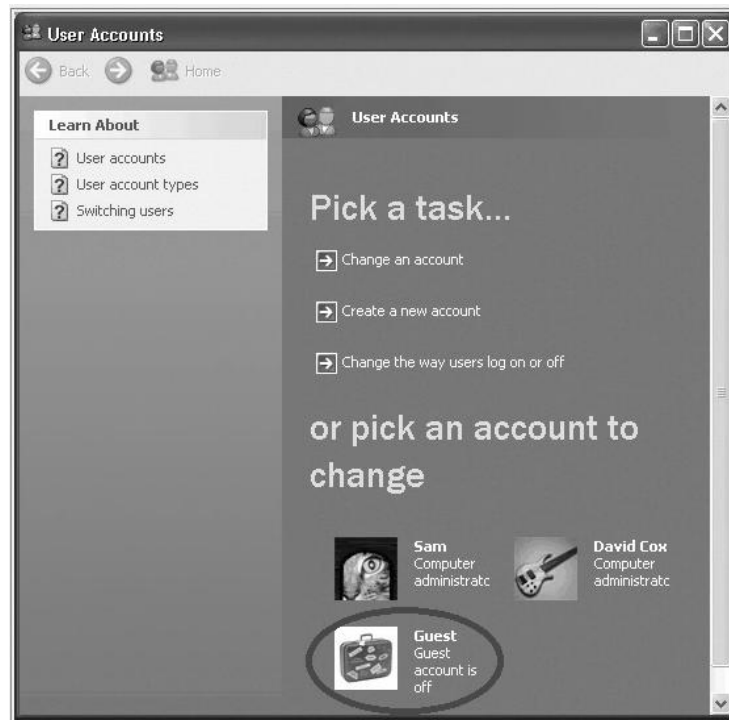
4. **Subnet Mask:** Enter the IP address for subnet mask (the same with PC subnet mask).
5. **PC Name:** Enter the full computer name of your PC.
6. **Dir Name:** Enter the sharing folder name (the same name with PC sharing folder )
7. **User Name:** Enter GUEST
8. Press 「**F1 OK**」 , and then reboot controller to finish installation.

## 3.4.7 PC Setting

### 3.4.7.1 XP OS

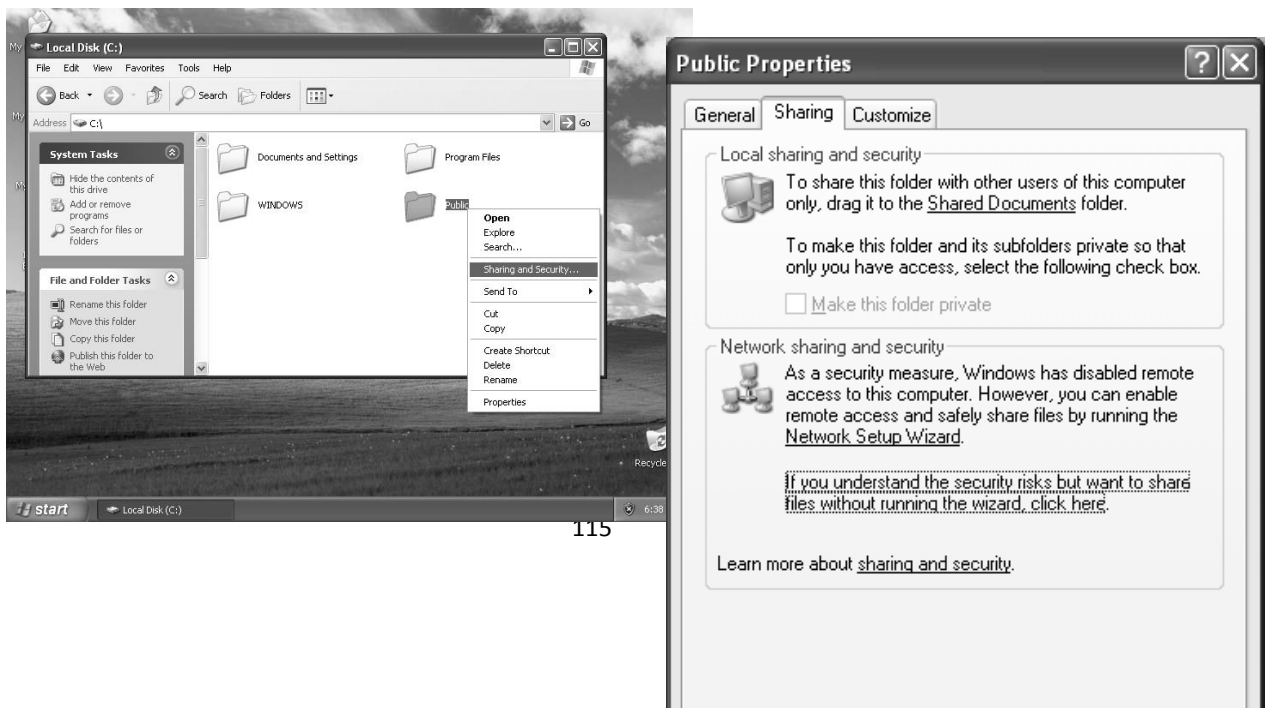
#### 1. Guest account setting

Log in as an Administrator and select “start”→ “control panel”→”user account”→ Guest

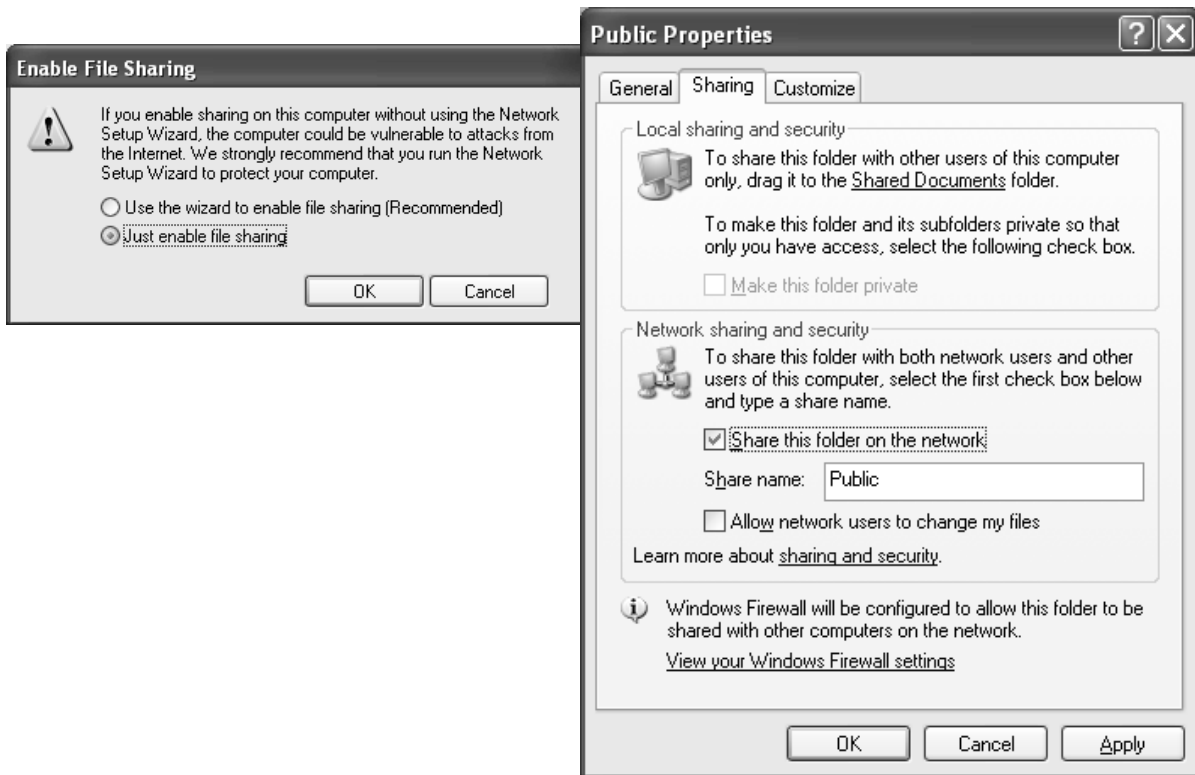


#### 2. Sharing resource setting

- Right click the folder you want to share and select “Sharing and security”
- Click on “If you understand security risks but want to share files without running the wizard, click here”



- Click “OK” to confirm sharing setting; Select “Share this folder on the network”, and “Allow network users to change my files”.



#### 4. Setting PC name and workgroup

“Start”→ “control panel”→”System”→ “change” to set “Computer Name” and “Workgroup”, and remember these setting contents to use later on when setting controller.



## 5. TCP/IP setting

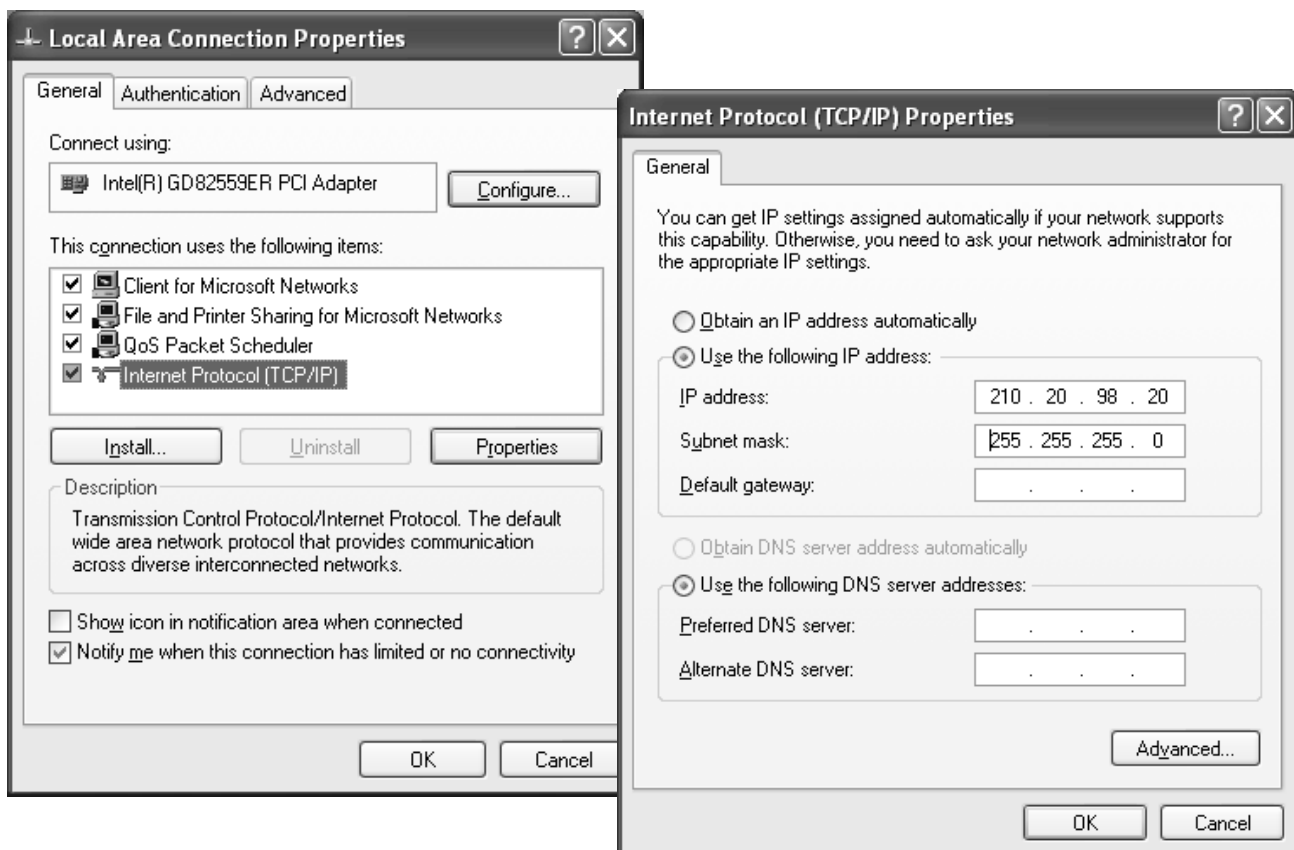
“Start” => “Setting” => “Network connections” and right click on



“Properties”, and select “Internet Protocol [TCP/IP]”

✧ Jumper cable (without HUB), select “use the following IP address” and enter IP address (the forth number is different from controller setting) and Subnet mask (same with controller setting)

✧ Network cable (with HUB), select “Obtain an IP address automatically”

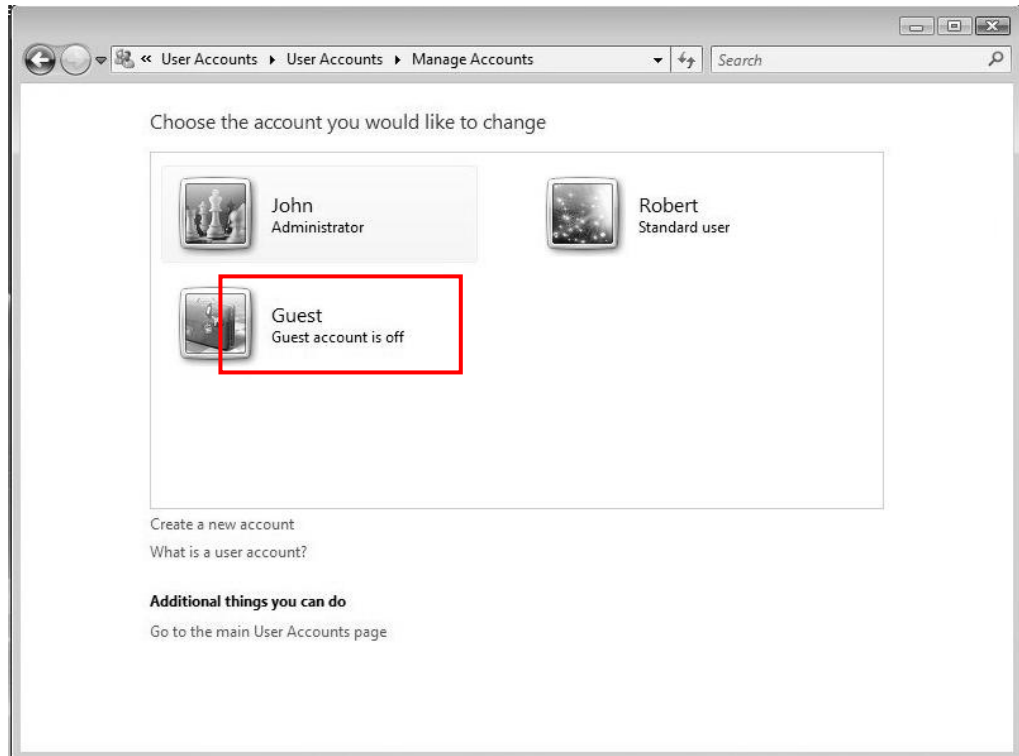




### 3.4.7.2 VISTA OS

#### 1. Guest account setting

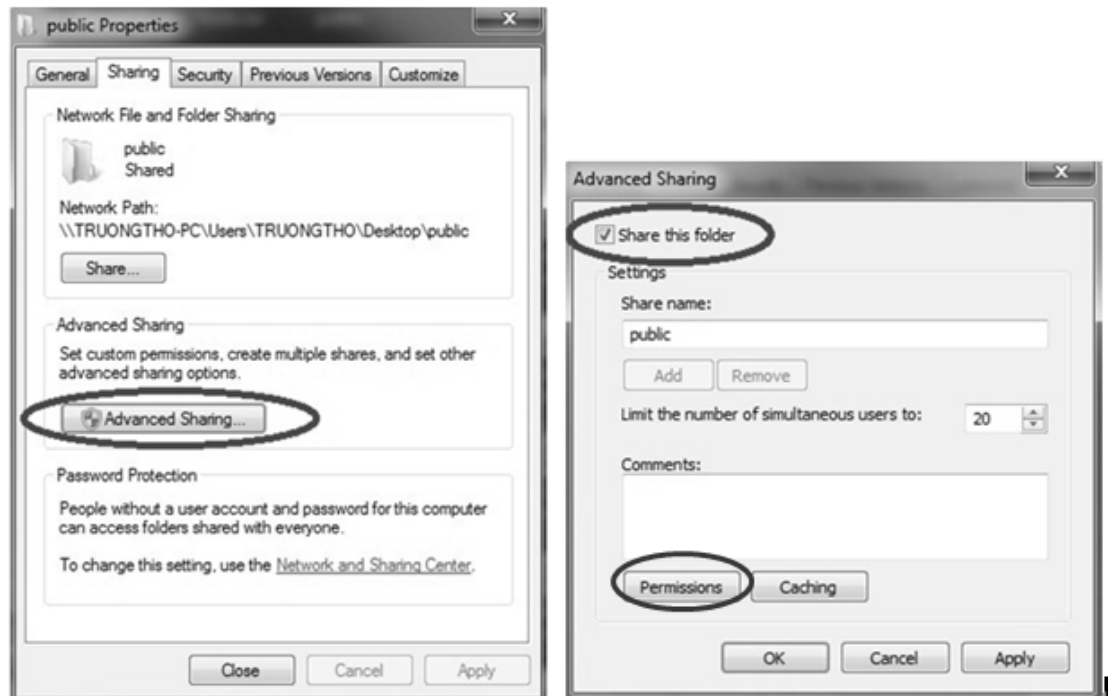
Log in as Administrator and select “Start” → “Control Panel” → “User Account” → Guest



## 2. Sharing Resource Setting

Create a sharing folder, and change this folder's setting to offer controller to use, as the below figure.

- A. Click on “advanced sharing”
- B. Click on “share this folder”

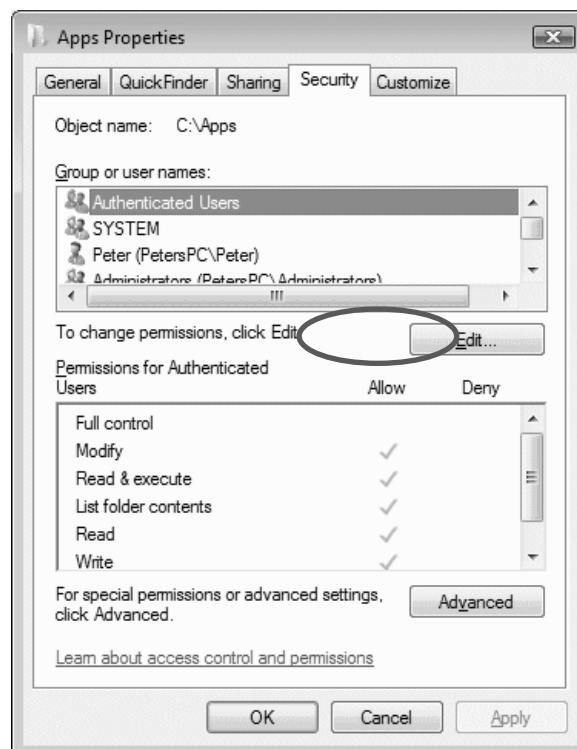


- C. Click on “permission”
- D. Click on “add”
- E. Enter “GUEST” as the new group name, click “OK” to complete setting



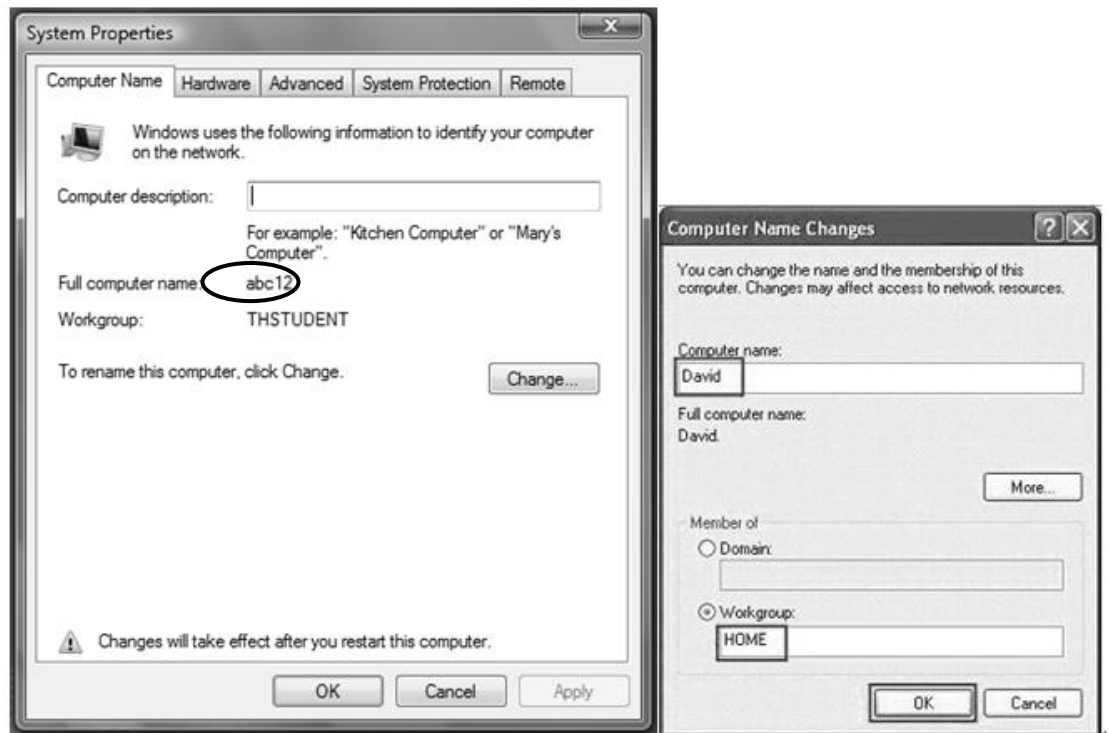
### 3. Security setting

Right click on folder to share → properties → security → Edit → add  
 “Guest” as a new group, then open group permissions to maximum.



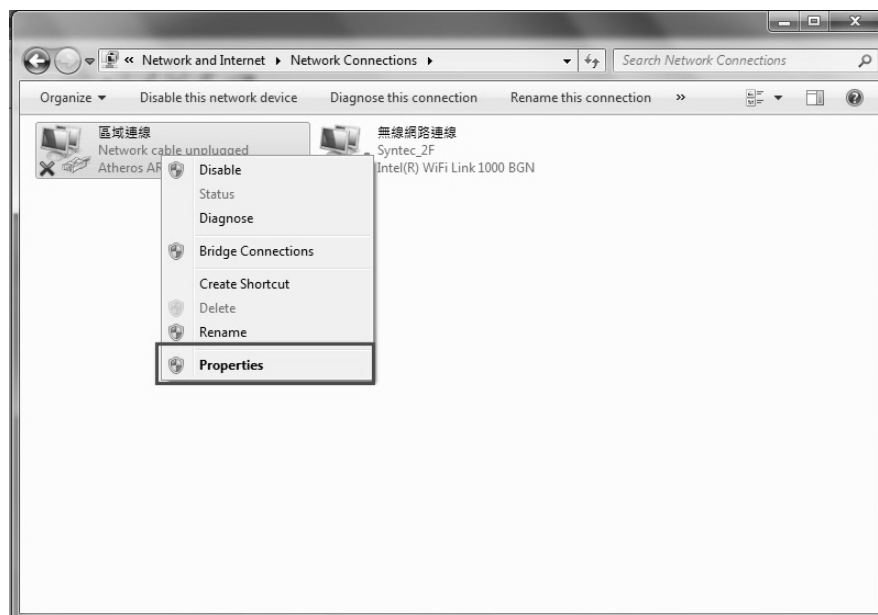
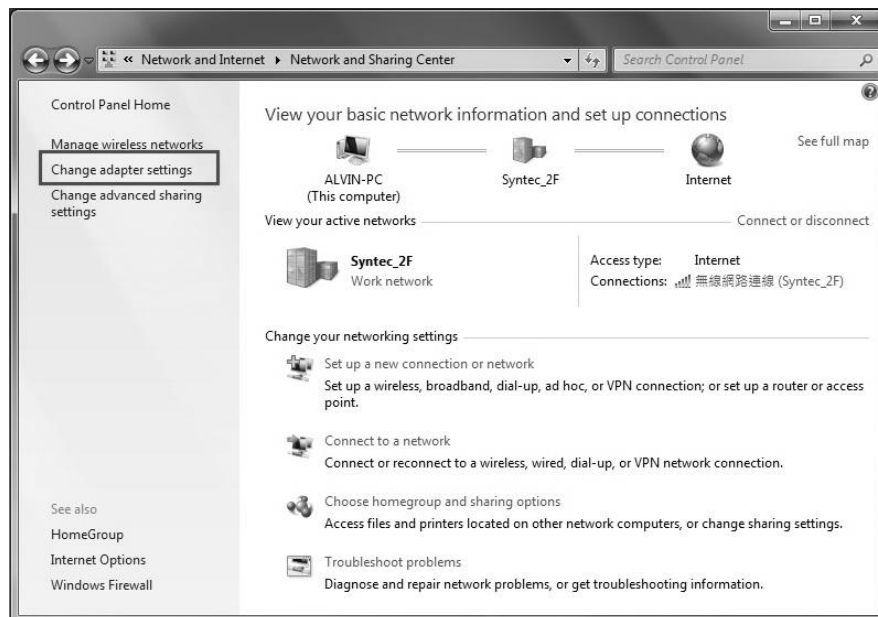
## 4. Setting PC name and workgroup

“Start”→ “control panel”→”System”→ “change” to set “Computer Name” and “Workgroup”, and remember these setting contents to use later on when setting controller.



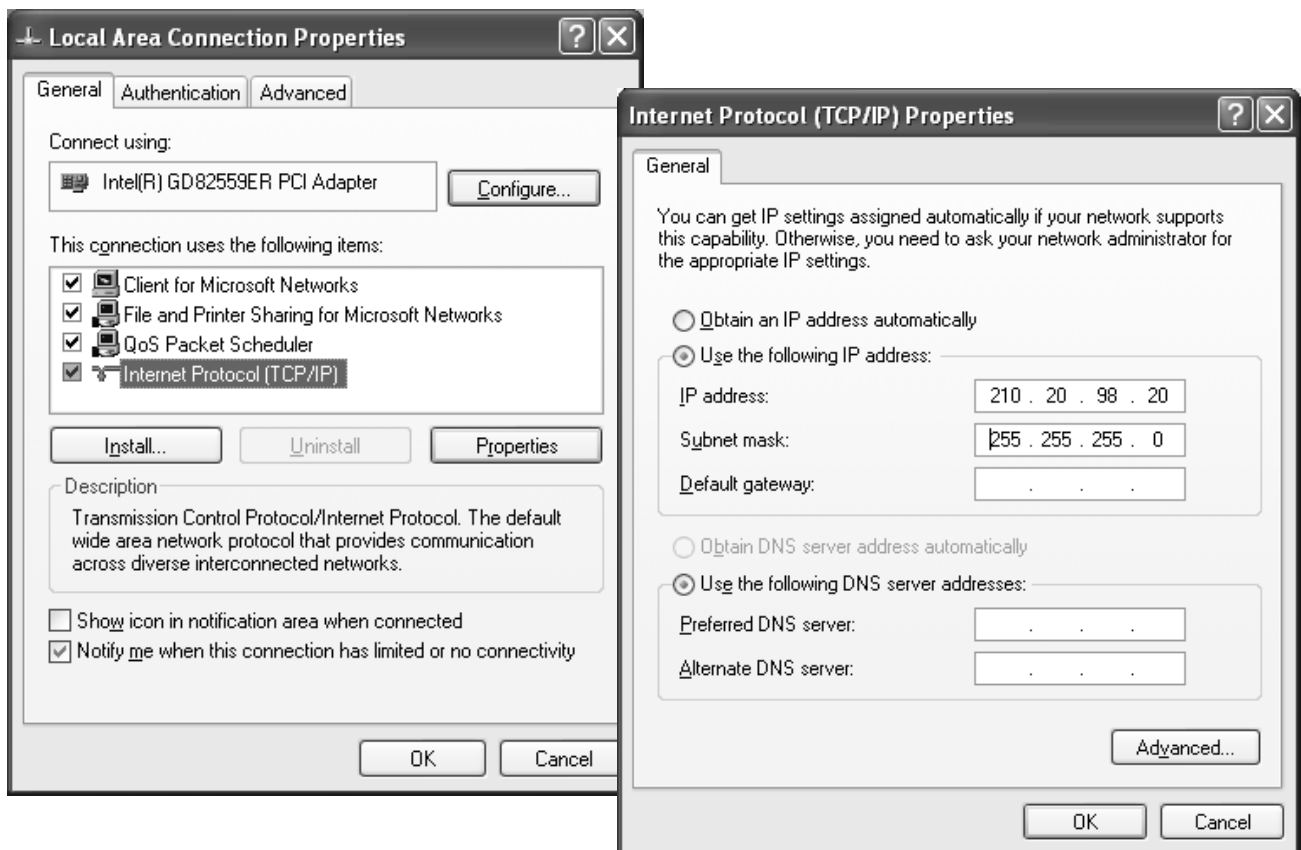
## 5. TCP/IP Setting

- a. “Start” → “control panel” → “Network and Internet”→“Network and Sharing Center” → “Properties”



b. Select “internet protocol(TCP/IP)” as shown below:

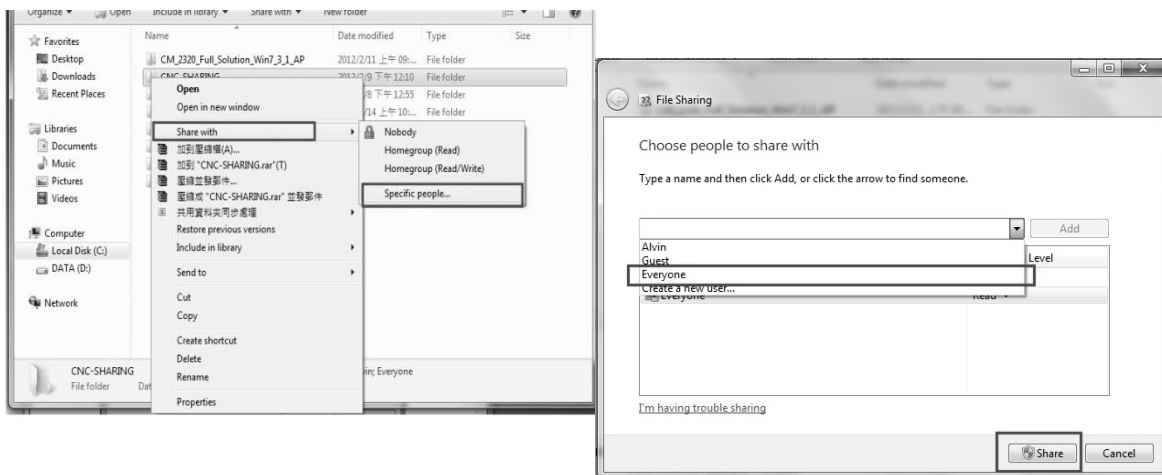
- ✧ Jumper cable (without HUB), select “use the following IP address” and enter IP address (the forth number is different from controller setting) and Subnet mask (same with controller setting)
- ✧ Network cable (with HUB), select”Obtain an IP address automatically”



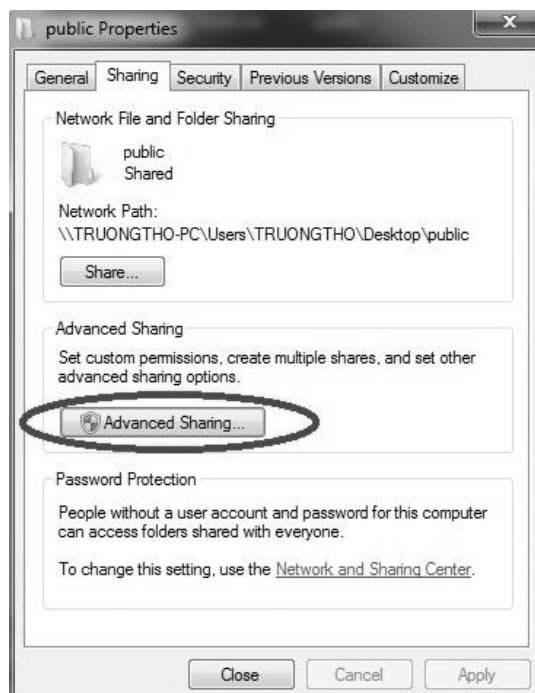
### 3.4.7.3 Win 7 OS

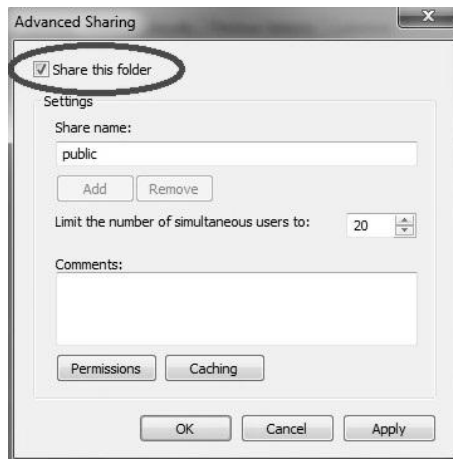
#### 1. Sharing resource setting

- ✧ Right-click on folder wants to share, select “share with” and “specific people”
- ✧ Share this folder to everyone, and then click “Share” as follows.
- ✧ Set permission as write/read

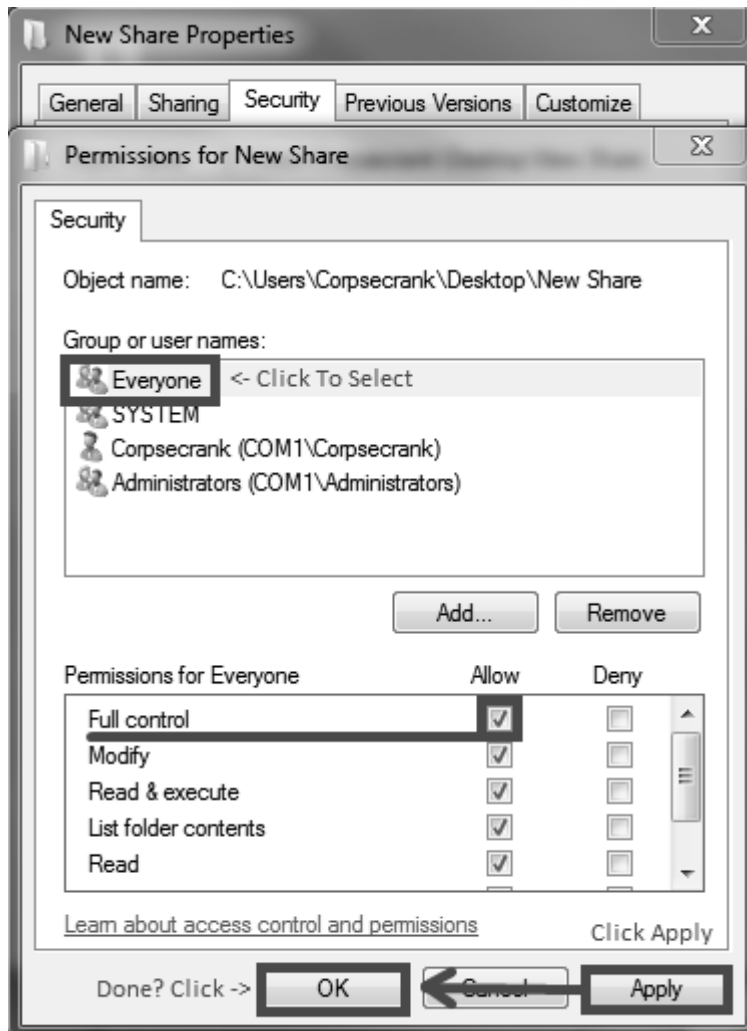


- ✧ Left-click on “advanced sharing” and select “share this folder” to everyone.



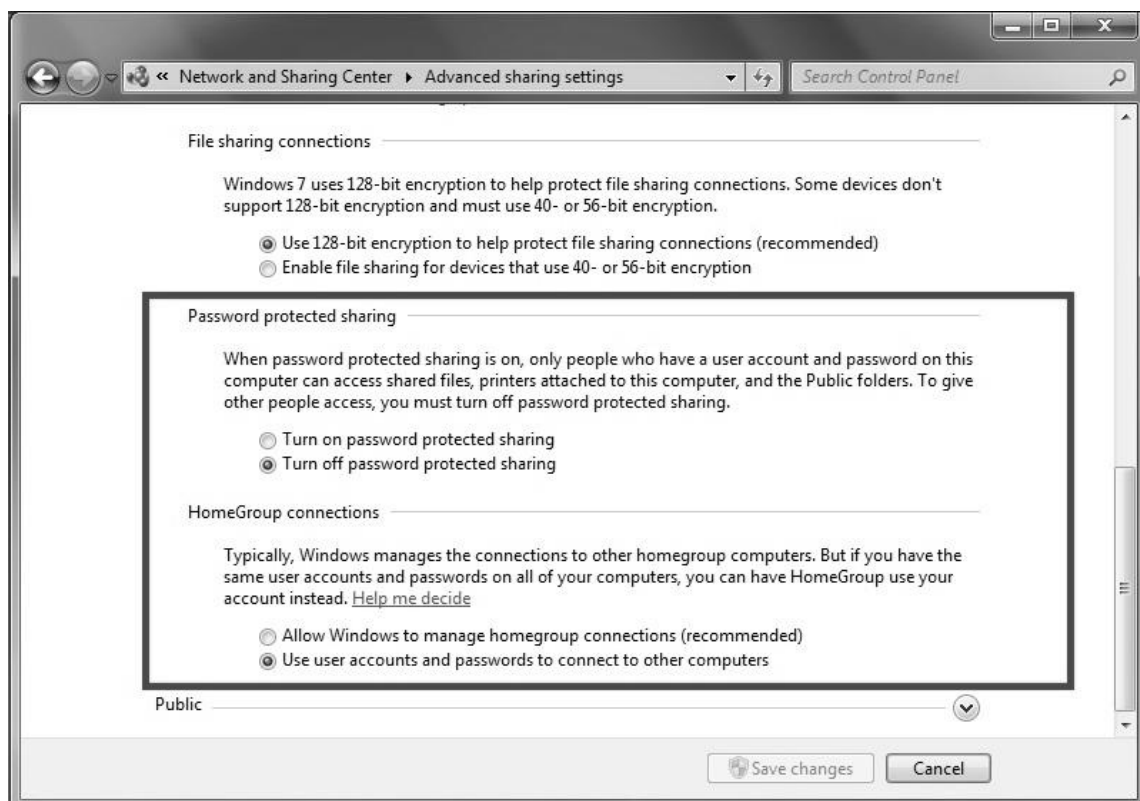
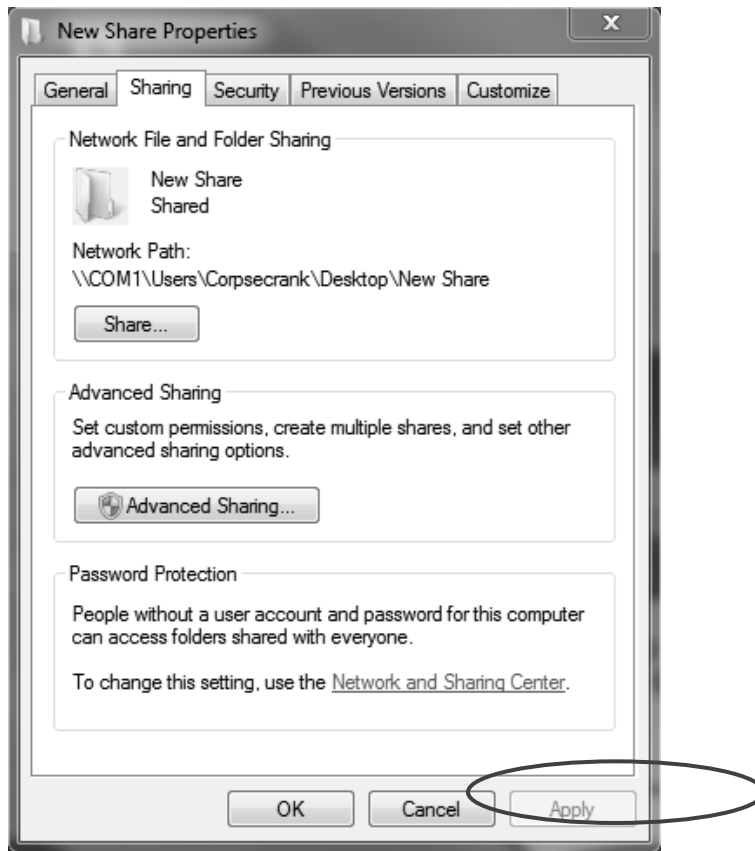


✧ Select “permission” and select “full control” “only read” and “change”



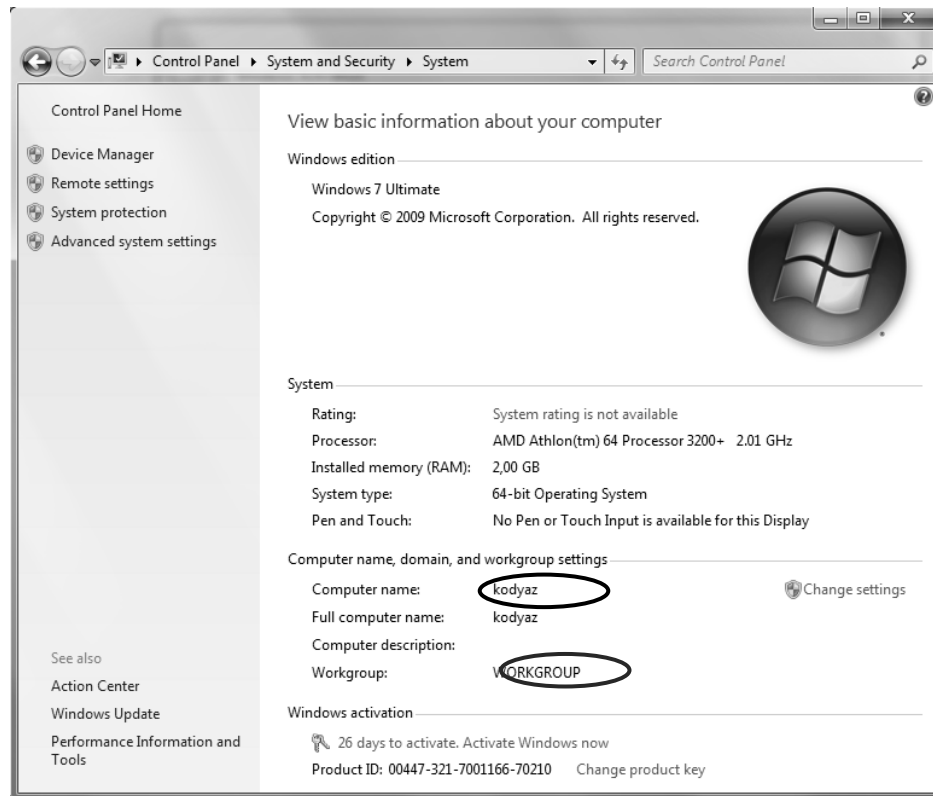


✧ Open "Network and sharing center", select "turn off password protected sharing" and "Open sharing...."



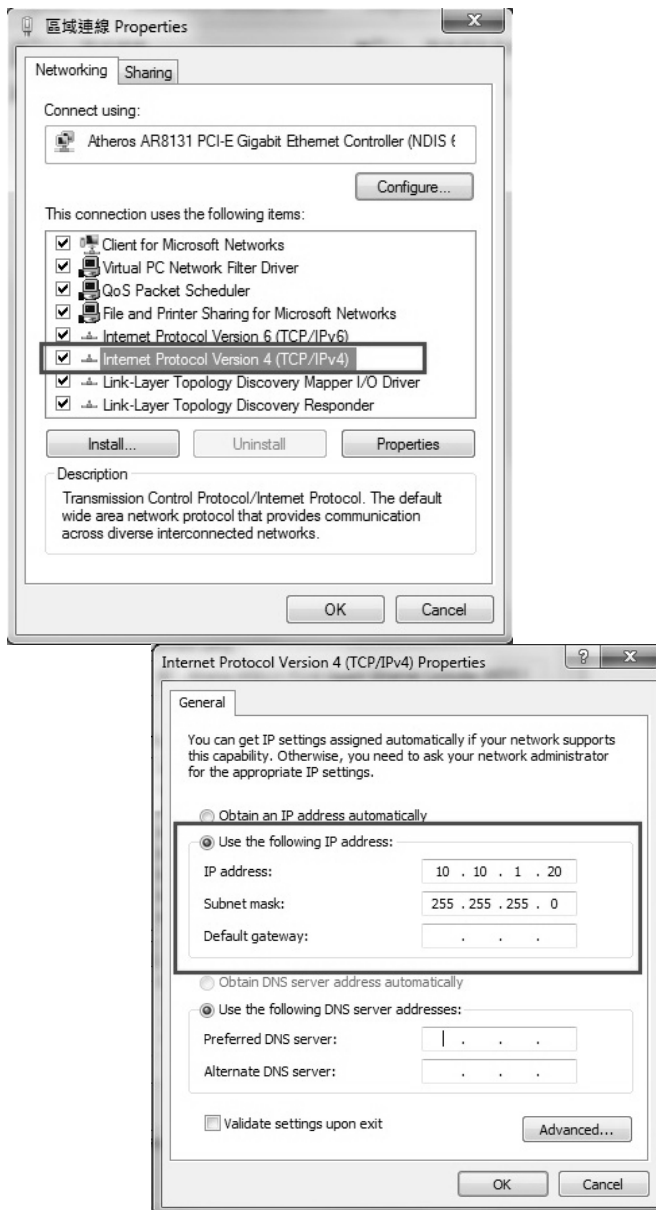
## 2. Setting PC name and workgroup

“Start”→ “control panel”→”system and security”→ ”System”→ "change" to set "Computer Name" and "Workgroup", remember these setting contents to use later on when setting controller.



### 3. TCP/IP Setting

- Double click “Internet Protocol Version 4 (TCP/IPv4)”
- Jumper cable(without HUB), select “use the following IP address” and enter IP address(the forth number is different from controller setting) and Subnet mask(same with controller setting)
- Network cable(with HUB), select ”Obtain an IP address automatically”

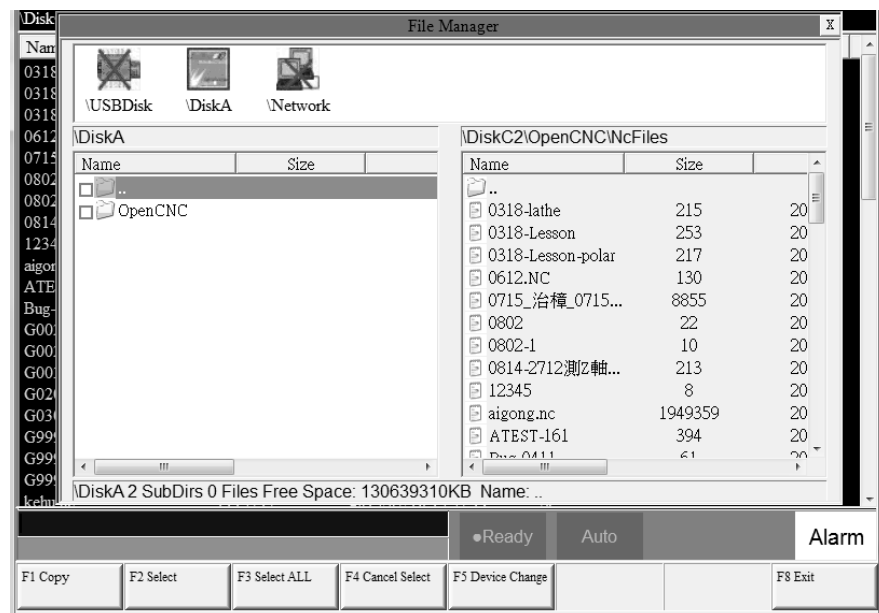


## 3.5 File Transfer

This section will show how to transfer files, files transfer is divided into import and export files, allowing controller share files to external devices, such as USB, CF card or users on the network.

### 3.5.1 File Import

- Operation
  - ✧ Command: F2-program → F8-file manager → F4 File import
  - ✧ New windows will pop up on screen, press F5-“device change” to move cursor to desired external device on the status bar
  - ✧ Press [Enter] key to access device, if the device icon has red cross, which means that there is no connection to this device (or not active)
  - ✧ Select the file wants to import and press [Copy] to complete import file
  - ✧ Press “F4 cancel select” to cancel the selected file
  - ✧ After complete file transfer, press [Left] or [ESC] to leave this screen



### **3.5.2 File Export**

- Operation
  - ✧ Command: F2-program → F8-file manager → F5 File export
  - ✧ New windows will pop up on screen, press F5-device change to move cursor to desired external device on the status bar
  - ✧ Press [Enter] key to access device, if the device icon has red cross, which means that there is no connection to this device (or not active)
  - ✧ Select the file wants to export and press [Copy] to complete export file
  - ✧ Press “F4 cancel select” to cancel the selected file
  - ✧ After complete file transfer, press [left] or [ESC] to leave this screen
- Note:
  - ✧ If destination of export file does not exist, below alarm will appear

## 4 Appendix

### 4.1 Release Note

Doc. Ver.	Content	Release Date	Author	Reviwer	CNC Ver.
1.0	1 <sup>st</sup> Version	2013/08/15	Tsai Chiju	Sandy Duan	1.0.6
1.1	Modify the content	2013/10/25	Sandy Duan	Yulius.Duma	1.0.6

### 4.2 Contact Window

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<p>Jiangsu-Nanjing The Suzhou new generation of CNC Equipment Co., Ltd. Chongqing Branch Room 505, Unit 3, Building 12,Wuyi Luzhou Guan Chu Yuan, No.99, Tianyuan Middle Road, Jiangning District, Nanjing TEL : 0512-69008860-300</p>	<p>Hubei-Wuhan Suzhou new generation of CNC Equipment Co., Ltd. Wuhan Office Room2003-2006,A#Guangguguoji,456 #Luoyu Road,Donghukaifaqu,Wuhan City, China TEL : 027-87638876 FAX : 027-87204137</p>
<p>Liaoning-Shenyang The Suzhou new generation CNC Equipment Co., Ltd. Shenyang Office No.3 A 1-12-3, South Wenhui Street, Shenhe District, Shenyang, Liaoning TEL : 15002491395 FAX : 18698806526</p>	<p>Anhui-Hefei The new generation of CNC Equipment Co., Ltd. in Suzhou, Hefei Office Room 704, Building 13,Wanzhen Xiaoyao Garden IV, Taihu East Road, Hefei TEL : 15951989576</p>
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