ADTECH 4 SERIES
CNC MAINTAINANCE USER MANUAL

Contents

Basic Information

This Manual is written by Adtech (Shenzhen) Technology Co., Ltd.

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Precautions and Explanations

※Transport and storage:

- ☞ Do not stack product package more than six layers;
- ☞ Do not climb, stand on or place heavy stuff on the product package;
- ☞ Do not pull the cable still connecting with machine to move product.
- ☞ Forbid impact and scratch on the panel and display;
- ☞ Prevent the product package from humidity, sun exposure,and rain.

※Open-box inspection:

- ☞ Open the package to confirm the product to be purchased by you.
- ☞ Check damages situation after transportation;
- ☞ Confirm the integrity of parts comparing with the parts list or damages situation;
- ☞ Contact our company promptly for discrepant models, shortage accessories, or transport damages.

※Wiring

- ☞ Ensure the persons involved into wiring and inspecting are specialized staff;
- ☞ Guarantee the product is grounded with less than 4Ω grounding resistance. Do not use neutral line (N) to substitute earth wire.
- ☞ Ensure grounding to be correct and solid, in order to avoid product failures or unexpected consequences;
- ☞ Connect the surge absorption diodes to the product in the required direction, otherwise, the product will be damaged;
- ☞ Ensure the power switch is OFF before inserting or removing plug,or disassembling chassis.

※Overhauling

- ☞ Ensure the power is OFF before overhauling or components replacement;
- ☞ Make sure to check failures after short circuit or overloading, and then reboot the machine after troubleshooting
- ☞ Do not allow to frequently connect and disconnect the power, and at least one minute interval between power-on and power-off.

※others

- ☞ Do not open housing without permit;
- ☞ Keep power OFF if not in use for a long time;
- ☞ Pay close attention to keep dust and ferrous powder away from control;
- ☞ Fix freewheel diode on relay coil in parallel if non-solid state relay is used as output relay. Check whether power supply meets the requirement to ensure not burning the control.
- ☞ Install cooling fan if processing field is in high temperature, due to close relationship between service life of the control and environmental temperature. Keep proper operative temperature range for the control: 0℃ ~60℃.
- ☞ Avoid to use the product in the overheating, humid, dusty, or corrosive environments;
- ☞ Add rubber rails as cushion on the place with strong vibration.

※Maintenance:

Please implement routine inspection and regular check upon the following items, under the General usage conditions (i.e. environmental condition: daily average 30℃, load rate: 80%, and operating rate: 12 hours/ day)

Routine Inspection	Routine	● Confirm environmental temperature, humidity, dust, or foreign objects. ● Confirm abnormal vibration and noise; ● Check whether vents are blocked by yarn etc.
Regular Check	One year	● Check whether solid components are loose ● Confirm whether terminal block is damaged

1. Foreword

CNC49 series cnc controllert developed by Adtech (Shenzhen) CNC Technology Co., Ltd. for milling machines and machining centers, CNC4940 is four axis motion controller and CNC4960 is six axis motion controller.

Instructions and reading convention of the Manual

Before using this CNC system, please read this Manual carefully to operate properly.

Terminology note and reading convention in this Manual:

CNC4940 and CNC4960 are the controller with different axis and same hardware.

“CNC system”, “NC controller” and “CNC49XX” mentioned in this Manual all refer to CNC4940/4960

The articles marked with “Caution” prompt users to pay special attention for operation or setting, or else this operation may fail or certain action can’t be performed.

2.System technical characteristics

2.1 System technical parameters

Function	Name		Specification
Control axis	Control axis		4 axes (CNC4940 series) 6 axes (CNC4920 series)
	Simultaneous control axes		4 axis linear interpolation (CNC4940 series) 6 axis linear interpolation (CNC4960 series)
Input instruction	Minimum setting unit		0.001mm
	Minimum moving unit		0.001mm
	Maximum instruction value		±9999.999mm
Feeding	Fast feeding speed		X axis, Y axis, Z axis, A axis: B axis, C axis 9999 mm/min (maximum)
	Feeding speed range	Per minute	1~9999mm/min
		Per rotation	1~500rpm
	Automatic acceleration/deceleration		Yes

Function	Name	Specification
	Feeding speed rate	10~150%
Manual	Jog feeding,	Yes
	Returning to reference point manually	All control axis return to reference point simultaneously (allow setting order of priority)
	Single step/handwheel function	Yes
Interpolation	Positioning, linear interpolation, arc interpolation	G00, G01, G02/G03
Operating mode	MDI, auto, manual, single step, edit	Yes
Testing function	Test run, single program section, Handwheel	Yes
Coordinate system and pause	Pause (sec/ms)	G04 X/P_
	Coordinate system setting	G92 (M series)
	Automatic coordinate system setting	Yes
Safe functions	Soft & hard limit check	Yes
	Emergency stop	Yes
Program storage	Program storage capacity, storage quantity	Capacity: 128MB 100 work areas No limit on processing file quantity
Program edit	Program edit	Insert, modify, delete, cancel
	Program No., sequence No., address, character retrieval	Yes
	Decimal point programming	Yes
Display	800×640 pixels 10” LCD	
	Position screen, program edit Tool compensation setting, alarm display Handwheel test, diagnosis interface Parameter setting, graphic simulation	Yes
M, S, T function	Auxiliary function	M code
	Spindle	S0-S15 (gear position control) S15-S99999 (analog)

Function	Name	Specification
	Tool function	T code
Compensation function	Tool compensation memory	30 tools length, radius compensation
	Reverse clearance compensation	Yes
Other functions	Measurement centered Automatic tool regulator	Yes
	Specify arc radius R/center position	Yes
	Electronic gear ratio	Yes

2.3 System function

2.3.1 Self-diagnosis

Diagnose CPU, memory, LCD, I/O interface, parameter state, coordinates and processing program Generally every time when the system power on; diagnose power supply, spindle, limit and I/O ports during operating.

2.3.2 Compensation

Automatic backlash compensation

Automatic tool length compensation

Automatic tool radius compensation

Automatic tool radius biasing and automatic tool tip transition

2.3.3 Abundant instruction system

Scaling instruction

Mirror processing instruction

Tool biasing instructions

Program cycle, program skip, program shift, program transfer, different end processing modes, macro definition and program management instructions

Fixed-point instructions: starting point, setting point, etc.

Linear, arc and spiral interpolation instructions

Six workpiece coordinate systems, nine extension coordinate systems and one reference point

2.3.4 Full English menu operation & full screen edit

4940/4960 CNC system uses cascading menu structure and full English operation to ensure simple operation and visibility.

2.3.5 Abundant error-correction functions

Point out the nature and correct the errors in operation.

2.3.6 Program exchange between CNC system and PC

Perform CAD/CAM/CAPP auxiliary programming with abundant software in PC, and then load G code program to the controller through communication interface (USB disk, RS232 interface), or transmit the programs from the controller to PC.

2.4 System operating condition

Operating voltage	24V DC (with filter)
Operating temperature	0℃— 45℃
Optimum operating temperature	5℃— 40℃
Operating humidity	10%——90% (no condensing)
Optimum operating humidity	20%——85%
Storage temperature	0℃—50℃
Storage humidity	10%——90%
Operating environment	No excessive dust, acid, alkali, corrosive and explosive gases, no strong electromagnetic interference

3. Operation panel

3.1 LCD/keypad

Keypad

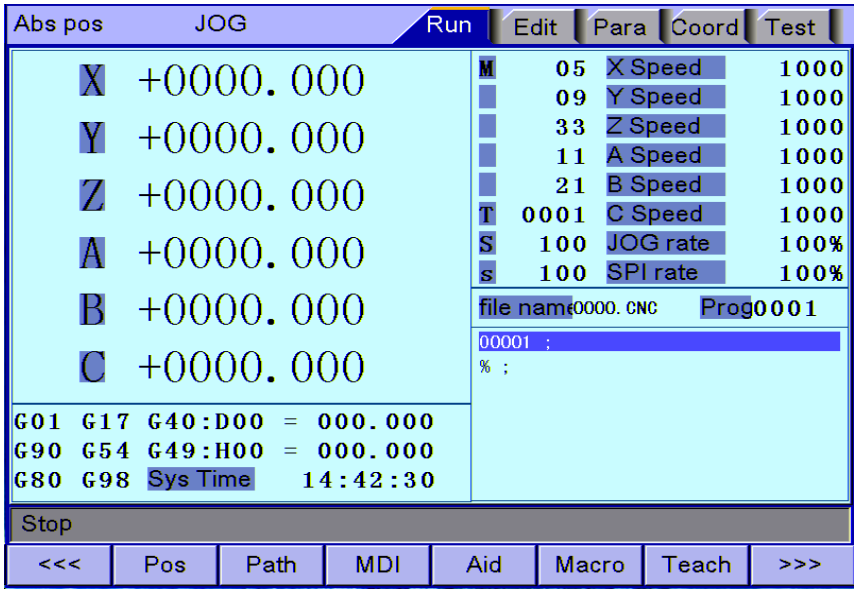
Note:

Press the submenu buttons to perform the operations of submenus.

JOG axis moving and edit & input are composite. It has different definitions according to the modes.

System working mode switch section is used to switch working modes, which can improve the security and system performance. Handwheel and single step mode are switched with Repeat button.

LCD unit



Note:

Screen info shows the information of current window

Working mode info shows currently selected working mode

System main screen shows current main screen.

The submenu options are used to switch submenus with left triangle, F1~F6 and right triangle. The right arrow is used to turn pages, and the left arrow is used to close the submenus in next level and previous menu.

3.2 LCD brightness adjustment

CNC49XX doesn't support brightness adjustment.

3.3 System menus

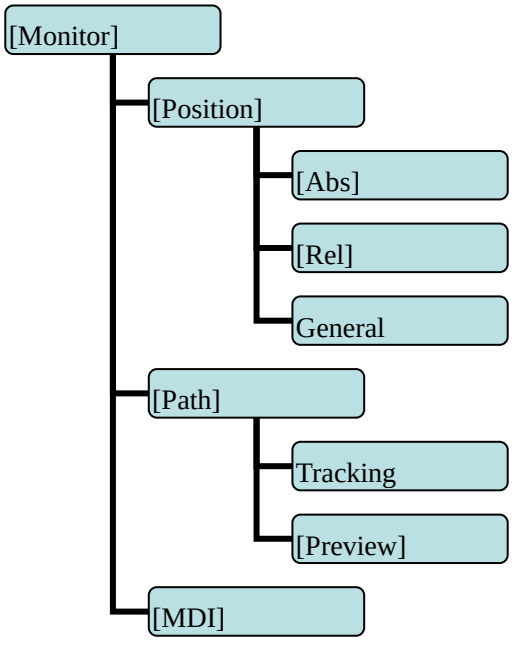
CNC49XX system uses cascading menu structure. You can press the following keys to operate the menus.

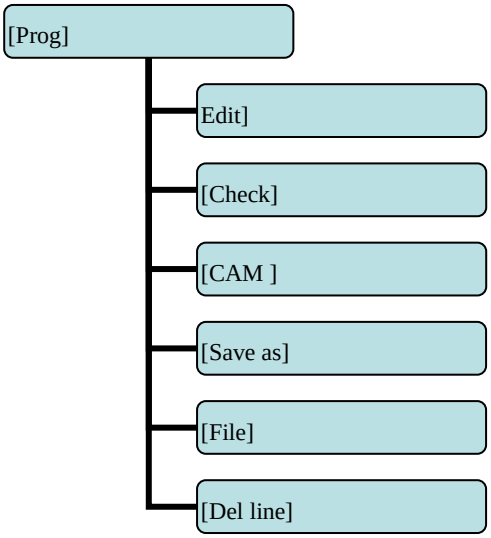
Press a key to show the corresponding content in the bottom of the LCD.

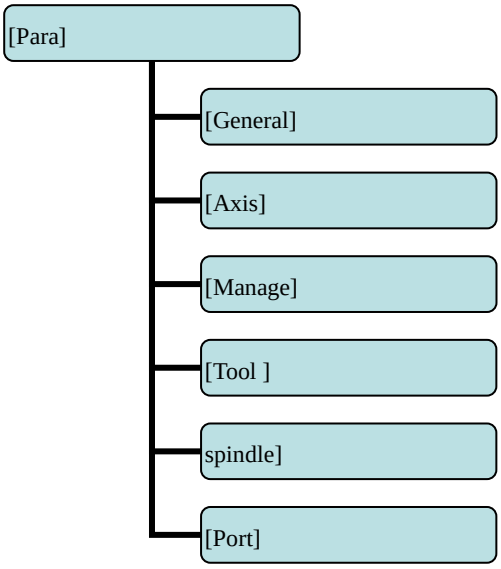
Key on the left: Return to previous menu

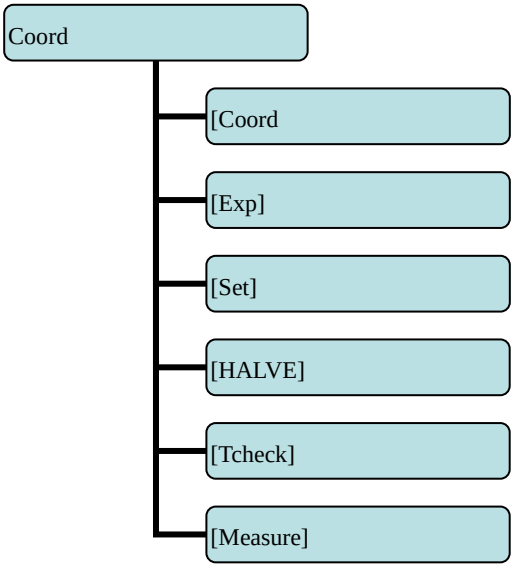
Key in the right: Turn pages to show other menus of same level

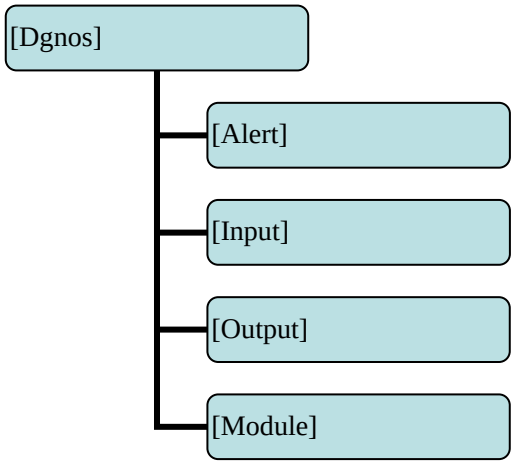
The main menus of the system include [Monitor], [prog], [Para], [Coord] and [Dgnos]. Each main menu contains several submenus, which are shown below:




[Prog]
Edit]
[Check]
[CAM]
[Save as]
[File]
[Del line]


[Para]
[General]
[Axis]
[Manage]
[Tool]
spindle]
[Port]


Coord
[Coord
[Exp]
[Set]
[HALVE]
[Tcheck]
[Measure]



3.4 Operating keys

The keys of CNC49XX system are defined below:

Key	Purpose
[RESET]	Cancel alarm, reset CNC
Address/number keys	Enter letters, numbers, etc.
[EOB], [CAN]	Confirm or cancel operation
[EOB], [CAN], [DEL]	Program edit (insert, delete, modify)
Mode switch key	Select operation mode
Cursor moving key	Four keys are available: Up/Down: adjust ration, move cursor between subsections; Left/Right: move cursor to left/right
Page key	Up/Down: Turn pages
Menu keys	Select the menus
Spindle cw rotation	Press it to rotate spindle cw, and press it again to stop rotating
Spindle ccw rotation	Press it to rotate the spindley ccw, and press it again to stop rotating
Coolant	Coolant on/off
Lubricant	Lubricant on/off
[BDT]	Block delete on/off
[SBK]	Single block function on/off
[PAUSE]	Pause automatic running
[START]	Start automatic running

4.Manual operation

4.1 Returning to home point manually

CNC machine has special mechanical position, which is called as home point and for tool exchange and coordinates setting. Generally, after power on ， the tool should be moved to the home point. This operation is also called as go home operation, which will make the CNC system confirm the origin of machine.

The home operation includes program and mechanical mode:

For program home, the action completes when the coordinates of machine are 0, and won't check whether home sensors are at position or not;

For mechanical home, the external home sensors are used to locate the origin of the machine ; two checking modes are available:

With the external sensor switch, the go home operation completed when the sensor sensing is successful

The external sensors are used as deceleration switch, the servo home is enabled as home signal after sensed and then stop

You can set the "Home mode" in [Parameter][General], in which 0 (default) indicates program and 1 indicates mechanical. You can also press [SBK] key in home mode to switch among "Mechanical – Program – Mechanical…" quickly. This method doesn't conflict with parameter setting.servo home as the home signal, you need to set "Axis phase Z home enable" to "1" in [Parameter][Axis] in mechanical home mode, and the setting will take effect in next home checking.

Several methods are available for tool returning to reference point and the steps as follow:

⑴ Each axis returns to home point separately

- Press the mode switch key [Home] to select home operation;
- Press the composite key [X-], [Y-], [Z-], [A-],[B-],[C-] at the numbers section to return the corresponding axis to reference point.

⑵ All axis return to reference point simultaneously

- Press the mode switch key [Home] to select home operation;
- Press the [Start] key ,after Z axis return to home point, then other axis return to hoime point simultaneously. The automatic home sequence can be configured in the parameters.

⑶ Reset machine tool position

- Press the mode switch key [Home] to select home operation;
- In [Absolute Position] and [Coordinate System] screen, press [X], [Y], [Z], [A],[B],[C]respectively to show the value of corresponding axis position, and then press the [Cancel] key to reset the machine position of current axis, i.e. current positions are used as machine origin position. After this operation, the system considers it as a home action. Therefore, when the program is running, the alarm of not home won't occur. If you press by mistake, it will switch the screen and cancel selection automatically.

(4) Reset relative position manually

- Press the mode switch key [Manual] to select manual operation;
- In [Relative Position] and [Coordinate System] screen, press [X], [Y], [Z], [A] ,[B],[C] respectively to show the value of corresponding axis, and then press the [Cancel] key to reset the relative position of current axis.

Note

The tool also can return to home point according to program instruction, i.e. returning tohome point automatically.

Caution:

General ly, the system should do go home operation after power on. If the power off while the machine is working, the controller also will return to home point when the power on again. So Return to Z axis firstly for preventing tool and workpiece from colliding and damaging them

.

4.2 JOG Function

Press the keys on the operation panel or handwheel to move the tool along every axis.

The operation follows:

⑴ Press the mode switch key [Manual] to select manual operation;

⑵ Press composite keys [X+], [X-]; [Y+], [Y-]; [Z+], [Z-]; [A+], [A-] [B+], [B-]; [C+], [C-] in numbers area to move the tool along selected axis. The keypad follows:

In Jog mode, 5# key can be used to switch the Jog speed and rapid move speed. The rapid move speed of each axis depends on General parameter 009-012 (fastspeed setting). After switching to rapid move speed, the Jog speed of the position interface will be highlighted, while the actual speed of the position interface is sampled from the moving speed of current axis. This value can truly reflect the moving speed of current axis (unit: mm/min);

Note

Only single axis motion is available at Jog mode.

4.3 Single step

Single step mode is similar to Jog mode, the operations are same, but only moves a specified pulse increment every time when press the key.

The operation as follows:

⑴ Press the mode switch key [MPG/ step] (this key is composite, and you can press it repeatedly to switch the modes) to select the single step operation;

⑵ Press composite keys [X+], [X-]; [Y+], [Y-]; [Z+], [Z-]; [A+], [A-] [B+], [B-]; [C+], [C-]in numbers area to move the tool for a fixed distance via the selected axis. This distance is controlled by four rates (1.000, 0.100, 0.010, 0.001) (unit: mm). To select pulse increment, press Up (+) and Down (-) key in the [Position] interface

4.4MPG

In MPG mode, rotate the handwheel to make the machine perform single step or continuous motion. Determine the feed by testing the handwheel signal of the handheld box. In MPG mode, the feeding axis and feeding unit are determined by the axis selection signal of the handheld box.

The MPG feeding step follows:

⑴ Press the mode switch key [MPG/ step] to select MPG operation;

⑵ Rotate the switch on the handwheel to select axis (X, Y, Z, A,B,C);

⑶ Rotate the increment switch on the handwheel to select the moving amount (0.1, 0.01, 0.001);

⑷ Rotate the handwheel to move the machine. The tool moves certain distance acoording to the handwheel scale setting. (For example, if you select X axis in step ⑵ and select 0.01 in step ⑶, the tool moves 0.01mm every scale). Rotate the handwheel continuously to move each axis continuously.

Note

The MPG mode controls only one axis every time; the faster the handwheel rotates, the faster the machine tool moves.

4.5 Manual auxiliary function operation

Coolant on/off

 at MPG/step/Jog mode, press this key to switch on/off the coolant.

Key indicator: No matter in what mode, the key indicator is on if only the coolant is on, or else the indicator is off.

Lubricant on/off

 at MPG/step/Jog mode, press this key to switch on/off the lubricant.

Key indicator: No matter in what mode, the key indicator is on if only the lubricant is on, or else the indicator is off.

Spindle CW/stop

 In at MPG/step/Jog mode, press this key to rotate the spindle cw and press it again to stop

Key indicator: No matter in what mode, the key indicator is on if only the principal axis is positive rotating, or else the indicator is off.

Spindle CCW/stop

 In at MPG/step/Jog mode, press this key to rotate the spindle ccw and press it again to stop

Key indicator: No matter in what mode, the key indicator is on if only the principal axis is reverse rotating, or else the indicator is off.

General instructions for manual operation keys

Cooling, lubricant, spindle cw/ccw are available in MPG, single step and Jog mode;

When the spindle is rotating, press the reverse rotation key, the Spindle will stop first, then rotate to the reverse direction after pressing it again.

When auxiliary output is on, if the system is switched to other modes, the output is unchanged; you need to press “Reset” key to switch it off, execute the corresponding M code in automatic mode or execute the corresponding M code in MDI interface to turn off the output;

When the spindle work cw/ccw and execute M04/M03 directly, the system first stops cw/ccw rotating and then execute M04/M03 code;

cw/ccw rotating of spindle is stopped while emergency stop pressed, and other outputs can be set according to system parameters.

4.6 Tool setting

Tool setting is the main operation and important skill for CNC machine operater Under certain conditions, tool setting precision can determine the precision of parts, and the tool setting efficiency also affects the CNC processing efficiency directly.there is two ,methods for cnc machine tool setting , i.e. centered and tool setting gauge

4.6.1 Centered

The centered function is that the system calculates the center position of the workpiece automatically while tool setting to realize segment centered, rectangle centered and circle center location.

Note

In the tool setting operation below, if the auxiliary parameters of the coordinate system doesn’t need setting, the first three steps can be omitted. Please refer to chapter 9.5 for auxiliary parameters of the coordinate system.

⑴ Single axis centered

- Select the edit mode;
- Select MPG or Jogl mode;
- Press [Coord] to enter coordinate system setting interface;
- Press the left/right arrow to move the cursor to select coordinate system;
- Press [HALVE] to enter centered interface;

- Move the tool to make its side blade touch side A surface of the workpiece, and press [EOB] to record boundary point 1;
- Move the tool to make its side blade touch side B surface of the workpiece, and press [EOB] to record boundary point 2;
- Press [EOB] to calculate the coordinates of center point;
- If all are ok , press [EOB] again to return the result to specified coordinate system.

⑵ Square centered

- Select the edit mode;
- Select MPG or Jogl mode;
- Press [Coord] to enter coordinate system setting interface;
- Press the left/right arrow to move the cursor to select coordinate system;
- Press [HALVE] to enter centered interface;
- Move the tool to make its side blade touch side A surface of the workpiece, and press [EOB] to record boundary point 1;
- Move the tool to make its side blade touch side B surface of the workpiece, and press [EOB] to record boundary point 2;
- Record boundary point 3.4 in the same method;
- Press [EOB] after recording all boundary points to calculate the coordinates of center point;
- If all are ok, press [EOB] again to return the result to specified coordinate system.

⑶ Plane circle (XY plane) centered

Circle centered has two modes, which are three points and two points with specified radius; If the user only types two coordinates in the option of workpiece boundary point and specifies one value for R, the system will determine the circle center with two points and radius automatically; if the user types coordinates of three points in the option of workpiece boundary point, the system will determine the circle center with three points and shield R.

- The centered step of three points arc follows:

- Select the edit mode;
- Select MPG or Jogl mode;
- Press [Coord] to enter coordinate system setting interface;
- Press the left/right arrow to move the cursor to select coordinate system;
- Press [HALVE] to enter centered interface;
- Move the tool to make its side blade touch the surface of round workpiece, and press [EOB] to record boundary point 1;
- Move the tool to make its side blade touch another point in the surface of the workpiece, and press [EOB] to record boundary point 2;
- Move the tool to make its side blade touch another point in the surface of the workpiece, and press [EOB] to record boundary point 3;
- Press [EOB] after recording all boundary points to calculate the coordinates of circle center and display in the result section;
- If all are ok , press [EOB] again to return the result to specified coordinate system.

Arc centered checking

under the main menu, press [Monitor], [MDI] to enter the MDI interface, select edit mode, enter program block G55G0X0Y0 (if coordinate system G55 is selected while tool setting), press [Start], [EOB], and the tool moves to workpiece center automatically, indicating that three points arc centered properly.

The validation steps for other tool setting methods are same.

4.6.2 tool setting gauge

tool setting gauge principle:

The tool setting gauge uses external sensor to set the reference point for axis Z, which is similar to home. After changing tool during machine working or changing tool manually, it will automatically check the Z value of current workpiece's home.

tool setting gauge usage

Before using the tool setting gauge, you need to set the parameters. In [Coord] menu, press [set] to show tool setting parameters. After that, press [Tcheck] in the setting interface to execute the tool setting gauge program according to specified parameters.

The action sequence oftool setting gauge follows

- Return Z axis to mechanical home first, and then locate spindle to X, Y coordinates of the tool setting gauge;
- tool setting gauge start blowing
- Z axis moves down, and return when touches tool setting gauge sensor, moves down at lower speed for leaving the sensor ,records the machine coordinates of Z axis when touches the sensor and import the Z coordinates to current selected coordinate system;
- tool setting gauge stop blowing
- Z axis returns to home position.

4.7 Data settings

4.7.1 Tool compensation setting

The tool compensation parameters can be set as follow:

- Select the edit mode;
- In the main menu, press [Coord], and then press submenu [Exp] to enter tool compensation parameter setting interface;
- Move cursor to select the parameter, enter the value and then press [EOB] to modify the parameter where the cursor locates.

Caution

1:there aree two types for assignment ,direct assignment and incremental assignment. direct assign is that import data directy to the specified parameter ,the incremental assignment is that the value which is input data plus the current value will be imported to the parameter

2:for incremental input and directly input ,there is a symbol at the left side ,"=" is directly input,"+" is incremental input ,the default setting is directly input(=),in setting dialog,press ↑ ↓ shift directly and incremental input .

4.7.2 System parameter setting

The system parameters can be modified as follow:

- Select the edit mode;
- In the main menu, press [Para] to enter parameter setting interface;
- Then, press the submenu key to select the parameter type (General, manage …);
- Move cursor to select the parameter, enter the value and then press [EOB] to modify the parameter where the cursor locates.

4.8 System shoutcut key operation

- Under [monitor]mode, [pos] interface,then "o"key,the controller will show a dialog ,you can select one O program (O0001,O0002,and son on), "EOB" for comfirming.
- Under [monitor]mode, [pos] interface,Jog mode,press "←", "→" ,for adjusting the spindle speed.

  Note :this function is effected only when the spindle is working and speed is not 0,so if the speed is 0 ,you can make a program start the spindle and speed is not 0 ,then you can use this shortcut key function.

5.Automatic operation

The machine works according to cnc program is called as automatic operation. The automatic operation modes of CNC49XX system as follow:

Memory operation, MDI operation, USB disk DNC operation.

5.1 Memory operation

The machine works according to the cnc program in CNC49XX memory, which is called as memory operation.

The program is prestored in the memory. Select and load a program with the operation panel and press the “Start” key to start the automatic operation. Then, press “Pause” key to pause, press “Start” key again to resume the operation, and press “Reset” during operation to stop the program immediately.

The step of memory operation as follows:

⑴ Save the program in the memory (read 8.1 for details);

⑵ Select [Edit], [File] in the menu or press [File] on the panel to enter file operation interface;

⑶ Press the “arrow”keys to move the cursor, press [EOB] to select a program and load the file into the work area;

⑷ Press [Auto]

⑸ Press the [Start] to run the program, and the indicator is on.

5.2 MDI operation

In [Monitor] interface, switch to [MDI], enter the program with keypad and machine works according to the program. The program isn’t saved in system memory, and lost after reboot. This is called as MDI operation and the step as follows:

⑵ Press [Edit];

⑵ press [Monitor],then press [MDI]

⑶ input program manually;

⑷ Press [Start], [EOB] to start the program

5.3 USB disk(flash drive) DNC

The controller read program from external USB disk and worked without saving in CNC memory. This operation is called as USB disk DNC operation.

The step of USB disk DNC operation as follows:

⑵ Insert the USB disk;

⑵ press [File]

⑶ Select [data traveler(u)]and press [EOB] to enter;

⑷ Move cursor to select a file in the disk;

⑸ Press [EOB] to load the file into work area (system buffer);

⑹ Press [Auto];

⑺ Press the [Start] to run the program, and the indicator is on.

Caution

The system won't record the USD disk path. If power off during DNC processing, the program info will be lost after power on ,so if you want to continue,you should do above steps again.

5.4 Speed rate adjustment

Feeding rate

at auto mode, press " ↑ ", " ↓ "key in [Position] interface to adjust the feeding rate; Press the key once to increase or decrease by 10% (10%-150%).

Jog rate

at Jog mode, press " ↑ ", " ↓ "key in [Position] interface to adjust the Jog rate; Press the key to increase or decrease by 10% (10%-150%).

Spindle speed

at auto or Jog mode, press the "→","←"key to adjust the spindle speed by 100r/min. The maximum speed is set by the spindle parameters in the system and the minimum speed is 16r/min. If you press and hold the key for three seconds, the value will be increased or decreased quickly.

5.5 Run idle

(Reserved)

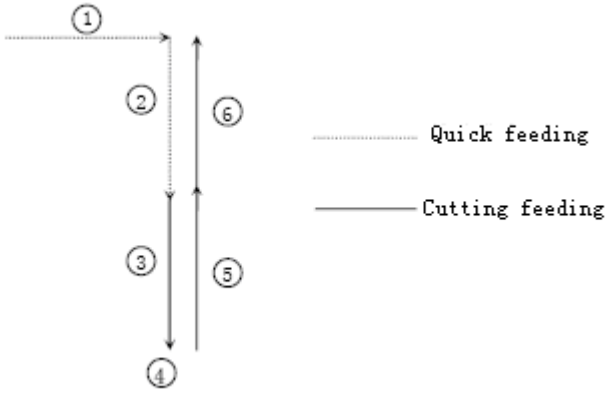
5.6 SBK function

at auto mode, press [SBK] to start the SBK function. Current program stop; press [Start] again and next line stops after executing. The SBK mode can checking the program line by line.

Caution:

① In G28-G30, single line also can be stopped at the midpoint;

② The stop points of single line in fixed circle are ①, ②, ⑥ in the figure below; when the single line of ①, ② stops, the feeding pauses and the pause indicator is on.



5.7 BDT function

at auto mode, press [BDT] to start the BDT function, which will make the instructions invalid, the instructions are that hace a '/' symbol at the begaining of program segments.

5.8 Stopping automatic operating

Two methods are available to stop automatic operating,one is that when the controller exctue M01 or M00 code,the other is that press stop key on the panel

Program stops

After executing M00 or M01 code, the controller stop automaticly, which is same as SBK function,after press [start],the controller continue working

After finish a work piece ,the controller stop automaticly

Program ends

After executing M30, the controller stop automaticly, and returns to program start.point

Feeding pause

During automatic operation, press the [Pause] key on the operation panel, the automatic operation pauses and the indicator is on; press [Start] again to continue working and the pause indicator is off

Reset

During automatic operation, press the [Reset] key on the operation panel and the system stops immediately. Here, [Reset] is same as emergency stop button.

6.Safe operation

6.1 Emergency stop

Press the emergency stop button on the machine which will stop immediately, and all outputs such as spindle and coolant are turned off., but all outputs must be rebooted after emergency stop button release

Caution:

The power supply maybe not cut off when the emergency stop button be pressed. Please refer to the electrical configuration description of the machine manufacturer for details;

Before releasing emergency stop, please eliminate the problems of the machine

6.2 Hard limit over travel

The controller will show alarm when machine touch limit switch. The axis in corresponding direction can't move, and only moves in reverse direction. Before the alarm is resetd, the system can't enter automatic operation. After investigating the alarm reason, press [Reset] to clear the alarm

6.3 Soft limit over travel

If themachine enters the limt area which set by axis parameters , the controller show alarm , and the machine decelerates and stops. At this moment, you can move the machine to safe direction with Jog mode, and then press [Reset] to release the alarm.

Caution:

During automatic operation, when the machine touches an axis's limit switch, the machine decelerates and stops all axis motion, and only displays one alarm

During Jog operation, when the machine touches an axis limit switch, the machine only decelerates and stops motion on current axis, but you can move other axis

When the machine is in safe position, press [Reset] to clear the alarm. Please refer to the manual of the machine for details.

Both hard limit alarm and soft limit alarm have a deceleration stop, and therefore it should have enough sufficient space fore detecting limit switch, or else the limit protection will be disabled due to over travel

7. Alarm and self- diagnosis function

The system has several levels, and the alarm numbers also have different type, as follow:

0~1023: G code program running alarm info

1024~2048: System environment alarm info

7.1 NC program execution alarm

0000	:	Reset
0001	:	Prog No End
0004	:	M6Tx Abort
0005	:	Tool Invalid
0006	:	G Program Repeat Error
0007	:	G Program Number Error
0008	:	G7X8X Instruction Run Error
0009	:	Program Abend
0010	:	Appointed M01 Instruction Stop
0011	:	M98 Format Error
0012	:	Motion Run Error
0013	:	Current Program No Repair
0014	:	G Program Format Error
0015	:	M99 Instruction Abort
0016	:	Motion Abort
0017	:	Illegal char
0018	:	Noneffective Exegesis Character
0019	:	Illegal G Code
0020	:	GCode RadialOffset Num Err
0021	:	Noneffective GCode RadialOffset
0022	:	Arc Appointed Error
0023	:	Appointed Noneffective Plane
0024	:	M98 Instruction Abort
0025	:	Spindle Appointed Number Error
0026	:	MCode Instruction Abort
0027	:	Spi Appointed Err
0028	:	Motion Repeat Request
0029	:	Appointed Arc Nonentity

0030	:	Missing X Code Error
0031	:	Missing X Code Error
0032	:	Missing X Code Error
0033	:	Missing X Code Error
0034	:	Missing X Code Error
0035	:	Missing X Code Error
0036	:	Missing X Code Error
0037	:	Missing X Code Error
0038	:	Missing X Code Error
0039	:	Missing X Code Error
0040	:	Missing X Code Error
0041	:	Missing X Code Error
0042	:	Missing X Code Error
0043	:	Missing X Code Error
0044	:	Missing X Code Error
0045	:	Missing X Code Error
0046	:	Missing X Code Error
0047	:	Missing X Code Error
0048	:	Screw Value Repeat Error
0049	:	System Abort
0050	:	Factitious return
0051	:	no parameter input
0052	:	no store address for Gcode pro num form

7.2 System environment alarm

1024	:	no \"return zero\

1. The system doesn’t perform home action after started

1025	:	4 - direction program limit
1026	:	4 + direction program limit
1027	:	Z - direction program limit
1028	:	Z + direction program limit
1029	:	Y - direction program limit
1030	:	Y + direction program limit
1031	:	X - direction program limit

1032	:	X+ direction program limit
1033	:	4 - direction machine limit
1034	:	4 + direction machine limit
1035	:	Z - direction machine limit
1036	:	Z + direction machine limit
1037	:	Y - direction machine limit
1038	:	Y + direction machine limit
1039	:	X - direction machine limit
1040	:	X+ direction machine limit

When controller shows limit alarm. Please check corresponding limit sensor point or parameters.

If hard limit occurs, and the appearance of the sensor point doesn't has any problem, enter the diagnosis mode and check the state of the input port. If the state is valid, please eliminate in sequence. Disconnect the input IO cable and check whether the sense disappears. If yes, please check the circuit. If the problem still exists, the internal optocoupler is broken. Please contact the supplier.

1041	:	Emergency stop

Check Emergency stop button of the handheld box is pushed down or not

External emergency stop 2 input is push down?;check whether IO assignment has conflict or interference.

Search for corresponding function ports in IO configuration, and then check in input diagnosis.

1042	:	X Sevor driver alarm
1043	:	Y Sevor driver alarm
1044	:	Z Sevor driver alarm
1045	:	4 Sevor driver alarm

Servo alarm; if there is no alarm on servo , parameter P2(axis parameter).001~004 setting and actual servo alarm level may be reverse. Please modify the parameters.

The corresponding function ports are IN34~37, which can be checked in input diagnosis.

1046	:	Axis's physical line redefine

axis No. setting by parameter P2.45~P2.49 is specified repeatedly

1047	:	spi no to home
1048	:	workpiece no lock
1049	:	safe signal can't detect
1051	:	air no enough

1052	:	chuck signal alarm detect

7.3 Alarm processing

- If alarm occurs, please refer to the alarm code to confirm the failure reason.
- When alarm occurs, if the system isn't reset, the alarm will constantly prompt no matter whether the alarm still exists, so as to avoid the conditions that alarm causes system suspended, but can't find the reason.
- If the error is caused by data setting, modify the data, and then press [Reset] to clear the alarm info.
- When alarm occurs, please check and remove the alarm if there are several alarms that occur at the same time. Please refer to the alarm info in the Diagnosis menu for details. When the alarms are eliminated, please press [Reset] to clear the alarm.

7.4 Self-diagnosis function

The CNC system may stop even when there is no alarm, this maybe he system is executing certain processes. Then you can check with the self-diagnosis function.

The step of self-diagnosis as follows:

⑴ In the main menu, press [Dgnos] to enter the diagnosis interface;

⑵ Select [Input], or select [Output]

⑶ Output diagnosis: In edit mode, press the "←","→","↑","↓"keys to select the output port, and press [EOB] to switch the output level of corresponding output port;

⑷ Input diagnosis: When certain input signal is vactive, the corresponding area flashes on the screen.

8.Program saving & editing

8.1 Saving the program to the memory

8.1.1 Keypad input (new program)

Create new program in the memory with the keypad, and the step as follows:

- In the main menu, press [Edit] to enter program edit interface;
- Press [File]
- Select [New] to create a new file;
- Enter the file name and press [EOB] to confirm and create a new program in current directory in the memory, and load into the controller by default ;
- Select [Close] to exit [Edit] interface;
- In edit mode, enter the program content;
- After editing all programs, press [Reset] to save the edited programs into the system memory.

8.1.2 PC serial port input

The step of loading files to controller through PC follows:

- Set system baud rate and ID No.;
- Connect to PC and run Adtech serial communication software;
- Set the baud rate same as controller, and scan ID device;
- Select the [Upload file to NC] button in the communication software;
- Select CNC file in the popup dialog box and press [Open] button.

8.1.3 Copy program from USB disk

The step of copying CNC file to system memory through USB disk as follows:

- Press [File],find [data traveler]
- Select [data traveler] and press [EOB] to enter;
- Move the cursor to select a CNC file and then select [Copy];
- Press [File] again,select [local disk(d)],and press [EOB]
- Select [PROG] folder,press[EOB] to enter ,then press [paste]to complete copying.

8.2 Reading programs into work area

8.2.1 Reading programs from controller into work area

The step of loading files from controller memory into work area as follows:

- Press [File]
- Select [local disk(d)], and press [EOB]
- Select [PROG] folder, press [EOB] to enter
- Move cursor to select desired program, press [EOB] to confirm and load the program.

8.2.2 Reading programs from USB disk into work area

The step of loading files from USB disk into work area follows:

- Insert the USB disk;
- Press [File] to enter file operation interface;
- Select USB disk, move cursor to select a file in the disk, and press [EOB] to load the file.

8.3 Editing & modifying programs

The program in CNC memory can be edited with controller keypad. In the main menu, press [program] to enter program edit interface and edit the program in current work area (for loading program into work area, refer to 8.2).The program mode similar to notepad in Windows. Move the cursor directly to locate, press keys to enter, press [EOB] to change line, and press [Delete] to delete the character where the cursor locates.

Caution

After all operations, press Reset to save the files, and this functions base on program mode;

CNC49XX uses new file mapping technology, and allows loading processing files that exceed its memory. Therefore, to ensure the system efficiency, you can only search and process, but can't edit the program that exceed 2MB.

8.4 Deleting files

8.4.1 Deleting files in memory

Follow the below steps to delete the programs in controller memory:

- Press [File]
- select the file and press [Delete] ,when show a dialog ,press [EOB] to confirm and delete the file.

Caution

- If the program has been loaded into work area, you need to reboot the controller after deleting the program, or else the comtroller will report error.

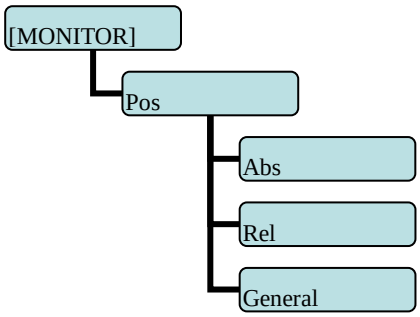
- `The programs loaded into the work area can’t be deleted, or else the comtroller will report error.

9 Main interfaces of the controller

9.1 Position interface

The position interface shows current machine tool coordinates, including absolute position, relative position and General position. In the main interface, press [Monitor] to enter the position interface.

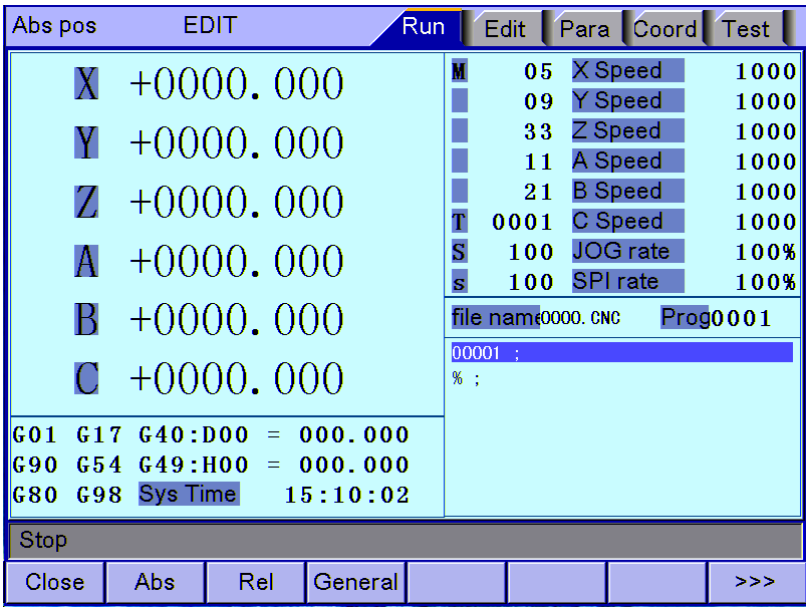
To enter position interface:



Absolute position

The position of current machine coordinates relative to the origin of workpiece coordinate system

The absolute position interface as follows:



Absolute Position Interface

Relative position

In Jog mode, reset current coordinates to check the relative motion distance of any displacement, and thus it is called as relative position.

This interface is usually used for early tool setting. Considering that some operators have been used to manual calculation, this function is preserved. With the more and more powerful of automatic centered function, it is used less.

The operation as follows:

Enter [Pos] interface;

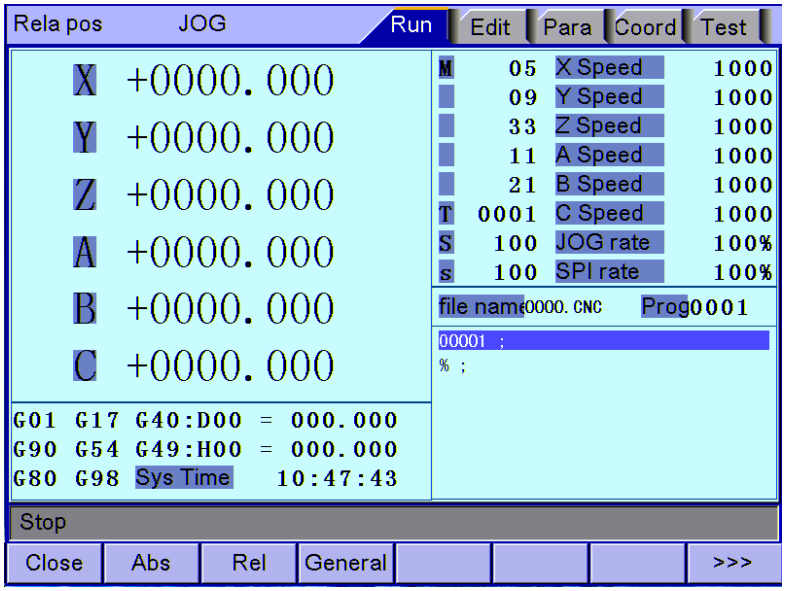
Switch to [Rele] interface;

Then, enter Jog mode;

Press a coordinate axis No., e.g., 'X', and the X coordinate flashes;

Press "Cancel" to reset X coordinate to 0;

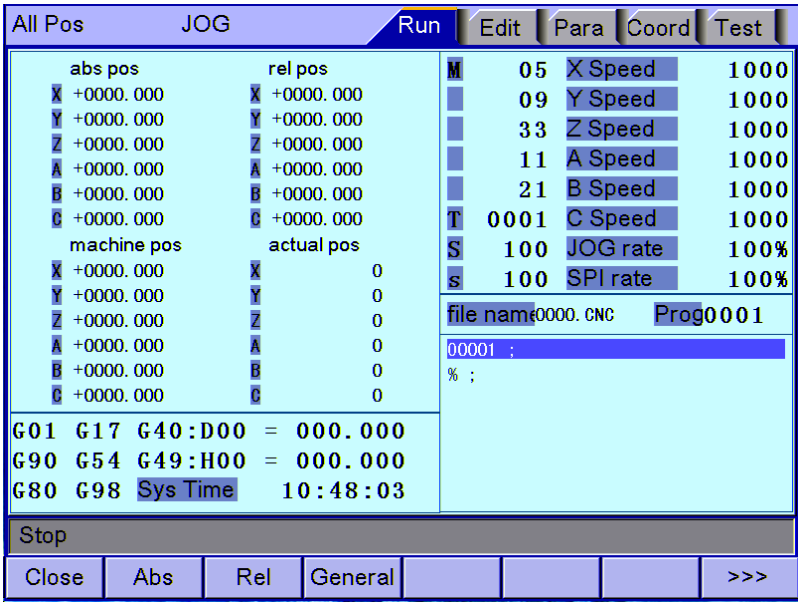
The relative position interface as follows:



Relative Position Interface

General (All) coordinates

The interface displayed by absolute coordinates and machine coordinate
General position interface is shown as below:

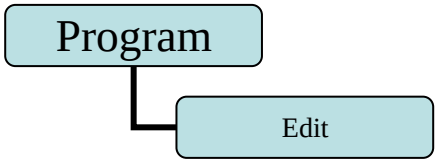


General (All) Position Interface

9.2 Edit interface

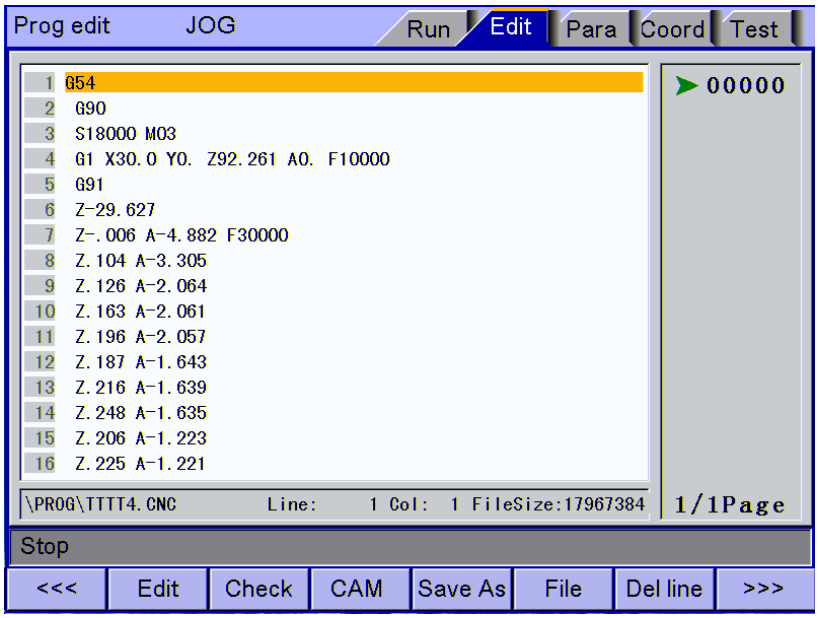
The program interface shows the program info in current work area. In the main interface, press [program] to enter the program interface.

To enter program edit interface:



Program edit

The program edit interface shows the NC program currently processed; in this mode, you can edit the NC program (see 8.3 for details).

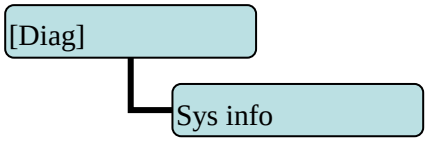


Program Edit Interface

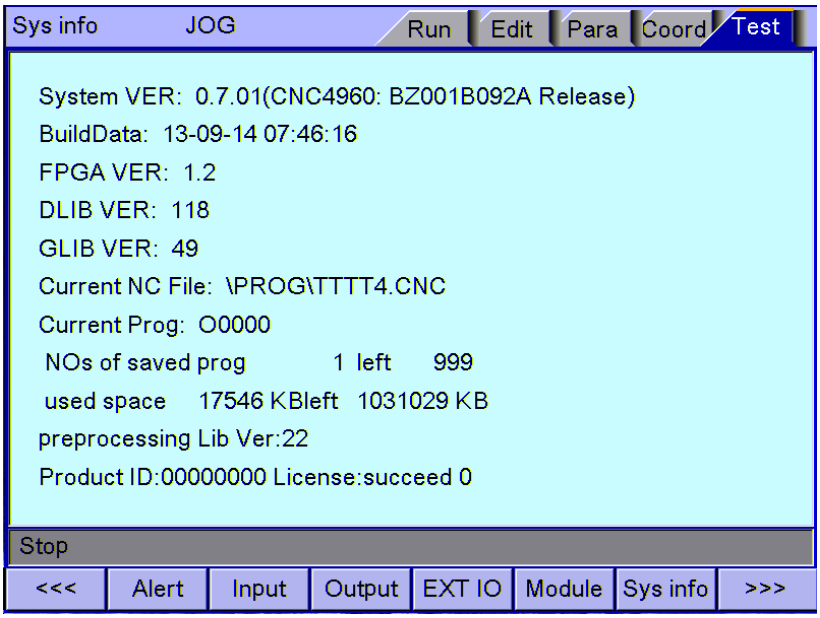
System info interface

The system info is a summary of the program blocks in current processing area, and calculates the resource usage in current work area. The upper right of the program directory interface shows the version info of current controller software.

To enter system info interface:



System info interface is shown below:

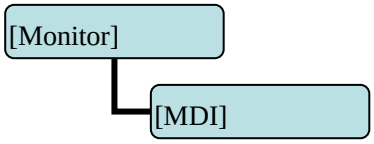


System Info Interface

9.3 MDI interface

MDI mode is mainly used for the execution of single G code in certain occasions.

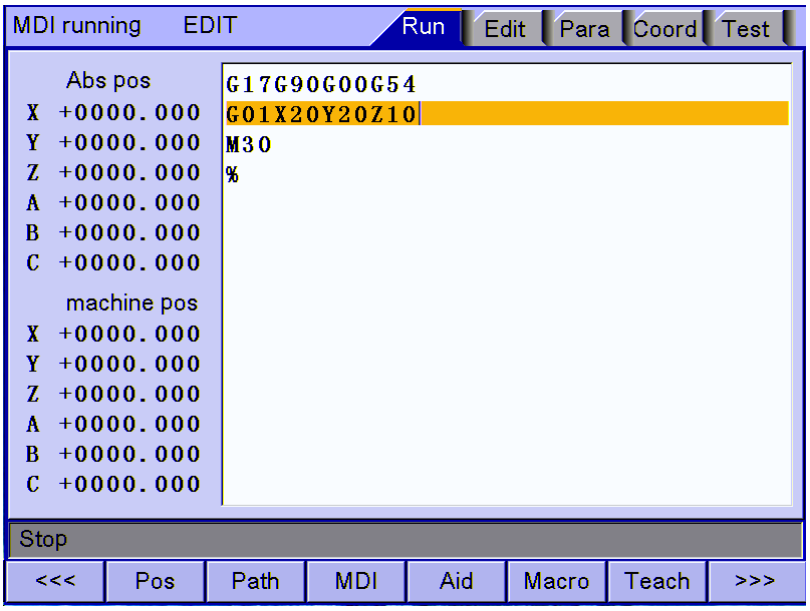
To enter MDI interface:



In MDI interface, enter complete NC code instruction in edit mode, press the [Start] key in the edit mode and confirm to execute directly.

To restore the default settings quickly, press and hold the [Reset] key for three seconds and choose to reset or not.

MDI interaction interface is shown below:

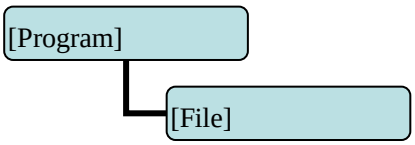


MDI Interface

9.4 File management

In the file management interface, you can manage the controller files.

To enter file management interface:

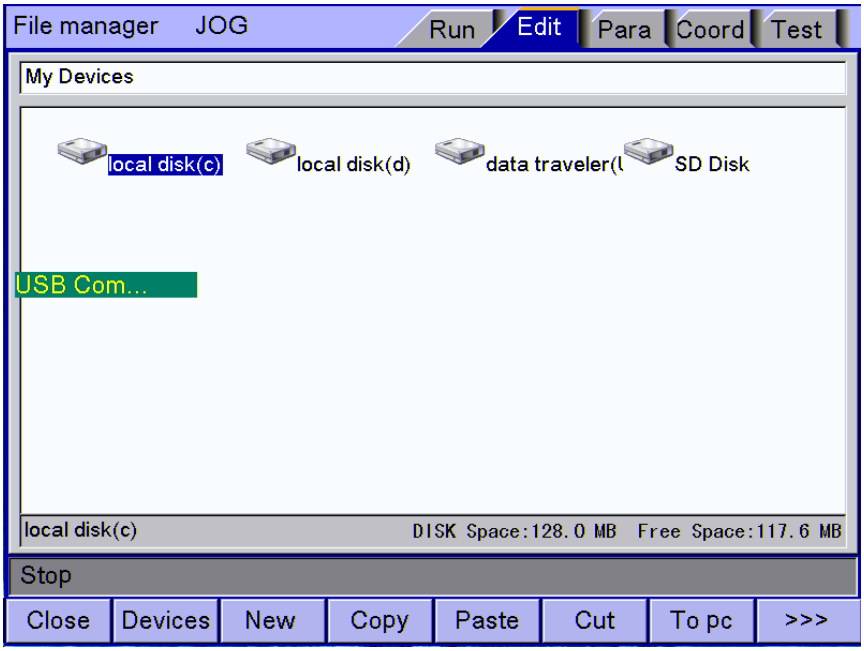


File management mainly has the following functions:

- Connect the USB device(Via USB port or flash drive),
- Upgrade controllerystem software: Copy the upgrade file to memory in either method above to upgrade the software;

  Reboot the controller. In [File] interface, press [Reset] button,the controller will show a dialog,then presss[EOB] to reboot the controller. This method is different from power off for reboot. In certain occasions, you can reboot the controller quickly in this method to make certain function take effect.
- Connect to PC with the USB cable, and exchange the file between controller memory and PC.

File operation interface is shown below:

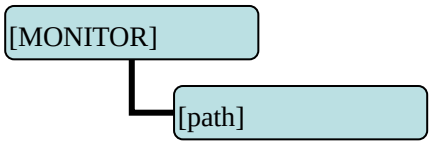


File Operation Interface

9.5 Graph simulation

[Track] function is to simulate NC processing program.

To enter graphic simulation interface:



Enter path interface to enable real-time track display automatically. During automatic running of the system, the motion track is displayed in real-time. In other (Jog/edit mode, you can also press Preview to preview the processing file.

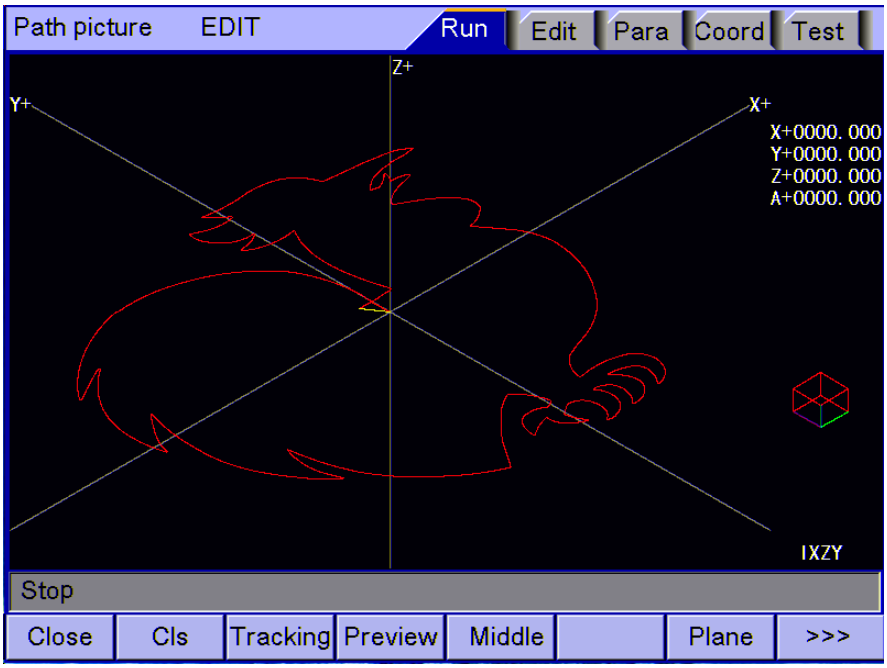
The shortcuts of adjusting position:

PageUp: Zoom in

PageDown: Zoom out

→←↑↓: Shift position; the shift unit is the set pixel unit

Graphic simulation interface is shown below:

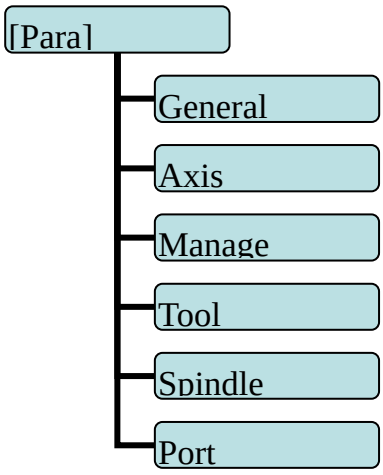


Graphic Simulation Interface

9.6 Parameter interface

The parameter interface shows comtroller parameter info, including General, axis parameter, management, tool magazine, spindle, port, etc. In the main interface, press [para] to enter the interface.

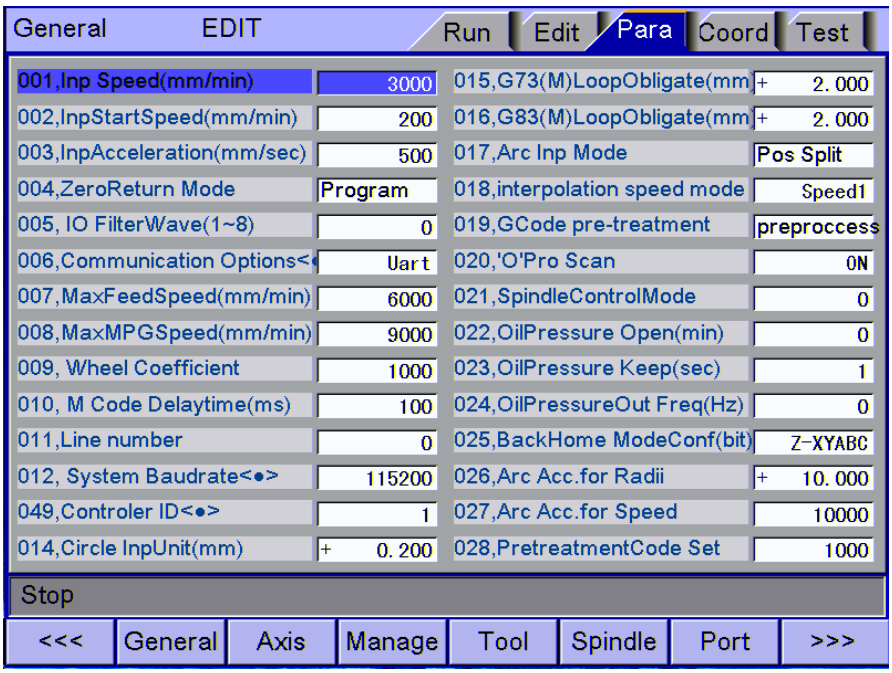
Parameter has the following menus:



General parameters

General parameters are a set of functions that aren't classified in details, e.g. home mode, Jog speed, etc.

General parameter interface is shown as below:

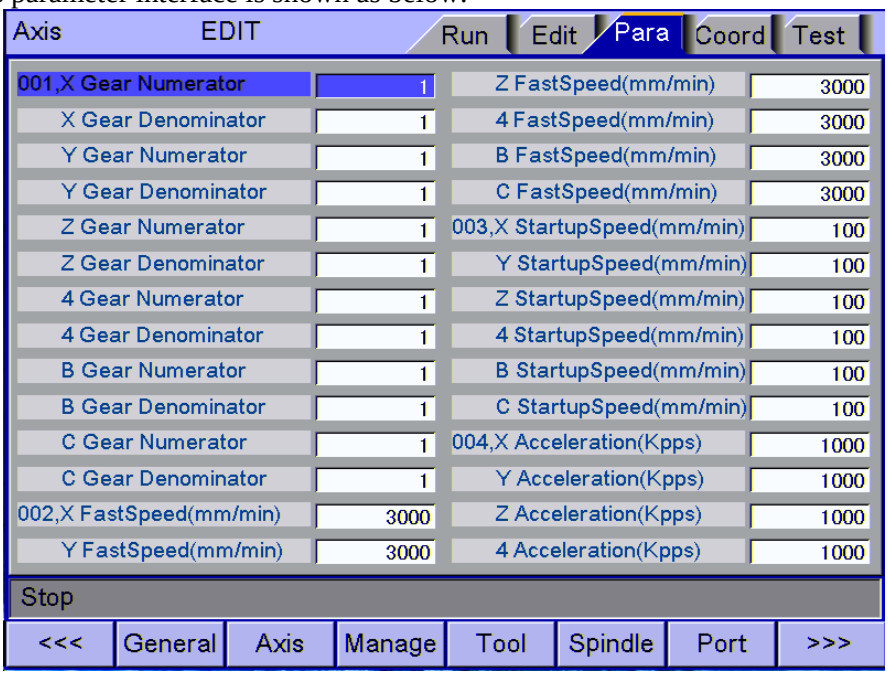


General Parameter Interface

Axis parameters

Axis parameters are parameter set of interface characteristics of control position axis. Please refer to the parameter description for details.

Axis parameter interface is shown as below:

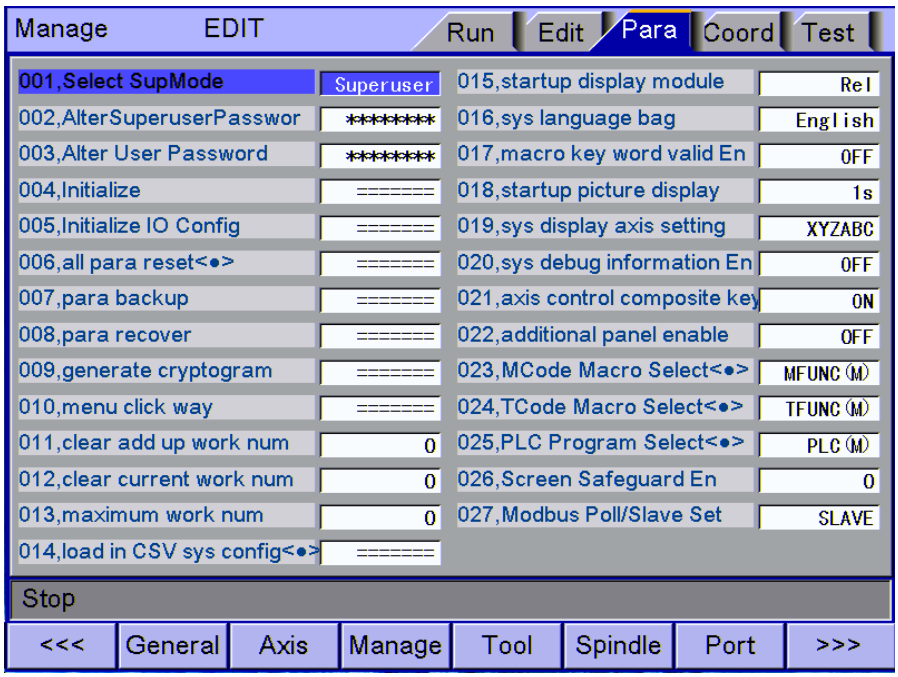


Axis Parameter Interface

Management parameters

This is a function that confirms identity and initialize the controller

Management parameter interface is shown as below:



Management Parameter Interface

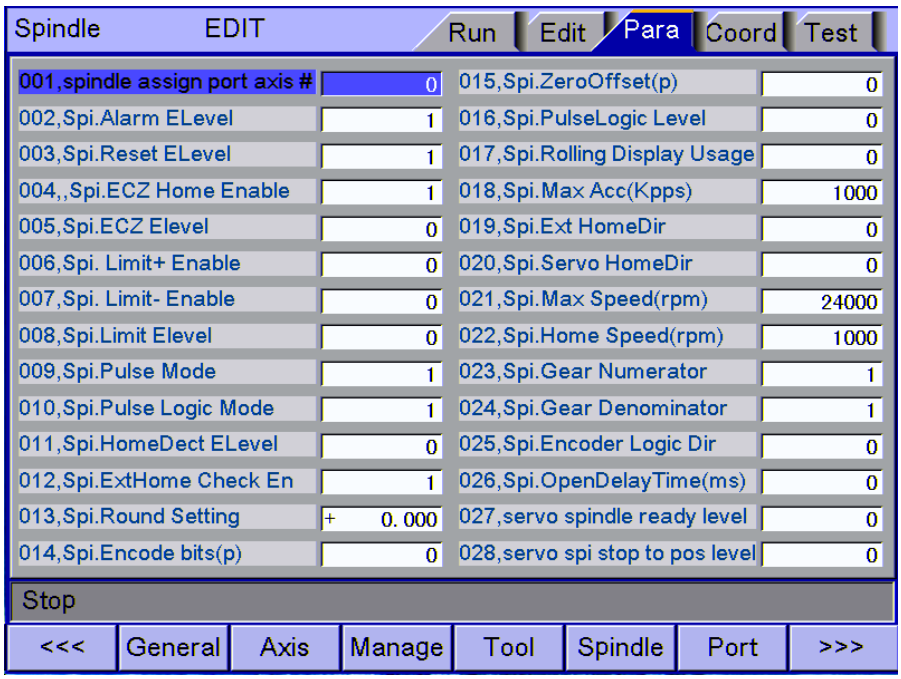
Tool magazine parameters

Tool magazine parameters collect the parameters that the tool magazine requires. The specific meaning of the parameters should be determined by the tool magazine of the machine, and therefore should refer to the instructions provided by the machine manufacturer.there are several kinds of tool magazine (linear ,umbrella tool magazine),the parameter and macro program made acoording to the tool magazine type .the default parameter and build-in program is for linear tool magazine .

Spindle parameters

Spindle parameters include the spindle motor (Induction Motor)electrical characteristics of and spindle servo motor(servo spindle is speciall for ATC,it is different of normal servo motor) characteristics . The specific application also depends on the spindle selection of the machine manufacturer. The servo parameters is similar as axis parameters, lease refer to the description of axis parameters.

spindle parameter interface is shown as below:

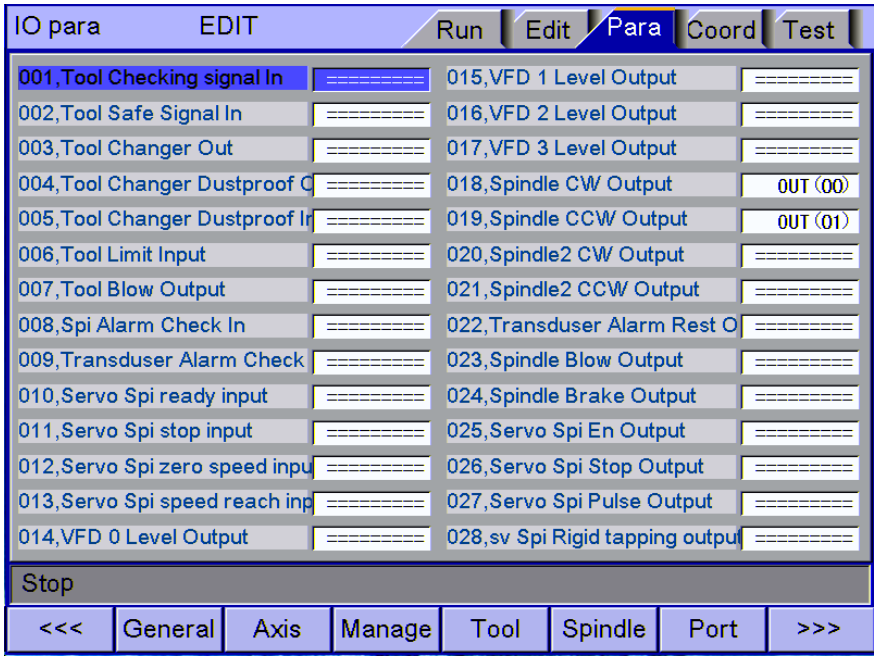


Spindle Parameters Interface

IO configuration(port) parameters

IO configuration parameters are the assignment of hardware interfaces. This parameter setting is the IO pin sequence specified by the controller's IO function numbers, which will improve the controller flexibility.

IO configuration parameter interface is shown as below:

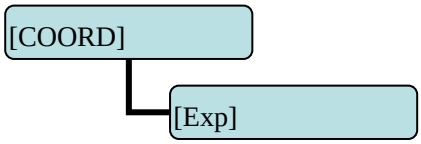


IO Configuration Parameters Interface

9.7 Compensation interface

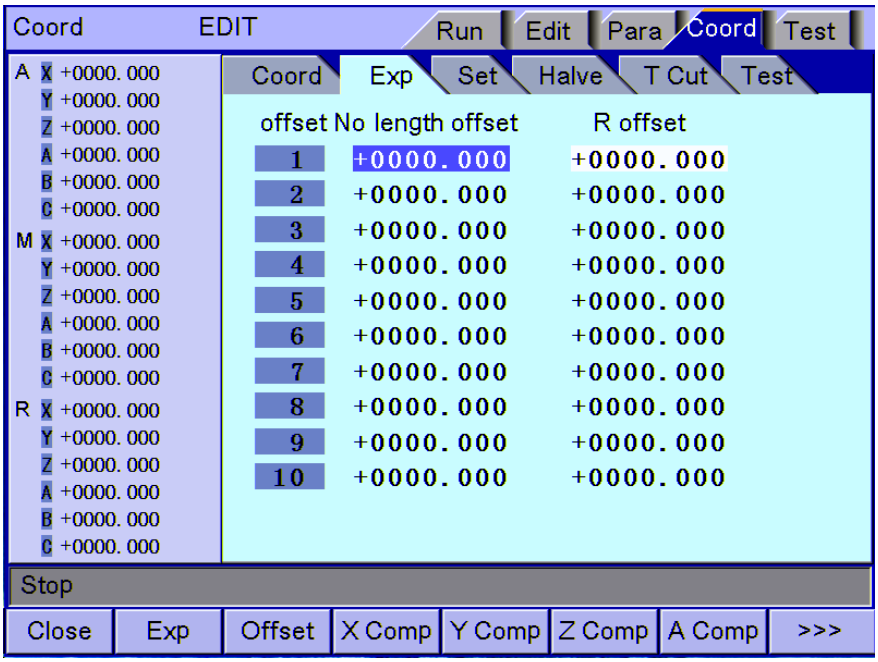
Tool compensation interface shows tool compensation info of the controller, including tool length compensation, tool radius compensation and other input variables.

To enter tool compensation interface:



There are two compensation variables, i.e. length offset and R offset; corresponding to G43, G44 and G41, G42; input compensation value to corresponding compensation number, and call the compensation number in NC program to realize the compensation. Tool compensation numbers have 36 variables.

Tool compensation interface is shown below:



Tool Compensation Parameter Setting Interface

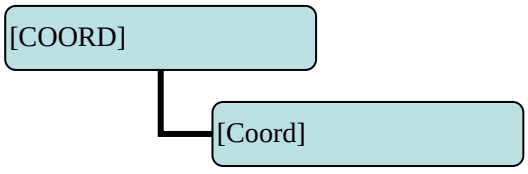
9.8 workpiece coordinate system setting interface

The coordinates interface shows coordinate system info, including, coordinate system setting(G54—G59), centered, and tool setting gauge. In the main interface, press [Coord] to enter coordinate system.

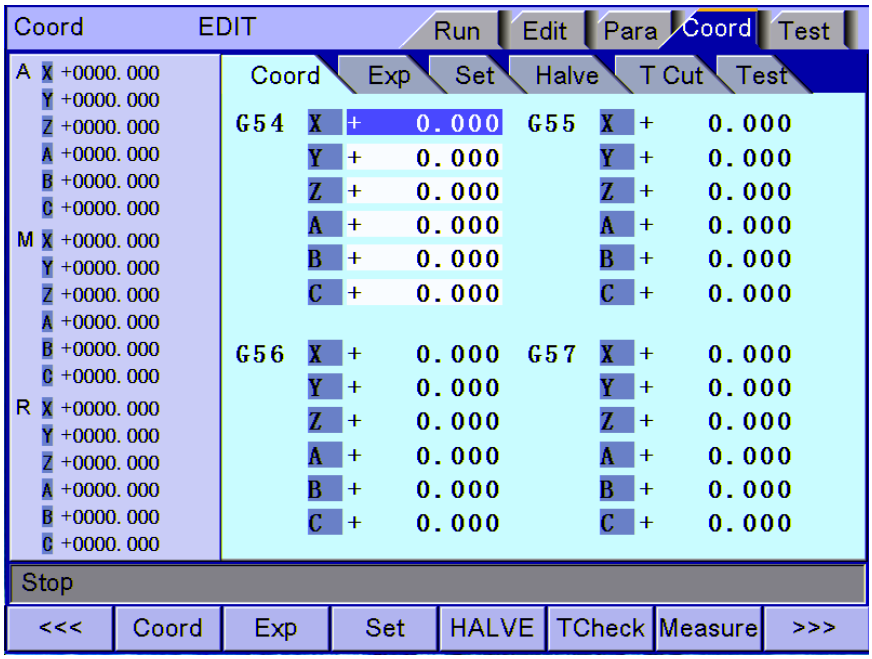
Workpiece coordinate system

Display workpiece coordinate system, i.e. the offset of workpiece home position and machine home position, Totally six basic workpiece coordinate systems (G54~G59) and nine extension coordinate systems (G591~G599) are available.

To enter workpiece coordinate system interface:



The workpiece coordinate system interface is shown as below:

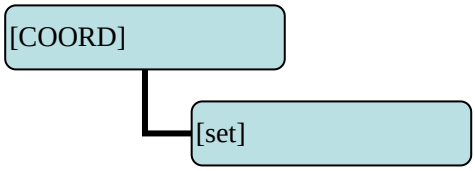


Workpiece Coordinate System Setting Interface

Coordinate system auxiliary parameter setting interface

The auxiliary parameters for workpiece coordinate system, including offset and tool setting parameters of tool setting gauge

To enter coordinate system auxiliary parameter setting interface:



The detailed auxiliary parameters are described in the table below:

1	X coord offset
2	Y coord offset
3	Z coord offset
4	A coord offset
5	X knife tool coord
6	Y knife tool coord
7	Z knife tool coord
8	A knife tool coord
9	Auto tool choice
10	Tool checking elevel
11	Tool checking run after T code

12	Tool checking limit x
13	To Tool checking limit y
14	Tool checkinglimit z
15	Tool checking limit A
16	Tool checking Dir x
17	Tool checking Dir y
18	Tool checking Dir z
19	Tool checking Dir A
….	…….
33	Tool set mode(0—Nos.1 Tis base ,1—not base)

(1) home offset

- The home offset is added to current machine coordinates when setting the coordinate system; this parameter setting is available in next tool setting;
- The application of this parameter is for the processing of certain parts that require several working procedures. The first processing procedure may damage the tool setting position of the workpiece, and the next procedure can't locate the proper tool setting position. Therefore, a reference tool setting point is required, and the offset from reference point to actual tool setting position can be set to this parameter. No matter tool setting in which procedure, you only need to set to this reference point and it is same like setting to home position of the workpiece.

(2) tool setting gauge, effective signal, automatic tool setting, machine tool Z negative limit of tool setting gauge:

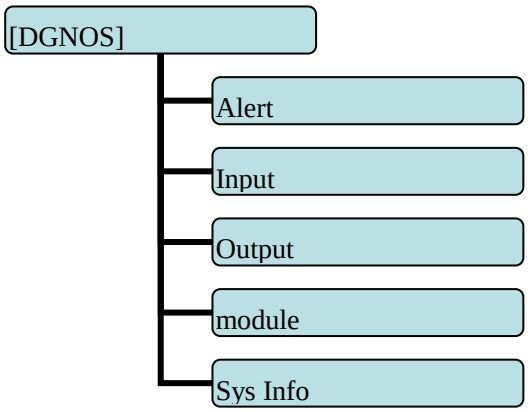
- The X, Y coordinates are the mechanical coordinates of the t tool setting gauge on machine; tool setting gauge can position automatically only when the coordinate is set properly.
- Effective voltage level of tool setting gauge is for setting the signal interface level of tool setting gauge, which should be set according to the actual interface of the tool setting gauge
- Automatic tool setting after tool changing is that the tool setting gauge function executes automatically after tool change instruction

- Z negative limit is used to prevent crash caused by not in right place of Z axis. Once negative limit alarm occurs, the tool setting gauge stops working immediately. If the system is in working state, the system will send alarm; during separate setting of the tool setting gauge, the alarm won't occur.

9.9 Controller diagnosis interface (DGNOS)

The diagnosis interface is used to display the hardware interfaces and system info, including alarm, input, output, DA diagnosis; press [DGNOS] to enter the diagnosis interface.

The diagnosis interface as follows:



Alert interface

Display the alarm of the system after power on, including 15 alarm records.

IO diagnosis interface

IO diagnosis allows entering at any moment. You can check current IO state of the controller. In Jogmode, press the direction keys to select corresponding IO, and press EOB to control the output manually.

DA diagnosis interface(module)

Correct the output voltage of two lines DA voltage module for testing; press the "→", "←", "↑","↓"to output corresponding voltage directly, input the actually measured voltage to corresponding position; when call instructions of spindle, the system will correct according to correction value.

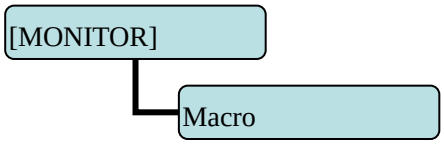
System info

The system info shows basic information of current system, and is used to mark current software version, hardware version, upgrade info, etc. In this interface, you can follow the prompt to perform operations.

9.10 Macro variable view interface (macro variable)

This is the variable register view menu of macro function. In this menu, you can turn pages to view the macro variables, or enter values to variable register directly in edit mode.

To enter macro variable view interface:



The macro variable menu has eight levels, as below:

Local variable

#100~#199

#500~#599

#600~#699

#700~#799

#800~#899

#900~#999

user variables

- In the variable interfaces of different levels, you can check the corresponding variable number. Local variable has five levels totally, and shows the variables of current working layer by default. To view a specific layer, please enter local variable submenu, and then select according to layers.
- user variables are to customize the names of 20 variables (#100~#999) according to CSV configuration table, so that the variable names have visual meanings. In programs, the user customized variables are called with variable number.

9.11 Current modal instruction info

Display the G code modal info of current system;

In [Monitor] interface, you can check the running code info of current system:

Motion instruction: G00, G01

Select plane: G17, G18, G19

Coordinate logic: G90, G91

Workpiece coordinate system: G54, G59, G591…G599

Radius compensation: G40, G41, G42

Length compensation: G43, G44, G49

Compound instruction retracting plane: G98, G99

spindles rotation: S

Tool No.: T

10.System maintenance

10.1 Retoot

1) In the main menu, press [PROG]
2) Press [File]
3) Press [Reset] and the system asks whether reboot or not;
4) Press [EOB] to reboot the system.

10.2 System upgrade

The step of copying upgrade program with USB disk(flash drive) as follows:

1) In the main menu, press [PROG]
2) Press [File] to enter the file management interface;
3) Insert the USB disk, select the [data traveler] symbol in the root directory; after reading successfully, the system enters the USB directory automatically;
4) Move cursor to the upgrade file ADTROM.BIN, select [Copy], press [file] again,find [local d] ,press [EOB],enter ADT folder and paste;
5) Select the second upgrade file NC_RES.NC; skip this step if the file doesn't exist. Also select Copy, press [file] again, find [local d] ,press [EOB],enter ADT folder and paste
6) After that, reboot controller ,and press CAN button(hold 3s),then release ,input password 26722719
7) select 1—BIOS set,in the mext interface ,press 1---prog sec , it will show "are you sure ?[y/n]',then press Y,it will show program success,reboot
8) Enter System Info in Diagnosis menu to view the system version and compilation date, and check whether the upgrade is successful.

10.3 Reset parameters to default value

1) Select the edit mode;
2) In the main menu, press [Para],Press [Manage]
3) Move cursor to "006 all prameter reset";]
4) Press [EOB], the system confirms, reset the default parameters and reboots automatically.

10.4 Parameter backup and recover

Select the edit mode;

1) In the main menu, press [Para]

2) Press [Manage]

3) Move cursor to 007 ,it's for para back up ,after press[EOB],then it will show a dialog ,then press [EOB] to comfirm

4) Move cursor to 008, it's for para recover ,after press[EOB],then it will show a dialog ,then press [EOB] to comfirm

5) The backup operation will generate the SYSCONF.BAK file in the root directory of [local disk d]. Please save this file for backup in the future.

6) For recover operation, also save the SYSCONF.BAK file in the root directory of [local disk d]. The controller will recognize this file automatically in the process of recovering

10.5 Entering BIOS

1) If the system has irreversible error and can't be started, please enter BIOS to upgrade and maintain the program;

2) To enter BIOS, press the [Can] key when controller power on,hold [Can] key 3s ,then release, input password 26722719,then it show BIOS interface

3) Enter BIOS to perform operations such as format disk C, D, and copy files from USB disk to upgrade(pls read details at the end of manual)

11.System parameters

`According to occasions and functions, the parameters contain General parameters, IO configuration parameters, management parameters and spindle parameters.

General parameters are General, and contain basic operation and usage settings of the controller, including spindle, MPG, home, tool magazine, etc.;

IO configuration parameters are mainly used for machine installation and test, adapting to the interface characteristics of machine and motor drive;

spindle parameters are the setting;of spindle motor

⑴ It is required to confirm user identity before modifing the parameter. The controller has two levels of user authority, which are super user and operator; super user can modify all parameters and user passwords; while operator only can operate the parameters that require modification, and modify the operator password; in P3.1 of management parameters, the controller enters the corresponding mode automatically according to the entered password.

⑵ According to the application, the parameters will take effect immediately or after reboot; the parameters that require reboot are marked with <●>.

⑶ Certain parameters are set in binary system (parameter descriptor has bit symbol); the conversion between binary system and decimal system follows:

Bit0: Set to 1 to correspond to decimal 1;

Bit1: Set to 1 to correspond to decimal 2;

Bit2: Set to 1 to correspond to decimal 4;

Bit3: Set to 1 to correspond to decimal 8;

Bit4: Set to 1 to correspond to decimal 16;

Bit5: Set to 1 to correspond to decimal 32;

Bit6: Set to 1 to correspond to decimal 64;

Bit7: Set to 1 to correspond to decimal 128;

For more bits, multiply the decimal system corresponding to binary system of previous position by 2. If only the corresponding bit is 1, accumulate the numbers of corresponding decimal system according to the comparison table to get the setting value.

For example: set Bit0, Bit1 and Bit5 to 1, and the parameter will be 1+2+32=35.

11.1 Parameter index list

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	001	Inp Speed(mm/min)	Instant		
General parameter (P1.)	002	InpStartSpeed(mm/min)	Instant		
General parameter (P1.)	003	InpAcceleration(mm/sec)	Instant		
General parameter (P1.)	004	ZeroReturn Mode	Instant		
General parameter (P1.)	005	IO FilterWave(1~8)	Instant		
General parameter (P1.)	006	Communication options	Instant		
General parameter (P1.)	007	MaxFeedSpeed(mm/min)	Instant		
General parameter (P1.)	008	MaxMPGSpeed(mm/min)	Instant		
General parameter (P1.)	009	Wheel Coefficient	Instant		
General parameter (P1.)	010	M Code Delaytime(ms)	Instant		
General parameter (P1.)	011	Line number	Instant		
General parameter (P1.)	012	System Baudrate	Instant		
General parameter (P1.)	013	Controler ID	Instant		
General parameter (P1.)	014	Circle InpUnit(mm)	Instant		
General parameter (P1.)	015	G73(M)LoopObligate(mm)	Instant		
General parameter (P1.)	016	G83(M)LoopObligate(mm)	Instant		
General parameter (P1.)	017	Arc Inp Mode	Instant		
General parameter (P1.)	018	interpolation speed mode	Instant		
General parameter (P1.)	019	GCode pre-treatment	Instant		
General parameter (P1.)	020	'O'Pro Scan	Instant		
General parameter (P1.)	021	SpindleControlMode	Instant		
General parameter (P1.)	022	OilPressure Open(min)	Instant		
General parameter (P1.)	023	OilPressure Keep(sec)	Instant		
General parameter (P1.)	024	OilPressureOut Freq(Hz)	Instant		
General parameter (P1.)	025	BackHome ModeConf(bit)	Instant		
General parameter (P1.)	026	Arc Acc.for Radii	Instant		
General parameter (P1.)	027	Arc Acc.for Speed	Instant		
General parameter (P1.)	028	PretreatmentCode Set	Instant		
General parameter (P1.)	029	Inp AccSpeed Mode	Instant		
General parameter (P1.)	030	'S'Speed Acceleration	Instant		
General parameter (P1.)	031	HOME Check for alarm	Instant		
General parameter (P1.)	032	HOME Check Enable	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	033	X diameter prog enable	Instant		
General parameter (P1.)	034	default process plane	Instant		
General parameter (P1.)	035	T code form	Instant		
General parameter (P1.)	036	IP address	Instant		
General parameter (P1.)	037	Subnet mask	Instant		
General parameter (P1.)	038	Default gateway	Instant		
General parameter (P1.)	039	Mac Addresss<●>	Instant		
General parameter (P1.)	040	Pretreatment segments	Instant		
General parameter (P1.)	041	feed speed setting En	Instant		
General parameter (P1.)	042	enable of G00 Inp mode	Instant		
General parameter (P1.)	043	Abnormal memory En	Instant		
General parameter (P1.)	044	Z rise to safe pos en	Instant		
General parameter (P1.)	045	Arise to safe pos en	Instant		
General parameter (P1.)	046	Pro RZ to reference pos	Instant		
General parameter (P1.)	047	Mac RZ to reference pos	Instant		
General parameter (P1.)	048	Home mode cls coord	Instant		
General parameter (P1.)	049	Z safe height	Instant		
General parameter (P1.)	050	A safe height	Instant		
General parameter (P1.)	051	Z axis feed speed limit	Instant		
General parameter (P1.)	052	A axis feed speed limit	Instant		
General parameter (P1.)	053	Screw Acc pitch p(mm)	Instant		
General parameter (P1.)	054	Screw slow pitch D(mm)	Instant		
General parameter (P1.)	055	Screw backvalue V(mm)	Instant		
General parameter (P1.)	056	M98 jumpp line En	Instant		
General parameter (P1.)	057	System boot zero way	Instant		
General parameter (P1.)	058	Spi brake deay(ms)	Instant		
General parameter (P1.)	059	Rotation axis opt feature	Instant		
General parameter (P1.)	060	4 axis max rotate speed	Instant		
General parameter (P1.)	061	Hand wheel encoder dir	Instant		
General parameter (P1.)	062	Hand wheel control mode	Instant		
General parameter (P1.)	063	Hand wheel max rate	Instant		
General parameter (P1.)	064	Hand wheel ACC(Kps)	Instant		
General parameter (P1.)	065	Machine end to refernce	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	001	X Gear Numerator	Instant		
Axis parameter (P2.)		X Gear Denominator	Instant		
Axis parameter (P2.)		Y Gear Numerator	Instant		
Axis parameter (P2.)		Y Gear Denominator	Instant		
Axis parameter (P2.)		Z Gear Numerator	Instant		
Axis parameter (P2.)		Z Gear Denominator	Instant		
Axis parameter (P2.)		4 Gear Numerator	Instant		
Axis parameter (P2.)		4 Gear Denominator	Instant		
Axis parameter (P2.)		B Gear Numerator	Instant		
Axis parameter (P2.)		B Gear Denominator	Instant		
Axis parameter (P2.)		CGear Numerator	Instant		
Axis parameter (P2.)		C Gear Denominator	Instant		
Axis parameter (P2.)	002	X FastSpeed(mm/min)	Instant		
Axis parameter (P2.)		Y FastSpeed(mm/min)	Instant		
Axis parameter (P2.)		Z FastSpeed(mm/min)	Instant		
Axis parameter (P2.)		4 FastSpeed(mm/min)	Instant		
Axis parameter (P2.)		B FastSpeed(mm/min)	Instant		
Axis parameter (P2.)		C FastSpeed(mm/min)	Instant		
Axis parameter (P2.)	003	XStartupSpeed(mm/min	Instant		
Axis parameter (P2.)		YstartupSpeed(mm/min)	Instant		
Axis parameter (P2.)		ZstartupSpeed(mm/min)	Instant		
Axis parameter (P2.)		4StartupSpeed(mm/min)	Instant		
Axis parameter (P2.)		BStartupSpeed(mm/min	Instant		
Axis parameter (P2.)		CStartupSpeed(mm/min)	Instant		
Axis parameter (P2.)	004	X Acceleration(Kpps)	Instant		
Axis parameter (P2.)		Y Acceleration(Kpps)	Instant		
Axis parameter (P2.)		Z Acceleration(Kpps)	Instant		
Axis parameter (P2.)		4 Acceleration(Kpps)	Instant		
Axis parameter (P2.)		B Acceleration(Kpps)	Instant		
Axis parameter (P2.)		C Acceleration(Kpps)	Instant		
Axis parameter (P2.)	005	X Soft PosLimit+(mm)	Instant		
Axis parameter (P2.)		X Soft PosLimit-(mm)	Instant		
Axis parameter (P2.)		Y Soft PosLimit+(mm)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)		Y Soft PosLimit-(mm)	Instant		
Axis parameter (P2.)		Z Soft PosLimit+(mm)	Instant		
Axis parameter (P2.)		Z Soft PosLimit-(mm)	Instant		
Axis parameter (P2.)		4 Soft PosLimit+(mm)	Instant		
Axis parameter (P2.)		4 Soft PosLimit-(mm)	Instant		
Axis parameter (P2.)		B Soft PosLimit+(mm)	Instant		
Axis parameter (P2.)		B Soft PosLimit-(mm)	Instant		
Axis parameter (P2.)		C Soft PosLimit+(mm)	Instant		
Axis parameter (P2.)		C Soft PosLimit-(mm)	Instant		
Axis parameter (P2.)	006	XBacklashExpiate(pulse)	Instant		
Axis parameter (P2.)		YBacklashExpiate(pulse)	Instant		
Axis parameter (P2.)		ZBacklashExpiate(pulse)	Instant		
Axis parameter (P2.)		4BacklashExpiate(pulse)	Instant		
Axis parameter (P2.)		BBacklashExpiate(pulse)	Instant		
Axis parameter (P2.)		CBacklashExpiate(pulse)	Instant		
Axis parameter (P2.)	007	X HOME Offset(mm)	Instant		
Axis parameter (P2.)		Y HOME Offset(mm)	Instant		
Axis parameter (P2.)		Z HOME Offset(mm)	Instant		
Axis parameter (P2.)		4 HOME Offset(mm)	Instant		
Axis parameter (P2.)		B HOME Offset(mm)	Instant		
Axis parameter (P2.)		C HOME Offset(mm)	Instant		
Axis parameter (P2.)	008	X HomeDir	Instant		
Axis parameter (P2.)		Y HomeDir	Instant		
Axis parameter (P2.)		Z HomeDir	Instant		
Axis parameter (P2.)		4 HomeDir	Instant		
Axis parameter (P2.)		B HomeDir	Instant		
Axis parameter (P2.)		C HomeDir	Instant		
Axis parameter (P2.)	009	X ZeroReturn Speed	Instant		
Axis parameter (P2.)		Y ZeroReturn Speed	Instant		
Axis parameter (P2.)		Z ZeroReturn Speed	Instant		
Axis parameter (P2.)		4 ZeroReturn Speed	Instant		
Axis parameter (P2.)		B ZeroReturn Speed	Instant		
Axis parameter (P2.)		C ZeroReturn Speed	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	010	X axis JOG speed(mm/min)	Instant		
Axis parameter (P2.)		Y axis JOG speed(mm/min)	Instant		
Axis parameter (P2.)		Z axis JOG speed(mm/min)	Instant		
Axis parameter (P2.)		A axis JOG speed(mm/min)	Instant		
Axis parameter (P2.)		B axis JOG speed(mm/min)	Instant		
Axis parameter (P2.)		C axis JOG speed(mm/min)	Instant		
Axis parameter (P2.)	011	X restrain acc (mm/s^2)	Instant		
Axis parameter (P2.)		Y restrain acc (mm/s^2)	Instant		
Axis parameter (P2.)		Z restrain acc (mm/s^2)	Instant		
Axis parameter (P2.)		4 restrain acc (mm/s^2)	Instant		
Axis parameter (P2.)		B restrain acc (mm/s^2)	Instant		
Axis parameter (P2.)		C restrain acc (mm/s^2)	Instant		
Axis parameter (P2.)	012	X max restrain rate	Instant		
Axis parameter (P2.)		Y max restrain rate	Instant		
Axis parameter (P2.)		Z max restrain rate	Instant		
Axis parameter (P2.)		4 max restrain rate	Instant		
Axis parameter (P2.)		B max restrain rate	Instant		
Axis parameter (P2.)		C max restrain rate	Instant		
Axis parameter (P2.)	013	X_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)		Y_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)		Z_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)		4_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)		B_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)		C_ServoAlarmIn ELevel	Instant		
Axis parameter (P2.)	014	X_ServoResetOut ELeve	Instant		
Axis parameter (P2.)		Y_ServoResetOut ELeve	Instant		
Axis parameter (P2.)		Z_ServoResetOut ELeve	Instant		
Axis parameter (P2.)		4_ServoResetOut ELeve	Instant		
Axis parameter (P2.)		B_ServoResetOut ELeve	Instant		
Axis parameter (P2.)		C_ServoResetOut ELeve	Instant		
Axis parameter (P2.)	015	X_ECZ Home Enable	Instant		
Axis parameter (P2.)		Y_ECZ Home Enable	Instant		
Axis parameter (P2.)		Z_ECZ Home Enable	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)		4_ECZ Home Enable	Instant		
Axis parameter (P2.)		B_ECZ Home Enable	Instant		
Axis parameter (P2.)		C_ECZ Home Enable	Instant		
Axis parameter (P2.)	016	X_ECZ Home ELevel	Instant		
Axis parameter (P2.)		Y_ECZ Home ELevel	Instant		
Axis parameter (P2.)		Z_ECZ Home ELevel	Instant		
Axis parameter (P2.)		4_ECZ Home ELevel	Instant		
Axis parameter (P2.)		B_ECZ Home ELevel	Instant		
Axis parameter (P2.)		C_ECZ Home ELevel	Instant		
Axis parameter (P2.)	017	X Limit ELeve	Instant		
Axis parameter (P2.)		Y Limit ELevel	Instant		
Axis parameter (P2.)		Z Limit ELevel	Instant		
Axis parameter (P2.)		4 Limit ELevel	Instant		
Axis parameter (P2.)		B Limit ELevel	Instant		
Axis parameter (P2.)		C Limit ELevel	Instant		
Axis parameter (P2.)	018	X Pulse Mode<●>	Instant		
Axis parameter (P2.)		Y Pulse Mode<●>	Instant		
Axis parameter (P2.)		Z Pulse Mode<●>	Instant		
Axis parameter (P2.)		4 Pulse Mode<●>	Instant		
Axis parameter (P2.)		B Pulse Mode<●>	Instant		
Axis parameter (P2.)		C Pulse Mode<●>	Instant		
Axis parameter (P2.)	019	X Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)		Y Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)		Z Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)		4 Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)		B Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)		C Pulse Dir Mode<●>	Instant		
Axis parameter (P2.)	020	X Ext Home ELevel	Instant		
Axis parameter (P2.)		Y Ext Home ELevel	Instant		
Axis parameter (P2.)		Z Ext Home ELevel	Instant		
Axis parameter (P2.)		4 Ext Home ELevel	Instant		
Axis parameter (P2.)		B Ext Home ELevel	Instant		
Axis parameter (P2.)		C Ext Home ELevel	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	021	X Round Setting<●>	Instant		
Axis parameter (P2.)		Y Round Setting<●>	Instant		
Axis parameter (P2.)		Z Round Setting<●>	Instant		
Axis parameter (P2.)		4 Round Setting<●>	Instant		
Axis parameter (P2.)		B Round Setting<●>	Instant		
Axis parameter (P2.)		C Round Setting<●>	Instant		
Axis parameter (P2.)	022	X physial Assign Num<●>	Instant		
Axis parameter (P2.)		Y physial Assign Num<●>	Instant		
Axis parameter (P2.)		Z physial Assign Num<●>	Instant		
Axis parameter (P2.)		4 physial Assign Num<●>	Instant		
Axis parameter (P2.)		B physial Assign Num<●>	Instant		
Axis parameter (P2.)		C physial Assign Num<●>	Instant		
Axis parameter (P2.)	023	X Encoder bit(p)	Instant		
Axis parameter (P2.)		Y Encoder bit(p)	Instant		
Axis parameter (P2.)		Z Encoder bit(p)	Instant		
Axis parameter (P2.)		4 Encoder bit(p)	Instant		
Axis parameter (P2.)		B Encoder bit(p)	Instant		
Axis parameter (P2.)		C Encoder bit(p)	Instant		
Axis parameter (P2.)	024	X Reset to 360	Instant		
Axis parameter (P2.)		Y Reset to 360	Instant		
Axis parameter (P2.)		Z Reset to 360	Instant		
Axis parameter (P2.)		4 Reset to 360	Instant		
Axis parameter (P2.)		B Reset to 360	Instant		
Axis parameter (P2.)		C Reset to 360	Instant		
Axis parameter (P2.)	025	X PulseLogic Level<●>	Instant		
Axis parameter (P2.)		Y PulseLogic Level<●>	Instant		
Axis parameter (P2.)		Z PulseLogic Level<●>	Instant		
Axis parameter (P2.)		4 PulseLogic Level<●>	Instant		
Axis parameter (P2.)		B PulseLogic Level<●>	Instant		
Axis parameter (P2.)		C PulseLogic Level<●>	Instant		
Axis parameter (P2.)	026	X feature(Rotate0 Line1)	Instant		
Axis parameter (P2.)		Y feature(Rotate0 Line1)	Instant		
Axis parameter (P2.)		Z feature(Rotate0 Line1)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)		4 feature(Rotate0 Line1)	Instant		
Axis parameter (P2.)		B feature(Rotate0 Line1)	Instant		
Axis parameter (P2.)		C feature(Rotate0 Line1)	Instant		
Axis parameter (P2.)	027	X Rolling Display Usage	Instant		
Axis parameter (P2.)		Y Rolling Display Usage	Instant		
Axis parameter (P2.)		Z Rolling Display Usage	Instant		
Axis parameter (P2.)		4 Rolling Display Usage	Instant		
Axis parameter (P2.)		B Rolling Display Usage	Instant		
Axis parameter (P2.)		C Rolling Display Usage	Instant		
Axis parameter (P2.)	028	X Rolling Path Optimize	Instant		
Axis parameter (P2.)		Y Rolling Path Optimize	Instant		
Axis parameter (P2.)		Z Rolling Path Optimize	Instant		
Axis parameter (P2.)		4 Rolling Path Optimize	Instant		
Axis parameter (P2.)		B Rolling Path Optimize	Instant		
Axis parameter (P2.)		C Rolling Path Optimize	Instant		
Axis parameter (P2.)	029	Max Acc of X(Kpps)	Instant		
Axis parameter (P2.)		Max Acc of Y(Kpps)	Instant		
Axis parameter (P2.)		Max Acc of Z(Kpps)	Instant		
Axis parameter (P2.)		Max Acc of 4(Kpps)	Instant		
Axis parameter (P2.)		Max Acc of B(Kpps)	Instant		
Axis parameter (P2.)		Max Acc of C(Kpps)	Instant		
Axis parameter (P2.)	030	X Servo Home Dir	Instant		
Axis parameter (P2.)		Y Servo Home Dir	Instant		
Axis parameter (P2.)		Z Servo Home Dir	Instant		
Axis parameter (P2.)		4 Servo Home Dir	Instant		
Axis parameter (P2.)		B Servo Home Dir	Instant		
Axis parameter (P2.)		C Servo Home Dir	Instant		
Axis parameter (P2.)	031	X Ext Home Eanble	Instant		
Axis parameter (P2.)		Y Ext Home Eanble	Instant		
Axis parameter (P2.)		Z Ext Home Eanble	Instant		
Axis parameter (P2.)		4 Ext Home Eanble	Instant		
Axis parameter (P2.)		B Ext Home Eanble	Instant		
Axis parameter (P2.)		C Ext Home Eanble	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	032	X Encoder LogicDir<●>	Instant		
Axis parameter (P2.)		Y Encoder LogicDir<●>	Instant		
Axis parameter (P2.)		Z Encoder LogicDir<●>	Instant		
Axis parameter (P2.)		4 Encoder LogicDir<●>	Instant		
Axis parameter (P2.)		B Encoder LogicDir<●>	Instant		
Axis parameter (P2.)		C Encoder LogicDir<●>	Instant		
Axis parameter (P2.)	033	X HomeSpeed2	Instant		
Axis parameter (P2.)		Y HomeSpeed2	Instant		
Axis parameter (P2.)		Z HomeSpeed2	Instant		
Axis parameter (P2.)		4 HomeSpeed2	Instant		
Axis parameter (P2.)		B HomeSpeed2	Instant		
Axis parameter (P2.)		C HomeSpeed2	Instant		
Axis parameter (P2.)	034	X HomeSpeed3	Instant		
Axis parameter (P2.)		Y HomeSpeed3	Instant		
Axis parameter (P2.)		Z HomeSpeed3	Instant		
Axis parameter (P2.)		4 HomeSpeed3	Instant		
Axis parameter (P2.)		B HomeSpeed3	Instant		
Axis parameter (P2.)		C HomeSpeed3	Instant		
Axis parameter (P2.)	035	X pitch compensate En	Instant		
Axis parameter (P2.)		Y pitch compensate En	Instant		
Axis parameter (P2.)		Z pitch compensate En	Instant		
Axis parameter (P2.)		4 pitch compensate En	Instant		
Axis parameter (P2.)		B pitch compensate En	Instant		
Axis parameter (P2.)		C pitch compensate En	Instant		
Axis parameter (P2.)	036	X axis pitch spacing(mm)	Instant		
Axis parameter (P2.)		Y axis pitch spacing(mm)	Instant		
Axis parameter (P2.)		Z axis pitch spacing(mm)	Instant		
Axis parameter (P2.)		4 axis pitch spacing(mm)	Instant		
Axis parameter (P2.)		B axis pitch spacing(mm)	Instant		
Axis parameter (P2.)		C axis pitch spacing(mm)	Instant		
Axis parameter (P2.)	037	X pitch com start pos(mm)	Instant		
Axis parameter (P2.)		Ypitch com start pos(mm)	Instant		
Axis parameter (P2.)		Z pitch com start pos(mm)	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)		4 pitch com start pos(mm)	Instant		
Axis parameter (P2.)		B pitch com start pos(mm)	Instant		
Axis parameter (P2.)		Cpitch com start pos(mm)	Instant		
Axis parameter (P2.)	038	X pitch comp end pos(mm)	Instant		
Axis parameter (P2.)		Y pitch comp end pos(mm)	Instant		
Axis parameter (P2.)		Z pitch comp end pos(mm)	Instant		
Axis parameter (P2.)		4 pitch comp end pos(mm)	Instant		
Axis parameter (P2.)		B pitch comp end pos(mm)	Instant		
Axis parameter (P2.)		C pitch comp end pos(mm)	Instant		
manage parameter (P3.)	001	Select SupMode	Instant		
manage parameter (P3.)	002	AlterSuperuserPasswor	Instant		
manage parameter (P3.)	003	Alter User Password	Instant		
manage parameter (P3.)	004	Initialize	Instant		
manage parameter (P3.)	005	Initialize IO Config	Instant		
manage parameter (P3.)	006	all para reset<●>	Instant		
manage parameter (P3.)	007	para backup	Instant		
manage parameter (P3.)	008	para recover	Instant		
manage parameter (P3.)	009	generate cryptogram	Instant		
manage parameter (P3.)	010	menu click way	Instant		
manage parameter (P3.)	011	clear add up work num	Instant		
manage parameter (P3.)	012	clear current work num	Instant		
manage parameter (P3.)	013	Maximum work num	Instant		
manage parameter (P3.)	014	lead in CSV sys config	Instant		
manage parameter (P3.)	015	startup display module	Instant		
manage parameter (P3.)	016	sys language bag	Instant		
manage parameter (P3.)	017	macro key word valid En	Instant		
manage parameter (P3.)	018	startup picture display	Instant		
manage parameter (P3.)	019	sys display axis setting	Instant		
manage parameter (P3.)	020	sys debug information En	Instant		
manage parameter (P3.)	021	axis control composite	Instant		
manage parameter (P3.)	022	additional panel enable	Instant		
manage parameter (P3.)	023	M CODE select	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
manage parameter (P3.)	024	T CODE select	Instant		
manage parameter (P3.)	025	PLC select	Instant		
manage parameter (P3.)	026	Screen saver en	Instant		
manage parameter (P3.)	027	Modbus Poll/Slave set	Instant		
tool parameter (P4.)	001	These parameters are made according to the tool magazine type(the default parameters for linear tool magazine)	Instant		
Spindle parameter (P5.)	001	Spindle assign port axis #	Instant		
Spindle parameter (P5.)	002	Spi.Alarm ELevel	Instant		
Spindle parameter (P5.)	003	Spi.Reset ELevel	Instant		
Spindle parameter (P5.)	004	Spi.ECZ Home Enable	Instant		
Spindle parameter (P5.)	005	Spi.ECZ Elevel	Instant		
Spindle parameter (P5.)	006	Spi. Limit+ Enable	Instant		
Spindle parameter (P5.)	007	Spi. Limit- Enable	Instant		
Spindle parameter (P5.)	008	Spi.Limit Elevel	Instant		
Spindle parameter (P5.)	009	Spi.Pulse Mode	Instant		
Spindle parameter (P5.)	010	Spi.Pulse Logic Mode	Instant		
Spindle parameter (P5.)	011	Spi.HomeDect ELevel	Instant		
Spindle parameter (P5.)	012	Spi.ExtHome Check En	Instant		
Spindle parameter (P5.)	013	Spi.Round Setting	Instant		
Spindle parameter (P5.)	014	Spi.Encode bits(p)	Instant		
Spindle parameter (P5.)	015	Spi.ZeroOffset(p)	Instant		
Spindle parameter (P5.)	016	PulseLogic Level	Instant		
Spindle parameter (P5.)	017	Rolling Display Usage	Instant		
Spindle parameter (P5.)	018	Spi.Max Acc(Kpps)	Instant		
Spindle parameter (P5.)	019	Spi.Ext HomeDir	Instant		
Spindle parameter (P5.)	020	Spi.Servo HomeDir	Instant		
Spindle parameter (P5.)	021	Spi.Max Speed(rpm)	Instant		
Spindle parameter (P5.)	022	Spi.Home Speed(rpm)	Instant		
Spindle parameter (P5.)	023	Spi.Gear Numerator	Instant		
Spindle parameter (P5.)	024	Spi.Gear Denominator	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Spindle parameter (P5.)	025	Spi.Encoder Logic Dir	Instant		
Spindle parameter (P5.)	026	Spi.OpenDelayTime(ms)	Instant		
Spindle parameter (P5.)	027	Servo spindle ready level	Instant		
Spindle parameter (P5.)	028	Servo spi stop pos level	Instant		
Spindle parameter (P5.)	029	Servo spi zero speed level	Instant		
Spindle parameter (P5.)	030	Sv spi speed reach level	Instant		
Spindle parameter (P5.)	031	Sys current speed	Instant		
Spindle parameter (P5.)	032	M30 close spi En	Instant		
Spindle parameter (P5.)	033	Spi Maximum speed	Instant		
Spindle parameter (P5.)	034	Second spi Maximum speed	Instant		
Spindle parameter (P5.)	035	Second spi speed	Instant		
Spindle parameter (P5.)	036	Spi code command invalid	Instant		
Spindle parameter (P5.)	037	Machine spi one speed	Instant		
Spindle parameter (P5.)	038	Machine spi two speed	Instant		
Spindle parameter (P5.)	039	Machine spi three speed	Instant		
Spindle parameter (P5.)	040	Machine spi four speed	Instant		
Spindle parameter (P5.)	041	Spindle stop delay(ms)	Instant		
Port parameter (P6.)	001	Tool Checking signal in	Instant		
Port parameter (P6.)	002	Tool Safe Signal in			
Port parameter (P6.)	003	Tool changer out			
Port parameter (P6.)	004	Tool changer dustproof out			
Port parameter (P6.)	005	Tool changer dustproof in			
Port parameter (P6.)	006	Tool limit input			
Port parameter (P6.)	007	Tool blow output			
Port parameter (P6.)	008	Spi alarm check in			
Port parameter (P6.)	009	Transduser alarm check			
Port parameter (P6.)	010	Servo spi ready input			
Port parameter (P6.)	011	Servo spi stop input			
Port parameter (P6.)	012	Servo spi sero speed input			
Port parameter (P6.)	013	Servo spi speed reach input			
Port parameter (P6.)	014	VFD o level output			
Port parameter (P6.)	015	VFD 1 level output			

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)	016	VFD 2 level output			
Port parameter (P6.)	017	VFD 3 level output			
Port parameter (P6.)	018	Spindle CW output			
Port parameter (P6.)	019	Spinde CCW output			
Port parameter (P6.)	020	Spindle 2 CW output			
Port parameter (P6.)	021	Spindle 2 CCW output			
Port parameter (P6.)	022	Transduser alarm reset			
Port parameter (P6.)	023	Spindle blow output			
Port parameter (P6.)	024	Spindle brake output			
Port parameter (P6.)	025	Servo spi en output			
Port parameter (P6.)	026	Servo spi stop output			
Port parameter (P6.)	027	Servo spi pulse output			
Port parameter (P6.)	028	Sv spi rigid tapping output			
Port parameter (P6.)	029	Safe Signal check input			
Port parameter (P6.)	030	Air pressure alarm input			
Port parameter (P6.)	031	Chuck alarm input			
Port parameter (P6.)	032	Oil pressure alarm input			
Port parameter (P6.)	033	ExStart2 check input			
Port parameter (P6.)	034	ExPause2 check input			
Port parameter (P6.)	035	ExScram2 check input			
Port parameter (P6.)	036	Cooler alarm input			
Port parameter (P6.)	037	Oiling alarm input			
Port parameter (P6.)	038	Ext reset input			
Port parameter (P6.)	039	Tool locking input			
Port parameter (P6.)	040	Alarm light output			
Port parameter (P6.)	041	Run light output			
Port parameter (P6.)	042	Stop light output			
Port parameter (P6.)	043	Sys ready light output			
Port parameter (P6.)	044	Oil output			
Port parameter (P6.)	045	Cool output			
Port parameter (P6.)	046	Oil pump output			
Port parameter (P6.)	047	X limit- input			
Port parameter (P6.)		X limit+ input			

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P6.)		Y limit- input			
Port parameter (P6.)		Y limit+ input			
Port parameter (P6.)		Z limit- input			
Port parameter (P6.)		Z limit+ input			
Port parameter (P6.)		4 limit- input			
Port parameter (P6.)		4 limit+ input			
Port parameter (P6.)		B limit- input			
Port parameter (P6.)		B limit+ input			
Port parameter (P6.)		C limit- input			
Port parameter (P6.)		C limit+ input			
Port parameter (P6.)	048	X Ext home input			
Port parameter (P6.)		Y Ext home input			
Port parameter (P6.)		Z Ext home input			
Port parameter (P6.)		4 Ext home input			
Port parameter (P6.)		BExt home input			
Port parameter (P6.)		XC Ext home input			
Port parameter (P6.)	049	X Servo En input			
Port parameter (P6.)		Y Servo En input			
Port parameter (P6.)		Z Servo En input			
Port parameter (P6.)		4 Servo En input			
Port parameter (P6.)		B Servo En input			
Port parameter (P6.)		C Servo En input			
Port parameter (P6.)	050	Input check level 00--31			
Port parameter (P6.)	051	Input check level 32--63			
Port parameter (P6.)	052	Input check level 64--95			
Port parameter (P6.)	053	IO Conf Reset 00--31			
Port parameter (P6.)	054	IO Conf Reset 32--63			
Port parameter (P6.)	055	IO Conf Reset 64--95			
Port parameter (P6.)	056	Led Reset 0--31			
Port parameter (P6.)	057	Led Reset 32--63			
Port parameter (P6.)	058	Led Reset 64--95			

11.2 Genal parameters (P1.)

001	Inp Speed(mm/min)
002	InpStartSpeed(mm/min)
003	InpAcceleration(mm/sec)
007	MaxFeedSpeed(mm/min)

Range : 1~9999, 1~9999, 1~8000, 1~9999

Unit : mm/min,mm/min,mm/sec,mm/min

Authority : Operation admin or super

Default : 3000,200,1000,3000

Effective time : Instant

Note : The feeding instructions such as G01, G02 and G03 move at the speed of F instruction. If the F instruction isn't specified in the program, the above instructions move at the speed set by this parameter. If the F instruction is specified, this parameter will be invalid.
The maximum feeding speed restricts the F instruction during processing, i.e. no matter what F is set to, the actual speed can't exceed this parameter value.
Setting this parameter will prevent the damage caused by accidental programming error when excute program

004	ZeroReturn Mode

Range : 0~1

Unit : None

Authority : Operation admin or super

Default : 0 (program)

Effective time : Instant

Note : 0 - Program home
1 - Mechanical home
Program home is that the coordinates all are zero (actually ,it is the workpiece home point
Mechanical home :it requires detecting external sensor to locate the home position; while home operation, move to specified home direction at home speed, and move back slowly after signal is detected. At this moment, move forward slowly when the signal is disconnected, and the home operation completes when the signal is valid again. When the servo Z phase enable switch in IO configuration parameters is enabled, mechanical home will enable Z phase positioning as home position automatically after signal reaches.

005	IO FilterWave(1~8)

Range : 0~8

Unit : None

Authority : Operation admin or super

Default : 0

Effective time : After rebooted

Note : Set the filter constant;
If the environment has too much interference, e.g. rain and thunder, please enter a filter value. Higher value indicates longer test time and high reliability; 0 indicates no filter;

006	Communication options

Range : No use ,Network,Uart,All User

Unit : None

Authority : Operation admin or super

Default : 0

Effective time : reboot

Note : Select communication mode ,there are four selection for communication with pc ,no use : don't allow communicate with pc ; Network :controller communicate with pc via network; uart : controller communicate with pc via RS232; All User :support network and uart communication mode.

008	MaxMPGSpeed(mm/min)

Range : 1~10000

Unit : mm/min

Authority : Operation admin or super

Default : 9000

Effective time : Instant

Note : This parameter for setting MPG Maximum speed ,the max setting is 10000, if this setting value is too low ,the MPG will not work well .uauslly ,the default value is ok

009	Wheel Coefficient

Range : 1~3000

Unit :

Authority : Operation admin or super

Default : 1000

Effective time : Instant

Note : This setting is handwheel response speed . if this setting value is too low ,the handwheel will not work well .uauslly ,the default value is ok

010	M Code Delaytime(ms)

Range : 1~9999

Unit : ms

Authority : Operation admin or higher

Default : 100

Effective time : Instant

Note : Set the waiting time (unit: ms) after executing M code, uauslly ,the default value is ok

011	Line number

Range : 0~100

Unit : None

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note	:	While editing G code manually, after this line is finished ,the program add a line number Nxxxxx automatically in a new line; 0 indicates that this function is disabled;

012	System Baudrate

Range	:	9600~115200
Unit	:	None
Authority	:	Operation admin or higher
Default	:	115200
Effective time	:	Reboot
Note	:	The communication rate setting for connection PC software when the controller communicate with pc software via RS232

013	Controler ID

Range	:	1~250
Unit	:	None
Authority	:	Operation admin or higher
Default	:	1
Effective time	:	Reboot
Note	:	The communication rate setting for connection PC software when the controller communicate with pc software via RS232 or network(RJ45)

014	Circle InpUnit(mm)

Range	:	0~1
Unit	:	mm
Authority	:	Operation admin or higher
Default	:	0.2
Effective time	:	Instant
Note	:	Set the arc interpolation equivalent If this value is too small, the arc is more better , but the internal algorithm is more complicated(as you know ,the Arc G code which inported from CAM software are composed by lots of small lines) , so that the controller response speed is slow ,it will take more time to excute program .the default value is ok .

015	G73(M)LoopObligate(mm)
016	G83(M)LoopObligate(mm)

Range	:	0.1~100
Unit	:	mm
Authority	:	Operation admin or higher
Default	:	2.000
Effective time	:	Instant

Note	:	Set the tool retracting amount Q value in G73 and G83 instructions; this parameter (default: 2mm) is set according to actual chip removal effect.

017 Arc Inp Mode

Range	:	Pos split / time split
Unit	:	
Authority	:	Operation admin or higher
Default	:	Pos split
Effective time	:	Instant
Note	:	Set the Arc interpolation mode ,pos split :when excute pretreatment,the controller excute program with small lines ; time split: :when excute pretreatment,the controller excute program with time (4s per period)

018 interpolation speed mode

Range	:	Angle / Speed / Speed1
Unit	:	None
Authority	:	Operation admin or higher
Default	:	Speed1
Effective time	:	Instant
Note	:	At pretreatment mode, if the setting is Angel,that means the controller works as The corner speed balancing algorithm; if it is speed ,it works as axis acceleration balancing algorithm; if it is speed1 ,it works as high effcient acceleration balancing algorithm.

019 GCode pre-treatment

Range	:	Real time /Preprocesss
Unit	:	None
Authority	:	Operation admin or higher
Default	:	real time
Effective time	:	Instant
Note	:	Real-time processing is suitable for machine debug In pretreatment mode, after controller start working ,there are 2s for buffering and pre-reads. For The pretreatment ,the controller can check the direction and size of feeding segment to adjust the speed automatically and get an optimized speed.

020 'O'Pro Scan

Range	:	0~1
Unit	:	None
Authority	:	Operation admin or higher
Default	:	1
Effective time	:	Instant
Note	:	File scanning can quicken the file transfer speed when processing large files. When transferring NC files, the system needs to scan over to position every program block. In this way, if the file only has one program segment and the file size is very big, it will cause unnecessary waiting time. If this option is closed, the system will exit after scanning the address of first program segment

021	SpindleControlMode

Range : 0~1

Unit : None

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note :
This setting is corresponding to spindle S value (VFD)
0: Analog output
1: Section speed regulation (4-digit code), as below:
P4.014------S0
P4.015------S1
P4.016------S2
P4.017------S3
In analog output mode, the analog voltage is:
V=S/MaxRPM
S is the rotation set by the user, and MaxRPM is the maximum rotation of spindle axis set by the parameter (P5.021);
In switching mode, 0-15 according to four-digit code to output; S value is restricted to 0-15;

022	OilPressure Open(min)
023	OilPressure Keep(sec)
024	OilPressureOut Freq(Hz)

Range :

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note :
OilPressure Open(min): Set the timing start and hold time of the automatic oil pump automatic timing star setting is that after comntroller power on ,it starts timer and when the timer over ,the oil pump output(P6.045 setting) is active .
The output holding time is set by 023 ,after this time over ,the output is inactive
OilPressureOut Freq(Hz): Output signal follows the hertz specified by 024 in working processing , and used for oil supply devices. If this setting is 0, the controller will keep low output level.

025	BackHome ModeConf(bit)

Range :

Unit : None

Authority : Operation admin or higher

Default : Z-XYABC

Effective time : Instant

Note :
This setting is sequence of machimne going home point .there are three setting dialogs.(X—C fisrt zero, X—C second zero, X—C thirdt zero,page dwon and page up for shift dialog),the default setting is Z-XYABC,that mean z aixs go home firtstly(the z axis fisrt zero is set with black point) ,then XYABC go home point together(X Y A B C second zero settings are black point)

026	Arc Acc.for Radii

027	Arc Acc.for Speed

Range :

Unit : Coefficient

Authority : Operation admin or higher

Default : 50, 100

Effective time : Instant

Note : Used to restrict the arc processing speed automatically. This parameter is valid in pretreatment mode.

The bigger the radius coefficient is, the lower the arc speed is.

The bigger the acceleration coefficient is, the higher the arc speed is.

028	PretreatmentCode Set

Range : 100~3000

Unit : Instruction line

Authority : Operation admin or higher

Default : 500

Effective time : Instant

Note : Set the pre-reading instruction lines; if the pretreatment processing pauses and pre-reads, please increase this value to pre-read more instructions.

029	Inp AccSpeed Mode
030	'S'Speed Acceleration

Range :

Unit :

Authority : Operation admin or higher

Default :

Effective time : Instant

Note : Inp AccSpeed Mode: it for setting the interpolation acceleration/ deceleration, 0 is linear acceleration and deceleration ; 1 is S curve acceleration/deceleration
'S'Speed Acceleration: Used to set the performance of S curve acceleration/deceleration

031	HOME Check for alarm
032	HOME Check Enable

Range : 0~1

Unit :

Authority : Operation admin or higher

Default : 0, 1

Effective time : Instant

Note : HOME Check for alarm :if there is alarm in controller ,and after the alarm removed ,the controller need go home point or not before working.
0 : disable ,no need go home point before working

1: enable ,need go home before working.

HOME Check Enable :after power on ,the controller whether go home point or not

0 : disable ,no need go home point before working
1: enable ,need go home before working.

033	X diameter prog enable

Range : 0~1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : This parameter for lathe machine , no need edit it .

034	default process plane

Range : G17,18,19

Unit :

Authority : Operation admin or higher

Default : G17

Effective time : Instant

Note : Set the default work plane to XY or XZ; modify the default plane, so that it no need to specify the modal plane value while programming, and write plane related instructions directly in stead;

035	T code form

Range : 0~2

Unit :

Authority : Operation admin or higher

Default : 2

Effective time : Instant

Note : This parameter for lathe machine ,no need edit it .

036	IP address
037	Subnet mask
038	Default gateway

Range :

Unit :

Authority : Operation admin or higher

Default : 192.168.0.123

255.255.255.0

192.168.0.1

Effective time : Reboot

Note : These parameter settings for communicating with PC software .
Used to configure Ethernet parameters, which shall comply with the actual network settings, or else it can't be accessed normally.
After configured successfully, the user can perform the ping command test on the PC of same network segment (same subnet mask) in the

intranet. The connection has error if the return overtimes. Please check the physical connection.
The network environment requires independent NC network. Do not connect to office network or Internet, because the broadcast in the network and regular query of windows will block the network communication of NC.

039	Mac Addresss<●>

Range :

Unit :

Authority : Operation admin or higher

Default :

Effective time : Reboot

Note : 18.52.86.168.0.123

These parameter settings for communicating with PC software .
And it should be input the PC MAC address

040	Pretreatment segments

Range : 10~200

Unit :

Authority : Operation admin or higher

Default : 20

Effective time : Instant

Note : Pretreatment forward segments are used to set the segments of pretreatment preview.
The larger this value is, the greater the operation is, and the longer the waiting time before motion is.
During small segment interpolating, if this value is larger, the possibility of waiting for operation during motion will become higher; the value is set according to the actual processing effect.
If this value is smaller, the value is set according to the actual effect because the forward data are insufficient and the speed can't be improved during small segment interpolating.

If the P1.018 setting is speed 1 ,this parameter is invalid.

041	feed speed setting En

Range : 0~1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : This parameter is used to modify the interpolation speed in programming, making F programming invalid.

Used for the cases that processing codes requires ignoring F-value.

042	enable of G00 Inp mode

Range : 0~1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time	:	Instant
Note	:	Used to set whether G00 instruction is work as G01 If this setting is 1 ,that means when the controller excute G00,it will work as G01(interpolation,not fast move) If G01 is used, the interpolation speed shall follow the setting of minimum speed; The acceleration is the interpolation acceleration.

043	Abnormal memory En

Range	:	off/ pos mem/ sta mem
Unit	:	
Authority	:	Operation admin or higher
Default	:	off
Effective time	:	Instant
Note	:	used for the controller abnormal stop at the process of working ,power off or other abnormal stops if The setting is pos mem ,the system will memory the current position ,then reboot or press start ,system show message and after starting ,it will move to the last position,press start again ,it work if The setting is sta mem, ,the system will memory the current state, ,then reboot or press start,the system will work directly from the last position

044	Z rise to safe pos en
045	Arise to safe pos en

Range	:	off/ Abs coord/ Mac coord
Unit	:	
Authority	:	Operation admin or higher
Default	:	off
Effective time	:	Instant
Note	:	0 is diaable when the controller pause (during working),the A and Z axis will move to the P1.050 and P1.049 setting safty position (this coordinate can be workpiece coordinate or machine coordinate)

046	Pro RZ to reference pos
047	Mac RZ to reference pos

Range	:	off/ Abs coord/ Mac coord
Unit	:	
Authority	:	Operation admin or higher
Default	:	off
Effective time	:	Instant
Note	:	0 is diaable 1 is enable ,When the controller go home (machine home or program home) at home mode ,the working process is that move to X---C coord offset setting coordinate (coord-----set)

048	Home mode cls coord

Range	:	Mac coord / G54 coord
Unit	:	None

Authority : Operation admin or higher

Default : Mac coord

Effective time : Instant

Note : At home mode ,clear the coordinate
at home mode ,press X Y Z A B C ,the axis coordinate wll be flicker ,then press CAN button ,all axis coordinate will be 0 ,if this setting is Mac coord ,that means the current coordinate system is machine coordinate system ; if it is G54 coord,that means the current coordinate system is G54 coordinate system
Note:this function only for machine debuging

049	Pro RZ to reference pos
050	Mac RZ to reference pos

Range : 0～20000

Unit : mm/min

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : If the P1.044 or P1.045 setting is 1 (enable), when the controller pause (during working),the A or Z axis will move to the P1.050 and P1.049 setting safty position (this coordinate can be workpiece coordinate or machine coordinate)

051	Z axis feed speed limit
052	A axis feed speed limit

Range : -9999.999～9999.999

Unit : mm

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : If the P1.044 or P1.045 setting is 1 (enable), when the controller pause (during working),the A or Z axis will move to the P1.050 and P1.049 setting safty position (this coordinate can be workpiece coordinate or machine coordinate)

053	Screw Acc pitch p(mm)
054	Screw slow pitch D(mm)
055	Screw backvalue V(mm)

Note These thress parameter for lathe machine ,no need set it

056	M98 jumpp line En

Range : On /Off

Unit :

Authority : Operation admin or higher

Default : Off

Effective time : Instant

Note : If this setting is on,when excute M98 code ,it will jump to subprogram

If it is OFF ,it will not jump when excute M98 code

057	System boot zero way

Range : Non RZ/ Prompt RZ / Auto RZ

Unit :

Authority : Operation admin or higher

Default : Non RZ

Effective time : Instant

Note : Non RZ: after power on controller ,it will keep the last system coordinate
Prompt RZ: after power on controller ,it will show message that remind u return zero or not ,if press EOB,it will return zero,if press cancel ,it will keep the last system coordinate
Auto RZ: after after power on controller,it will return zero automatic

058	Spi brake deay(ms)

Range : 0---3922

Unit : ms

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : after the spindle stop working , the controller has a delay and output a signal to Make the spindle brake signal inactive

059	Rotation axis opt feature

Range :

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : This parameter is invalid now ,so no need set it

060	4 axis max rotate speed

Range : 1--500

Unit :

Authority : Operation admin or higher

Default : 50

Effective time : Instant

Note : If the P1.018 setting is angle ,then this setting for setting the max speed of A axis(when theA axis is rotary ,not linear)

061	Hand wheel encoder dir

Range : 0--1

Unit : none

Authority : Operation admin or higher

Default : 0

Effective time	:	Instant
Note	:	If the handwheel direction is reverse ,you change this parameter 0 is positive direction 1 is negetive direction

062	Hand wheel control mode

Range	:	0--1
Unit	:	none
Authority	:	Operation admin or higher
Default	:	0
Effective time	:	Instant
Note	:	For setting the axis motion mde when contrlled by handwheel 0 is old mde 1 is new mode

063	Hand wheel max rate

Range	:	500---10000
Unit	:	none
Authority	:	Operation admin or higher
Default	:	4000
Effective time	:	Instant
Note	:	For setting the handwheel max speed rate(it is valid only when the P1.062 setting is 1)

064	Hand wheel ACC(Kps)

Range	:	1---20
Unit	:	none
Authority	:	Operation admin or higher
Default	:	10
Effective time	:	Instant
Note	:	For setting the handwheel max speed Acc(it is valid only when the P1.062 setting is 1)

065	Machine end to reference

Range	:	Off/on
Unit	:	none
Authority	:	Operation admin or higher
Default	:	off
Effective time	:	Instant
Note	:	After controller complete working ,the machine go to the reference position (press coord ---- down)

11.3 Axis parameter configuration (P2.)

001	X Gear Numerator
	X Gear Denominator

	Y Gear Numerator
	Y Gear Denominator
	Z Gear Numerator
	Z Gear Denominator
	4 Gear Numerator
	4 Gear Denominator
	B Gear Numerator
	B Gear Denominator
	CGear Numerator
	C Gear Denominator

Range : 1--65535

Unit : none

Authority : Operation admin or higher

Default : 1

Effective time : Reboot

Note :

These settings For making sure the actual distance is same as the programming distance,the formula as below
CMR/CMD =P/ (L×1000)
CMR: gear numerator
CMD: gear denominator
P: Pulses corresponding to one rotation of the motor encoder
L: Machine tool movement corresponding to one rotation of the motor (mm)(pitch or others)
CMD/CMR is the pulse equivalent actually, i.e. the motion distance corresponding to every pulse (unit: 0.001mm).
Ex 1: the motor encoder pulse is 5000 , and the machine moves 5mm (pitch is 5mm)when the motor rotates one cycle,and there is no gear ratio on this axis, then
CMR/CMD=5000/ (5*1000)=1/1
Then, CMR=1, CMD=1, the pulse equivalent is 0.001 p/mm

Ex 2: the motor encoder pulse is 5000, and the machine moves 10mm(pitch is 10mm)when the motor rotates one cycle,and there is no gear ratio on this axis,
then CMR/CMD=5000/ (10*1000)=1/2
Then, CMR=1, CMD=2, the pulse equivalent is 0.001p/mm

Ex 3: the motor encoder pulse is 5000, and the machine moves 10mm(pitch is 10mm)when the motor rotates one cycle,and the gear ratio is 1:2
then CMR/CMD=5000*2/ (10*1000)=1/1
Then, CMR=1, CMD=1, the pulse equivalent is 0.001 p/mm

002	X FastSpeed(mm/min)
	Y FastSpeed(mm/min)
	Z FastSpeed(mm/min)
	4 FastSpeed(mm/min)
	B FastSpeed(mm/min)
	C FastSpeed(mm/min)
003	XStartupSpeed(mm/min
	YstartupSpeed(mm/min)

	ZstartupSpeed(mm/min)
	4StartupSpeed(mm/min)
	BStartupSpeed(mm/min
	CStartupSpeed(mm/min)
004	X Acceleration(Kpps)
	Y Acceleration(Kpps)
	Z Acceleration(Kpps)
	4 Acceleration(Kpps)
	B Acceleration(Kpps)
	C Acceleration(Kpps)

Range : 1---9999，1---9999，1---8000

Unit : mm/min,mm/min,mm/sec

Authority : Operation admin or higher

Default : 3000,200,1500

Effective time : Instant

Note : This parameter is the trapezoid acceleration/deceleration setting and used for GOO instruction

About start speed, 1-2 rpm motor speed is recommended for step motor; as above, the machine moves 5mm when the motor rotates one cycle, and the speed is 5-10mm/sec (300-600mm/min). For servo motor, the start and stop shouldn't have vibration. If this speed is too high, it will cause vibration during motion, and the step motor will be out of step.

The acceleration and start speed also affect JOG speed, home speed, etc those speed not for interpolation.;

005	X Soft PosLimit+(mm)
	X Soft PosLimit-(mm)
	Y Soft PosLimit+(mm)
	Y Soft PosLimit-(mm)
	Z Soft PosLimit+(mm)
	Z Soft PosLimit-(mm)
	4 Soft PosLimit+(mm)
	4 Soft PosLimit-(mm)
	B Soft PosLimit+(mm)
	B Soft PosLimit-(mm)
	C Soft PosLimit+(mm)
	C Soft PosLimit-(mm)

Range : -9999----9999

Unit : mm

Authority : Operation admin or higher

Default : 9999 / -9999

Effective time : Instant

Note : Usually , the machine has hardware limit signal. In this case, software limit isn't required. Then Please set the positive limit to +9999.999, and negative limit to -9999.999.

If hardware limit switch isn't installed, please use soft limit, which uses machine home point as reference point. Positive limit and negative limit are subject to actual distance (unit: mm).

Since soft limit decelerates and stops at the limit point, it may exceed the seting distance, which depends on acceleration time and speed. Please keep certain margin when setting this parameter.

006	XBacklashExpiate(pulse)
	YBacklashExpiate(pulse)
	ZBacklashExpiate(pulse)
	4BacklashExpiate(pulse)
	BBacklashExpiate(pulse)
	CBacklashExpiate(pulse)

Range : 1---20000

Unit : pulse

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : Compensate the backlash of ballscrew or Pulley

Compensate with the pulse in minimum unit(the pulse equivalent). For example :if the forward is 100mm,but backward is 98mm ,that means the backlash is 2mm,if the the pulse equivalent is 0.001 ,then compensation pulse is 2/0.001=2000

007	X HOME Offset(mm)
	Y HOME Offset(mm)
	Z HOME Offset(mm)
	4 HOME Offset(mm)
	B HOME Offset(mm)
	C HOME Offset(mm)

Range : -9999～9999

Unit : pulse

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : Set the compensation home offset (unit: pulse) after axis home operation.

First, complete the mechanical home operation, offset corresponding pulse, and then set this point as mechanical home.

Note: This parameter is invalid during program home operation

008	X HomeDir
	Y HomeDir
	Z HomeDir
	4 HomeDir
	B HomeDir
	C HomeDir

Range : 0～1

Unit : pulse

Authority : Operation admin or higher

Default : 1,1,0,0

Effective time : Instant

Note : Set the mechanical home direction of each axis

1is Positive

1 is Negative

009	X ZeroReturn Speed
	Y ZeroReturn Speed
	Z ZeroReturn Speed
	4 ZeroReturn Speed
	B ZeroReturn Speed
	C ZeroReturn Speed

Range : 0～9999

Unit : Mm/min

Authority : Operation admin or higher

Default : 1000

Effective time : Instant

Note : Set the home speed of each axis

010	X axis JOG speed(mm/min)
	Y axis JOG speed(mm/min)

	Z axis JOG speed(mm/min)
	A axis JOG speed(mm/min)
	B axis JOG speed(mm/min)
	C axis JOG speed(mm/min)

Range : 0～9999

Unit : Mm/min

Authority : Operation admin or higher

Default : 1000

Effective time : Instant

Note : Set the Jog speed of each axis ,the start speed is the P2.003 setting ,and the Accis the P2.004 setting

011	X restrain acc (mm/s^2)
	Y restrain acc (mm/s^2)
	Z restrain acc (mm/s^2)
	4 restrain acc (mm/s^2)
	B restrain acc (mm/s^2)
	C restrain acc (mm/s^2)
012	X max restrain rate
	Y max restrain rate
	Z max restrain rate
	4 max restrain rate
	B max restrain rate
	C max restrain rate

Range : 1～9000

Unit :

Authority : Operation admin or higher

Default : 9000

Effective time : Instant

Note : At the pretreatment mode,these setting for setting every axis restrain Acc

If Any of these setting is too small ,the working process speed will be slow ,so the larger the setting is, the higher processing speed is.

as the machine working condition ,these settings are as lager as possible

if the parameter P1.018 setting is speed or speed 1 ,then this parameter is invalid .

013	X_ServoAlarmIn ELevel
	Y_ServoAlarmIn ELevel

	Z_ServoAlarmIn ELevel
	4_ServoAlarmIn ELevel
	B_ServoAlarmIn ELevel
	C_ServoAlarmIn ELevel
014	X_ServoResetOut ELeve
	Y_ServoResetOut ELeve
	Z_ServoResetOut ELeve
	4_ServoResetOut ELeve
	B_ServoResetOut ELeve
	C_ServoResetOut ELeve

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0,1

Effective time : Instant

Note : These parameters for setting the servo alarm level input ,if the controller shows alarm 1042----1047,and there is no alarm in servo driver ,then you should change these settings

1 is high level

0 is low level

015	X_ECZ Home Enable
	Y_ECZ Home Enable
	Z_ECZ Home Enable
	4_ECZ Home Enable
	B_ECZ Home Enable
	C_ECZ Home Enable

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : 1 is enable ,0 is disable

When mechanical home mode is selected, this parameter for setting whether external servo zero point (servo z phase signal)should be searched..

If these settings enable ,that means after the machine detecting sensor

signal , it will detect servo zero point , then the home operation is completed

For the better precision ,it is suggested that set these settings Enable

Note:these setting only for servo motor ,setp motor should disable.

016	X_ECZ Home ELevel
	Y_ECZ Home ELevel
	Z_ECZ Home ELevel
	4_ECZ Home ELevel
	B_ECZ Home ELevel
	C_ECZ Home ELevel

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : These settings for setting each axis servo zero point (z phase signal)level input

1 is high level ,0 is low level .

017	X Limit ELeve
	Y Limit ELevel
	Z Limit ELevel
	4 Limit ELevel
	B Limit ELevel
	C Limit ELevel

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : These settings for setting limit sensor level (it is suggested that using NPN type sensor)

1 is high level ,0 is low level .

018	X Pulse Mode<●>
	Y Pulse Mode<●>
	Z Pulse Mode<●>
	4 Pulse Mode<●>

	B Pulse Mode<●>
	C Pulse Mode<●>

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : Pulse command format setting is to configure the mode of output pulse. The compatible command format of the motor drive should be known in advance.

0 is Pulse + pulse mode

1 is Pulse + direction model

019	X Pulse Dir Mode<●>
	Y Pulse Dir Mode<●>
	Z Pulse Dir Mode<●>
	4 Pulse Dir Mode<●>
	B Pulse Dir Mode<●>
	C Pulse Dir Mode<●>

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : Set pulse direction; if the controller direction is reverse to actual direction, please modify this parameter to adjust the direction of motor.

020	X Ext Home ELevel
	Y Ext Home ELevel
	Z Ext Home ELevel
	4 Ext Home ELevel
	B Ext Home ELevel
	C Ext Home ELevel

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : Instant

Note : Set the home sensor level ((it is suggested that using NPN type sensor)

1 is high level ,0 is low level .

021	X Round Setting<●>
	Y Round Setting<●>
	Z Round Setting<●>
	4 Round Setting<●>
	B Round Setting<●>
	C Round Setting<●>

Range : 0～9999999

Unit : pulse

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : If the axis works as rotary (not linear, P2.026 settings is 0),then this parameter will be changed automatic(there is an Arithmetic which base on the parameters P2 001---P2.12 Setting)

022	X physial Assign Num<●>
	Y physial Assign Num<●>
	Z physial Assign Num<●>
	4 physial Assign Num<●>
	B physial Assign Num<●>
	C physial Assign Num<●>

Range : 0～6

Unit :

Authority : Operation admin or higher

Default : 1---6

Effective time : reboot

Note : At default mode, the actual number of every axis corresponds to the silk screen number on the shell. If certain axis is abnormal, you can replace the axis through this function. For example, set P2.022 X physial Assign Num is 4 ,and 4 physial Assign Num<●> is 1, then, any operation to X axis will be the operation to A axis pulse port on the shell.

0: no any axis (no pulse output)

1~6: corresponding to 1#---6# axis

These parameters can be set dual drive .one axis is master ,the other is

slave . for example ,if dual X axis ,the <X physial Assign Num> is 1 ,then you can set <4 physial Assign Num > =1 ,that means the x axis is dual drive ,x axis port is master ,A axis is slave .

If set y axis dual drive ,the <Y physial Assign Num> is 2 , ,then you can set <4 physial Assign Num > =2 ,that means the Y axis is dual drive ,x axis port is master ,A axis is slave .

Other axis is similar

023	X Encoder bit(p)
	Y Encoder bit(p)
	Z Encoder bit(p)
	4 Encoder bit(p)
	B Encoder bit(p)
	C Encoder bit(p)

Range : 0～9999

Unit : P/R

Authority : Operation admin or higher

Default : 2500

Effective time : reboot

Note : Set the servo motor encoder rated P/R ,if the encoder is 2000p/r ,pls set these parameters 2000

024	X Reset to 360
	Y Reset to 360
	Z Reset to 360
	4 Reset to 360
	B Reset to 360
	C Reset to 360

Range : 0/1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : These parameters are invalid ,no need set

025	X PulseLogic Level<●>
	Y PulseLogic Level<●>
	Z PulseLogic Level<●>
	4 PulseLogic Level<●>

	B PulseLogic Level<●>
	C PulseLogic Level<●>

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : Set pulse logic level .If the setting is different from the logic level required by motor drive, one motor direction will have accumulative error during every forward and backward motion. Therefore, if finding that there is error in one direction, please check whether this parameter matches.

026	X feature(Rotate0 Line1)
	Y feature(Rotate0 Line1)
	Z feature(Rotate0 Line1)
	4 feature(Rotate0 Line1)
	B feature(Rotate0 Line1)
	C feature(Rotate0 Line1)

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 1

Effective time : reboot

Note : 0 is rotary

1 is linear

027	X Rolling Display Usage
	Y Rolling Display Usage
	Z Rolling Display Usage
	4 Rolling Display Usage
	B Rolling Display Usage
	C Rolling Display Usage

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 1

Effective time : instant

Note : Set the axis coordinate display format ,only when the axis works as totary ,then these parameters are valid

0: 0---360 degree

1 :-9999.999---9999.999 degree

028	X Rolling Path Optimize
	Y Rolling Path Optimize
	Z Rolling Path Optimize
	4 Rolling Path Optimize
	B Rolling Path Optimize
	C Rolling Path Optimize

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 1

Effective time : instant

Note : These parameters are valid only when the P2.026 AND P2.027 settings are 0 ,

set whether looking for shortest path automatically; if it is rotary axis and is positioning but doesn't process, enable this function to shorten the motion time.

0: disable 1: Enable

Note: If processing is required during the motion, the shortest path may be not your desired processing track.

029	Max Acc of X(Kpps)
	Max Acc of Y(Kpps)
	Max Acc of Z(Kpps)
	Max Acc of 4(Kpps)
	Max Acc of B(Kpps)
	Max Acc of C(Kpps)

Range : 100～8000

Unit : Kpps（Kilo Pulse Per Second）

Authority : Operation admin or higher

Default : 2000

Effective time : instant

Note : Set the maximum acceleration of each axis. This setting will affect the

track speed optimization of pretreatment to each axis. If a high value is set, the axis response time will be shortened and characteristics of the motor will be improved according to the machine tool.

This parameter also affects the home function and limit stop function.

Hard limit function: Use hard limit in software scanning mode, in which the hard limit decelerates and stops according to the maximum acceleration of this axis. Therefore, if this value is too high, the machine tool will stop in emergency, and if this value is too low, it will cause too much overshoot.

Home function: the home acceleration of every axis uses this valu

030	X Servo Home Dir
	Y Servo Home Dir
	Z Servo Home Dir
	4 Servo Home Dir
	B Servo Home Dir
	C Servo Home Dir

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : Only when the parameter P2.015 is enable,then these parameter are valid

0 is positive direction

1 is negtive direction

031	X Ext Home Eanble
	Y Ext Home Eanble
	Z Ext Home Eanble
	4 Ext Home Eanble
	B Ext Home Eanble
	C Ext Home Eanble

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : When mechanical home mode is selected, this parameter determines whether external deceleration switch should be searched. If this parameter is set to 0, and P2.015~P2.016 (servo Z phase enable) is also set to 0, the home mode sets current point as the home directly in mechanical mode.

0: disable

1: enable

032	X Encoder LogicDir<●>
	Y Encoder LogicDir<●>
	Z Encoder LogicDir<●>
	4 Encoder LogicDir<●>
	B Encoder LogicDir<●>
	C Encoder LogicDir<●>

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : if the logic direction obtained by the encoder is reverse to the actual motion direction of the axis, please set this parameter.

0: Positive

1: Negative

033	X HomeSpeed2
	Y HomeSpeed2
	Z HomeSpeed2
	4 HomeSpeed2
	B HomeSpeed2
	C HomeSpeed2
034	X HomeSpeed3
	Y HomeSpeed3
	Z HomeSpeed3
	4 HomeSpeed3
	B HomeSpeed3
	C HomeSpeed3

Range : 1～20000

Unit : mm/min

Authority : Operation admin or higher

Default : 100，60

Effective time : instant

Note : Used to set the speed parameters of mechanical home

035	X pitch compensate En
	Y pitch compensate En
	Z pitch compensate En
	4 pitch compensate En
	B pitch compensate En
	C pitch compensate En

Range : On/ off

Unit :

Authority : Operation admin or higher

Default : Off

Effective time : instant

Note : make the pitch compensate enable or disable,EN means the pitch compensate is effective ,off means the pitch compensate is ineffective

036	X axis pitch spacing(mm)
	Y axis pitch spacing(mm)
	Z axis pitch spacing(mm)
	4 axis pitch spacing(mm)
	B axis pitch spacing(mm)
	C axis pitch spacing(mm)

Range : 1～1000

Unit : mm

Authority : Operation admin or higher

Default : 10

Effective time : instant

Note : set pitch compensate spacing ,this setting for laser interferometer to measure the pitch error the normal setting is 10mm

037	X pitch com start pos(mm)
	Ypitch com start pos(mm)
	Z pitch com start pos(mm)
	4 pitch com start pos(mm)
	B pitch com start pos(mm)
	Cpitch com start pos(mm)

Range : -9999.999 ~ 9999.999

Unit : mm

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : when the pitch compensation is effective , set the compensation range.it can be 0---100mm or 10---120mm.or others , but the minimum should be more than pitch compensate spacing.so the start point can be 0 or other values

038	X pitch comp end pos(mm)
	Y pitch comp end pos(mm)
	Z pitch comp end pos(mm)
	4 pitch comp end pos(mm)
	B pitch comp end pos(mm)
	C pitch comp end pos(mm)

Range : -9999.999 ~ 9999.999

Unit : mm

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : when the pitch compensation is effective , set the compensation range. it can be 0---100mm or 10---120mm.or others , but the minimum should be more than pitch compensate spacing.so the end point can be any point

11.4 Management parameters (P3.)

001	Select SupMode
002	AlterSuperuserPasswor
003	Alter User Password

Range : none

Unit : none

Authority : Super mode

Default : none

Effective time : instant

Note : In this menu, type the password and press 'Insert'. If the password is valid, the system will enter this user mode;

After entering, this menu will turn into "XXX admin mode", indicating

entering successfully;

In the new menu, press the Insert key to exit the admin mode. To modify the parameter table at this moment, you need to enter the admin mode again;

The super user can modify all passwords, while the operation user only can modify the own password.

The default password is 0 and 1

004	Initialize
005	Initialize IO Config
006	all para reset<●>

Range : none

Unit : none

Authority : Ssuper mode

Default : none

Effective time : instant

Note : At super mode ,you can reset the parameters to default value

007	para backup
008	para recover

Range : none

Unit : none

Authority : Super mode

Default : none

Effective time : instant

Note : The parameters can be backed up and restored only in super user mode

The parameters are backed up to the sysconf.bak file in the root directory of the controller. If this folder already has a file with same name, the latest backup will overwrite this file.

The sysconf.bak file in the root directory is also used for restoring. During restoring, it will check whether the parameter versions are same according to the backed up parameter version; if not, the system won't restore the parameter table.

After restoring, the system will reboot automatically.

009	generate cryptogram

Range : none

Unit : none

Authority : Super mode

Default : none

Effective time : instant

Note : If you have forgotten the password, you can generate a PassMeg.DAT file with this function, provide this file to controller manufacturer and ask the manufacturer to reset the password.

010	menu click way

Range : 0～1

Unit : none

Authority : Super mode

Default : 0

Effective time : instant

Note : This function This function is to be developed,now it is invalid

011	clear add up work num
012	clear current work num

Range : none

Unit : none

Authority : Super mode

Default : none

Effective time : instant

Note : Clear the accumulated value of current processing pieces

013	clear current work num

Range : 0 ~ 999999

Unit : none

Authority : Super mode

Default : 0

Effective time : instant

Note : When the accumulated value of current processing pieces is same with this setting ,then the controller show alarm ,after the clear the P3.011 value ,then it can continue working

014	lead in CSV sys config

Range : none

Unit : none

Authority : Super mode

Default : none

Effective time : reboot

Note : Import the CSV system configuration of the manufacturer into the system

Usually ,the CSV file is auto tool change parameters or thr macro Parameters

015	startup display module

Range :

Unit : none

Authority : Operation admin or higher

Default : ABS

Effective time : instant

Note : Select default boot screen from absolute position, relative position and comprehensive position.after power on .

016	lead sys language bag

Range :

Unit : none

Authority : Operation admin or higher

Default : English

Effective time : reboot

Note : Select system language

Simplified Chinese

Traditional Chinese

English

017	macro key word valid En

Range : 0～1

Unit : none

Authority : Operation admin or higher

Default : 0

Effective time : reboot

Note : Macro keyword effective parameter is used to set whether the macro expression symbol on the membrane is valid

1: valid 0: invalid

018	startup picture display

Range : 0～6

Unit : none

Authority : Operation admin or higher

Default : 1s

Effective time : reboot

Note : Set the logo display mode ,if the setting is 0 ,then it should press any button to enter the system ,if the setting is not 0 ,that means it will delay the setting time ro enter the system .

019	sys display axis setting

Range :

Unit : none

Authority : Operation admin or higher

Default : XYZ

Effective time : instant

Note : Used to configure the display axis of current system, and different display combinations are available.

This configuration only show the content of the interface. If the axis function of the hardware exists, it still can output axis control during programming, but the axis status won't be displayed. The status such as axis limit and alarm will be ignored.

020	sys debug information En

Range : 0～1

Unit : none

Authority : Super user

Default : Off / 0

Effective time : Instantt

Note : Used to configure whether RS232 of current system outputs the testing info while program is running.

This parameter is dedicated for programmers, and the users are not suggested using this parameter.

If the testing info is enabled, the system performance will be lowered, and therefore it is disabled during normal processing.

If networking is enabled, this function must be disabled, or else the networking will fail.

021	axis control composite

Range : 0～1

Unit : none

Authority : Super user

Default : on / 1

Effective time : Instantt

Note : Used to configure whether the key for axis motion on the control panel is enabled.

If you want to edit macro program ,pls make this parameter enable (on),then you can input symbles (“[”,“]” ， “= ” and so on)

022	additional panel enable

Range : 0～1

Unit : none

Authority : Super user

Default : off / 0

Effective time : Instantt

Note : Used to set whether controller uses additional panel, which must be ADT matching additional panel, or compatible with the interface of same protocol.

If additional panel is used, the sys debug information En must be disable (P3.020).

023	M CODE select

Range : M-Func / user _Def

Unit : none

Authority : Super user

Default : M-Func

Effective time : reboot

Note : Used for setting M code

MFUNC: the default m code

User-def: use the m code define by youself

024	T code select <●>

Range : T-Func / user _Def

Unit : none

Authority : Super user

Default : T-Func

Effective time : reboot

Note : Used for setting the ATC function of the controller, which is achieved by calling T_FUNC.NC or not.

025	PLC select

Range : PLC / user _Def

Unit	:	none
Authority	:	Super user
Default	:	PLC
Effective time	:	reboot
Note	:	Used for making PLC function enable

026	Screen saver en

Range	:	0 ~ 1
Unit	:	none
Authority	:	Super user
Default	:	0
Effective time	:	reboot
Note	:	Used for setting the screen protection enable or not 1 is enable,if enable and there is no any operation in 1and half min,the controller will be protected(the screen is closed ,press nay key can make the screen normal) 0 is diable

027	Modbus Poll/Slave set

Range	:	Slave/ poll
Unit	:	none
Authority	:	Super user
Default	:	Slave
Effective time	:	Instant
Note	:	If the controller used for Modbus,then this parameter for setting the controller mainframe or slave Salve : the controller is set for slave Poll :the the controller is set for mainframe.

11.5 Tool magazine parameters (P4.)

These parameters are made according to the tool magazine type(the default parameters for linear tool magazine) ,and the parameters made by customers ,if you don't know how to make it ,pls contact ADTECH technical support engineer.

11.6 spindle parameters (P5.)

002	Spi.Alarm ELevel
003	Spi.Reset ELevel

004	Spi.ECZ Home Enable
005	Spi.ECZ Elevel
006	Spi. Limit+ Enable
007	Spi. Limit- Enable
008	Spi.Limit Elevel
009	Spi.Pulse Mode
010	Spi.Pulse Logic Mode
011	Spi.HomeDect ELevel
012	Spi.ExtHome Check En
013	Spi.Round Setting
015	Spi.ZeroOffset(p)
016	PulseLogic Level
017	Rolling Display Usage
018	Spi.Max Acc(Kpps)
019	Spi.Ext HomeDir
020	Spi.Servo HomeDir
022	Spi.Home Speed(rpm)
025	Spi.Encoder Logic Dir

Range :

Unit :

Authority : Operation admin or higher

Default :

Effective time : Instant

Note : Servo spinde motor parameters are same as normal servo motor parameters. If the spindle is controlled with servo port, you can set the function according to normal axis parameters.

001	Spindle assign port axis #

Range : 0～7

Unit :

Authority : Super user

Default : 0

Effective time : reboot

Note : 0 : it is analog output (±10V for controlling VFD)

1---6 ： corresponding to 1#---6# axis

7：servo spindle port, the servo spindle motor which is special for ATC function

The default setting is 0 ,that means it is VFD control mode .if you want to

use servo spindle (servo motor controlled with pulse mode),then you can set this parameter and set one axis pulse output for spindle pulse port .

Note :if you set one axis pulse port for spinlde pulse prot ,pls change the one axis pulse port parameter.

For example, set P2.022 X physial Assign Num is 4 ,and 4 physial Assign Num<●> is 1, then, any operation to X axis will be the operation to A axis pulse port on the shell.

0: no any axis (no pulse output)

1~6: corresponding to 1#---6# axis

014	Spi.Encode bits(p)

Range : 0～5000

Unit :

Authority : Operation admin or higher

Default : 2500

Effective time : Instant

Note : This setting is the encoder line of spindle motor

This parameter will affect G74 and G84 tap instructions. Please set it properly.

021	Spi.Encode bits(p)

Range : 0～30000

Unit :

Authority : Operation admin or higher

Default : 24000

Effective time : instant

Note : This setting is used to calculate the analog output of the controller, and suppose that the analog of variable frequency control is in linear control mode;

This method is to set the motor speed corresponding to analog 10V, input the motor rated speed directly, while the controller will output corresponding analog voltage according to this setting. Only this setting is right then the controller can output correctly speed value

023	Spi.Encode bits(p)
024	Spi.Gear Numerator

Spi.Gear : 0～65535

Denominator

Unit :

Authority : Operation admin or higher

Default : 1

Effective time : instant

Note : If the spinde installed with gear ratio ,pls input the gear ratio value to these parameters ,noramlly ,these parameters are invalid ,but maybe it is used for certain special application

026	Spi Open Delay time(ms)

Range : 0～10000

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : After spindle start running ,there is a delay for spindle getting the speed then work the next codes.

027	Servo spindle ready level
028	Servo spi stop pos level
029	Servo spi zero speed level
030	Sv spi speed reach level

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : These signals are used for ATC function ,pls refer the servo spindle user manual and set the signal level

031	Sys current speed

Range : 1～24000

Unit : RPM/MIN

Authority : Operation admin or higher

Default : 6000

Effective time : instant

Note : Set the spindle speed

032	M30 close spi En

Range : 0～1

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : 0 : when the controller execute M30 code ,the spindle don't stop

1: when the controller execute M30 code ,the spindle stop immediately

033	Spi Minimum speed

Range : 100 ~ 100000

Unit : RPM/MIN

Authority : Operation admin or higher

Default : 100

Effective time : instant

Note : Set spinde the Min speed

034	Second spi Maximum speed

Range : 1 ~ 100000

Unit : RPM/MIN

Authority : Operation admin or higher

Default : 24000

Effective time : instant

Note : There are two aalong outputs port for spindle ,set the 2nd spindle the Max speed

035	Second spi speed

Range : 1 ~ 24000

Unit : RPM/MIN

Authority : Operation admin or higher

Default : 24000

Effective time : instant

Note : set the 2nd spindle the speed

036	Spi code command invalid

Range : OFF/ ON

Unit :

Authority : Operation admin or higher

Default : Off

Effective time : instant

Note : ON: when execute M03 s**** ,the s value is invalid .the spindle works as the speed of P5.031 setting

The 2nd spindle output commad is

037	Machine spi one speed
038	Machine spi two speed
039	Machine spi three speed
040	Machine spi four speed

Range : 1 ~ 1000000

Unit : RPM/MIN

Authority : Operation admin or higher

Default : 24000

Effective time : instant

Note : These parameters for lathe machine ,no need set it

041	Spindle stop delay(ms)

Range : 1 ~ 24000

Unit : ms

Authority : Operation admin or higher

Default : 24000

Effective time : instant

Note : When the spindle execute stop command ,there is a delay for spindle stop ,the delay time is this parameter setting .

11.7 Port configuration (P6.)

001	Tool Checking signal in
…	…
049	X---C Servo En input

Range : 0 ~ 23

Unit :

Authority : Operation admin or higher

Default :

Effective time : instant

Note : Assign input or output for each functional ports ,the input or output ports rang is 0—23 ,pls input the number directly ,and the input or output can not be repeated

If you want to shield this functional prot ,pls input 8888,then press EOB the setting will be "=========="

050	Input check level 00--31
051	Input check level 32--63

052	Input check level 64--95

Range : 0x00000000～0xFFFFFFFF

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : Used for setting the IO diagnosis level ,0 is low level ,1 is high level

Adopt binary system to configurating the input port level

For example , P6.050: 10 , then the binary dihgit is 00000000 00000000 00000000 00001010；

That means in the IN32 ~ IN6 input ports ,the IN33 IN35 diagnosis level is high level ,and others are low level

053	IO Conf Reset 00--31
054	IO Conf Reset 32--63
055	IO Conf Reset 64--95

Range : 0x00000000～0xFFFFFFFF

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : Used for closing the outputs when reset alarm

0 :keep before status 1: close this output

For example , P6.053: 10 , then the binary dihgit is 00000000 00000000 00000000 00001010；

That means when press “RESET” buuton to reset the alarm ,the output OUT33 OUT35 will be closed ,and others output will keep before status

056	Led Reset 0--31
057	Led Reset 32--63
058	Led Reset 64--95

Range : 0x00000000～0xFFFFFFFF

Unit :

Authority : Operation admin or higher

Default : 0

Effective time : instant

Note : Used for closing panel LED outputs when reset alarm

0 :keep before status 1: close this output

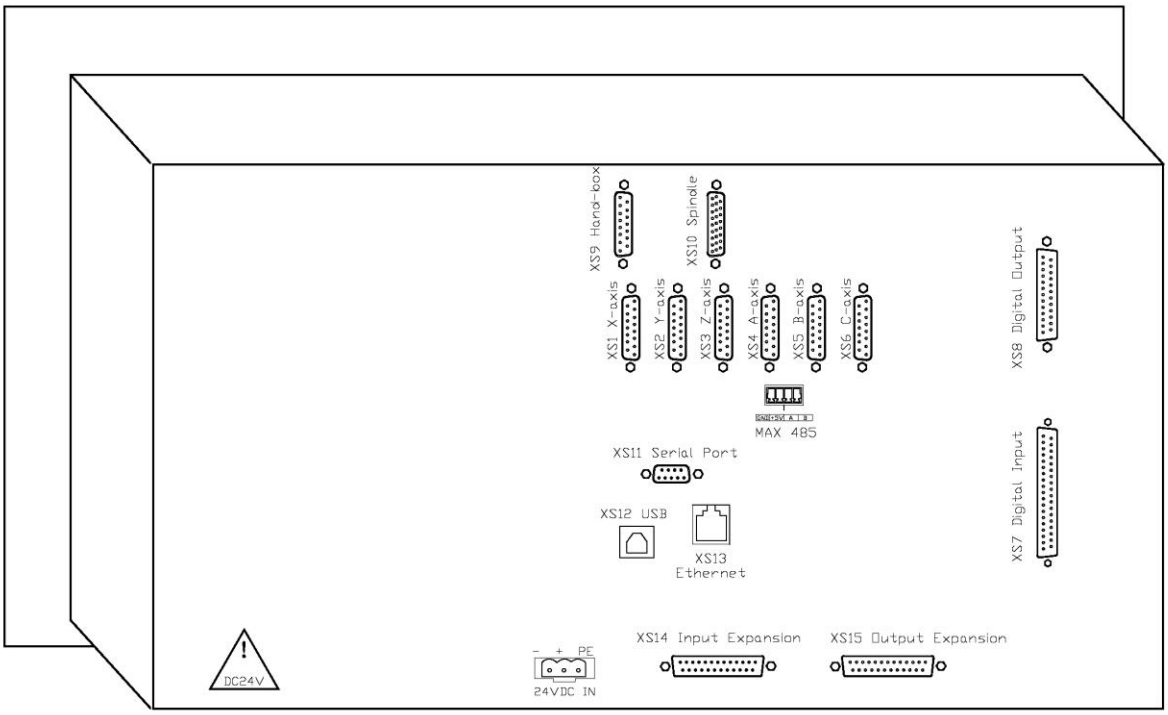
For example , P6.056: 10 , then the binary dihgit is 00000000 00000000 00000000 00001010；

That means when press “RESET” buuton to reset the alarm ,the output LED33 LED35 will be closed ,and others output will keep before status

12 interface definition and connection

12.1 Interface definition

12.1.1. 49 series controller interface



1:X---C axis pulse port

15 pins connector is used for connecting to stepper driver or servo driver

2:XS7 input port

37 pins input card board ,for connecting limit ,home and other input signals .

3:XS8 output port

25 pins output card board ,for all output signals

4:USB port ,it's for exchaging files and other functions

5:24v power input port , Internal power consumption is 5W

6:XS9 ,MPG input port

7: **XS10 spindle port**

26 pins connector for spindle inputs and outouts

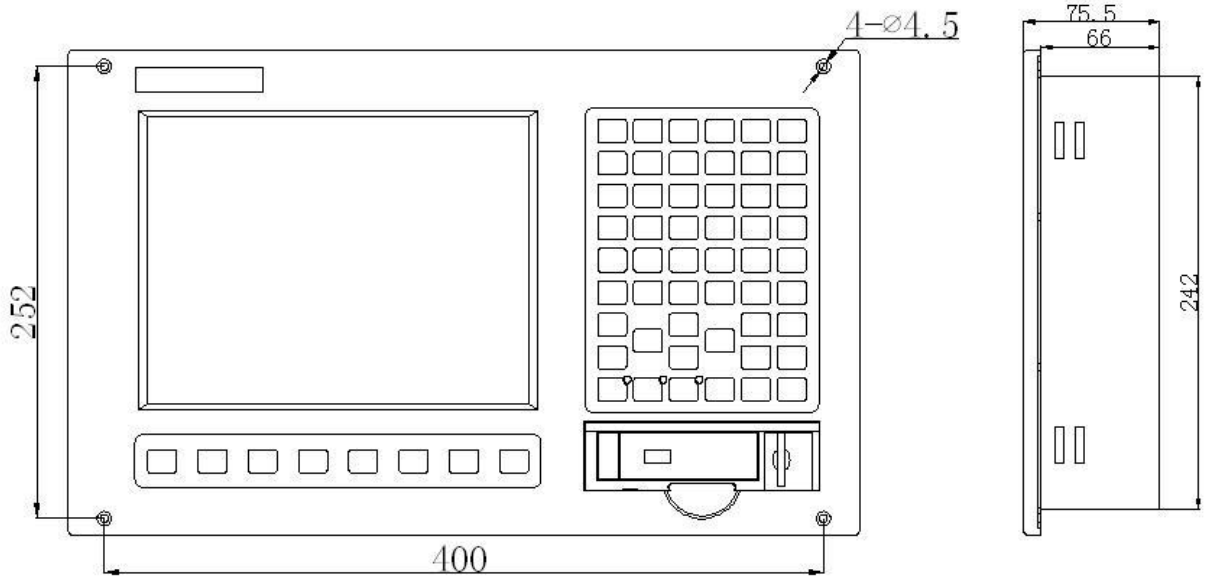
8: XS14 expand input port

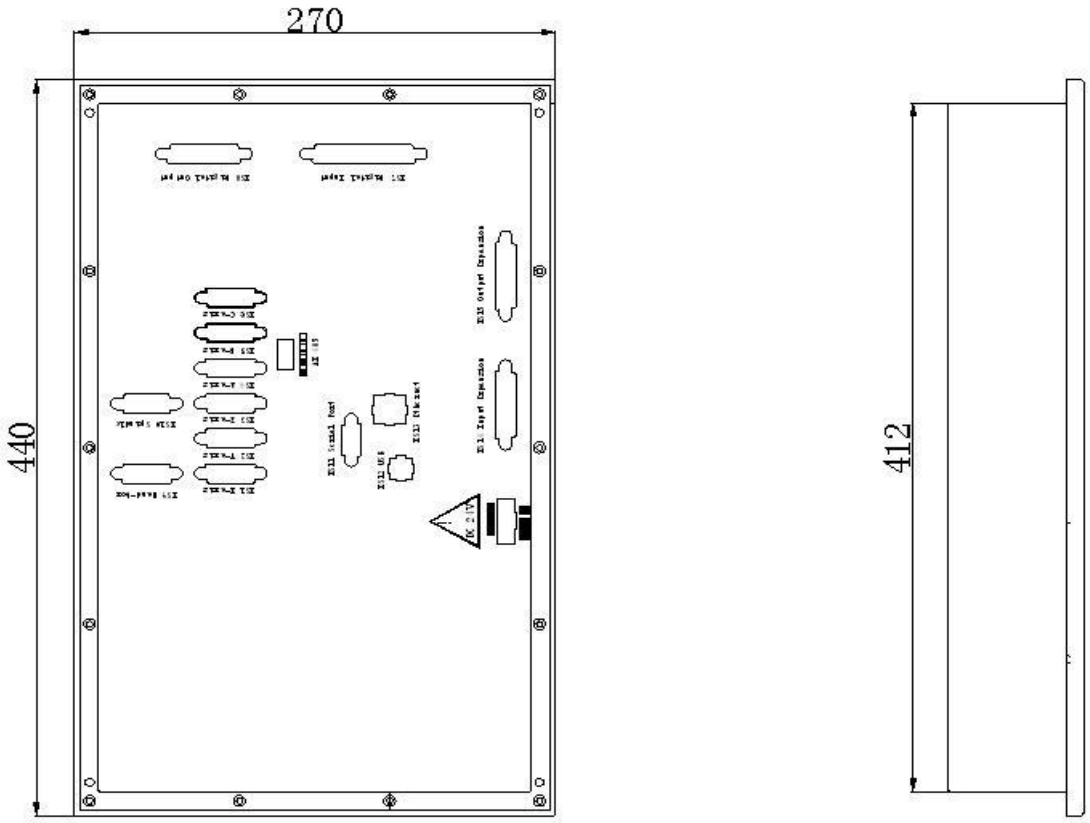
25 pins input card board for expand input signals

9:XS15 expand output

25 ins output card board for expand output signals

12.1.2. 49serise Mounting dimensions





12.1.3. Installation precautions

Installation condition for electric cabinet

⑴ The cabinet must be able to effectively prevent dust, coolant and organic solution entering;

⑵ When design electric cabinet, the distance between rear cover and case should be at least 20CM; considering the temperature rises in the cabinet, the temperature difference between interior and exterior of the cabinet shouldn't exceed 10℃;

⑶ The cabinet should be installed with fan to ensure interior ventilation;

⑷ The panel should be installed at the position can't be sprayed by the coolant;

⑸ When design electric cabinet, the external electrical interference should be reduced to lowest to prevent interfering with the system;

To prevent interference

The system is designed with anti-interference measures such as shielding space electromagnetic radiation, absorbing impact current and filtering power clutter, which can prevent interference with the system. To ensure system stability, please take the following measures

⑴ CNC must be kept away from the equipment with interference (e.g. inverter, AC contactor, electrostatic generator, high voltage generator, and sub-unit of power lines), and the SMPS should be connected to a filter to improve the anti-interference of controller(as in Fig. 1-7)

⑵ the supply power of controller should from isolation transformer, and the machine must be ground, controller and drive must be connected to separate ground point .

The measures of anti-interference

Connect RC circuit (0.01μF, 100~200Ω, as in Fig. 1-5) to both sides of AC contactor coil,RC circuit should be installed close to inductive load; connect freewheeling diode reversely on both sides of DC coil (as in Fig.1-6); connect surge absorber to the winding of AC motor (as in Fig. 1-7).

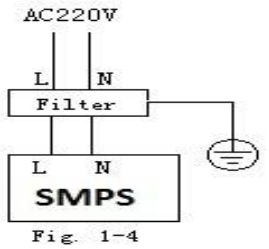


Fig. 1-4

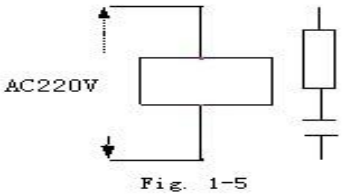


Fig. 1-5

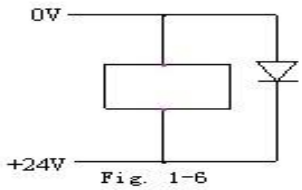


Fig. 1-6

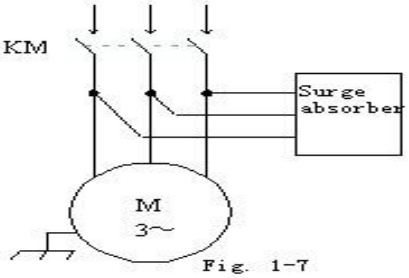
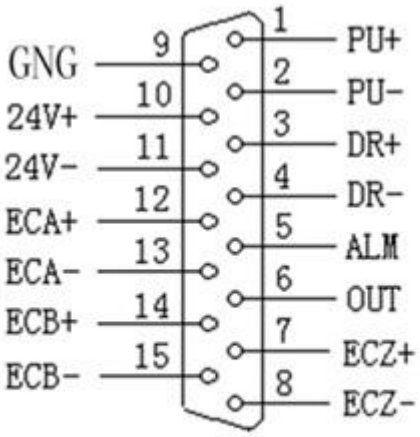


Fig. 1-7

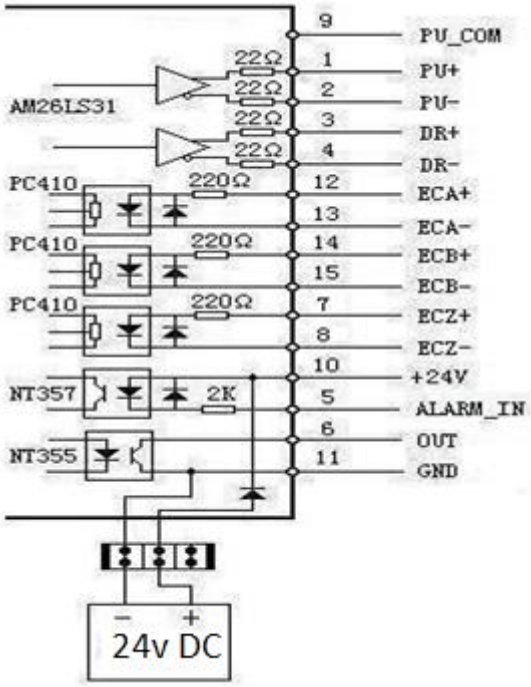
12.2 Port definition

12.2.1 pulse port (XS1---XS6)

There are 4 pulse ports (XS1---XS4)on cnc4940 ,6 pulse ports on CNC4960 (XS1---XS6)



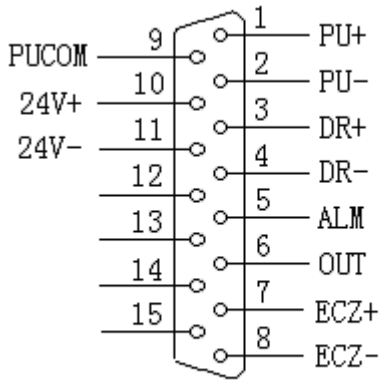
49 serise pulse port definition



Pulse port internal circuit

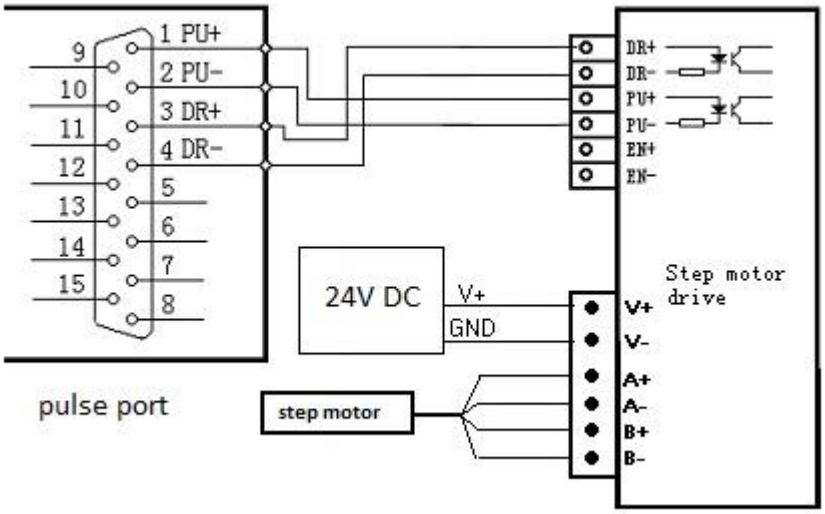
Pin No.	Definition	Function
1	PU+	Pulse signal +
2	PU-	Pulse signal -
3	DR+	Direction signal +
4	DR-	Direction signal -
5	ALM	Servo alarm signal input(low logic)
6	OUT	Axis alarm reset output signal
7	ECZ+	Encoder phase Z input +
8	ECZ-	Encoder phase Z input -
9	PUCOM	5V DC
10	24V+	Internal 24V power supply, directly connected to 24V power supply of the controller
11	24V-	
12	ECA+	Encoder phase A input +
13	ECA-	Encoder phase A input -
14	ECB+	Encoder phase B input +
15	ECB-	Encoder phase B input -

If the pulse cables supplied by ADTECH ,the standard wire diagram is as below



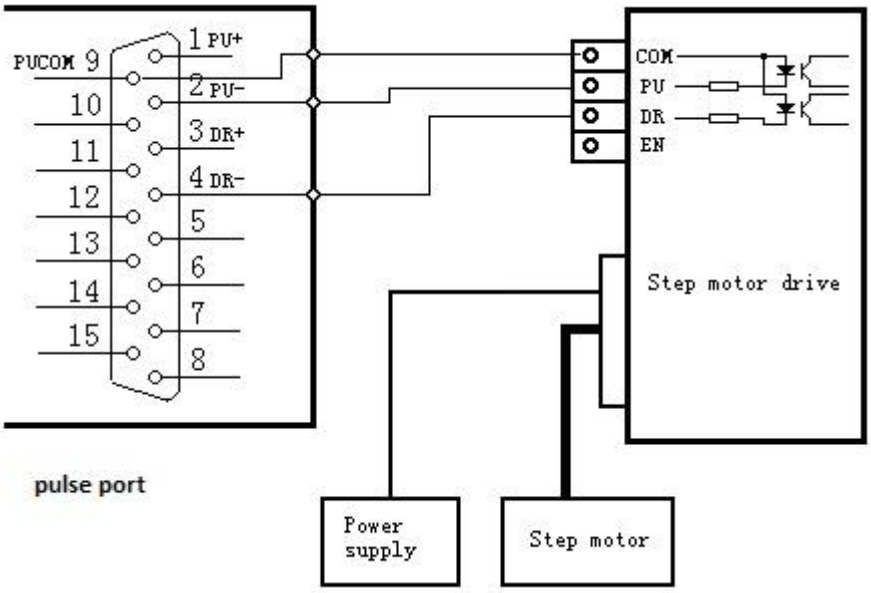
Connect to step driver with differential input (sample 1)

Adtech step drive for reference ,which use differential input mode ,this mode is strong anti-interference,so it is recommended,the connection is as below



Connect to step driver with differential input (sample 2)

Some companies connect together the optocoupler input cathodes of step drives, i.e. common cathode connection, which isn't suitable for CNC controller. Common anode connection connects together the anodes of optocoupler input. The wiring shall follow the figure below, and do not connect PU+ and DR+ together, or else the pulse interface may be damaged.



Connect to servo drive

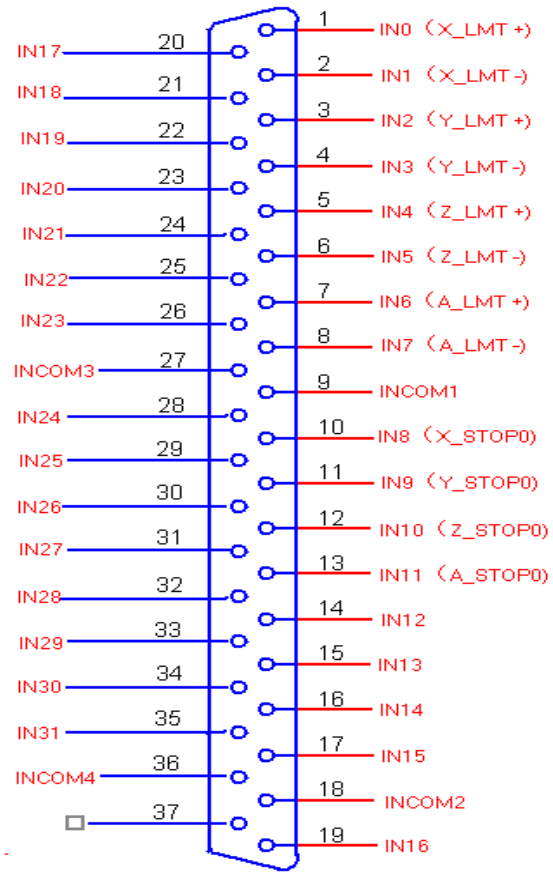
Most of servo drives are differential input,,so you can refere the above diagram (Connect to step driver with differential input (sample 1),and most of servo drive need 24VDC for input and output ,then you can connect pin 10 and p11 to servo driver directly (pin 10 and p11 are 24v power supply ,pin10 –24V+,pin11—24V-)

Caution

Either two of PU+, PU-, DR+ and DR- shouldn't be connected, or else the pulse port may be damaged.

12.2.2 Input port(XS7)

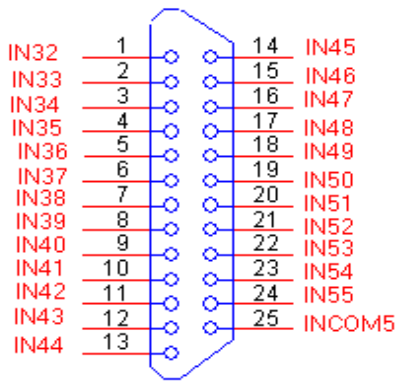
It include all axis limit inputs signal and other signal ,the definition as below



37pin plug pin NO.	**definition**	**function**	**9163 input board**
1	IN0（X_LMT+）	X axis limit+	IN00
2	IN1（X_LMT-）	X axis limit-	IN01
3	IN2（Y_LMT+）	Y axis limit+	IN02
4	IN3（Y_LMT-）	Y xis limit-	IN03
5	IN4（Z_LMT+）	Z axis limit+	IN04
6	IN5（Z_LMT-）	Z xis limit-	IN05
7	IN6（A_LMT+）	A axis limit+	IN06
8	IN7（A_LMT-）	A xis limit-	IN07
9	INCOM1	24v+	24V+
10	IN8（X_STOP0）	X home point	IN08
11	IN9（Y_STOP0）	Y home point	IN09
12	IN10（Z_STOP0）	Z home point	IN10

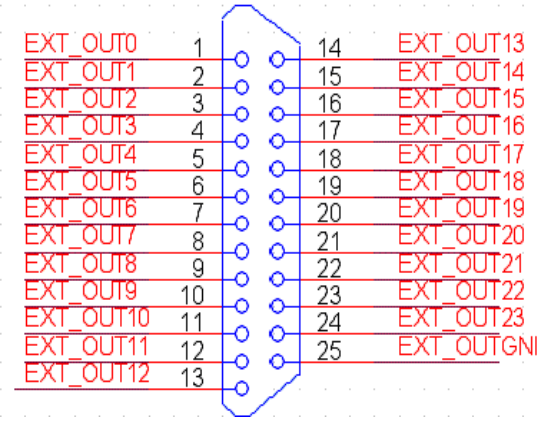
13	IN11（A_STOP0）	A home point	IN11
14	IN12(B_STOP0)	B home point	IN12
15	IN13(C_STOP0)	C home point	IN13
16	IN14	Standy by	IN14
17	IN15	Standy by	IN15
18	INCOM2	24v+	24V+
19	IN16	B axis limit+	IN16
20	IN17	B xis limit-	IN17
21	IN18	C axis limit+	IN18
22	IN19	C xis limit-	IN19
23	IN20	Standy by	IN20
24	IN21	Standy by	IN21
25	IN22	Standy by	IN22
26	IN23	Standy by	IN23
27	INCOM3	24v+	24V+
28	IN24	Standy by	IN24
29	IN25	Standy by	IN25
30	IN26	Standy by	IN26
31	IN27	Standy by	IN27
32	IN28	Standy by	IN28
33	IN29	Standy by	IN29
34	IN30	Standy by	IN30
35	IN31	Standy by	IN31
36	INCOM4	24v+	24V+
37			

XS14 expand input port ,the port definition as below



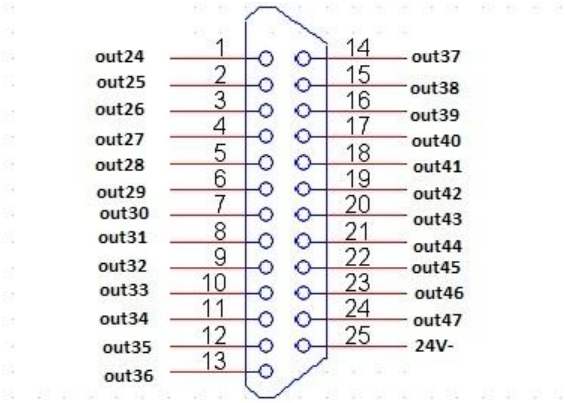
Pin NO.	definition	function
1	IN32	Standy dy
2	IN33	Standy dy
3	IN34	Standy dy
4	IN35	Standy dy
5	IN36	Standy dy
6	IN37	Standy dy
7	IN38	Standy dy
8	IN39	Standy dy
9	IN40	Standy dy
10	IN41	Standy dy
11	IN42	Standy dy
12	IN43	Standy dy
13	IN44	Standy dy
14	IN45	Standy dy
15	IN46	Standy dy
16	IN47	Standy dy
17	IN48	Standy dy
18	IN49	Standy dy
19	IN50	Standy dy
20	IN51	Standy dy
21	IN52	Standy dy
22	IN53	Standy dy
23	IN54	Standy dy
24	IN55	Standy dy
25	INCOM5	24v+

12.2.3 Output port (XS8)



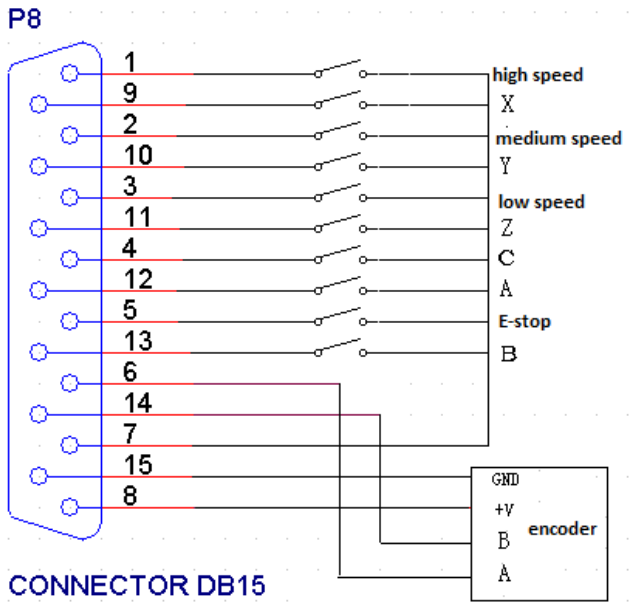
Pin NO.	Definition	Function
1	OUT0	Spinde CW(M03)
2	OUT1	Spinde CCW (M04)
3	OUT2	M10、M11
4	OUT3	M12、M13
5	OUT4	Cooling (M08、M09)
6	OUT5	Lubricating(M32、M33)
7	OUT6	(M14、M15)
8	OUT7	(M16、M17)
9	OUT8	(M18、M19)
10	OUT9	(M20、M21)
11	OUT10	(M22、M23)
12	OUT11	(M24、M25)
13	OUT12	(M26、M27)
14	OUT13	(M28、M29)
15	OUT14	(M30、M31)
16	OUT15	(M34、M35)
17	OUT16	(M36、M37)
18	OUT17	(M38、M39)
19	OUT18	(M40、M41)
20	OUT19	(M42、M43)
21	OUT20	(M44、M45)
22	OUT21	(M46、M47)
23	OUT22	(M48、M49)
24	OUT23	(M50、M51)
25	24V-	OUTGND24V-

XS15 expand input port ,the port definition as below



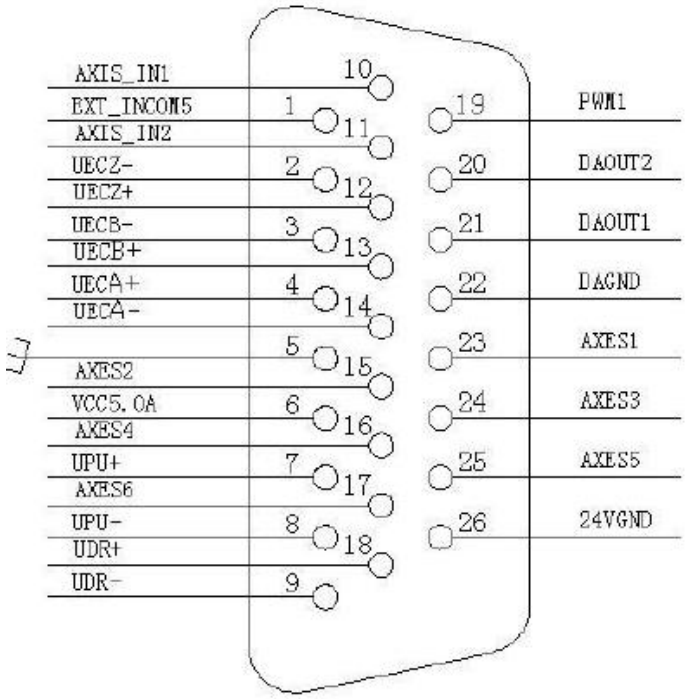
Pin NO.	definition	Function
1	OUT24	(FCNC6D panel F6 M52、M53)
2	OUT25	(FCNC6D panel F7 M54、M55)
3	OUT26	(FCNC6D panel F8 M56、M57)
4	OUT27	(FCNC6D panel F9 M58、M59)
5	OUT28	(FCNC6D panel F10 M60、M61)
6	OUT29	(FCNC6D panel F11 M62、M63)
7	OUT30	(FCNC6D panel F12 M64、M65)
8	OUT31	(FCNC6D panel F13 M66、M67)
9	OUT32	(standy by M68、M69)
10	OUT33	(standy by M70、M71)
11	OUT34	(standy by M72、M73)
12	OUT35	(standy by M74、M75)
13	OUT36	(standy by M76、M77)
14	OUT37	(standy by M78、M79)
15	OUT38	(standy by M80、M81)
16	OUT39	(standy by M82、M83)
17	OUT40	(standy by M84、M85)
18	OUT41	(standy by M86、M87)
19	OUT42	(standy by M90、M91)
20	OUT43	(standy by M92、M93)
21	OUT44	(standy by M94、M95)
22	OUT45	(standy by M96、M97)
23	OUT46	(standy by M98、M99)
24	OUT47	(standy by M100、M101)
25	24V-	OUTGND24V-

12.2.4 MPG port



Pin NO.	Definition	Function
1	IN63	0.1 --- High speed
2	IN64	0.01 --- Medium speed
3	IN65	0.001 --- Low speed
4	IN60	Start
5	IN61	Stop
6	HA	Handwheel Aphase
7	24V-	Internal 24V-
8	5V+	Internal 5V+
9	IN56	X axis
10	IN57	Y axis
11	IN58	Z axis
12	IN59	A axis
13	IN62	E-stop
14	HB	Handwheel B phase
15	5V-	Internal 5V-

12.2.5 Spindle port



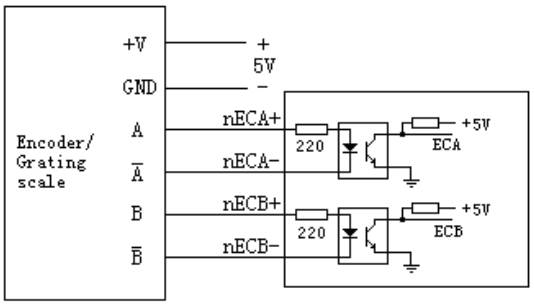
Pin NO.	Definition	Function
1	EXT-INCOM5	24V+
2	UECZ-	Spindle encoder Z-
3	UECB-	Spindle encoder B-
4	UECA+	Spindle encoder A+
5	EXT_GNDA	Spindle encoder 5V-
6	EXTVCC5.0A	Spindle encoder 5V+
7	CDR-	Spindle pulse port DR-
8	CDR+	Spindle pulse port DR+
9	CPU-	Spindle pulse port PU-
10	AXIS_IN1	Spindle alarm input 1
11	AXIS_IN2	Spindle alarm input 2
12	UECZ+	Spindle encoder Z+
13	UECB+	Spindle encoder B+
14	UECA-	Spindle encoder A-
15	AXIS 2	Spinde out2 (CCW)
16	AXIS 4	Spinde out4
17	AXIS 6	Spinde out6
18	CPU+	Spindle pulse port PU+
19	PWM	PWM output

20	DAOUT2	2nd analog output (0—10V)
21	DAOUT1	1st analog output (0—10V)
22	DAGND	Analog output GND
23	AXIS 1	Spinde out1(CW)
24	AXIS 3	Spinde out3
25	AXIS 5	Spinde out5
26	24V-	24V-

- AB phase input allows differential connection and common anode connection, which will be determined by the encoder type

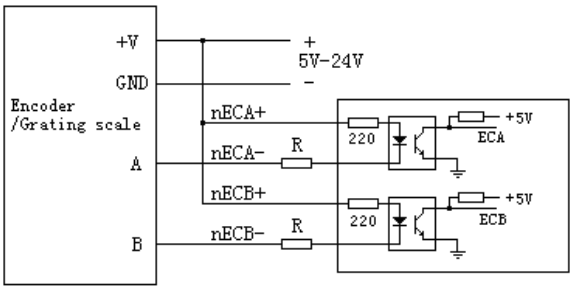
As shown in the figure below, differential input connection and common anode connection

Differential connection follows:



5V power supply should be external

Common anode connection follows:



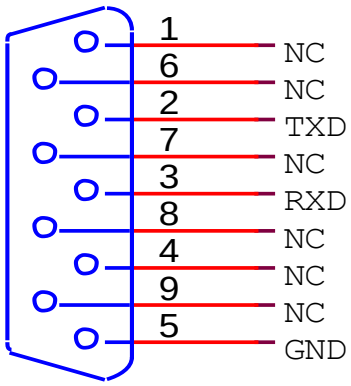
The power supply is determined by encoder. If 5V power supply is used, resistor R will be unnecessary. For 12V power supply, please use 1K-2K resistor, and for 24V power supply, please use 2K-5K resistor.

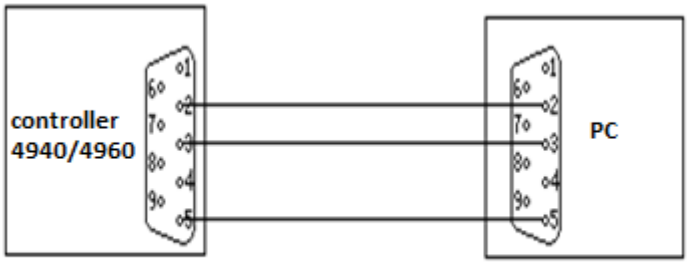
Suggestion:

Please use differential connection to ensure better anti-interference when the conection wires arelong.

12.2.6 RS232 port definition

RS232 communication port ---9 pins plug (male)





RS232 communication

12.2.7 USB memory (flash drive) port ---XS10

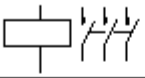
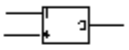
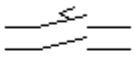
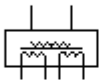
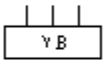
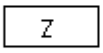
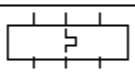
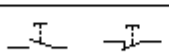
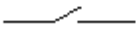
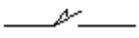
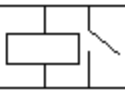
It is standard flash drive port

12.2.8 PC USB port ---XS11

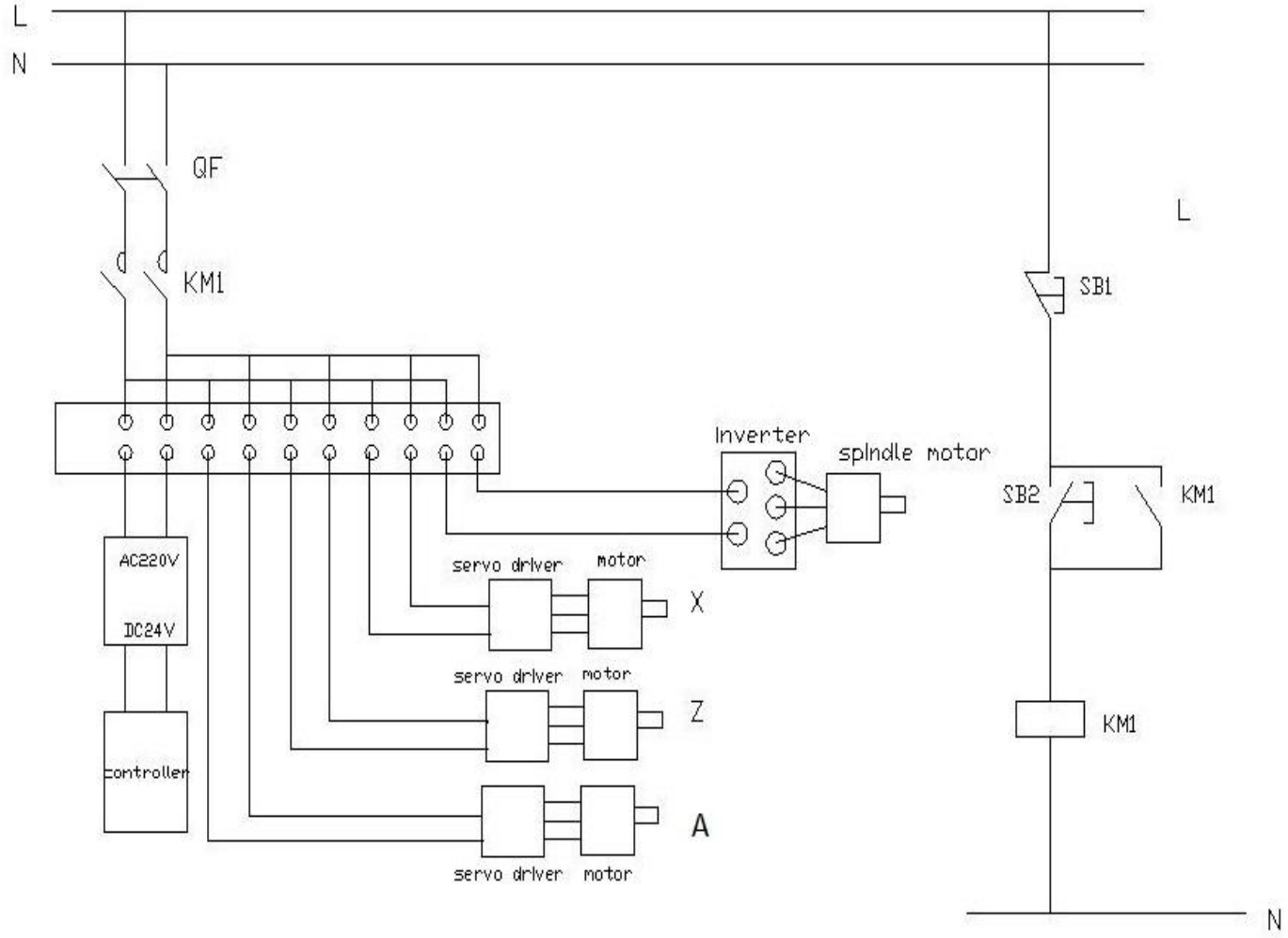
It is standard USB communication port

12.3 Electrical connection diagram

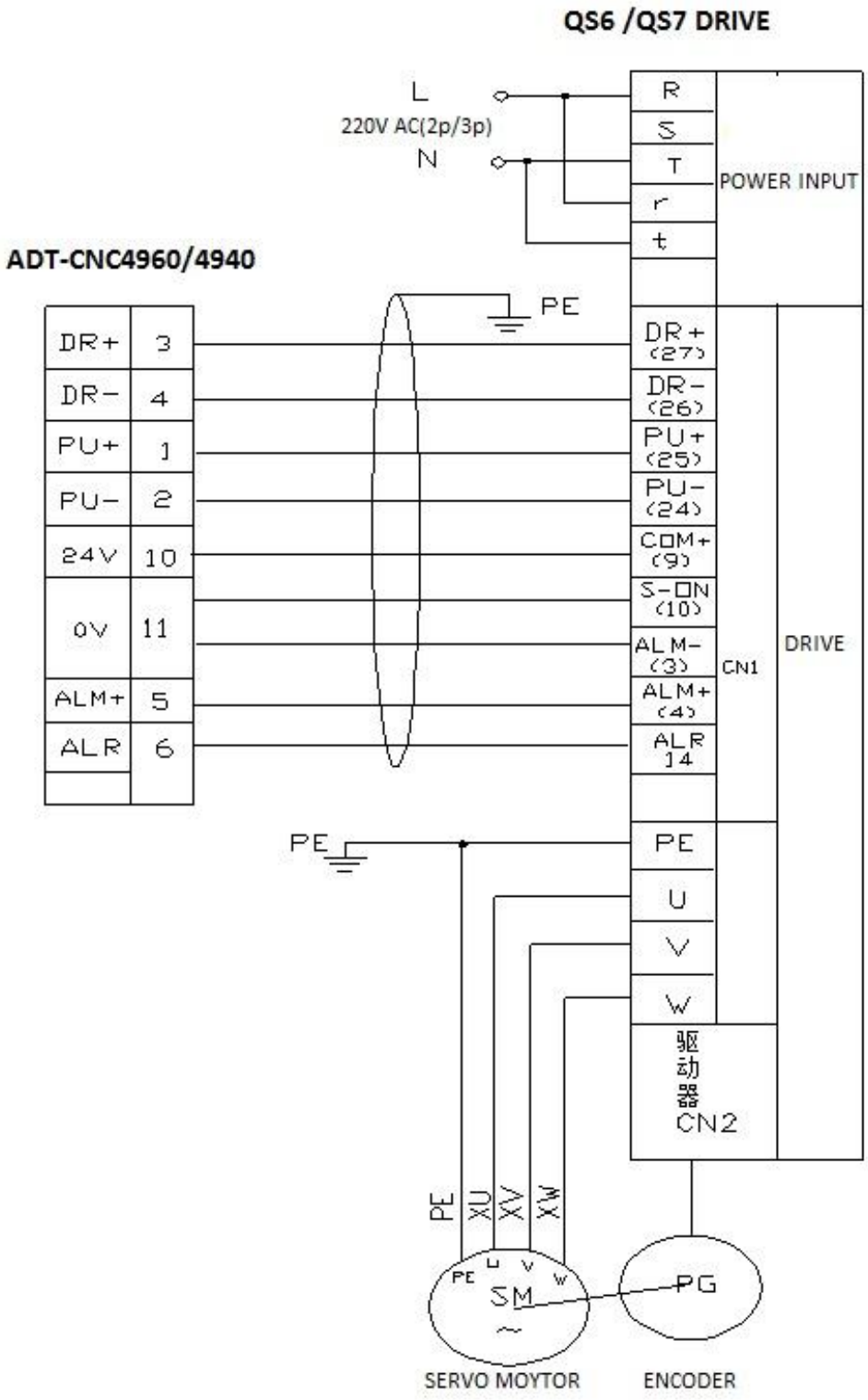
12.3.1 Electrical Symbol

Symbol	Name	Figure	Symbol	Name	Figure
QF	Breaker		SM	Servo motor	
KM	Contactor		M	Step motor	
UF	Inverter		SQ	Approach switch	
M	Motor		SA	Foot switch	
TC	Transformer		YB	Motor brake	
Z	Filter		FR	Thermal relay	
FU	Fuse		UC	Switching power supply	
SB	Button		YV	Electromagnetic valve	
FM	Fan		C	Capacitor	
HL	Indicator		R	Resistor	
QS	Touch switch		QS	Travel switch	
PG	Encoder		KA	Relay	

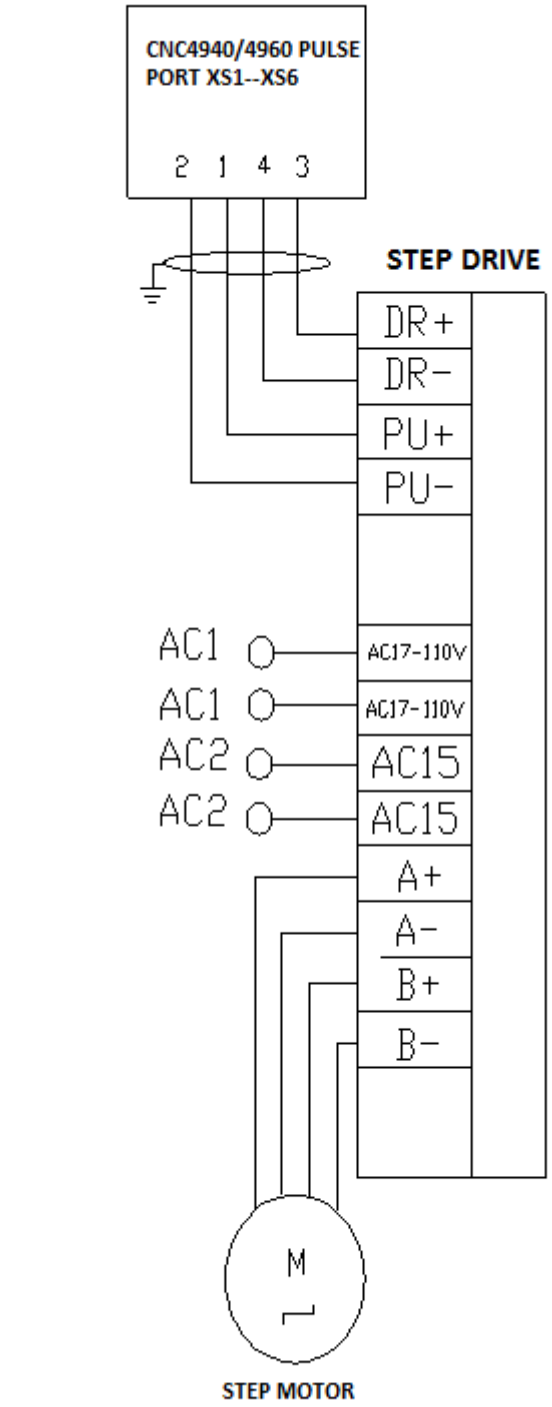
12.3.2 Main Power connection diagram



12.3.3 Servo drive connection diagram

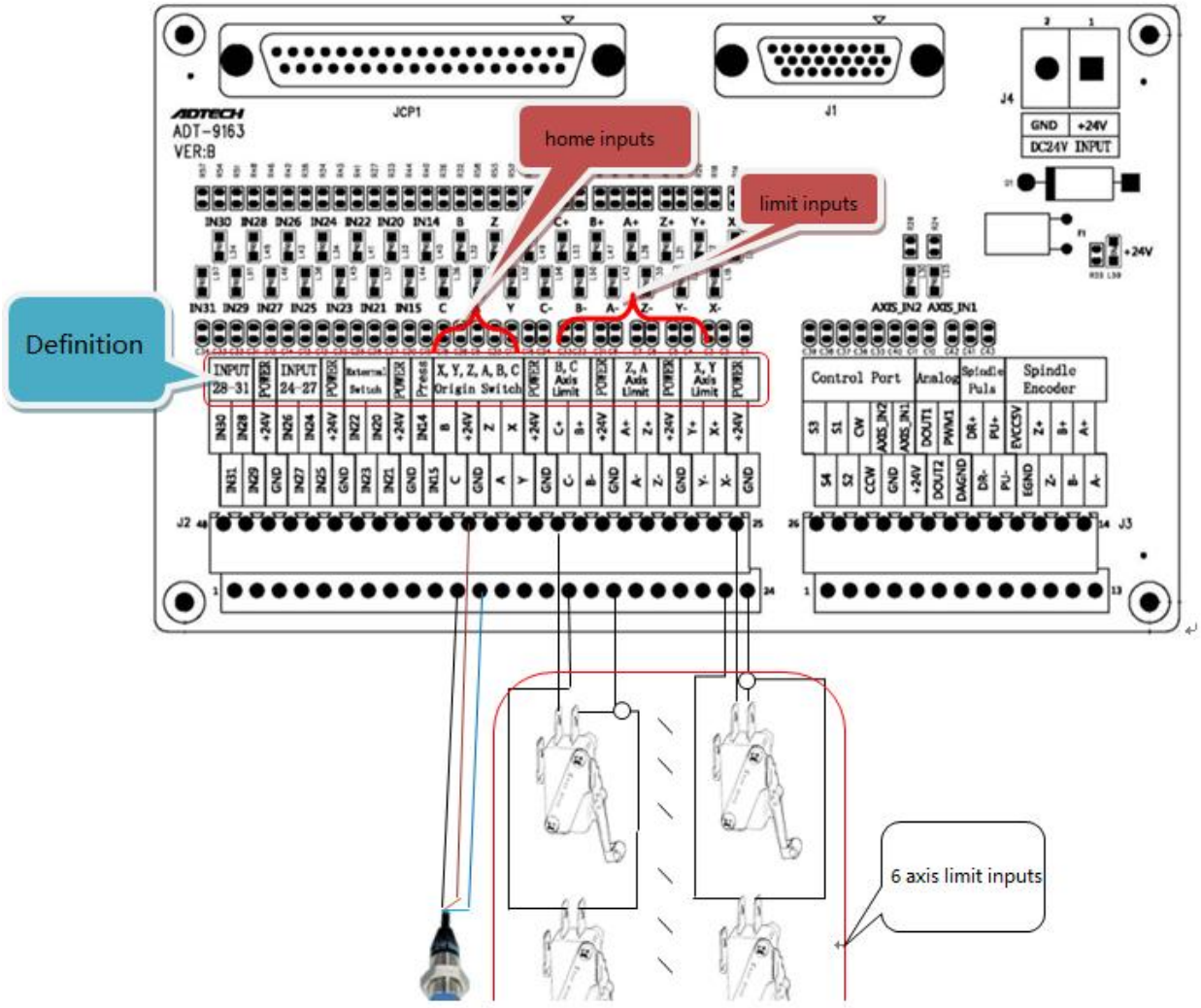


12.3.4 Step connection diagram



ADT-CNC4960/4940 CONNECT TO STEP DRIVE

12.3.5 ADT9163 PCB board



Note :the 24V and GND are the power supply for the limit and home sensors .the MAX current output is 200MA

ADT9163 definition chart

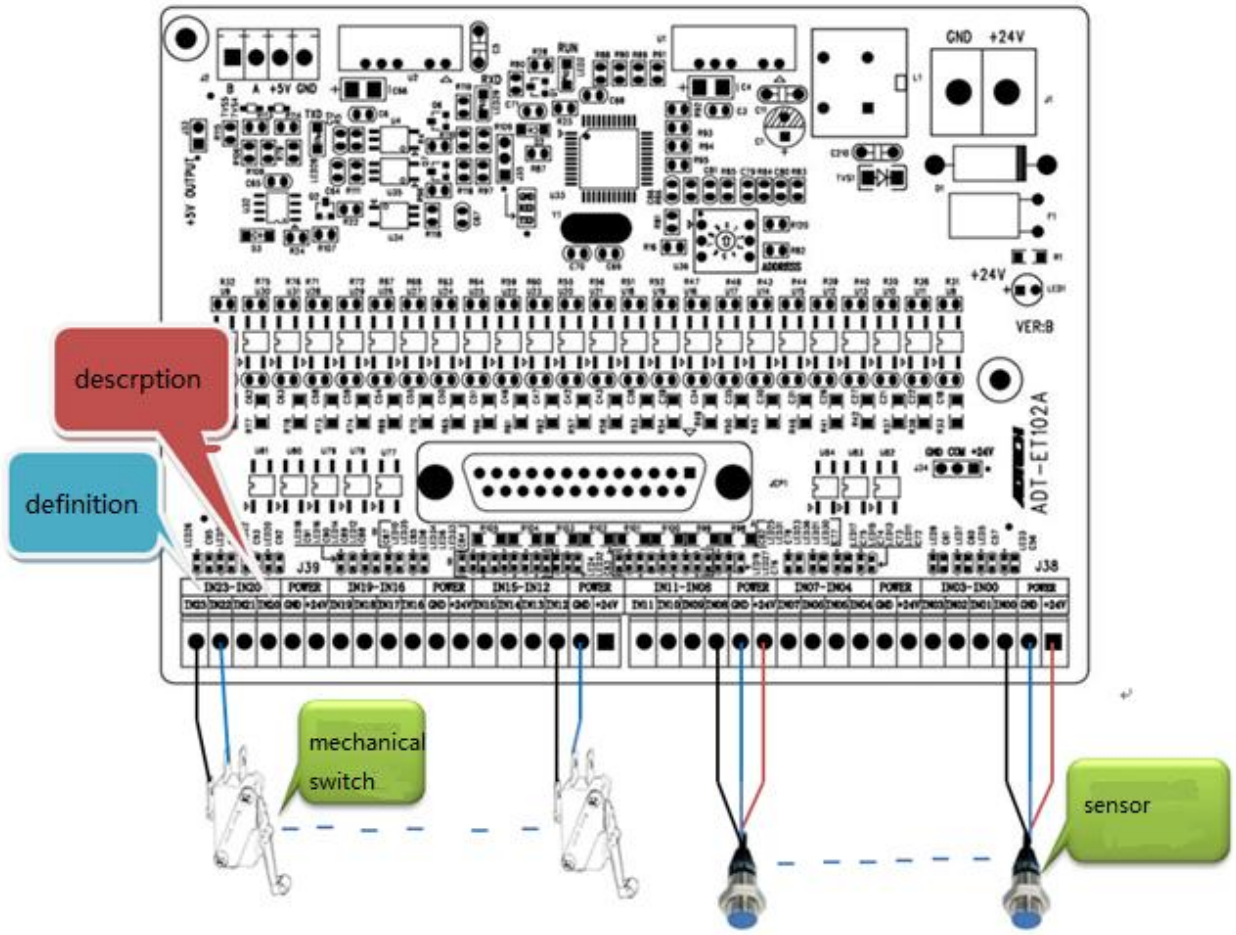
Port	region	definition	function
J2	POWER	24V+	24V+
J2		GND	24V-
J2	X， Y Axis Limit	X+	X+ limit
J2		X-	X- limit
J2		Y+	Y+ limit
J2		Y-	Y- limit
J2	POWER	24V+	24V+
J2		GND	24V-

J2	Z，A Axis Limit	Z+	Z+ limit
J2		Z-	Z- limit
J2		A+	A+ limit
J2		A-	A- limit
J2	POWER	24V+	24V+
J2		GND	24V-
J2	B，CAxis Limit	B+	B + limit
J2		B-	B - limit
J2		C+	C + limit
J2		C -	C - limit
J2	POWER	24V+	24V+
J2		GND	24V-
J2	X,Y,Z,Z Origin Switch	X	X home
J2		Y	Y home
J2		Z	Z home
J2		A	A home
J2	POWER	24V+	24V+
J2		GND	24V-
J2	B , C Origin Switch	B	B home
J2		C	C home
J2	Press	IN14	air-pressure detection
J2		IN15	Vacuum detection
J2	POWER	24V+	24V+
J2		GND	24V
J2	External Switch	IN20	External switch 1
J2		IN21	External switch 2
J2		IN22	External switch 3
J2		IN23	External switch 4
J2	POWER	24V+	24V+
J2		GND	24V-
J2	INPUT24-27	IN24	IN24
J2		IN25	IN25
J2		IN26	IN26
J2		IN27	IN27
J2	POWER	24V+	24V+

J2		GND	24V-
J2	INPUT28-31	IN28	IN28
J2		IN29	IN29
J2		IN30	IN30
J2		IN31	IN31
J3	Spindle Encoder	A+	Spindle encoder A＋
J3		A-	Spindle encoder A－
J3		B+	Spindle encoder B＋
J3		B-	Spindle encoder B－
J3		Z+	Spindle encoder Z＋
J3		Z-	Spindle encoder Z－
J3		EVCC5V	Spindle encoder power supply 5V+
J3		EGND	Spindle encoder power supply 0V
J3	S pindle Pulse	PU+	Spindle PU+
J3		PU-	Spindle PU-
J3		DR+	Spindle DR+
J3		DR-	Spindle DR-
J3	Analog	PWM1	PWM1
J3		DAGND	Analog output GND
J3		DOUT1	0-10V the 1st analog out
J3		DOUT2	0-10V the 2nd analog out
J3	Control Port	IAXIS_IN1	Spindle servo alarm 1
J3		24V+	24V+
J3		IAXIS_IN2	Spindle servo alarm 2
J3		GND	24V-
J3		CW	Spindle CW
J2		CCW	Spindle CCW
J2		S1	VFD speed 1
J2		S2	VFD speed 2
J2		S3	VFD speed 3
		S4	VFD speed 3

Note :spindle PU+ PU- DR+ DR- are used for controlling servo driver which is position control mode

12.3.6 ET102A PCB board



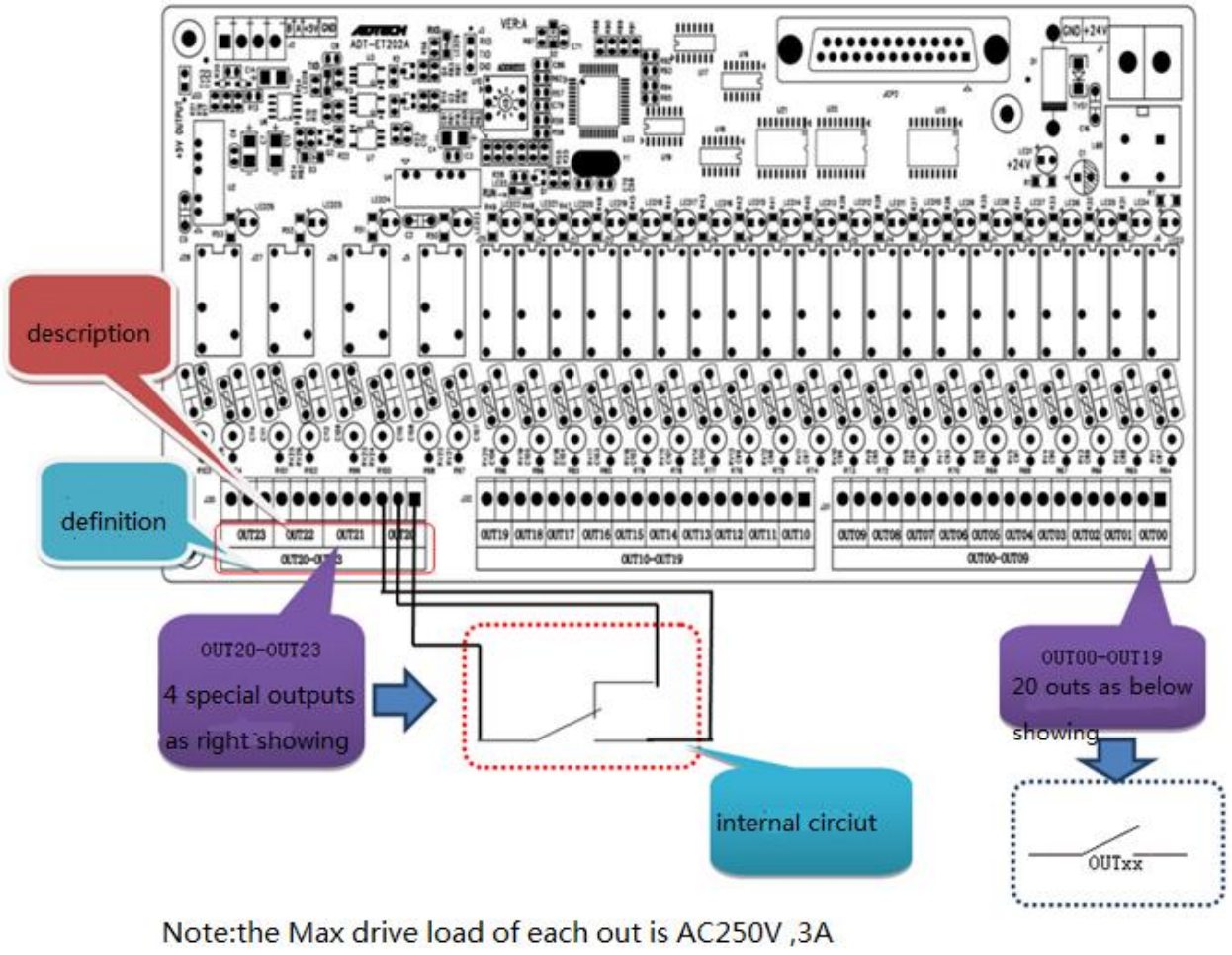
Note :the 24V and GND are the power supply for the limit and home sensors .the MAX current output is 200MA

ET102A definition chart

port	region	definition	function
J38	POWER	24V+	24V+
J38		GND	24V-
J38	IN03-IN00	IN00	IN00
J38		IN01	IN01
J38		IN02	IN02
J38		IN03	IN03
J38	POWER	24V+	24V+
J38		GND	24V-
J38	IN07-IN04	IN04	IN04
J38		IN05	IN05
J38		IN06	IN06
J38		IN07	IN07
J38	POWER	24V+	24V+

J38		GND	24V-
J38	IN11-IN08	IN08	IN08
J38		IN09	IN09
J38		IN10	IN10
J38		IN11	IN11
J39	POWER	24V+	24V+
J39		GND	24V-
J39	IN15-IN12	IN12	IN12
J39		IN13	IN13
J39		IN14	IN14
J39		IN15	IN15
J39	POWER	24V+	24V+
J39		GND	24V-
J39	IN19-IN16	IN16	IN16
J39		IN17	IN17
J39		IN18	IN18
J39		IN19	IN19
J39	POWER	24V+	24V+
J39		GND	24V-
J39	IN23-IN20	IN20	IN20
J39		IN21	IN21
J39		IN22	IN22
J39		IN23	IN23

12.3.7 ET202A PCB board



Note:the Max drive load of each out is AC250V ,3A

ET202A definition chart

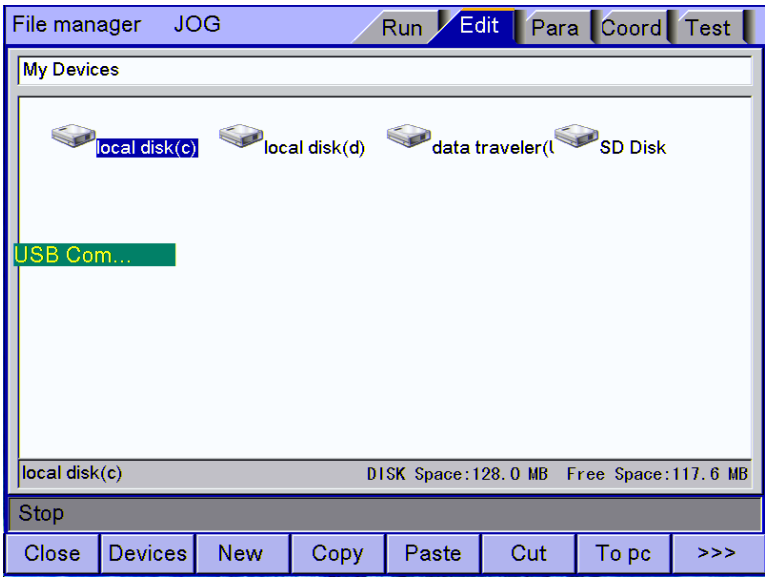
port	region	definition	function
J31	OUT00-OUT09	OUT00	OUT00
J31		OUT01	OUT01
J31		OUT02	OUT02
J31		OUT03	OUT03
J31		OUT04	OUT04
J31		OUT05	OUT05
J31		OUT06	OUT06
J31		OUT07	OUT07
J31		OUT08	OUT08
J31		OUT09	OUT09
J32	OUT10-OUT19	OUT10	OUT10
J32		OUT11	OUT11
J32		OUT12	OUT12
J32		OUT13	OUT13

J32		OUT14	OUT14
J32		OUT15	OUT15
J32		OUT16	OUT16
J32		OUT17	OUT17
J32		OUT18	OUT18
J32		OUT19	OUT19
J30	OUT20-OUT23	OUT20	OUT20
J30		OUT21	OUT21
J30		OUT22	OUT22
J30		OUT23	OUT23

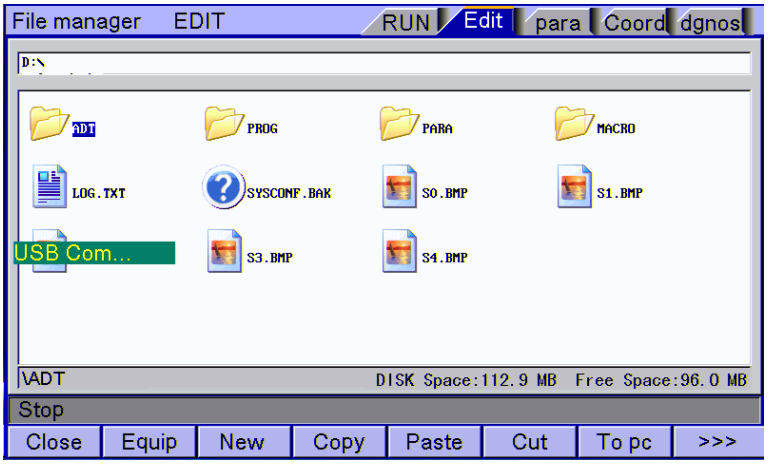
13 how to load program (CNC OR NC file)

1) **by usb line (connect pc with controller by usb line –the back of controller usb port xs11) ,the steps as follow**

a:press FILE button ,it will show as below

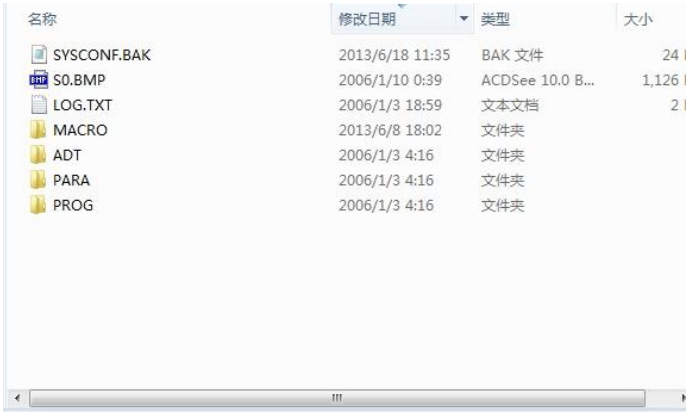


B:then press TO PC—F6 button

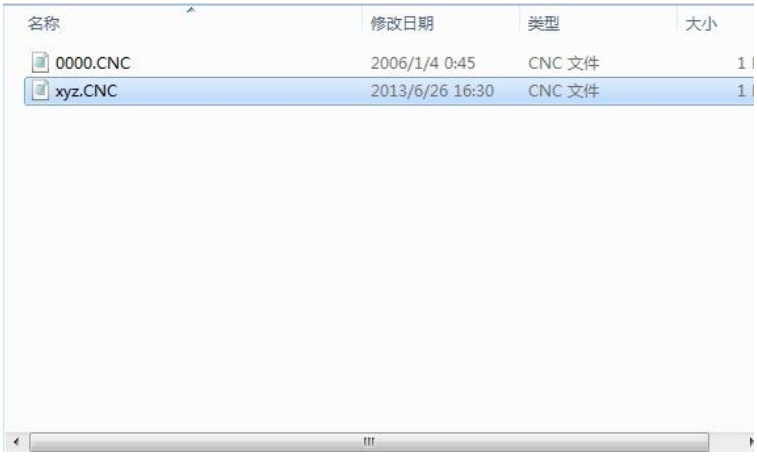


C:open you pc ,then you can find a u disk in your pc

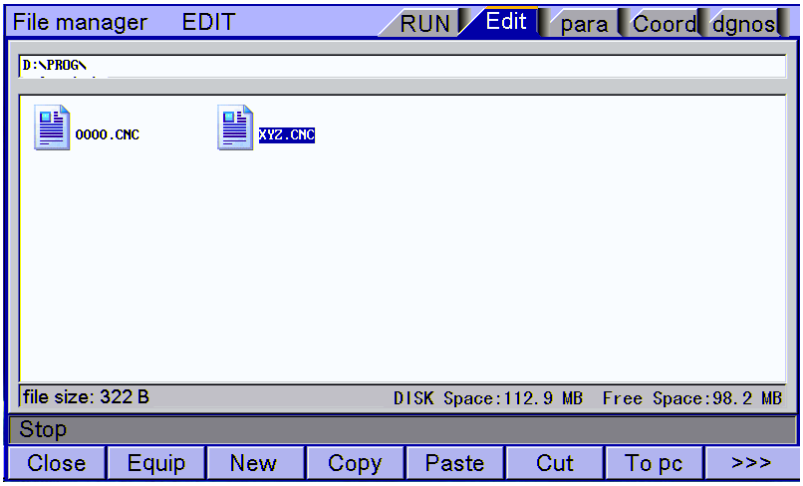
D:open the u disk (H)



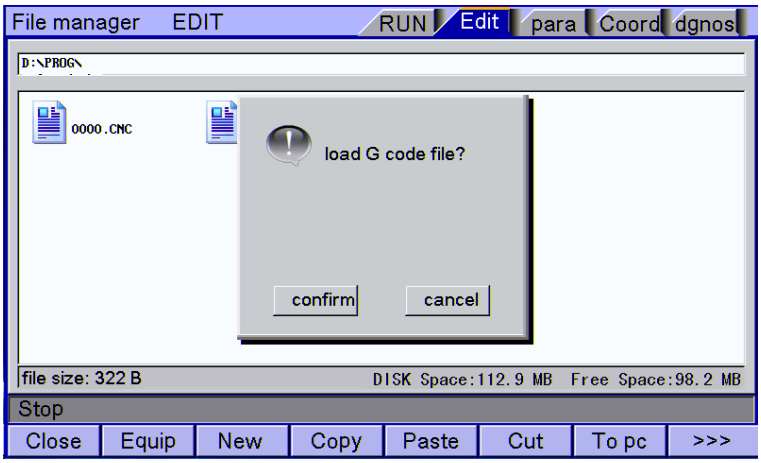
E:open the PROG folder ,and copy the NC OR CNC file to this folder



F:select NC or CNC file in controller



G:then press EOB button

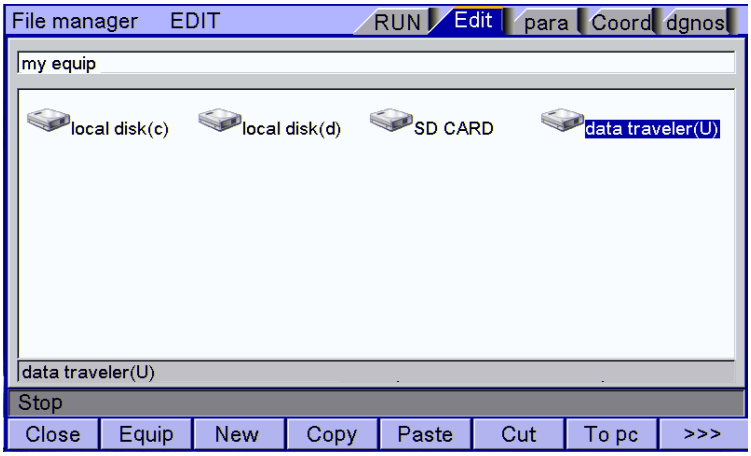


H:after pressing EOB button ,the program loading is finished

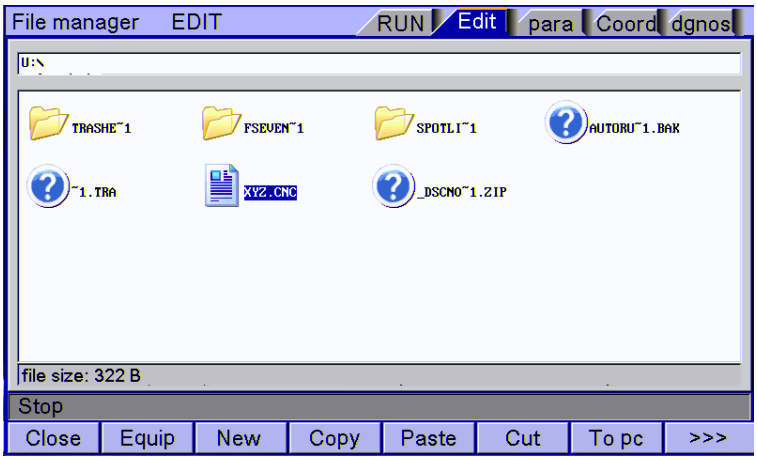
2) copy program by flash drive

A:insert the flash drive to usb port that at the front of controller

B:press file button ,then select data traveler



C:then you can find the cnc file in controller

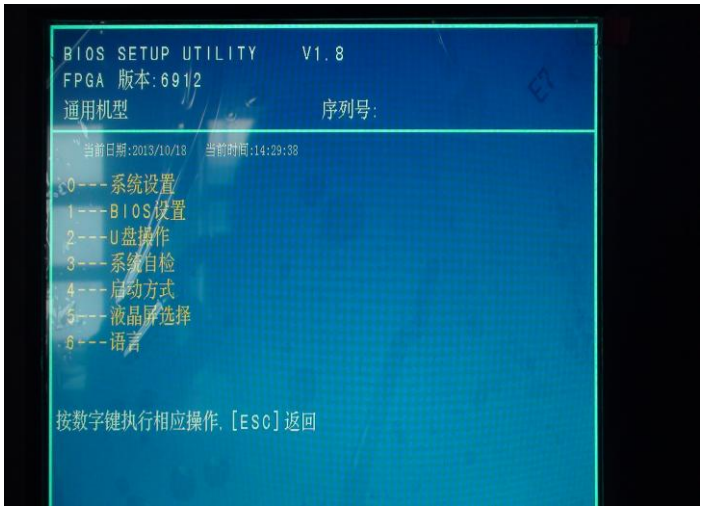


D:press F3-copy ,then press CAN button ,back to lock disk ,and enter prog folder ,then press paste –F4 button

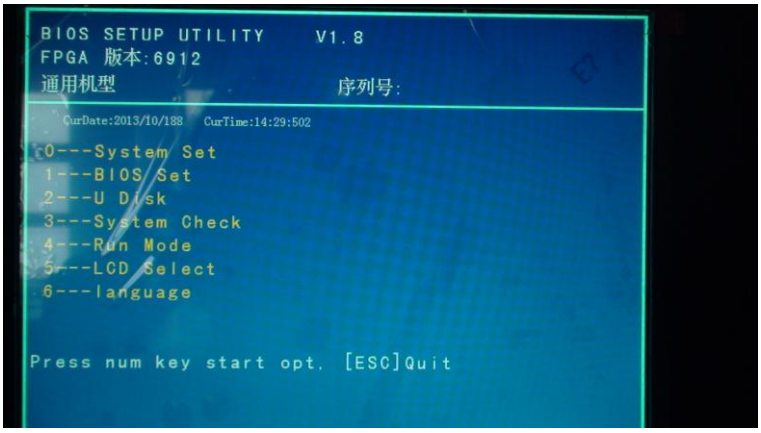
14 how to upgrade software

Update software with pc

1) connect pc with controller by usb line
2) press “CAN”button (hold it)and power on the controller ,when hear a buzzing ,then loose the button ,
3) input the password 26722719
4) the controller will display the picture as follow



5) select 6(press 6),change the language \
6) then will show

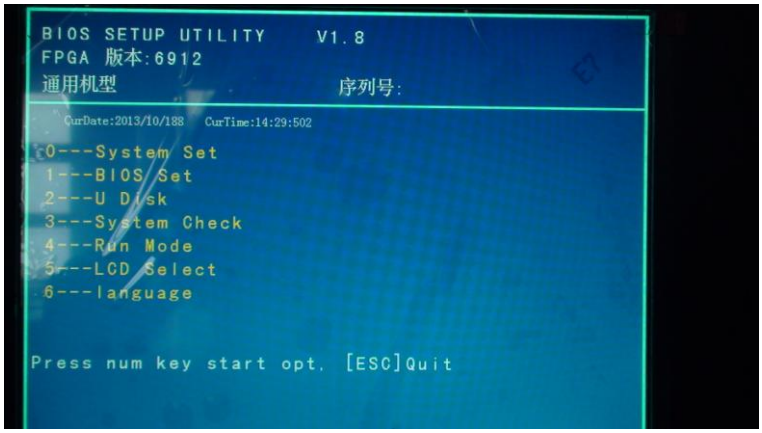


7) select “2 u disk “ then will show

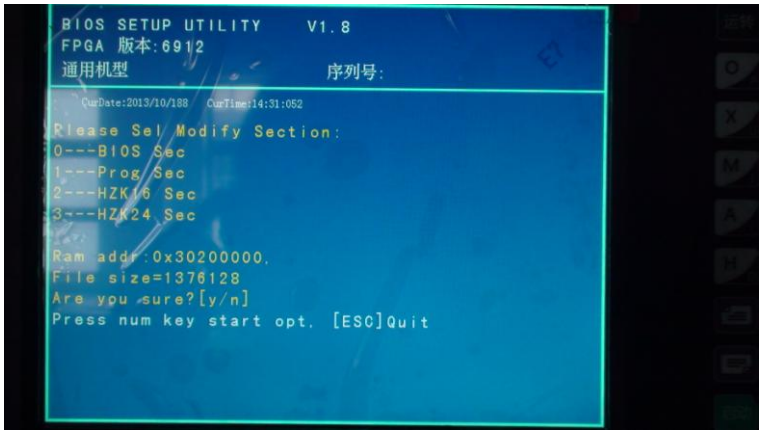
8)select 0 –USB communication ,if connect successfully, will show “USB Transmiting”

9)then copy the file(ADTROM.BIN and nc_res.ncp) I send you to ADT file of controller

10)when finish ,press CAN button(2 times) ,back to the main interface



11)then select 1 prog sec and press Y,then finish



12)reboot controller

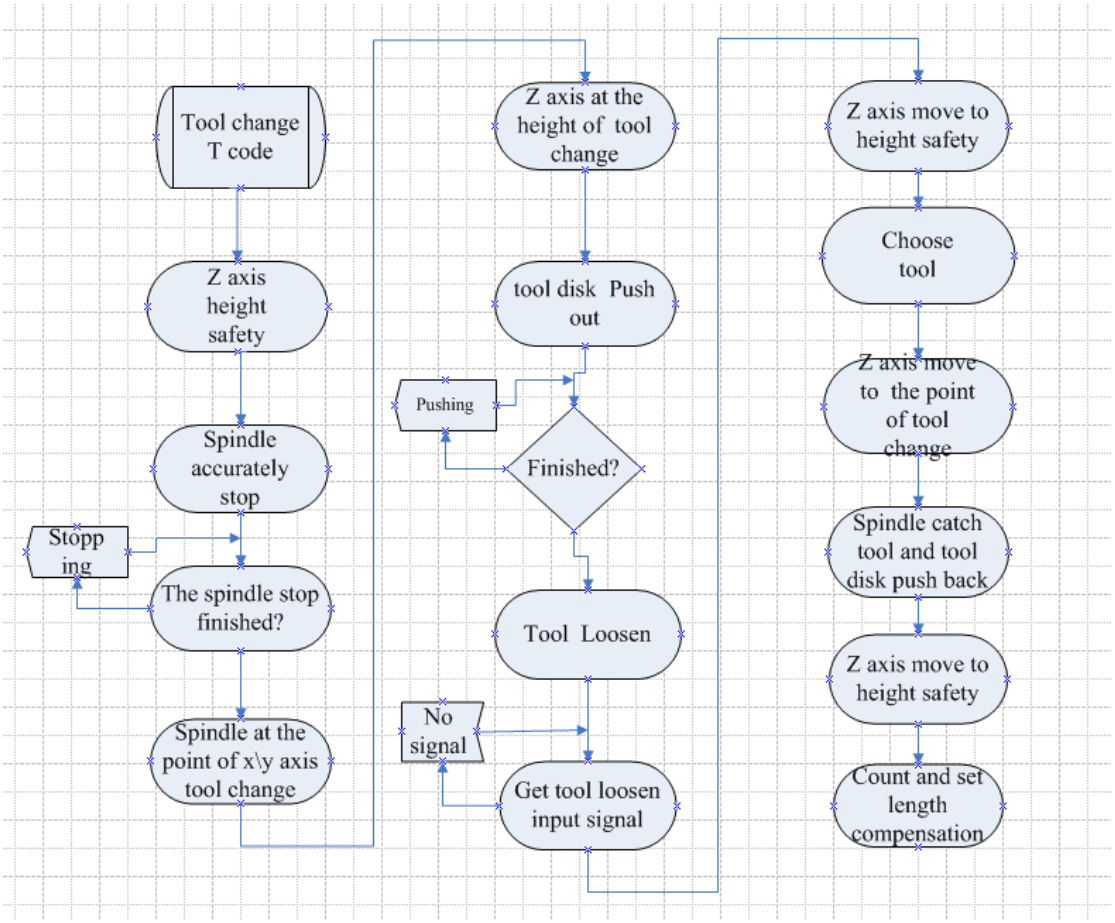
15 ATC Function

49 serise controller support ATC function ,the program made by macro . the controller support several kinds of tool magazines . there are two samples for reference as below:

Sample 1

15.1 umbrella type tool magazine

15.1.1 FLOWCHART



15.1.2 I/O definition

Output definition

main function	pin number	Out	Macro address
spindle stop accurately	9	OUT8	#1408
disk cw output	10	OUT9	#1409
disk ccw output	11	OUT10	#1410
air cylinder push	12	OUT11	#1411
spindle air cylinder push	13	OUT12	#1412

input definition

main function	pin number	IN	Macro address
spindle stop input	5	IN4	#1004
disk air cylinder back input	6	IN5	#1005
disk air cylinder push input	7	IN6	#1006
tool counting input	8	IN7	#1007
disk home signal input	9	IN8	#1008
spindle cut loosen input	10	IN9	#1009
spindle cut clamp input	11	IN10	#1010

15.1.3 Macro address

series no.	Defination	Macro address
1	current tool no.	#4120
2	target tool no.	#200
3	max tool no.	#400
4	z offset	#4126

series no	Defination	Macro address
1	System tool amount	#400
2	X axis tool change position	#401
3	Y axis tool change position	#402
4	Z axis tool change position	#403
5	Z axis safety height	#404
6	Speed of tool change	#405
7	XY axis speed of tool change	#406

8	Blow delay	#407
9	Foreward delay	#408
10	Backward delay	#409
11	No.1 Z axis tool setting position	#410
12	No.2 Z axis tool setting position	#411
13	No.3Z axis tool setting position	#412
14	No.4 Z axis tool setting position	#413
15	No.5 Z axis tool setting position	#414
16	No.6 Z axis tool setting position	#415
17	No.7 Z axis tool setting position	#416
18	No.8 Z axis tool setting position	#417
19	No.9 Z axis tool setting position	#418
20	1 No.10 Z axis tool setting position	#419
21	No.11 Z axis tool setting position	#420
22	No.12 Z axis tool setting position	#421
23	No.13 Z axis tool setting position	#422
24	No.14 Z axis tool setting position	#423
25	No.15 Z axis tool setting position	#424
26	No.16 Z axis tool setting position	#425
27	No.17 Z axis tool setting position	#426
28	No.18 Z axis tool setting position	#427
29	No.19 Z axis tool setting position	#428
30	No.20 Z axis tool setting position	#429
31	No.21 Z axis tool setting position	#430
32	.22 Z axis tool setting position	#431
33	No.23 Z axis tool setting position	#432
34	No.24 Z axis tool setting position	#433

15.1.4 macro program description

(1)O0123 program No.

(2)G90 G599 shift tool change use absolute programme,use G599 coordinate system,can't use in working file))

(3)#201=#4120 (read current tool number to #201

(4)IF[[#200] == 0]GOTO 100 (##200is the ready change tool's number,the tool number is 0 and then quit changing tool

(5)IF[[#200] == #201]GOTO 100 if current tool is the tool want to be changed then quit

(6)IF[#400 > 24] (it will alarm if the system tool number exceed 24)

(7){

(8)#3000=1（warm :the setting tool exceed the max!) (system parameter no 3001 alarm,the content can be revise)

(9)}

(10)IF[[[#200] > [#400]] || [[#201] > [#400]]] if the current tool NO. or target too NO. is bigger than system max tool NO., then show alarm)

(11){

(12)#3000=1 (alarm: the setting tool number exceed maximum tool number!)(NO.3001 alarm appear, can modify alarm contain)

(13)}

(14)IF[#201==0] if the current tool no.was 0 ,then show alarm)

(15){

(16)#3000=1 (current tool number is 0, alarmr)

(17)}

This macro program corresponding to the flowchart " tool change T code" , diagnose function that when system not sending tool change instruction, and detect tool number, "(2) G90 G599" ,when enter tool changing procedure, it will shift to G599 machine tool coordinate system and the values are absolute in the program, each axis refer the machine coordinate system. so the match parameter of the tools are refering to machine coordinate , "(3)#201=#4120" read current tool number to #201 variable, use for compare with"(5)IF[[#200] == #201]GOTO 100", #200's variable value is transmit by target tool number of code, if the target tool number as same as current tool NO., it will jump to N100 and not make tool change motion, if different, it will execute "(6)IF[#400 > 24]"to detect if the setting of max tool value by user exceed the max tool contain 24. over setting it will alarm: "(8)#3000=1" and stop changing, 10-17 is tool detect, if it is no problem it will execute the coming code.

z axis back to tool changing reference point

(18)G01 Z[#403+#404] F#405 (z axis rise to safe position)

This code is used for X and Y axis to avoid colliding when tool is at the position of tool changing

"(19)M09", close cooling liquid to prevent cool liquid splashing to tool head or blade guard in case of effecting tool changing precision.

Spindle stop accurately

Since tool installed on the spindle, cutting torque transmited can't only by bole-hole's friction, so there are one bolt at ahead of the spindle, when tool installed to spindle, the keyway of tool head must match with the bolt of spindle, and then can finish tool change, so spindle require stopping accurately at a fix angle, this is the purpose of spindle stop accurately.

(20)M89 P8 L1 start spindle stop accurately

(21)M89 P13 L1 (blow)

(22)G04 X#407 (blow delay)

(23)M89 P13 L0 (close blow)

spindle blow use for blow off cooling liquid or piece

(24)M88 P4 L0 (spindle stop accurately) (wait for spindle stop accurately position)

This code is corresponding to the flow chart "spindle accuracy stop" and make sure the spindle stop accurately.

X、Y axis position to tool changing point

(25)G01 X[#401] Y[#402] F#406

Above program is for machine move to X and Y axis tool changing point , ready for tools back to tool magazine, this is corresponding to work flow chart "Spindle at the point of X/Y axis tool change"

(26)IF[[#201]!=0] (judge if current tool no. is o or not)

(27){ (if the value is not 0, then execute next codes 码)

(28)G01 Z[#403] F#405 (machine move to Z axis tool chaning point

(29)M89 P11 L1 (air cylinder push out)

(30)M88 P6 L0 (wait for disk air cylinder back input—sensor signal)

(31)M89 P12 L1 (spindle air cylinder push out)

(32)G04 P300 (delay 300 millisecond)

(33)G01 Z[#403+2.5] F1000 (Z axis rise up 2.5+#403mm to prevent withhold tool disc when loose tool)

(34)M88 P9 L0 (wait for spindle cut loosen input-sensor signal)

(35)G01 Z[#403+#404] F#405 (Z axis rise up to safe position)

(36)}

Above program is simple and clear, for judging the return tool number is 0 or not , Z axis position to tool changing point , and then push out tool disc, next step is checking and waiting for disk air cylinder back input signal, when get this signal means handle on the spindle was block in tool disc already, and then output spindle air cylinder push signal to loose tool handle, G04 P300 delay is make sure that there is enough time to loose the tool, "G01 Z[#403+2.5] F1000", this code is add base on customer's tool magazine, not necessary for all tool magazine. After getting the spindle air cylinder push signal , Z axis back to safe height, ready for next tool changing.

choose tool nearby

choose a tool nearby for disc tool magazine, for each selection ,the +or – direction rotate will not exceed 180 °, short time and high efficiency.

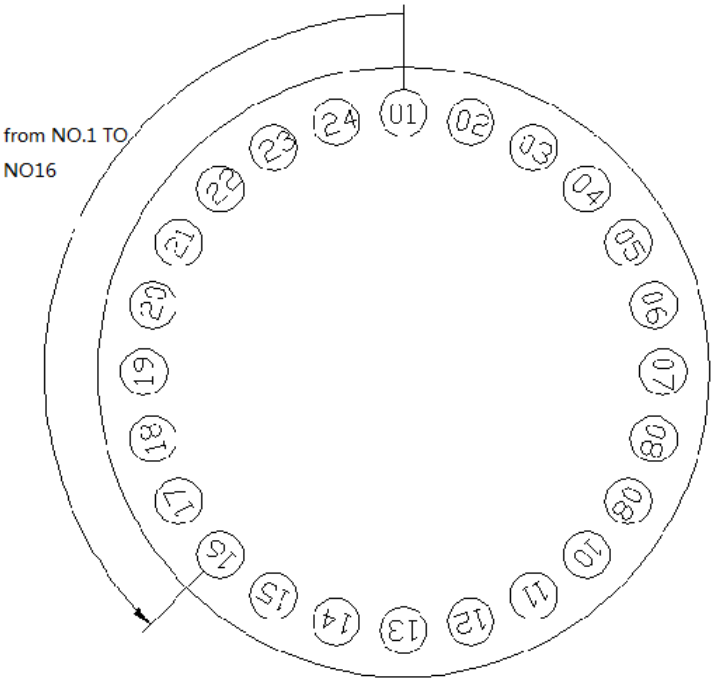
(37)#1=0 (symbol for tool disc +or- rotate, #=1 is +, and #=0 is -) the default value is #=1

(38)IF[#201 > [#400/2]] GOTO 1

(if the current tool NO. is in lower half of tool magazine,the program will jump to N1)???

(39)IF[[#201 >= #200] || [#200 > [#201+[#400/2]]]] GOTO 2

(39) code is use for below type of tool magazine)



The current tool NO. is bigger than target tool number or target tool located at lower half of tool magazine, for example, the max tool number is 24, current tool NO. is 1, target tool NO.is 16, the nearest path is: No 1—>No 24 →-No 23...No 16

forward rotate choose tool

(40)M89 P9 L1

(disc CW output : P9 is disc CW output signal..nearby tool changing : if current tool NO. is 3 and target tool NO. is 4, disc CW)

(41)#1=0 (symbol is 0, tool selection of disc CW)

(42)GOTO 3 jump to N3

(43)N2 tool seletion of ccw

(44)M89 P10 L1 (disc ccw output)

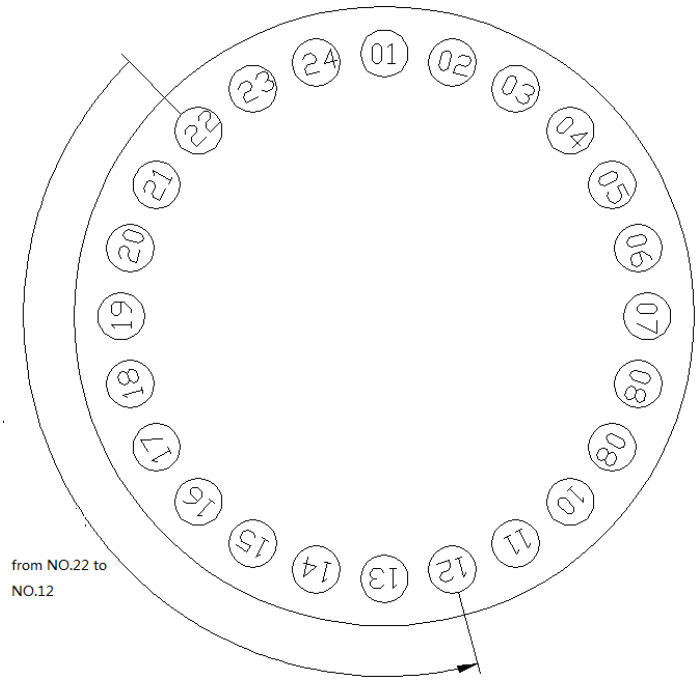
(45)#1=1 (symbol is 1, tool selection of disc CCW)

(46)GOTO 3 jump to N3

(47)N1

(48)IF[[#201 >= #200 && #200 <= #400] && [#200 > [#201+#400/2]MOD#400]] GOTO 4

if the condition of program NO. (49 is established,then JUMP to N4,or execute the coming program tool selection of cw, dragram show as follow



(the current tool NO.is bigger or same as target tool NO., target tool NO. is smaller or same as system max tool NO. and both current tool NO. and target NO.locat at lower half of tool magazine, for example:current tool NO. is 22 and target tool NO. is 12, it will be ccw)

(49)M89 P9 L1 (disc cw, P9 is the signal of the disc cw)

(50)#1=0 (symbol is 0, tool selection of cw)

(51)GOTO 3 jump to N3

(52)N4 (tool selection of CCW)

(53)M89 P10 L1

(54)#1=1 (symbol is 1, tool selection of ccw)

tool selection counting

(55)N3

(56)#2=#201 (current tool NO.saved into temporary variable)

(57)WHILE[#2!=#200] DO1 (judge whether it is target tool or not)

(58)M88 P7 L0 (wait for tool counting input signal is low level)

(59)M88 P7 L1 (wait for tool counting input signal is high level)

(60)IF[#1==1] GOTO 7 jump to ccw counting

(61)#2 = #2+1 (cw add 1 each time)

(62)IF[#2>#400] #2=1 (if it is bigger than system tool NO. then it will recount from 1)

(63)GOTO 8

(64)N7

(65)#2 = #2-1 (ccw reduce 1 each time)

(66)IF[#2<=0] #2=#400 (if counting NO. is smaller than 0, then recount from max tool number)

(67)N8

(68)END1 (end)

The programs From No (55) to (68) are for counting base on previous tool selection direction to select tool, principle is accumulation or decrease by current tool number , tool selection is finished when current tool NO. is same as target tool NO..

Finish tool selcetion

(69)IF[#1==1] GOTO 5 (JUMP to N5)

(70)G04 P#408 (dealy)

(71)M89 P9 L0 close disc cw output signal after delay)

(72)GOTO 6

(73)N5

(74)G04 P#409 (delay)

(75)M89 P10 L0 (close disc ccw output signa after delay)

The programs From (69) to (75) are for closing corresponding port according to previous tool selection direction.

tool installed to spindle

(76)N6

(77)M89 P11 L1 (output air cylinder push signal)

(78)M88 P6 L0 (waiting for disk air cylinder back input

(79)M89 P13 L1 (output blow signa)

(80)G04 X#407 (dealy)

(81)M89 P13 L0 (close blow signal)

(82)M89 P12 L1 (output spindle air cylinder push)

(83)M88 P9 L0 (spindle cut loosen input)

(84)G01 Z[#403+2.5] F#405 (Z axis move to above the position of tool changing point 2.5

(85)M89 P12 L0 (spindle grab tool)

(86)G01 Z#403 F6000 (z axis move to position of the tool changing point

(87)M88 P10 L0 (spindle tool clamp input)

(88)M89 P11 L0 output air cylinder push signal

install the chose tool into spindle ‘s taper suite, tool disc return

(89)M88 P5 L0 (disk air cylinder back input)

(90)M89 P8 L0 (spindle accuracy stop signal invalid)

(91)G01 Z[#403+#404] F#405 (Z axis rise to safe position)

count length excursion

(92)#2=#[409+#200] (obtain current tool's setting value)

(93)#3=#[409+#201] (obtain previous tool's setting value)

(94)#1=#2-#3 calculate two tools' length excursion)

(95)#1=#4126-#1 (calculate length compensation)

(96)#4126=#1 (setting length compensation)

(97)N100 (program jump)

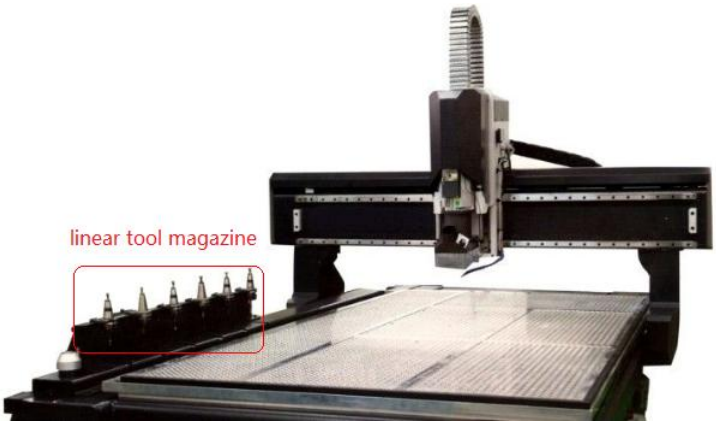
(98)M30 (program end)

(99)%

calculate the D-value between target tool and present tool

Sample 2

15.2 Linear tool magazine



Linear magazine generally fix on X or y axis, the interval of tools is same, now we take X axis for example.

15.2.1 Program process

1. check parameters address
2. Z axis go to safe position
3. Y axis move to safe distance
4. X axis move to tool release position
5. Dust cover up
6. Z axis move to datum point
7. Y axis locating to tool release position
8. Spindle release tool
9. Z axis move to safe position

10. X axis move to tool change position
11. Z axis move to datum point
12. Spindle pick up tool
13. Y axis move to safe position
14. Z axis move to safe position
15. Dust cover down
16. Z axis move to datum position
17. ATC finish

15.2.2 I/O Definition

Output definition

main function	pin number	Out	Macro address
spindle stop accurately	9	OUT8	#1408
Dust cover up/down	7	OUT6	#1406
Tool clamp/release	8	OUT7	#1407

input definition

main function	pin number	IN	Macro address
spindle stop input	5	IN4	#1004
disk air cylinder back input	6	IN5	#1005
disk air cylinder push input	7	IN6	#1006
tool counting input	8	IN7	#1007
spindle cut clamp input	12	IN11	#1010

Macro address

series no.	Defination	Macro address
1	current tool no.	#4120
2	max tool no.	#400
4	1st tool position(mm)	#401
2	Y reference position(mm)	#402
3	Z reference position(mm)	#403
4	Z safe position(mm)	#404
5	Fast speed (mm/min)	#405
6	Low speed (mm/min)	#406
7	Y safte position	#412
8	Tool interval(mm)	#413

Description

Current tool :when first time debugging tool magazine ,we set the current position of tool.

Total tool NO: the maximum tools

1st tool position: set the 1st tool mechanical coordinate

Y reference position(mm): Y mechanical coordinate

Z reference position(mm): Z mechanical coordinate

Z safe position: before ATC Z move to a safe position and then X,Y move to tool release position .

Fast spee**d**: long distance moving speed

low speed: the speed move to reference point

Y safe position: Y move to this position then X move to next tool position and pick up tool.

Tool interval: the distance between adjacent 2 tools.

15.2.3 Macro program and descriptoin

```
O0001
IF[#4120==#200] GOTO 100
IF[#400==0] GOTO 100
IF[#4120 > #400 || #4120 <=0 ] #3000=1(Current tool number error)
IF[#200 > #400 || #200 <=0 ] #3000=1(Current tool number error)
G90
(Linear tool magzine)
(Z axis go to safe position)
G53.1 Z#404 F#405
M89 P8 L1 (spindle locating)
M88 P4 L0 Q10000(locating signal detection)
( Y move to safe position )
G53.1 Y#412 F#405

(x move to the former tool position)
#1=#401+[#4120-1]*#413
G53.1 X#1 F#406

(dust cover up OUT6)
M89P6L1
#2=0
WHILE[#1011!=0]DO1
IF[#2>1000]THEN #3000=1(IN11 Time Out!)
G04P10
#2=#2+1
```

```
END1

(Z move slowly to tool release position)
G53.1 Z#403 F#406

(Y move to tool release position)
G53.1Y #402 F#406

(tool release)
G04P500
M89P7L1
#1=0;
WHILE[#1005!=0]DO1
IF[#1>1000]THEN #3000=1(IN5 Time Out!)
G04P10
#1=#1+1
END1

(Zmove to safe height)
G53.1 Z#404 F#405

(Xmove to tool pick up position)
#1=#401+[#200-1]*#413
G53.1 X#1 F#406

(Zmove to tool release position slowly)
G53.1 Z#403 F#406

(tool clamp)
M89P7L0
#1=0
WHILE[#1006!=0]DO1
IF[#1>1000]THEN #3000=1(INT6 Time Out!)
G04P10
#1=#1+1
END1
```

(Y move to safe position)

G53.1 Y#412 F#405

(Z up to safe heigh)

G53.1 Z#404 F#405

(dust cover down OUT6)

M89P6L0

#1=0

WHILE[#1007!=0]DO1

IF[#1>1000]THEN #3000=1(INT7 Time Out!)

G04P10

#1=#1+1

END1

(Zmove to reference position)

G53.1Z#403F#406

N100

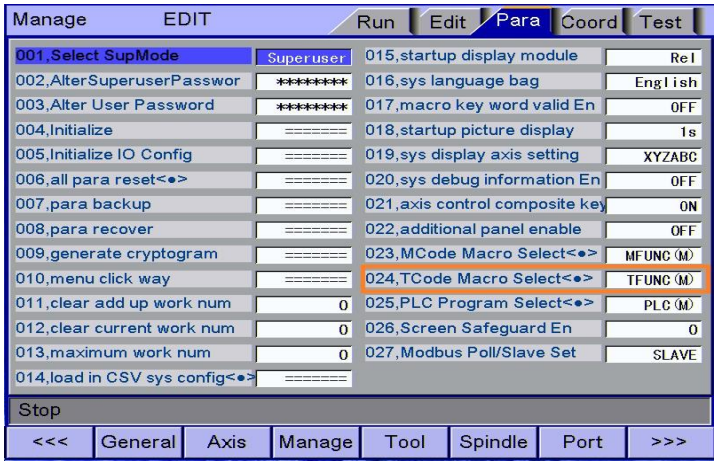
(ATC finish)

M30

%

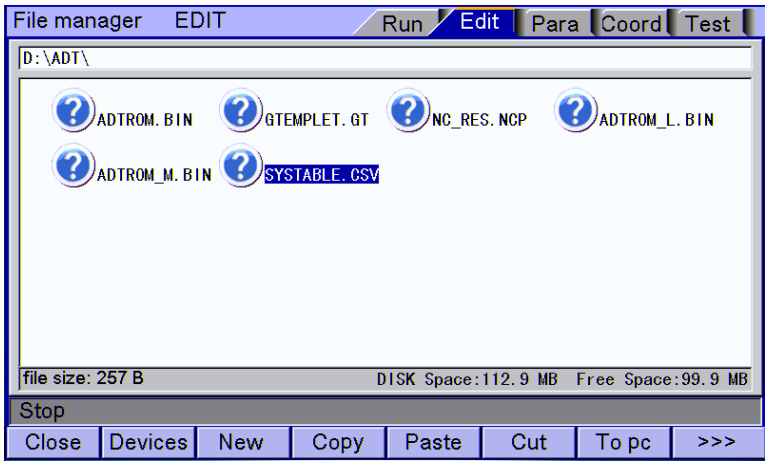
15.3 parameter settings

For the ATC is active , it should change the manage parameter 023,set it to be User-Def. after changing ,after that ,reboot

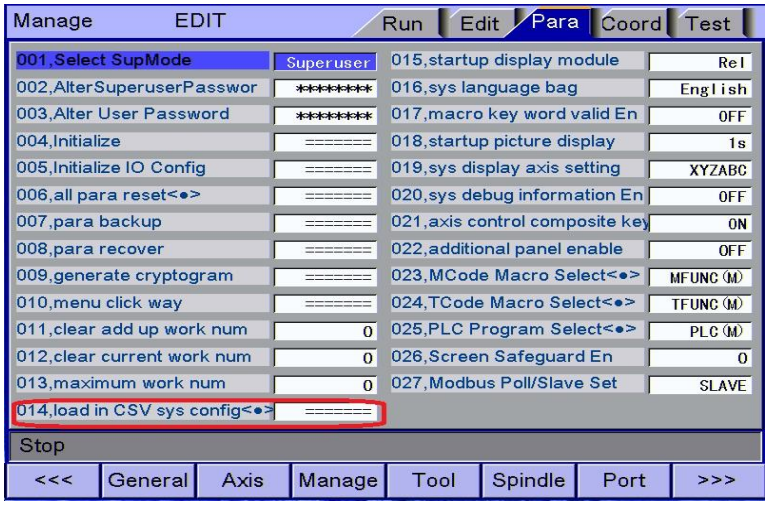


15.4 copy systable.csv file to controller and make it active

1) copy systable.csv file to ADT folder



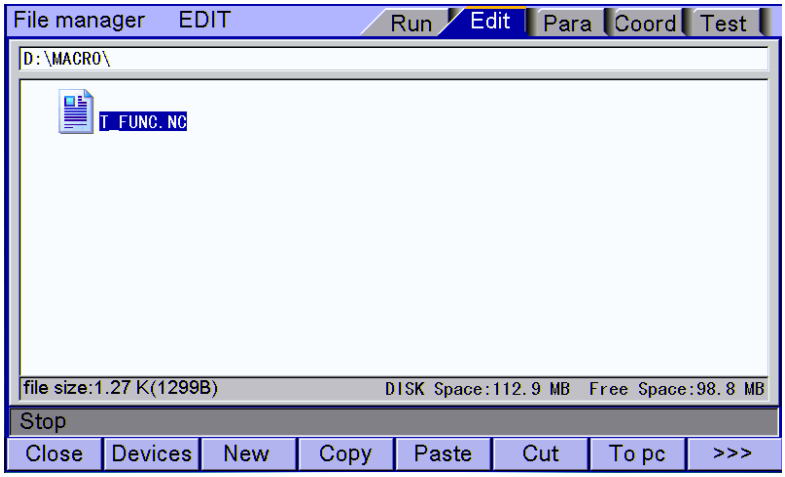
2) load CSV file into controller



Select this parameter ,then press EOB,the controller will show a dialog ,press EOB,reboot

15.5 copy macro program file to controller

Copy T_func.nc file to cotroller MACRO folder



After that ,reboot

appendix

SYSTABE.CSV file sample (for umbralle tool magazine)

Macro Config		User self-defined name	Macro address
The user defined macro variable name	100	current tool no.	4120
The user defined macro variable name	101	System tool no.	400
The user defined macro variable name	102	X axis change tool position	401
The user defined macro variable name	103	Y axis change tool position	402
The user defined macro variable name	104	Z axis change tool position	403
The user defined macro variable name	105	Z axis safety height	404
The user defined macro variable name	106	Speed of change tools	405
The user defined macro variable name	107	XY axis speed of change tools	406
The user defined macro variable name	108	Blow delay	407
The user defined macro variable name	109	Foreward delay	408
The user defined macro variable name	110	Reversal delay	409
The user defined macro variable name	111	No.1 Z axis tool setting postion	410
The user defined macro variable name	112	No.2 Z axis tool setting postion	411
The user defined macro variable name	113	No.3 Z axis tool setting postion	412
The user defined macro variable name	114	No.4 Z axis tool setting postion	413
The user defined macro variable name	115	No.5 Z axis tool setting postion	414
The user defined macro variable name	116	No.6 Z axis tool setting postion	415
The user defined macro variable name	117	NO.7 Z axis tool setting postion	416
The user defined macro variable name	118	NO.8 Z axis tool setting postion	417
The user defined macro variable name	119	NO.9 Z axis tool setting postion	418
The user defined macro variable name	120	NO.10 Z axis tool setting postion	419
The user defined macro variable name	121	NO.11 Z axis tool setting postion	420
The user defined macro variable name	122	NO.12 Z axis tool setting postion	421
The user defined macro variable name	123	NO.13 Z axis tool setting postion	422
The user defined macro variable name	124	NO.14 Z axis tool setting postion	423
The user defined macro variable name	125	NO.15 Z axis tool setting postion	424
The user defined macro variable name	126	NO.16 Z axis tool setting postion	425
The user defined macro variable name	127	NO.17 Z axis tool setting postion	426
The user defined macro variable name	128	NO.18 Z axis tool setting postion	427
The user defined macro variable name	129	NO.19 Z axis tool setting postion	428
The user defined macro variable name	130	NO.20 Z axis tool setting postion	429
The user defined macro variable name	131	NO.21 Z axis tool setting postion	430

The user defined macro variable name	132	NO.22 Z axis tool setting postion	431
The user defined macro variable name	133	NO.23 Z axis tool setting postion	432
The user defined macro variable name	134	NO.24 Z axis tool setting postion	433
The user defined macro variable name	135	z offset	4126
The user defined macro variable name	136	aim tool no.	200