

NCT-04/03/02

Punch CNC System (Maintainance)

User Manual



ADTECH 众为兴

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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 restart 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.

※Miscellaneous

- ☞ 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: $0^{\circ}\text{C} \sim 60^{\circ}\text{C}$.
- ☞ 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°C , load rate: 80%, and operating rate: 12 hours/ day)

Routine Inspection	Routine	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● Check whether solid components are loose ● Confirm whether terminal block is damaged

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1 Foreword

NCT-04/03/02 numerical control system is economic embedded system developed by Adtech (Shenzhen) Technology Co., Ltd. for mechanical flywheel, hydraulic punch systems, where NCT-04 is four axes system, NCT-03 is three axes system and NCT-02 is two axes system; the system hardware platform is classified into two axes and four axes.

Instructions and reading convention of the Manual

1. Before using this CNC system, please read this Manual carefully to operate properly.
2. This Manual applies to two axes, three axes, and four axes system, and the programming codes are mutual applicable; the three axes system integrates the pagoda mold control function, and the four axes system integrates mold rotation control function; when performing the corresponding instructions, system-related signals should be detected properly, or else the system may generate a corresponding error alarm.

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Ensure the power is OFF before overhauling or components replacement;
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Regular Check	One year	<ul style="list-style-type: none"> ● Check whether solid components are loose ● Confirm whether terminal block is damaged

2 System Overview

2.1 System Structure

CPU: ARM industrial mainboard;

Communication: USB interface;

Capacity: 64MB RAM, 60M Flash ROM;

Feedback: AB phase pulse feedback;

Control: FPGA motion controller;

Hand pulse: Incremental hand encoder;

Display: 800×480 pixels 7" LCD;

I/O full optical coupling isolation;

Touch/film type operation panel;

Highly anti-interference switching power supply;

RS232 interface

2.2 System Technical Parameters

Function	Name	Specification
Control axis	Control axes	4 axes (NCT-04/03) 2 axes (NCT-02)
	Simultaneous control axes	4 axes linear interpolation (NCT-04/03) 2 axes linear interpolation (NCT-02)
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, T axis: 500Kps (maximum)
	Automatic acceleration/deceleration	Yes

Function	Name	Specification
	Feeding speed rate	10~150%
Manual	Continuously manual feeding,	Yes
	Returning to reference point manually	All control axes return to reference point simultaneously (allow setting order of priority)
	Single step/handwheel function	Yes
Punching	Single punching	G00
Operating mode	MDI, auto, manual, single step, edit	Yes
Testing function	Test run, single program section,	Yes
Coordinate system and pause	Pause (sec/ms)	G04 X/P_
	Coordinate system setting	G92
Safe functions	Soft & hard limit check	Yes
	Emergency stop	Yes
Program storage	Program storage capacity, storage quantity	Capacity: 60MB 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	800×480 pixels 7" LCD	
	Position screen, program edit Tool compensation setting, alarm display Handwheel test, diagnosis screen Parameter setting, graphic simulation	Yes
Tool changer function	Tool function	T code
Compensation	Mold offset compensation function	Mold center X, Y offset compensation
	Reverse clearance compensation	Yes
Other functions	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 comprehensively every time the system is started or reset; diagnose power supply, principal axis, limit and I/O ports in real-time during operating.

2.3.2 Compensation

Automatic reverse clearance compensation

Mold center offset compensation

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.

Point punching, arc nibbling, linear nibbling, grid punching, etc.

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

2.3.4 Full Chinese Menu Operation & Full Screen Edit

NCT-04/03/02 CNC system uses cascading menu structure and full Chinese 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 transmit CNC program to the system through communication interface (USB disk, RS232 interface), or transmit the programs from the system to PC.

2.4 System Operating Condition

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

3 Operating Panel

3.1 Main Screen

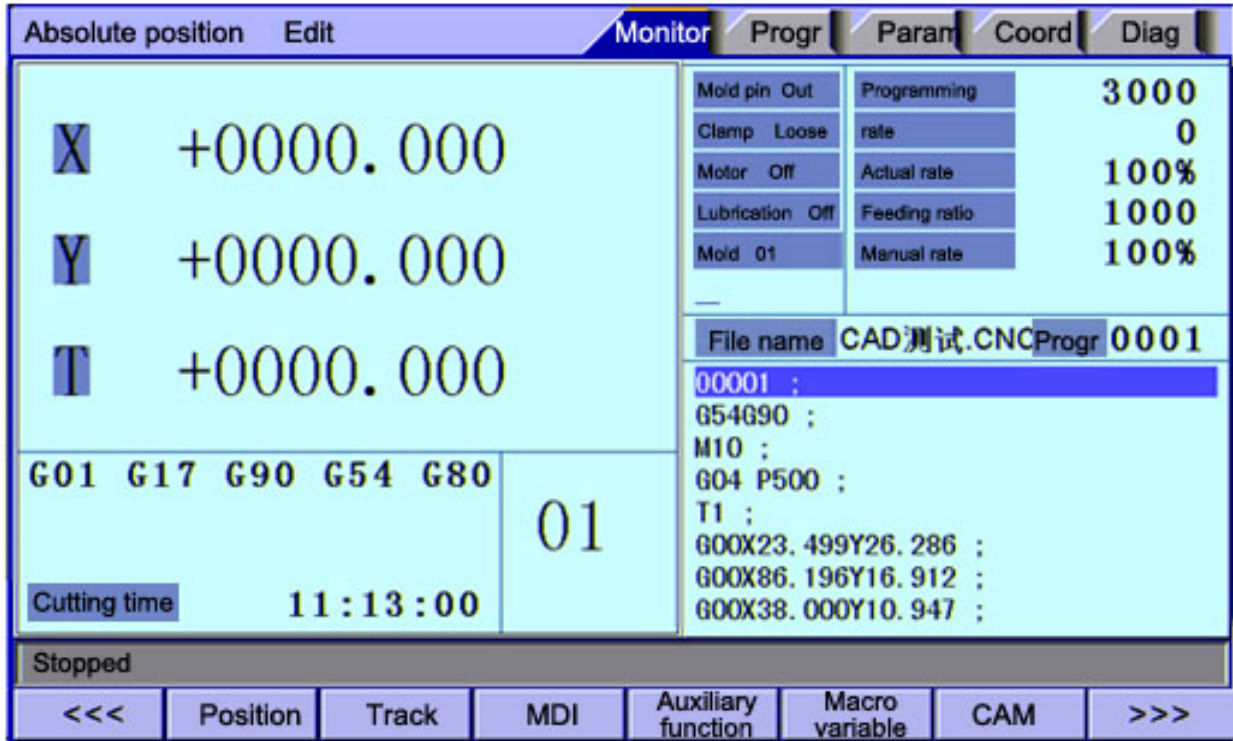


Fig. 3.1 NCT-XX Main Screen

After the system is restarted, the main screen is as shown in Fig. 3.1.

3.2 System Menus

NCT-XX system uses cascading menu structure. You can press the following keys to operate the menus.

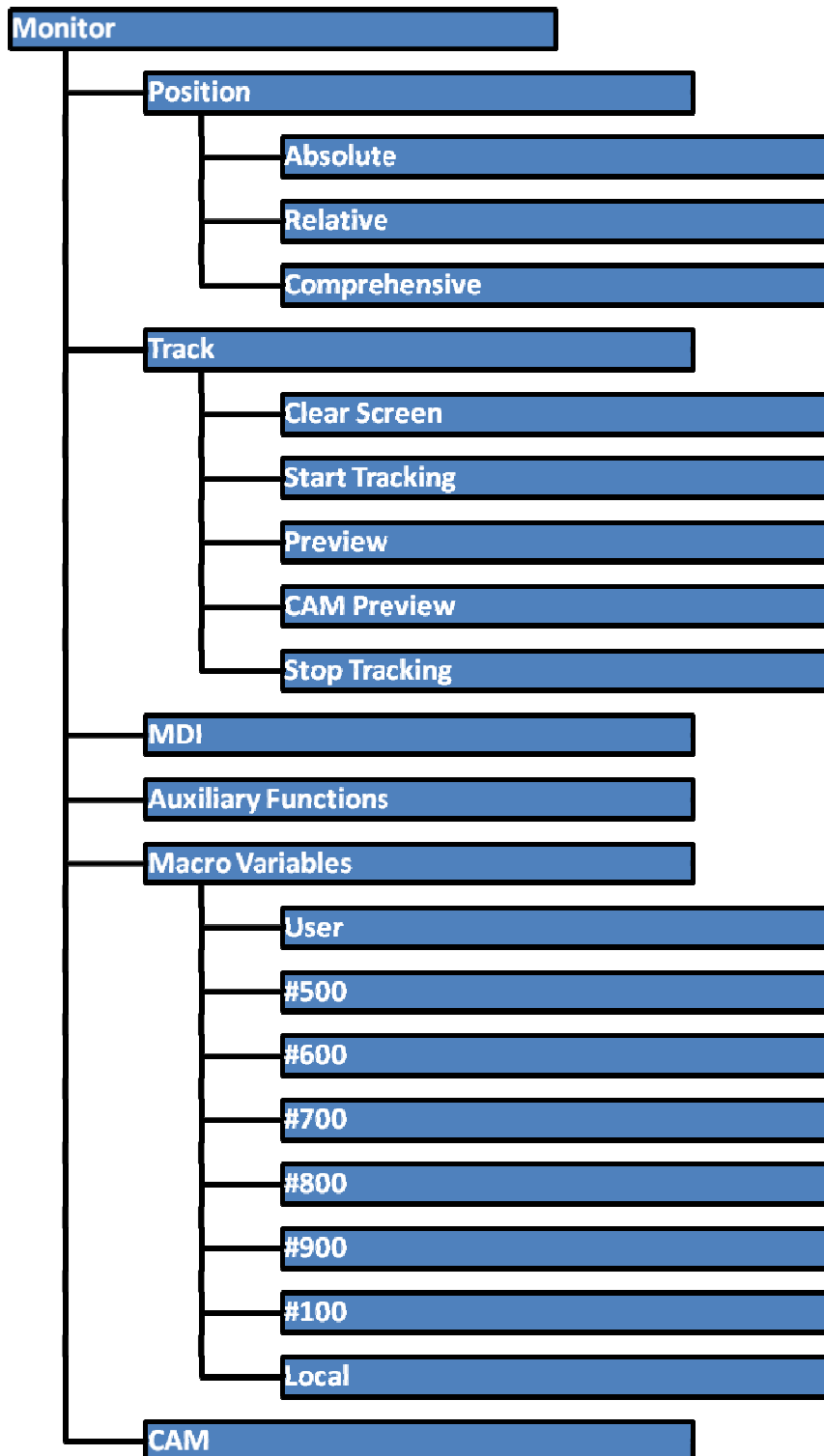


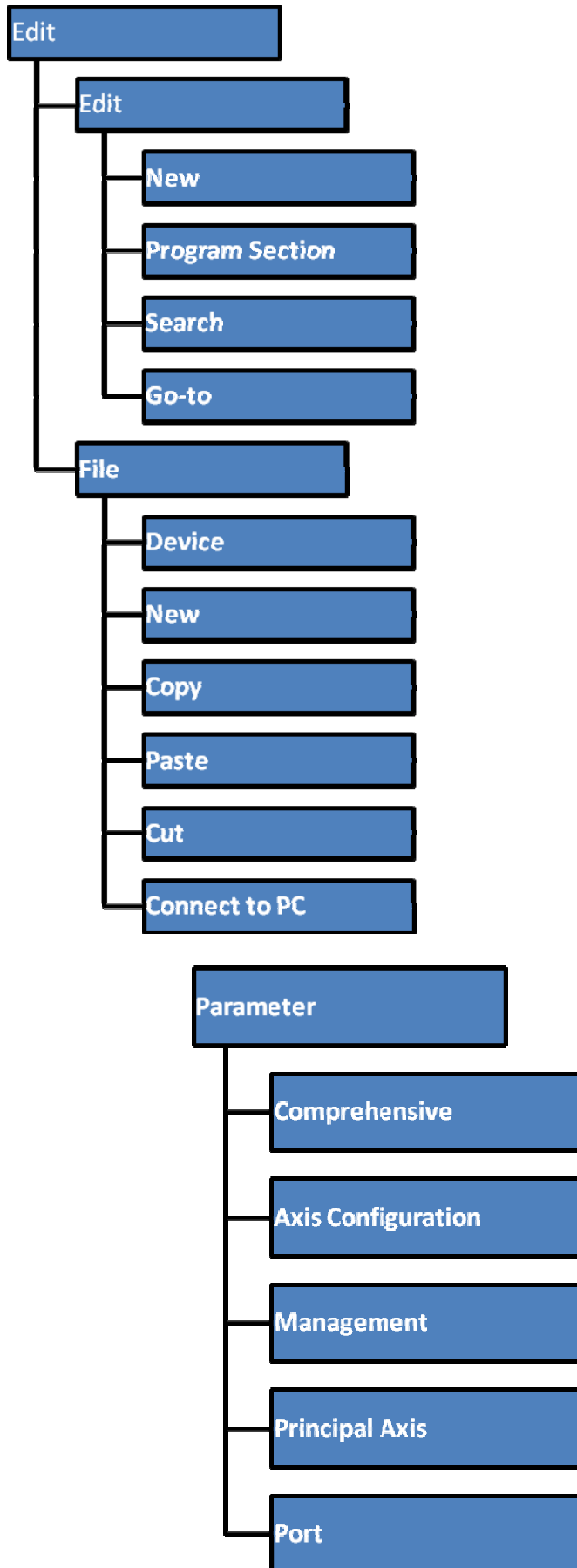
Press a key to show the corresponding content in the bottom of the LCD.

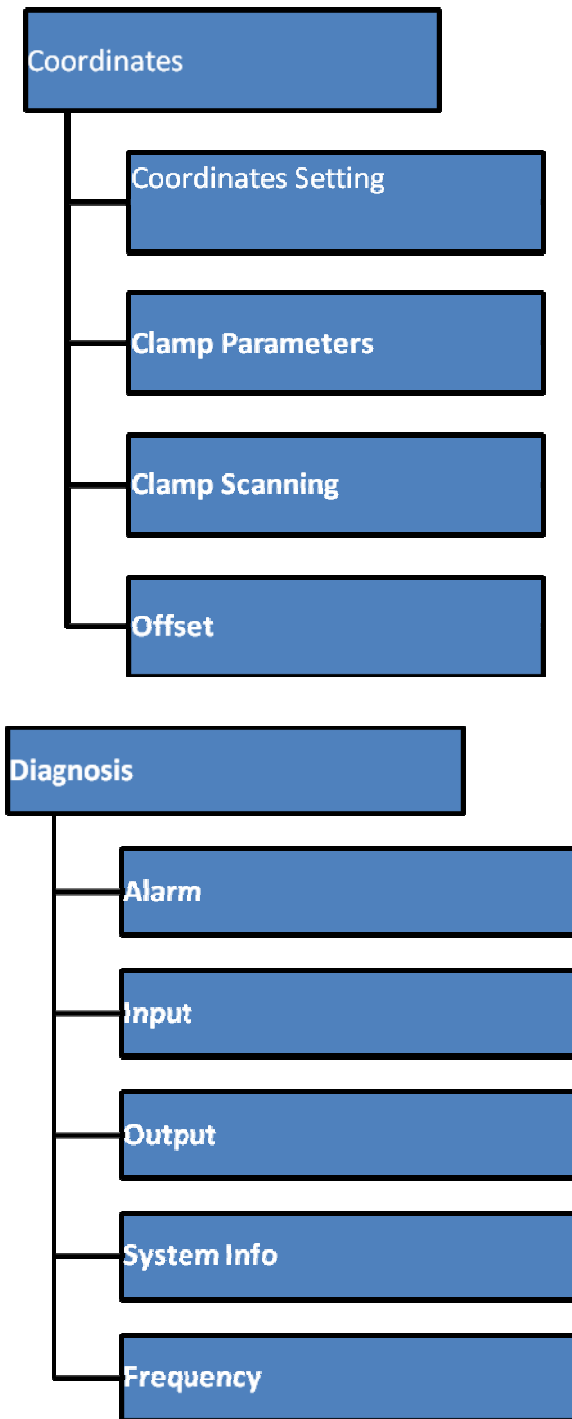
Key in the left: Return to previous menu

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

The main menus of the system include [Monitor], [Edit], [Parameter], [Coordinate] and [Diagnosis]. Each main menu contains several submenus, which are shown below:







3.3 Operating Keys

3.3.1 Keys on Controller Panel

The keys of NCT-XX system are defined below:

Key	Purpose
[RESET]	Cancel alarm, reset CNC
Address/number keys	Enter letters, numbers, etc.
[EOB], [CAN]	Confirm or cancel operation

Key	Purpose
[EOB], [CAN], [DEL]	Program edit (insert, delete, modify)
Mode switch key	Select operating 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
Punching lock	System punching switch
Single / continuous	In single mode, the system pauses after punching once; in continuous mode, the system punches until the program ends
Main motor	Control an output port to turn on the main motor of the equipment
Manual punching	In manual mode and when the system is stopped, press to punch once If the indicator is lit, the punch is in upper dead point position
[SBK]	Pause in SBK state after running each line of program, and press the Start key to continue punching
[PAUSE]	Press the Pause key and the system enters pause state; press the Start key again and the system continue processing from this point
[START]	Start automatic running

3.3.2 Keys on Additional Panel

The meaning and function of each button:

Key	Purpose
[STOP]	Emergency stop key
[Cycle Start]	Select a program to be executed and press this button to enter automatic cycle operation, and the indicator is lit, indicating in automatic state.
[Feed Hold]	In the process of automatic cycle, press this button and each axis decelerates and stops, and the [Ready] indicator is lit, indicating the holding state.
[SBK]	After running each line of program, the system pauses in SBK state; press the Start key to continue punching

Key	Purpose
[M01]	In the process of automatic cycle, press this button and the system pauses automatically when the program runs to M01;
[Skip]	Press this button to turn on the indicator, and press it again to turn off the indicator; when the indicator is on, the block started with “/” won’t be executed automatically; when the indicator is off, the system executes normally.
+X, -X, +Y, -Y, +T, -T, +C, -C (jog feeding button)	<p>In JOG mode, press X+, X-, Y+, Y-, C+, C- to run the axes of the machine tool to specified direction continuously;</p> <p>In STEP mode, press X+, X-, Y+, Y-, T+, T-, C+, C- to move the axes of the machine tool for specified distance to specified direction;</p> <p>In the retooling mode, press T+ or T- to rotate turret forward or backward for one station;</p>
[~]	Fast moving switch key; press this key and the axes run at fast moving speed, or else they run at jog speed
[Punching Lock]	<p>In any mode, this button can be used to lock punching, i.e. do not punch; press this button again to unlock; this feature is typically used to check the smooth running of sheet metal and the reliability of clamp safe area.</p> <p>The upper left indicator represents the punching lock state;</p>
[Single / Continuous]	<p>In single mode, it punches once and pauses; in continuous mode, the system punches until the program ends</p> <p>The indicator represents the status of single punching</p>
[Main Motor]	Press this button to start running of the main motor, and press it again to stop the main motor; the upper left indicator represents running of the main motor
[Hand Punch]	<p>In JOG mode, press it to punch when the system is stopped; the punching mode is 1,3, and the punching frequency depends on P1.132 hand punching times;</p> <p>In step mode, press it to achieve step punching of the punch, and the moving distance depends on P1.075 Clutch delay time;</p>
[Mould Pin]	"Jog", "Step" and "Retool": press this button to insert the mould pin, press it again to pull out the mould pin, and the lit indicator means that the mould is inserted;
[T Axis Lock]	<p>Press it and the T-axis servo is disengaged, and press it again to enable T axis servo</p> <p>Lit indicator: T axis enabled</p>
[Clamp Gripped]	In "Jog", "Step" and "Retool" mode, press this button to switch among clamp grip - delay - positioning block down, and press it again to switch among locating pin up --- delay - clamp loose;

Key	Purpose
[Clamp Scanning]	<p>Lit indicator: Clamps grips, and positioning block drops down;</p> <p>In the position of X-axis direction clamp, the scanning is automatic; after (mechanical) reference point home, press this button in the JOG mode to scan clamp position automatically; when the clamp scanning is completed, the indicator turns off; press this button again to re-scan the clamp. Clamp scanning results can be seen in the clamp security page.</p>
[Relocation]	<p>Press this button, and the positioning cylinder falls down; press it again and the positioning cylinder lifts up;</p> <p>Lit indicator: positioning cylinder down;</p>
[Positioning Block]	<p>Press this button, and the positioning block lifts up; press it again and the positioning block falls down;</p> <p>Lit indicator: Positioning block up;</p>
[Servo Lock]	<p>After pressing it, X-axis and Y-axis servo disengage; press it again, X-axis and Y-axis servo are enabled</p> <p>Lit indicator: X-axis, Y-axis enable</p>
[Zero Setting]	<p>After the machine is powered, you must perform zero setting.</p>
[Hand Climbing Mode]	<p>Press this button, the corresponding indicator is lit, and the machine enters the hand climbing mode;</p> <p>Note: hand climbing is invalid if the mould pin is not inserted;</p> <p>1) Main motor power off</p> <p>2) Clutch actuates</p> <p>Allow hand climbing of flywheel to adjust the punch;</p>
[Lubrication]	<p>Press this button, and the positioning block opens; press it again and the lubrication turns off;</p> <p>Lit indicator: Lubrication turns on;</p>
[Mold conversion Combination]	<p>Press this button, and mold conversion combines; press it again and the mold releases;</p> <p>Lit indicator: mold conversion combination</p>
Operation Mode	<p>Use this button to select the operation mode of machine tools; after zero setting, use this button to select: automatic, manual, step, edit, home, retool, and monitor;</p>
Automatic / Manual Ratio	<p>This button can adjust the feed rate for each axis;</p>

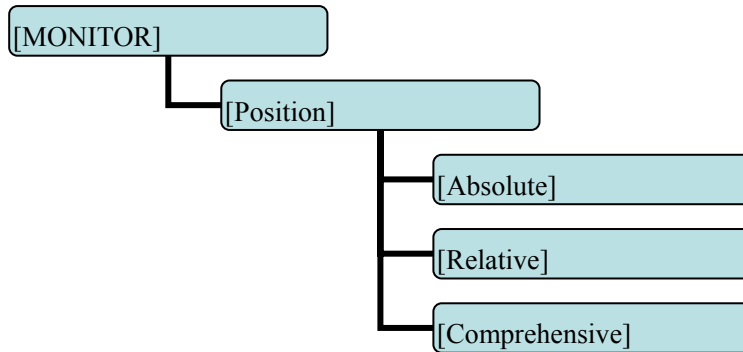
Key	Purpose
Home Indicator	Before re-powering and processing, the system must return to the reference point; lit indicator means that axis home operation has been performed;
Status Indicator	Upper dead point: indicator lit represents that the punch is in the upper dead point; Ready: indicator lit represents the pause state; Run: indicator lit represents that the system is in automatic cycle processing state; Alarm: Flashing indicator means that the system is in alarm state;

4 Main Interfaces of the System

4.1 Position Interface

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

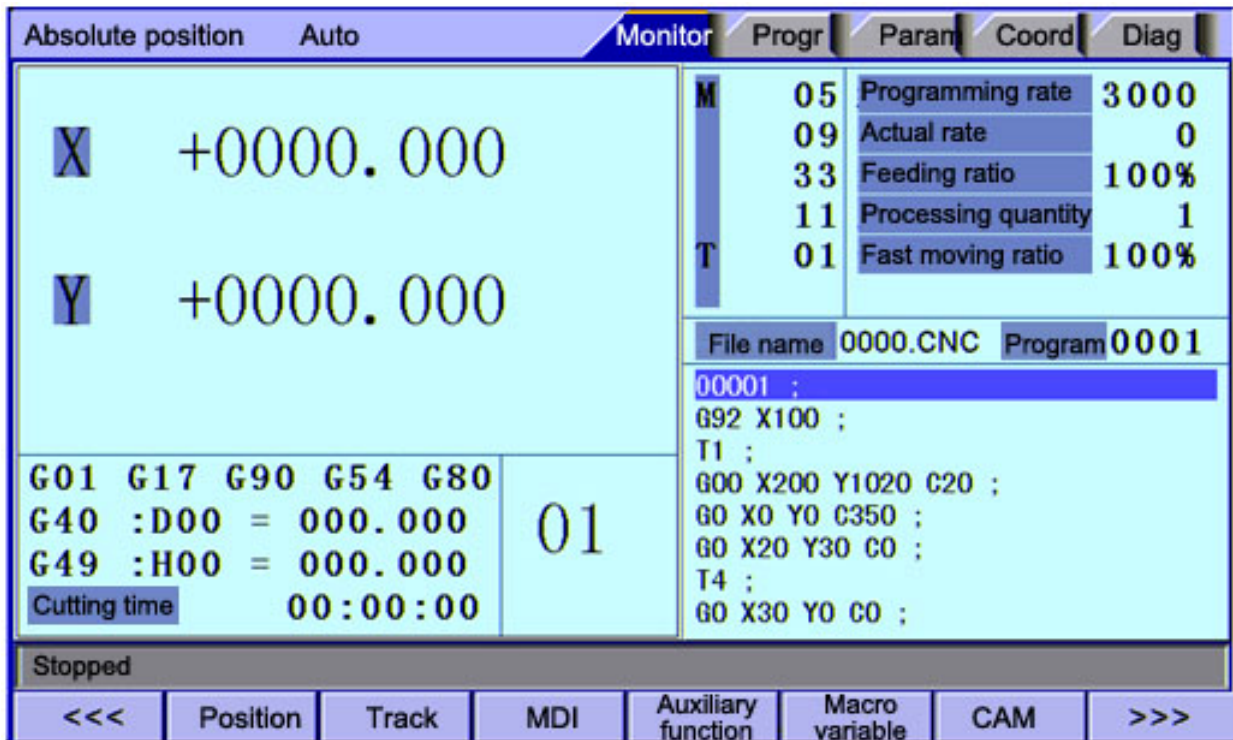
To enter position interface:



Absolute position

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

The absolute position interface follows:



Absolute Position Interface

Relative position

In manual 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 follows:

Enter [Position] interface;

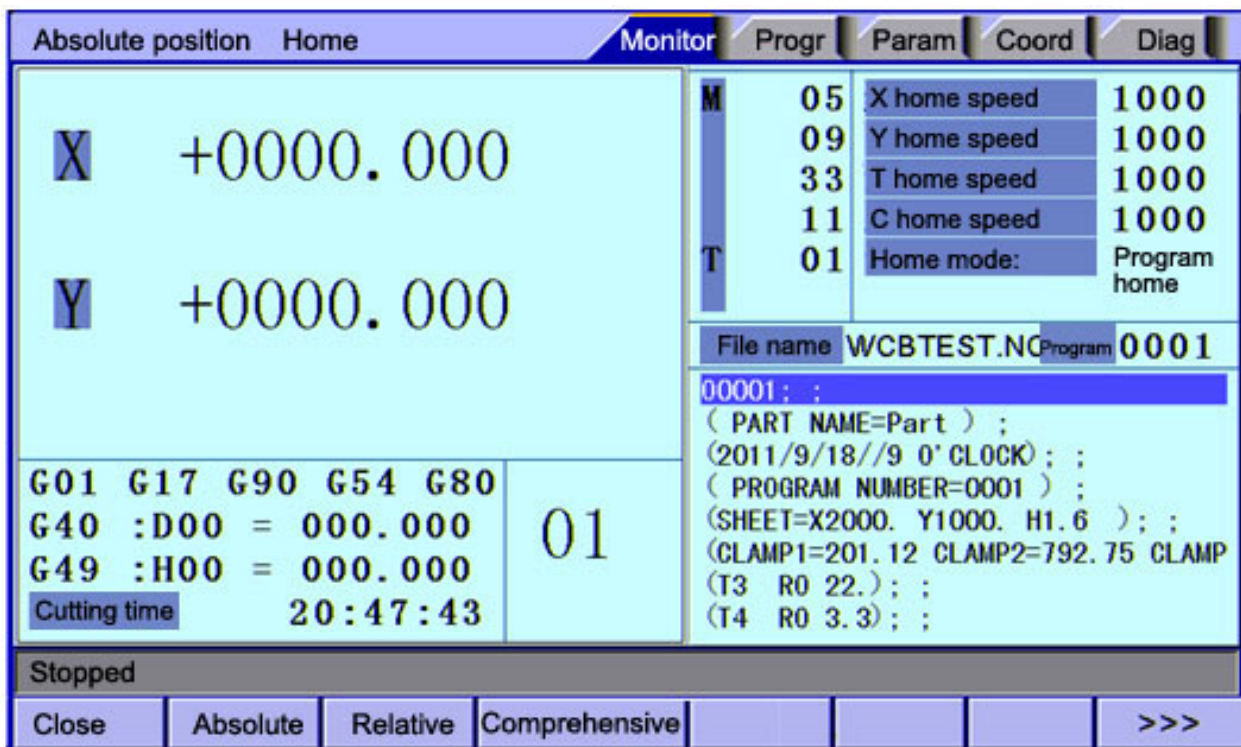
Switch to [Relative] interface;

Then, enter manual 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 follows:

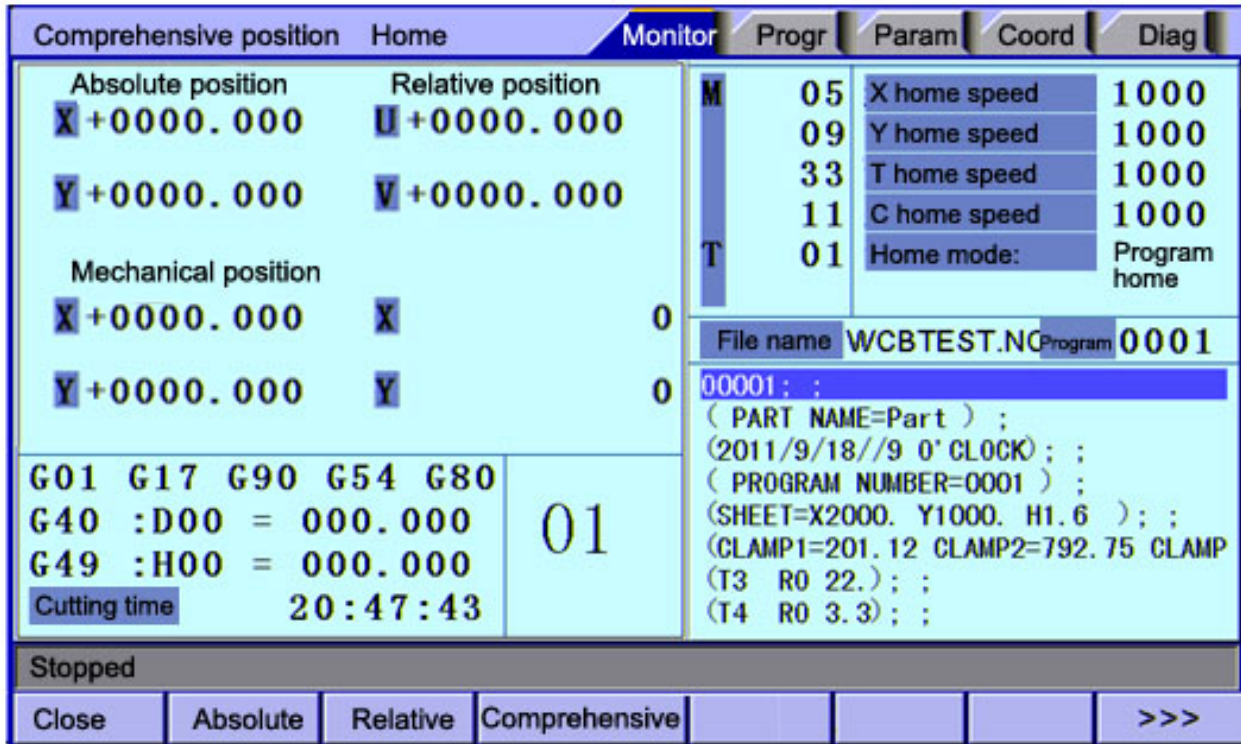


Relative Position Interface

Comprehensive coordinates

The interface displayed by absolute coordinates and machine tool coordinates

Comprehensive position interface is shown below:

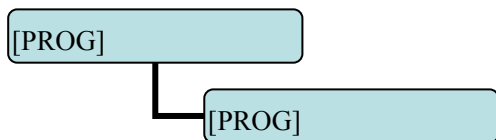


Comprehensive Position Interface

4.2 Programming Interface

The edit interface shows the program info in current workpiece, including program, file, etc. In the main interface, press [Edit] to enter the program interface.

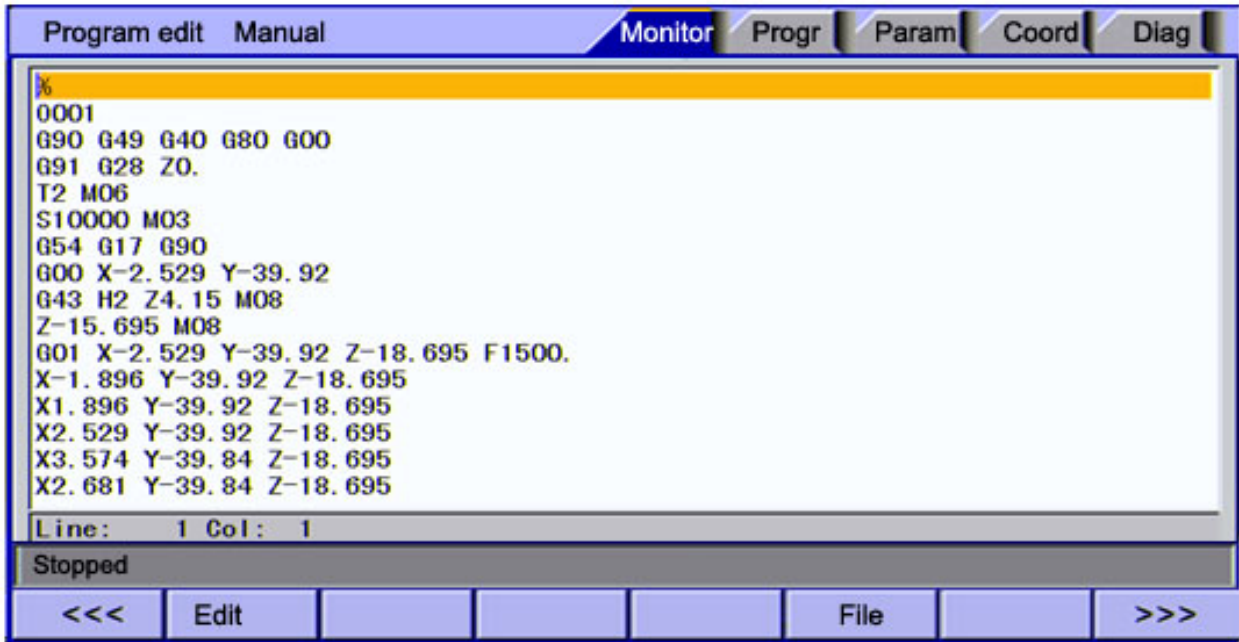
To enter program edit interface:



Program edit

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

Program edit interface is shown below:

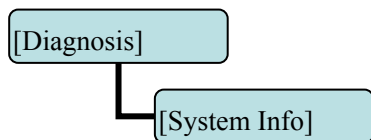


Program Edit Interface

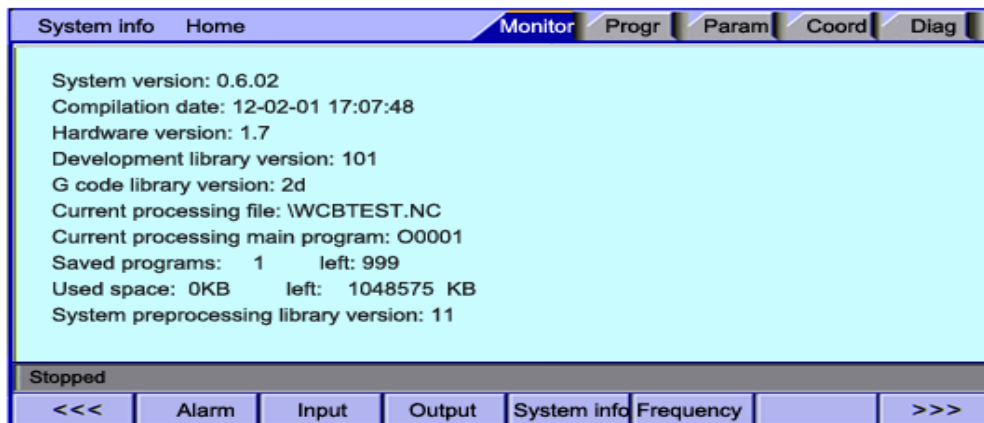
System info interface

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. If our engineering personnel ask to confirm the software version of the controller on site, please provide this version info.

To enter system info interface:



System info interface is shown below:

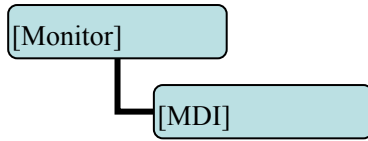


System Info Interface

4.3 MDI interface

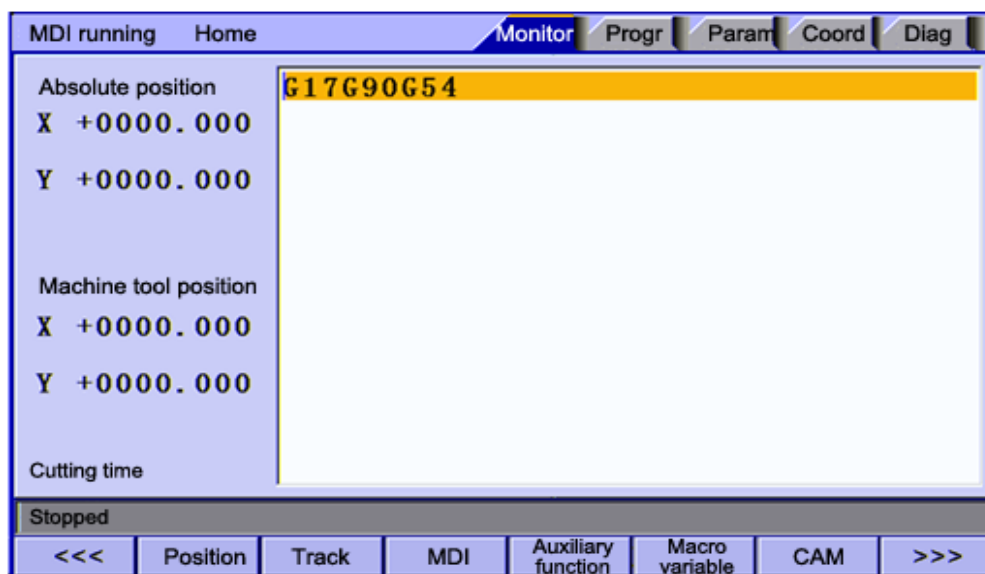
MDI mode is mainly used for the execution of single G code in certain occasions.

To enter MDI interface:



In MDI interface, enter complete NC code and then press [Insert] to enter NC instruction to corresponding position, and press [Start] to run.

MDI interaction interface is shown below:

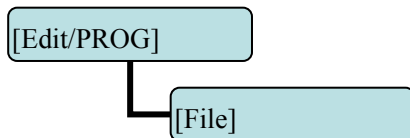


MDI Interface

4.4 File Management

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

To enter file management interface:

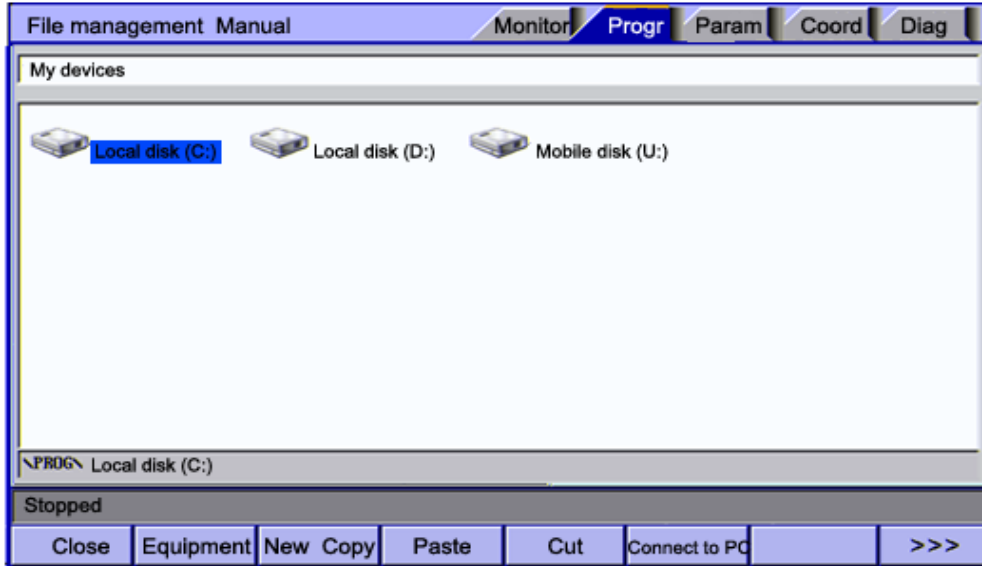


File management mainly has the following functions:

1. Connect the UBS disk, and copy the files between USB disk and electronic disk;
2. Upgrade system software: Copy the upgrade file to system memory in either method above to upgrade the software;

3. Restart the controller. In [File Management] interface, press the Reset key to restart the controller. This method is different from restarting due to power failure. In certain occasions, you can restart the controller quickly in this method to make certain function take effect.
4. Connect to PC with the USB cable, and exchange the data between USB disk and PC.

File operation interface is shown below:

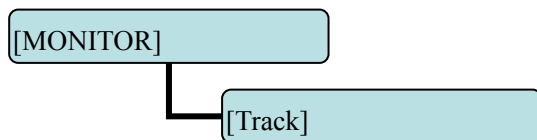


File Operation Interface

4.5 Graphic Simulation

[Track] function is to simulate NC processing program.

To enter graphic simulation interface:



Enter track interface to enable real-time track display automatically. During automatic running of the system, the motion track is displayed in real-time. In standby mode, you can also press Preview to pre-scan the processing file.

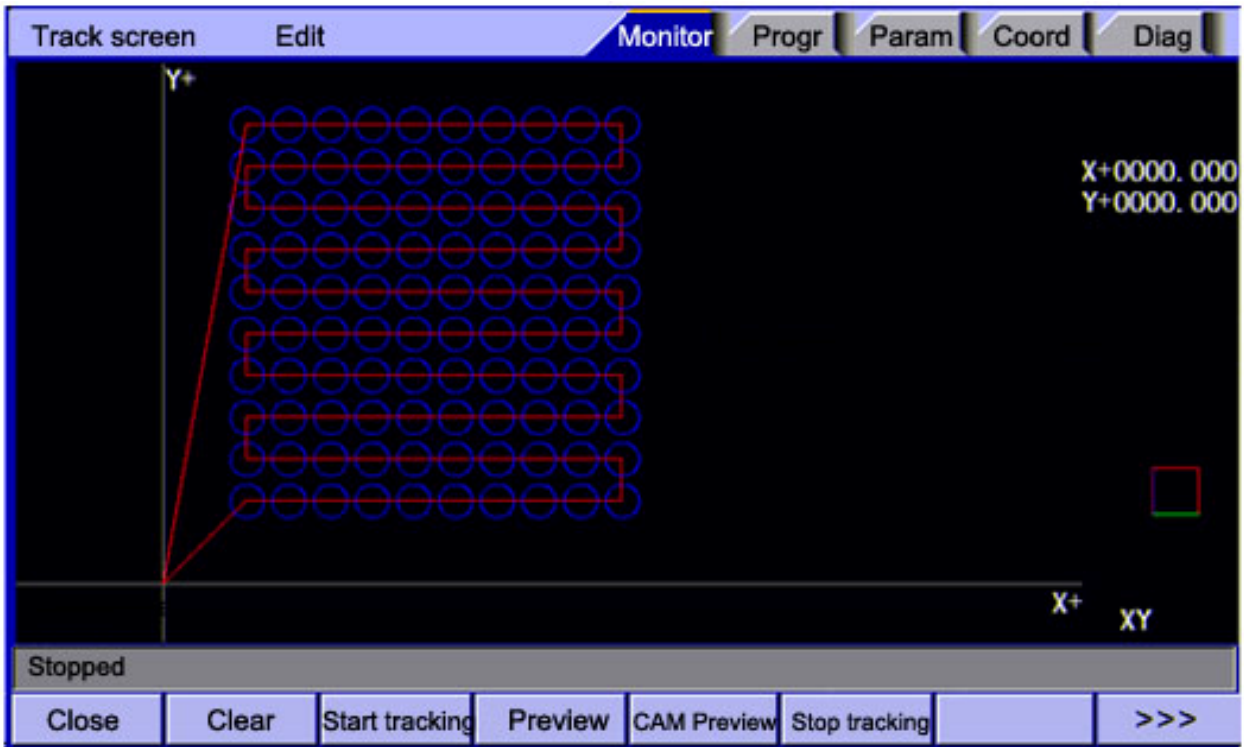
The shortcuts of adjusting position:

PageUp: Zoom in

PageDown: Zoom out

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

Graphic simulation interface is shown below:

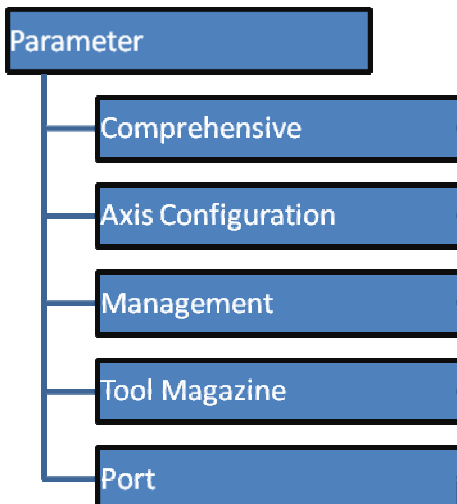


Graphic Simulation Interface

4.6 Parameter Interface

The parameter interface shows system parameter info, including comprehensive, axis parameter, management, tool magazine, principal axis, port, etc. In the main interface, press [parameter] to enter the interface.

Parameter has the following menus:



Comprehensive parameters

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

Comprehensive parameter interface is shown below:

Comprehensive Parameter		Home	Monitor	Progr	Param	Coord	Diag
025 Feeding speed (mm/min)	3000						
026 Start feeding speed (mm/min)	200						
027 Feeding acceleration (mm/sec)	500						
028 X axis reverse clearance compensation (pulse)	0						
029 Y axis reverse clearance compensation (pulse)	0						
030 T axis reverse clearance compensation (pulse)	0						
031 C axis reverse clearance compensation (pulse)	0						
032 Home mode	0						
033 IO filtering grade (1~8)	0						
034 Manual speed (mm/min)	1000						
035 Maximum feeding speed (mm/min)	6000						
036 M code waiting time (ms)	100						
037 X axis origin offset (pulse)							0
038 Y axis origin offset (pulse)							0
039 T axis origin offset (pulse)							0
040 C axis origin offset (pulse)							0
041 Line No. increment							0
042 System baud rate							115200
043 Controller ID							1
044 X axis home direction							1
045 Y axis home direction							1
046 T axis home direction							0
047 C axis home direction							0
048 X home speed (mm/min)							1000

Stopped

<<< Comprehensive Axis Management Tool Port >>>

Comprehensive 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 below:

Axis Parameter		Home	Monitor	Progr	Param	Coord	Diag
001 Effective voltage level for servo X axis alarm	0						
002 Effective voltage level for servo Y axis alarm	0						
003 Effective voltage level for servo T axis alarm	1						
004 Effective voltage level for servo C axis alarm	1						
005 Effective voltage level for servo X axis reset	1						
006 Effective voltage level for servo Y axis reset	1						
007 Effective voltage level for servo T axis reset	1						
008 Effective voltage level for servo C axis reset	1						
009 Servo X axis Z phase zero enable	0						
010 Effective voltage level for servo X axis Z phase	0						
011 Servo Y axis Z phase zero enable	0						
012 Effective voltage level for servo Y axis Z phase	0						
013 Servo T axis Z phase zero enable	0						
014 Effective voltage level for servo T axis Z phase	0						
015 Servo C axis Z phase zero enable	0						
016 Effective voltage level for servo C axis Z phase	0						
017 X hardware positive limit enable	0						
018 X hardware negative limit enable	0						
019 Effective voltage level for X hard limit	0						
020 Y hardware positive limit enable	0						
021 Y hardware negative limit enable	0						
022 Effective voltage level for Y hard limit	0						
023 X pulse command format							1
024 Y pulse command format							1

Stopped

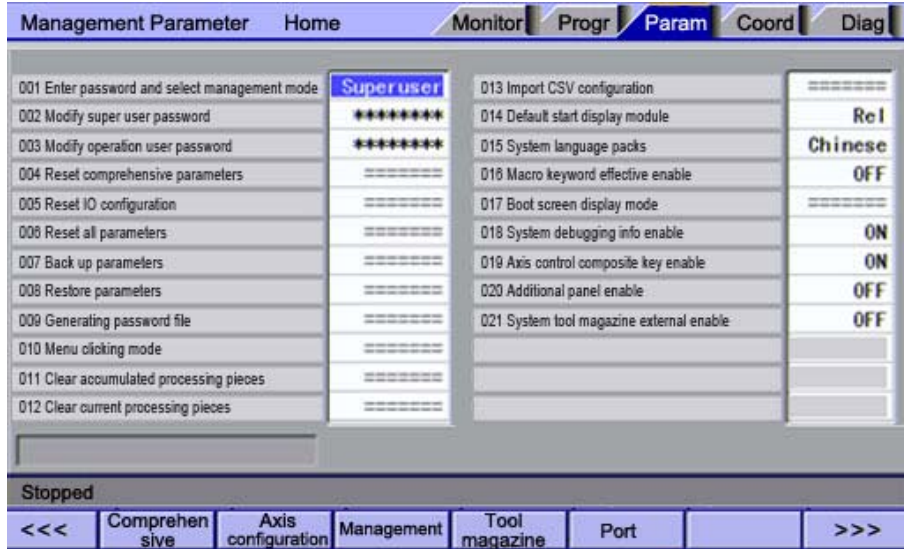
<<< Comprehensive Axis Management Tool Port >>>

Axis Parameter Interface

Management parameters

This is a function set that confirms identity and initialize the system.

Management parameter interface is shown below:



Management Parameter Interface

Tool magazine parameters

Tool magazine parameters are mold library related parameters set by the three axes and four axes punching system.

	Name	Angle	Diameter	Shape	Whether convert mold
1	Tool 1 (T1)	0.000	20.000	0.000	1
2	Tool 1 (T2)	0.000	0.000	0.000	0
3	Tool 1 (T3)	0.000	0.000	0.000	0
4	Tool 1 (T4)	0.000	5.000	0.000	0
5	Tool 1 (T5)	0.000	0.000	0.000	0
6	Tool 1 (T6)	0.000	0.000	0.000	0
7	Tool 1 (T7)	0.000	0.000	0.000	0
8	Tool 1 (T8)	0.000	0.000	0.000	0
9	Tool 1 (T9)	0.000	0.000	0.000	0
10	Tool 1 (T10)	0.000	0.000	0.000	0

IO configuration parameters

IO configuration parameters are the assignment of hardware interfaces. This parameter set is the IO pin sequence specified by the system's IO function numbers, which will improve the system flexibility. Please refer to System Parameters for the specific meaning of the parameters.

IO configuration parameter interface is shown below:

Management Parameter Home Monitor Progr Param Coord Diag			
001 Servo X alarm	34	013 IN8 - Line No. (1-24)	9
002 Servo Y alarm	35	014 IN9 - Line No. (1-24)	10
003 Servo T alarm	36	015 IN10 - Line No. (1-24)	11
004 Servo C alarm	37	016 IN11 - Line No. (1-24)	12
005 IN0 - Line No. (1-24)	1	017 IN12 - Line No. (1-24)	13
006 IN1 - Line No. (1-24)	2	018 IN13 - Line No. (1-24)	14
007 IN2 - Line No. (1-24)	3	019 IN14 - Line No. (1-24)	15
008 IN3 - Line No. (1-24)	4	020 IN15 - Line No. (1-24)	16
009 IN4 - Line No. (1-24)	5	021 IN16 - Line No. (1-24)	17
010 IN5 - Line No. (1-24)	6	022 IN17 - Line No. (1-24)	18
011 IN6 - Line No. (1-24)	7	023 IN18 - Line No. (1-24)	19
012 IN7 - Line No. (1-24)	8	024 IN19 - Line No. (1-24)	20

Stopped

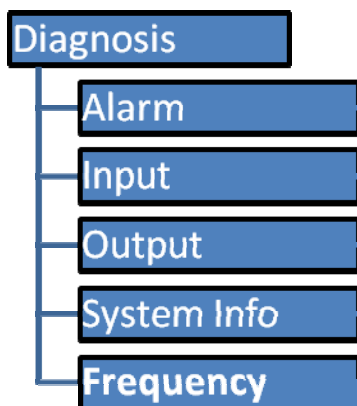
<<< Comprehensive Axis configuration Management Tool magazine Port >>>

IO Configuration Parameters Interface

4.7 Controller Diagnosis Interface (Diagnosis)

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

The diagnosis interface follows:



Alarm 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 system. In manual mode, press the direction keys to select corresponding IO, and press EOB to control the output manually.

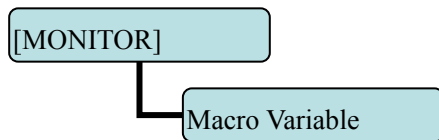
System info

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.

4.8 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

Process variable

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.

Process 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 transferred with variable number.

4.9 Clamp Scanning Function

1, System clamp number N ----- the number of clamps mounted on the X axis of the system; this version supports up to four clamps.

2,1 clamp home position L1 ----- base on the machine tool home, the clamp center to the home position; the negative X-axis direction is negative, and the positive direction is positive. This parameter is automatically scanned by the system, or can also be measured directly.

2,2 clamp position L2 ----- if clamp parameter is 2, the position of 2# clamp = 1# clamp home + the distance between the clamps 1

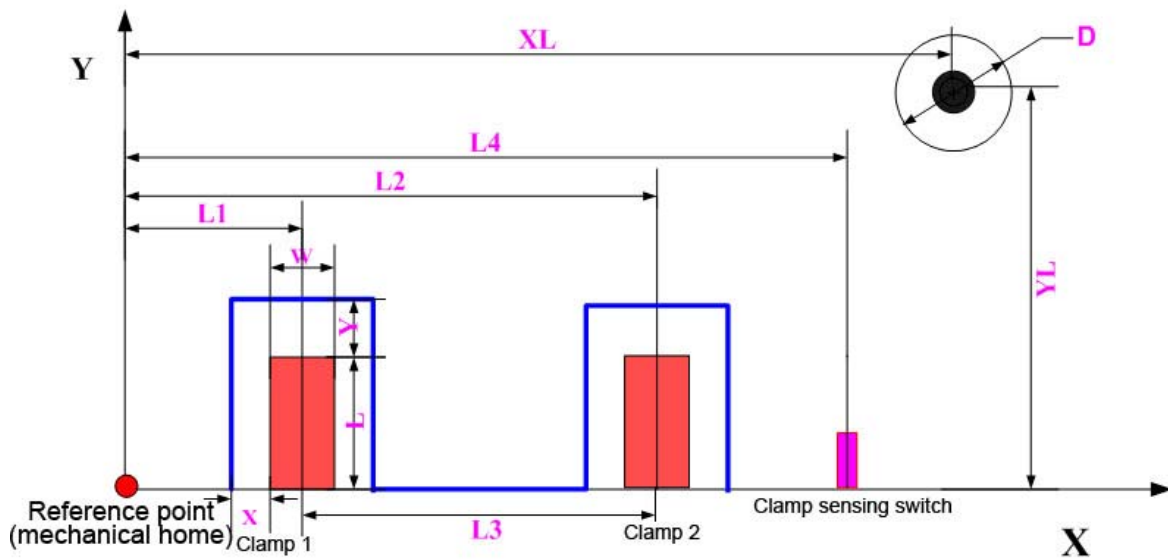
2,3 clamp position ----- if the clamp parameter is 3, the position of 3# clamp = 2# clamp home + distance between two clamps 1

- 5, distance between the two clamps 1 L3** ----- the distance from 1# clamp to 2# clamp centerline; it is scanned and calculated by the system automatically, or measured and input; the parameter is unsigned number.
- 6, distance between two clamps 2** ----- the distance from 2# clamp to 3# clamp centerline; it is scanned and calculated by the system automatically, or measured and input; the parameter is unsigned number.
- 7, distance between two clamps 3** ----- the distance from 3# clamp to 4# clamp centerline; it is scanned and calculated by the system automatically, or measured and input; the parameter is unsigned number.
- 8, clamp forearm width W** ----- the width in the X direction of the clamp; the two clamps have same width; this parameter is unsigned number and must be measured and entered into the system.
- 9, clamp X-direction safe distance X** ----- the safe distance in X direction; it is unsigned number and must be set in the system. When calculate the protected area in X direction, the left and right side of the clamp will plus this parameter respectively as the safe area.
- 10, clamp Y-direction safe distance Y** ----- the safe distance in Y direction; it is unsigned number and must be set in the system. When calculate the protected area in Y direction, the jaw will plus this parameter as the safe area.
- 11, clamp length L** ----- the length from the Y-axis home to the jaw; it is unsigned number and must be set in the system.
- 12, clamp sensing point effective voltage level;** it can be tested in the diagnostic screen; the lit red indicator means low (0) effective, or else it is high (1) effective
- 13, clamp X direction limit** ----- set the safe distance of clamp scanning in X direction; if no signal is detected beyond this value, the system will alarm. This parameter is a signed number, and depends on the clamp scanning direction.
- 14, Clamp scanning direction** ----- clamp mounting position; it is 0 if the clamp is in X-axis positive direction, and 1 in X-axis negative direction; if this parameter setting does not match the mounting position, an error occurs.
- 15, current mold station D** ----- mold diameter of machining tool of current tool magazine; this value will update when the system changes tool; the system will add this parameter in X and Y direction when calculates the safe zone; this parameter is unsigned, and needs to be set.
- 16, Whether scan clamp after restarted** ----- The system determines whether starts clamp scanning after a power outage according to this parameter; the default value is 1: Yes, while 0 indicate No.
- 17, clamp X-direction sensing point position L4** ---- This parameter is the distance from clamp sensing point to X-axis home; it is unsigned and requires user configuration; it is used to calculate the clamp position when the system scans clamp.
- 18, Mold center X-direction position XL** ----- This parameter is the offset of X-axis direction center of current punch from the machine tool center; the system automatically updates, and doesn't need setting; this parameter is a signed number and depends on X-axis direction.

19, Mold center Y-direction position YL ----- This parameter is the offset of Y-axis direction center of current punch from the machine tool center; the system automatically updates, and doesn't need setting; this parameter is a signed number and depends on Y-axis direction.

20, Whether perform home operation after scanning ----- Set whether perform home operation after scanning; 0: No, 1: Yes.

21, Clamp scanning speed ----- clamp scanning speed, unsigned number; the speed should be appropriate, or else the clamp signal can't be scanned.



Clamp Protection Area Diagram

Note

When the user manually enters clamp parameter: if [System Clamps Number] is 2: the position of 2# clamp depends on [1# Clamp Home Position] and [Distance between Two Clamps 1]; [2# Clamp Position] parameter is invalid.

Similarly, if the [System Clamps Number] is 3: 1# and 2# clamp position should be entered manually: the position of 3# clamp depends on [2# Clamp Position] and [Distance between Two Clamps 2]; [3# Clamp Position] parameter is invalid.

Similarly, if the [System Clamp] number is 4: 1#, 2# and 3# clamp position should be entered manually: the position of 4# clamp depends on [3# Clamp Position] and [Distance between Two Clamps 3];

5 Manual Operation

5.1 Returning to reference point manually

CNC machine tool has specific mechanical position, which is called as reference point and for tool exchange and coordinates setting. Generally, when the power supply is connected, the tool should be moved to the reference point. This operation is also called as home operation, which will make the CNC system confirm the origin of machine tool.

The home operation includes program and mechanical mode:

1. For program home, the action completes when the coordinates of machine tool are 0, and won't check whether origin switch is in position;
2. For mechanical home, the external home sensor switch is used to locate the origin of the machine tool; two checking modes are available:
 - a) With the external sensor switch, the home operation completes when the sensing is successfully repeatedly.
 - b) The external sensor switch is used as deceleration switch, the servo home is enabled as home signal after sensing and then the sensing stops.
3. You can set the "Home mode" in [Parameter][Comprehensive Parameter], 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. You can select accordingly. To use servo home as the home signal, you need to set "Axis phase Z home enable" to "1" in [Parameter][Axis Configuration] 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 follow:

1. Each axis returns to reference point separately
 - a) Press the mode switch key [Home] to select home operation;
 - b) Press the composite key [X-], [Y-], [T-], [C-] in the numbers section to return the corresponding axis to reference point.
2. The axes return to reference point simultaneously
 - a) Press the mode switch key [Home] to select home operation;
 - b) Press the [Start] key to return Z axis to reference point, and other axes return to reference point simultaneously.

The automatic home sequence can be configured in the parameters.

3. Reset machine tool position

- a) Press the mode switch key [Home] to select home operation;
- b) In [Absolute Position] and [Coordinate System] screen, press [X], [Y], [T], [C] respectively to show the value of corresponding axis position, and then press the [Cancel] key to reset the machine tool position of current axis, i.e. current point is used as machine tool origin. 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

- a) Press the mode switch key [Manual] to select manual operation;
- b) In [Relative Position] and [Coordinate System] screen, press [X], [Y], [T], [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 reference point according to program instruction, i.e. returning to reference point automatically.

Caution:

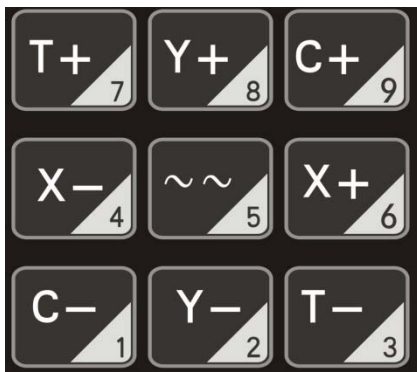
Generally, the system will perform home operation after connecting the power supply. If the power fails while the machine tool is moving, the system also will return to reference point when the power supply is connected again.

5.2 Continuous Feeding Manually

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

The operation follows:

1. Press the mode switch key [Manual] to select manual operation;
2. Press composite keys [X+], [X-]; [Y+], [Y-]; [C+], [C-] in numbers area to move the tool along selected axis. The keypad follows:



In manual mode, 5# key can be used to switch the manual speed and rapid traverse speed. The rapid traverse speed of every axis depends on comprehensive parameter 009-012 (rapid traverse speed setting). After switching to rapid traverse speed, the manual 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 in manual mode.

5.3 Manual Retooling Operation

1. Press the operating mode button [Step / Retool] (the key is composite key, and switches between the two modes repeatedly.), and select retooling mode;
2. Press and hold the composite key [T +], [T-] and the system will conduct retooling once; T+ is retooling in the direction with larger tool number, and T- is retooling in the direction under the tool; T axis is valid for three axes and four axes punch system.

Note:

Do not move the T axis before home operation is performed;

Before moving T axis, the punch must be in the upper dead point position;

5.4 Single Step Feeding

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

The specific operation follows:

1. Press the mode switch key [Single step/Die change] (this key is composite, and you can press it repeatedly to switch the modes) to select the single step operation;
2. Press composite keys [X+], [X-]; [Y+], [Y-]; [T+], [T-]; [C+], [C-] in numbers area to move the tool for a fixed distance along 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.

Note

In step mode, the fixed distance of selected axis can be determined by [Parameters] [Comprehensive] 114# Parameter "Step Increment (mm)";

6 Automatic Operation

The machine tool moving according to prepared program is called as automatic operation. The automatic operation modes of NCT-XX system follow:

Memory operation, MDI operation, USB disk DNC operation

6.1 Memory Operation

The machine tool can operate according to the program in NCT-XX memory, which is called as memory operation.

The program is pre-stored 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 follows:

1. Save the program in the memory (see 8.1 for details);
2. Select [Edit], [File] in the menu or press [File] on the panel to enter file operation interface;
3. Press the direction keys to move the cursor, press [EOB] to select a program and load the file into the work area;
4. Press mode selection key [Auto] to switch to automatic mode;
5. Press the [Start] key to run the program, and the indicator is on.

6.2 MDI Operation

In [Monitor] interface, switch to [MDI], enter the program with keypad and make the machine tool operate according to the program. The program block isn't saved in system memory, and can't be preserved upon power failure. This is called as MDI operation and the step follows:

1. Press mode selection key [Edit];
2. Select [Monitor], [MDI] in the menu to enter MDI interface;
3. Enter program block instruction manually;
4. Press [Start], [EOB] to start executing the program block.

6.3 USB disk DNC

The program read from external USB disk can operate the machine tool without saving in CNC memory. This operation is called as USB disk DNC operation.

The step of USB disk DNC operation follows:

1. Insert the USB disk;
2. Select [Monitor], [File] in the menu to enter file operation interface;
3. Select USB disk and press [EOB] to enter;
4. Move cursor to select a file in the disk;
5. Press [EOB] to load the file into work area (system buffer);
6. Press mode selection key [Auto];
7. Press the [Start] key to run the program, and the indicator is on.

Caution

The system won't record the USD disk path. If power failure occurs during DNC processing, the program info will be lost when the power supply is connected again.

6.4 CAM Running

Press [F6] in the [Monitor] screen to switch to CAM interface, enter the parameters of the graphics, and the machine tool runs according to the trajectory of graphics; the parameters have power-down memory function, which is called CAM running and the steps are as follows:

1. In the CAM main interface, press Up, Down, Left and Right key to select desired CAM diagram and press [EOB] to enter;
2. Press the operating mode selection button [Monitor];
3. Monitor the parameters and press the operating mode button [Auto];
4. Press the [Start] key to run the program, the start indicator is lit, and the program starts to run;

6.5 SBK function

In automatic mode, press [SBK] to start the SBK function. Current program block stops after executing; press [Start] again and next block stops after executing. The SBK mode allows checking the program block by block.

6.6 Stopping Automatic Operating

Two methods are available to stop automatic operating, i.e. enter stop command where the program will stop (M00, M01) and press the key on the operation panel to stop the machine tool.

Program stops

After executing the block with M00 or M01, the automatic operating stops, which is same to single block stop, and all mode information is saved. Start with CNC and the automatic operation can be started again.

After processing a part, the automatic operation stops.

Program ends

After executing the block with M30, the automatic operating stops, changes into reset state, and returns to program start.

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 operating the machine tool and the pause indicator is on.

Reset

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

7 Program Saving, Editing & Deleting

7.1 Saving the Program in the Memory

7.1.1 Keypad Input (New Program)

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

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

7.1.2 PC Serial Port Input

The step of transmitting files to controller through PC follows:

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

7.1.3 Copying Processing Files from USB Disk

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

1. In the main menu, press [Edit] to enter program edit interface;
2. Select [File] to enter file operation interface;
3. Select USB disk and press [EOB] to enter;
4. Move the cursor to select a CNC file and then select [Copy];
5. Return to the root directory, locate the PROG directory in disk D, enter the directory, and select [Paste] to complete copying.

7.2 Reading Programs into Work Area

7.2.1 Reading Programs from Controller into Work Area

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

1. Press [File] to enter file operation interface;
2. Select desired program, which is in PROG directory in disk D by default, press [EOB] to enter subdirectory, or press [Cancel] to exit;
3. Move cursor to select desired program, press [EOB] to confirm and load the program.

7.2.2 Reading Programs from USB Disk into Work Area

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

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

7.2.3 Editing & Modifying Programs

The program in CNC memory can be edited with NC keypad. In the main menu, press [Edit] to enter program edit interface and edit the program in current work area (for loading program into work area, refer to 8.2). The edit mode is 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 the functions base on edit mode;

NCT-XX 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 processing files that exceed 2MB.

7.3 Deleting Programs

7.3.1 Deleting Programs in Memory

Follow the step below to delete the programs in system memory:

1. Press [File] to enter file operation interface;
2. Follow the prompt on the screen, select the file and press [Delete] to confirm and delete the file.

Caution

If the program has been loaded into work area, you need to restart the system to delete the program, or else the system will report error.

The programs loaded into the work area can't be deleted, or else the system will report error.

8 Safe Operation

8.1 Emergency Stop

Press the emergency stop button on the machine tool, which will stop immediately, and all outputs are turned off. Rotate the button clockwise to cancel emergency stop, but all outputs must be restarted.

Caution:

The power supply isn't always cut off upon emergency stop. Please refer to the electrical configuration description of the machine tool manufacturer for details;

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

8.2 Hard Limit Over Travel

The system alarms if the tool touches travel switch during operation. The axis in corresponding direction can't move, and only moves in reverse direction. Before the alarm is released, the system can't enter automatic operation normally. After investigating the alarm reason, press [Reset] to clear the alarm information.

8.3 Soft Limit Over Travel

If the tool enters the restriction area regulated by the parameter (travel limit), the system alarms over travel, and the tool decelerates and stops. At this moment, you can move the tool to safe direction in manual mode, and then press [Reset] to release the alarm.

Caution:

During automatic operation, when the tool touches an axial travel switch, the tool decelerates and stops all axial motions, and only displays one over travel alarm.

During manual operation, when the tool touches an axial travel switch, the tool only decelerates and stops motion on current axis, and still moves along other axes.

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

9 System Maintenance

9.1 Restart

In the main menu, press [Edit] to enter the program interface;

Press [File] to enter the file interface;

Press [Reset] and the system asks whether restart or not;

Press [OK] to restart the system.

9.2 System Upgrade

The step of copying upgrade program with USB disk follows:

In the main menu, press [Edit] to enter the program interface;

Press [File] to enter the file interface;

Select and access the USB disk;

Move cursor to the upgrade file, select [Copy], and the system checks the upgrade file according to the file name automatically;

After upgrading, restart the system to take effect.

9.3 Parameter Backup & Restore

In the main menu, press [Parameters] key to enter the parameter interface;

Press the [Management] key to enter management parameters interface;

Move the cursor to "007 Parameter Backup";

Press the [EOB] key, the system confirms and restores factory parameters, and restarts automatically

The restore steps are same as above, and the parameter position is "008 Parameter Restore";

Note

Parameter backup and restore support cross-version invocation; before upgrading, be sure to back up the parameters, and restore the parameter after upgraded successfully;

9.4 Reset

Select the edit mode;

In the main menu, press [Parameter] to enter the parameter interface;

Press [Management] key to enter management parameter interface;

Move cursor to "006 Reset all parameters";

Press [EOB], the system confirms, restores the default parameters and restarts automatically.

9.5 Entering BISO Interface

If the system can't be started due to irreversible error, you can enter the BIOS to upgrade and maintain the program;

Enter the BIOS after the controller powers on and before the program is started, press the [Cancel] button to enter a blue background successfully; if the BIOS has password, it will pop up a prompt, and type the valid password to enter the BIOS

Enter the BIOS to perform the maintenance: Format C, D disk, copy USB disk files and upgrade;

10 System Parameters

According to occasions and functions, the parameters contain comprehensive parameters, IO configuration parameters, management parameters and coordinate setting parameters.

Comprehensive parameters are complete, and contain basic operation and usage settings of the controller, including principal axis, handwheel, home, tool magazine, etc.;

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

Coordinate setting parameters are tool setting configuration in [Coordinate] interface;

(1) It is required to confirm user identity to modify the parameter table. 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 system enters the corresponding mode automatically according to the entered password.

(2) According to the application, the parameters will take effect immediately or after restarted; the parameters that require restart are marked with <●>.

(3) 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 $1+2+32=35$.

10.1 Parameter Index List

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	001	X axis instruction frequency multiplication ratio	Instant	1	
General parameter (P1.)	002	X axis instruction frequency division coefficient	Instant	1	
General parameter (P1.)	003	Y axis instruction frequency multiplication ratio	Instant	1	
General parameter (P1.)	004	Y axis instruction frequency division coefficient	Instant	1	
General parameter (P1.)	005	T axis instruction frequency multiplication ratio	Instant	1	
General parameter (P1.)	006	T axis instruction frequency division coefficient	Instant	1	
General parameter (P1.)	007	C axis instruction frequency multiplication ratio	Instant	1	
General parameter (P1.)	008	C axis instruction frequency division coefficient	Instant	1	
General parameter (P1.)	009	X axis rapid traverse rate (mm/min)	Instant	3000	
General parameter (P1.)	010	Y axis rapid traverse rate (mm/min)	Instant	3000	
General parameter (P1.)	011	T axis rapid traverse rate (mm/min)	Instant	3000	
General parameter (P1.)	012	C axis rapid traverse rate (mm/min)	Instant	3000	
General parameter (P1.)	013	X axis start rate (mm/min)	Instant	100	
General parameter (P1.)	014	Y axis start rate (mm/min)	Instant	100	
General parameter (P1.)	015	T axis start rate (mm/min)	Instant	100	
General parameter (P1.)	016	C axis start rate (mm/min)	Instant	100	
General parameter (P1.)	017	X axis acceleration (Kpps)	Instant	1000	
General parameter (P1.)	018	Y axis acceleration (Kpps)	Instant	1000	
General parameter (P1.)	019	T axis acceleration (Kpps)	Instant	50	
General parameter (P1.)	020	C axis acceleration (Kpps)	Instant	50	
General parameter (P1.)	021	X axis positive soft limit (mm)	Instant	+9999.999	
General parameter (P1.)	022	X axis negative soft limit (mm)	Instant	-9999.999	
General parameter (P1.)	023	Y axis positive soft limit (mm)	Instant	+9999.999	
General parameter (P1.)	024	Y axis negative soft limit (mm)	Instant	-9999.999	

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	025	Feeding speed (mm/min)	Instant	3000	
General parameter (P1.)	026	Initial feeding speed (mm/min)	Instant	200	
General parameter (P1.)	027	Feeding acceleration (mm/sec)	Instant	500	
General parameter (P1.)	028	X axis reverse clearance compensation (pulse)	Instant	0	
General parameter (P1.)	029	Y axis reverse clearance compensation (pulse)	Instant	0	
General parameter (P1.)	030	T axis reverse clearance compensation (pulse)	Instant	0	
General parameter (P1.)	031	C axis reverse clearance compensation (pulse)	Instant	0	
General parameter (P1.)	032	Home mode	Instant	0	
General parameter (P1.)	033	IO filter level (1~8)	Instant	0	
General parameter (P1.)	034	Manual speed (mm/min)	Instant	3000	
General parameter (P1.)	035	Maximum feeding speed (mm/min)	Instant	6000	
General parameter (P1.)	036	M code waiting time (ms)	Instant	0	
General parameter (P1.)	037	X axis home offset (mm)	Instant	0	
General parameter (P1.)	038	Y axis home offset (mm)	Instant	0	
General parameter (P1.)	039	T axis home offset (mm)	Instant	0	
General parameter (P1.)	040	C axis home offset (mm)	Instant	0	
General parameter (P1.)	041	Line number increment	Instant	9000	
General parameter (P1.)	042	System baud rate	Instant	100	
General parameter (P1.)	043	Controller ID No.	Instant	0	
General parameter (P1.)	044	X axis home direction	Instant	0	
General parameter (P1.)	045	Y axis home direction	Instant	0	
General parameter (P1.)	046	T axis home direction	Instant	0	
General parameter (P1.)	047	C axis home direction	Instant	0	
General parameter (P1.)	048	X axis home speed (mm/min)	Instant	115200	
General parameter (P1.)	049	Y axis home speed (mm/min)	Instant	1	
General parameter (P1.)	050	T axis home speed (mm/min)	Instant	1	
General parameter (P1.)	051	C axis home speed (mm/min)	Instant	1	
General parameter (P1.)	052	Lubricant pressure schedule open (min)	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	053	Lubricant pressure holding time (sec)	Instant	0	
General parameter (P1.)	054	Lubricant control frequency (Hz)	Instant	0	
General parameter (P1.)	055	Lubricant pressure test voltage level	Instant	0	
General parameter (P1.)	056	External emergency stop 2 test voltage level	Instant	2	
General parameter (P1.)	057	Automatic home mode configuration (bit)	Instant	100	
General parameter (P1.)	058	External start 2 test voltage level	Instant	0	
General parameter (P1.)	059	External pause 2 test voltage level	Instant	0	
General parameter (P1.)	060	Home test enable after alarm	Instant	0	
General parameter (P1.)	061	System home test enable	Instant	1	
General parameter (P1.)	062	IP address	Instant	192	
General parameter (P1.)	063	Subnet mask	Instant	255	
General parameter (P1.)	064	Default gateway	Instant	192	
General parameter (P1.)	074	Positioning delay time (ms)	Instant	100	
General parameter (P1.)	075	Clutch delay time (ms)	Instant	100	
General parameter (P1.)	076	Punch cycle (ms)	Instant	0	
General parameter (P1.)	077	Punch cycle factor	Instant	100	
General parameter (P1.)	078	Punching method	Instant	0	
General parameter (P1.)	079	Punch peak effective voltage level <I>	Instant	0	
General parameter (P1.)	080	Punch safe height effective voltage level <I>	Instant	0	
General parameter (P1.)	081	Punch ON effective voltage level <O>	Instant	0	
General parameter (P1.)	082	Feeding position simulation	Instant	1	
General parameter (P1.)	083	Punch motion mode	Instant	1	
General parameter (P1.)	084	Maximum punching step	Instant	0	
General parameter (P1.)	085	Punch control mode	Instant	0	
General parameter (P1.)	086	Mold clamping effective voltage level <I>	Instant	0	
General parameter (P1.)	087	Mold release effective voltage level <I>	Instant	0	
General parameter (P1.)	088	Positioning block in place effective voltage level <I>	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	089	Foot clamp material effective voltage level <I>	Instant	0	
General parameter (P1.)	090	Mold pin lock effective voltage level <O>	Instant	0	
General parameter (P1.)	091	Mold conversion combination effective voltage level <O>	Instant	0	
General parameter (P1.)	092	Mold conversion combination in-place effective voltage level <I>	Instant	0	
General parameter (P1.)	093	Mold conversion disengagement in place effective voltage level <I>	Instant	0	
General parameter (P1.)	094	Mold conversion position in-place effective voltage level <I>	Instant	0	
General parameter (P1.)	095	C-axis rotation switch upper dead point enable	Instant	0	
General parameter (P1.)	096	--	Instant	0	
General parameter (P1.)	097	Relocation clamp back distance (mm)	Instant	2	
General parameter (P1.)	098	Relocation clamp feeding distance (mm)	Instant	2	
General parameter (P1.)	099	Back to loading point after processing (mm)	Instant	2	
General parameter (P1.)	100	X -axis loading position (mm)	Instant	+0.000	
General parameter (P1.)	101	Y -axis loading position (mm)	Instant	+0.000	
General parameter (P1.)	102	Handwheel enable	Instant	0	
General parameter (P1.)	103	Punch speed 1(mm/min)	Instant	3000	
General parameter (P1.)	104	Punch speed 2(mm/min)	Instant	8000	
General parameter (P1.)	105	Punch speed 3(mm/min)	Instant	30000	
General parameter (P1.)	106	Single-step increment (mm)	Instant	0.1	
General parameter (P1.)	107	1# mold X direction offset (mm)	Instant	0	
General parameter (P1.)	108	2# mold Y direction offset (mm)	Instant	0	
General parameter (P1.)	109	Home & back to loading point enable	Instant	0	
General parameter (P1.)	110	Turret retooling debugging enable	Instant	0	
General parameter (P1.)	111	Clamp delay time (ms)	Instant	500	
General parameter (P1.)	112	Upper dead point stopping effective	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
		voltage level			
General parameter (P1.)	113	Cylinder relocation speed	Instant	5000	
General parameter (P1.)	114	Detection coding enable	Instant	0	
General parameter (P1.)	115	X axis encoder pulse ratio P/mm	Instant	1000	
General parameter (P1.)	116	Y axis encoder pulse ratio P/mm	Instant	1000	
General parameter (P1.)	117	X axis position deviation	Instant	0	
General parameter (P1.)	118	Y axis position deviation	Instant	0	
General parameter (P1.)	119	Serial / Modbus switching	Instant	1	
General parameter (P1.)	120	Delay time before moving (ms)	Instant	10	
General parameter (P1.)	121	Single punch off clutch delay time (ms)	Instant	0	
General parameter (P1.)	122	Nibbling off clutch delay time (ms)	Instant	0	
General parameter (P1.)	123	Clutch detection delay time (ms)	Instant	10	
General parameter (P1.)	124	Manual punching times	Instant	1	
General parameter (P1.)	125	T axis home mode	Instant	0	
General parameter (P1.)	126	Breakpoint memory function enable	Instant	0	
General parameter (P1.)	127	Positioning completion detection enable	Instant	0	
General parameter (P1.)	128	Pre-reading program enable	Instant	0	
General parameter (P1.)	129	Encoder filter level (1~20)	Instant	0	
General parameter (P1.)	130	Ejector control enable	Instant	0	
General parameter (P1.)	131	Clamp avoidance enable	Instant	0	
General parameter (P1.)	132	Blanking detection alarm times	Instant	0	
General parameter (P1.)	133	Trajectory simulation over-travel detection enable	Instant	OFF	
General parameter (P1.)	134	Velocity curve adjustment segments	Instant	0	
General parameter (P1.)	135	Punching center distance X(mm)	Instant	+0.000	
General parameter (P1.)	136	Punching center distance Y(mm)	Instant	+0.000	
General parameter (P1.)	137	Lubricant pressure schedule open B (min)	Instant	1	
General parameter (P1.)	138	Lubricant pressure holding time B (sec)	Instant	1	
General parameter (P1.)	139	Lubricant control frequency B(Hz)	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
General parameter (P1.)	140	Lubricant test voltage level B	Instant	0	
Axis parameter (P2.)	001	Effective voltage level for servo X axis alarm	Instant	0	
Axis parameter (P2.)	002	Effective voltage level for servo Y axis alarm	Instant	0	
Axis parameter (P2.)	003	Effective voltage level for servo T axis alarm	Instant	0	
Axis parameter (P2.)	004	Effective voltage level for servo C axis alarm	Instant	0	
Axis parameter (P2.)	005	Effective voltage level for servo X axis reset	Instant	1	
Axis parameter (P2.)	006	Effective voltage level for servo Y axis reset	Instant	1	
Axis parameter (P2.)	007	Effective voltage level for servo T axis reset	Instant	1	
Axis parameter (P2.)	008	Effective voltage level for servo C axis reset	Instant	0	
Axis parameter (P2.)	009	Servo X axis Z phase home enable	Instant	0	
Axis parameter (P2.)	010	Effective voltage level for servo X axis Z phase	Instant	0	
Axis parameter (P2.)	011	Servo Y axis Z phase home enable	Instant	0	
Axis parameter (P2.)	012	Effective voltage level for servo Y axis Z phase	Instant	0	
Axis parameter (P2.)	013	Servo T axis Z phase home enable	Instant	0	
Axis parameter (P2.)	014	Effective voltage level for servo T axis Z phase	Instant	0	
Axis parameter (P2.)	015	Servo C axis Z phase home enable	Instant	0	
Axis parameter (P2.)	016	Effective voltage level for servo C axis Z phase	Instant	0	
Axis parameter (P2.)	017	X hardware positive limit enable	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	018	X hardware negative limit enable	Instant	0	
Axis parameter (P2.)	019	Effective voltage level for X hard limit	Instant	0	
Axis parameter (P2.)	020	Y hardware positive limit enable	Instant	0	
Axis parameter (P2.)	021	Y hardware negative limit enable	Instant	0	
Axis parameter (P2.)	022	Effective voltage level for Y hard limit	Instant	1	
Axis parameter (P2.)	023	X pulse command format	Instant	1	
Axis parameter (P2.)	024	Y pulse command format	Instant	1	
Axis parameter (P2.)	025	T pulse command format	Instant	1	
Axis parameter (P2.)	026	C pulse command format	Instant	1	
Axis parameter (P2.)	027	X pulse logic direction	Instant	1	
Axis parameter (P2.)	028	Y pulse logic direction	Instant	1	
Axis parameter (P2.)	029	T pulse logic direction	Instant	1	
Axis parameter (P2.)	030	C pulse logic direction	Instant	1	
Axis parameter (P2.)	031	Effective voltage level for X external home	Instant	0	
Axis parameter (P2.)	032	Effective voltage level for Y external home	Instant	0	
Axis parameter (P2.)	033	Effective voltage level for T external home	Instant	0	
Axis parameter (P2.)	034	Effective voltage level for C external home	Instant	0	
Axis parameter (P2.)	035	X axis ROUND settings	Instant	0	
Axis parameter (P2.)	036	Y axis ROUND settings	Instant	0	
Axis parameter (P2.)	037	T axis ROUND settings	Instant	0	
Axis parameter (P2.)	038	C axis ROUND settings	Instant	0	
Axis parameter (P2.)	039	X axis specified interface axis No.	Instant	1	
Axis parameter (P2.)	040	Y axis specified interface axis No.	Instant	2	
Axis parameter (P2.)	041	T axis specified interface axis No.	Instant	3	
Axis parameter (P2.)	042	C axis specified interface axis No.	Instant	4	
Axis parameter (P2.)	043	X axis encoder wire number (p)	Instant	2500	
Axis parameter (P2.)	044	Y axis encoder wire number (p)	Instant	2500	
Axis parameter (P2.)	045	T axis encoder wire number (p)	Instant	2500	

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	046	C axis encoder wire number (p)	Instant	2500	
Axis parameter (P2.)	047	X axis 360 reset	Instant	0	
Axis parameter (P2.)	048	Y axis 360 reset	Instant	0	
Axis parameter (P2.)	049	T axis 360 reset	Instant	0	
Axis parameter (P2.)	050	C axis 360 reset	Instant	0	
Axis parameter (P2.)	051	X axis pulse logic voltage level	Instant	0	
Axis parameter (P2.)	052	Y axis pulse logic voltage level	Instant	0	
Axis parameter (P2.)	053	T axis pulse logic voltage level	Instant	0	
Axis parameter (P2.)	054	C axis pulse logic voltage level	Instant	0	
Axis parameter (P2.)	055	X axis characteristics (rotation: 0, linear: 1)	Instant	1	
Axis parameter (P2.)	056	Y axis characteristics (rotation: 0, linear: 1)	Instant	1	
Axis parameter (P2.)	057	T axis characteristics (rotation: 0, linear: 1)	Instant	1	
Axis parameter (P2.)	058	C axis characteristics (rotation: 0, linear: 1)	Instant	1	
Axis parameter (P2.)	059	X axis rotation display mode	Instant	0	
Axis parameter (P2.)	060	Y axis rotation display mode	Instant	0	
Axis parameter (P2.)	061	T axis rotation display mode	Instant	0	
Axis parameter (P2.)	062	C axis rotation display mode	Instant	0	
Axis parameter (P2.)	063	X axis rotation path optimization	Instant	1	
Axis parameter (P2.)	064	Y axis rotation path optimization	Instant	1	
Axis parameter (P2.)	065	T axis rotation path optimization	Instant	1	
Axis parameter (P2.)	066	C axis rotation path optimization	Instant	1	
Axis parameter (P2.)	067	X axis maximum acceleration (Kpps)	Instant	2000	
Axis parameter (P2.)	068	Y axis maximum acceleration (Kpps)	Instant	2000	
Axis parameter (P2.)	069	T axis maximum acceleration (Kpps)	Instant	2000	
Axis parameter (P2.)	070	C axis maximum acceleration (Kpps)	Instant	2000	
Axis parameter (P2.)	071	X servo home direction	Instant	0	
Axis parameter (P2.)	072	Y servo home direction	Instant	0	
Axis parameter (P2.)	073	T servo home direction	Instant	0	
Axis parameter (P2.)	074	C servo home direction	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
Axis parameter (P2.)	075	X axis external home enable	Instant	1	
Axis parameter (P2.)	076	Y axis external home enable	Instant	1	
Axis parameter (P2.)	077	T axis external home enable	Instant	1	
Axis parameter (P2.)	078	C axis external home enable	Instant	1	
Axis parameter (P2.)	079	X axis encoder pulse logic direction	Instant	0	
Axis parameter (P2.)	080	Y axis encoder pulse logic direction	Instant	0	
Axis parameter (P2.)	081	T axis encoder pulse logic direction	Instant	0	
Axis parameter (P2.)	082	C axis encoder pulse logic direction	Instant	0	
Axis parameter (P2.)	083	X axis home deceleration speed	Instant	100	
Axis parameter (P2.)	084	Y axis home deceleration speed	Instant	100	
Axis parameter (P2.)	085	T axis home deceleration speed	Instant	100	
Axis parameter (P2.)	086	C axis home deceleration speed	Instant	100	
Axis parameter (P2.)	087	X axis home scanning speed	Instant	60	
Axis parameter (P2.)	088	Y axis home scanning speed	Instant	60	
Axis parameter (P2.)	089	T axis home scanning speed	Instant	60	
Axis parameter (P2.)	090	C axis home scanning speed	Instant	60	
Axis parameter (P2.)	091	Effective voltage level of servo X axis enable	Instant	1	
Axis parameter (P2.)	092	Effective voltage level of servo Y axis enable	Instant	1	
Axis parameter (P2.)	093	Effective voltage level of servo T axis enable	Instant	1	
Axis parameter (P2.)	094	Effective voltage level of servo C axis enable	Instant	1	
Axis parameter (P2.)	095	Servo X axis enable delay time (ms)	Instant	500	
Axis parameter (P2.)	096	Servo Y axis enable delay time (ms)	Instant	500	
Axis parameter (P2.)	097	Servo T axis enable delay time (ms)	Instant	500	
Axis parameter (P2.)	098	Servo C axis enable delay time (ms)	Instant	500	
Axis parameter (P2.)	099	Servo X axis enable control	Instant	0	
Axis parameter (P2.)	100	Servo Y axis enable control	Instant	0	
Axis parameter (P2.)	101	Servo T axis enable control	Instant	0	
Axis parameter (P2.)	102	Servo C axis enable control	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
Management parameter (P3.)	001	Type password to select management mode	Instant	1	
Management parameter (P3.)	002	Edit super user password	Instant	1	
Management parameter (P3.)	003	Edit operation user password	Instant	1	
Management parameter (P3.)	004	Initialize comprehensive parameters to default	Restart	-----	
Management parameter (P3.)	005	Initialize IO configuration to default	Restart	-----	
Management parameter (P3.)	006	Reset all parameters	Restart	-----	
Management parameter (P3.)	007	Back up parameters	Instant	-----	
Management parameter (P3.)	008	Restore parameters	Restart	-----	
Management parameter (P3.)	009	Generate password file	Instant	-----	
Management parameter (P3.)	010	Menu clicking mode	Instant	-----	
Management parameter (P3.)	011	Clear accumulated processing pieces	Instant	-----	
Management parameter (P3.)	012	Clear current processing pieces	Instant	-----	
Management parameter (P3.)	013	Import CSV system configuration	Restart	-----	
Management parameter (P3.)	014	Default boot screen	Restart	Rel	
Management parameter (P3.)	015	System language packs	Restart	Chinese	

Parameter type	S/N	Description	Effective mode	Default value	Page
Management parameter (P3.)	016	Macro keyword effective enable	Instant	OFF	
Management parameter (P3.)	017	Boot screen mode	Instant	-----	
Management parameter (P3.)	018	System debugging info enable	Instant	OFF	
Management parameter (P3.)	019	Axis control composite key enable	Instant	ON	
Management parameter (P3.)	020	Additional panel enable	Instant	OFF	
Management parameter (P3.)	021	System tool magazine external enable	Instant	OFF	
Management parameter (P3.)	022	Program header file running enable	Instant	OFF	
Management parameter (P3.)	023	System positioning mode	Instant	Manual	
Mold parameter (P4.)					
Mold parameter (P4.)	001	(T1)	Instant	0	
Mold parameter (P4.)	002	(T2)	Instant	0	
Mold parameter (P4.)	003	(T3)	Instant	0	
Mold parameter (P4.)	004	(T4)	Instant	0	
Mold parameter (P4.)	005	(T5)	Instant	0	
Mold parameter (P4.)	006	(T6)	Instant	0	
Mold parameter (P4.)	007	(T7)	Instant	0	
Mold parameter (P4.)	008	(T8)	Instant	0	
Mold parameter (P4.)	009	(T9)	Instant	0	
Mold parameter (P4.)	010	(T10)	Instant	0	
Mold parameter (P4.)	011	(T11)	Instant	0	
Mold parameter (P4.)	012	(T12)	Instant	0	
Mold parameter (P4.)	013	(T13)	Instant	0	
Mold parameter (P4.)	014	(T14)	Instant	0	
Mold parameter (P4.)	015	(T15)	Instant	0	

Parameter type	S/N	Description	Effective mode	Default value	Page
Mold parameter (P4.)	016	(T16)	Instant	0	
Mold parameter (P4.)	017	(T17)	Instant	0	
Mold parameter (P4.)	018	(T18)	Instant	0	
Mold parameter (P4.)	019	(T19)	Instant	0	
Mold parameter (P4.)	020	(T20)	Instant	0	
Mold parameter (P4.)	021	(T21)	Instant	0	
Mold parameter (P4.)	022	(T22)	Instant	0	
Mold parameter (P4.)	023	(T23)	Instant	0	
Mold parameter (P4.)	024	(T24)	Instant	0	
Mold parameter (P4.)	025	(T25)	Instant	0	
Mold parameter (P4.)	026	(T26)	Instant	0	
Mold parameter (P4.)	027	(T27)	Instant	0	
Mold parameter (P4.)	028	(T28)	Instant	0	
Mold parameter (P4.)	029	(T29)	Instant	0	
Mold parameter (P4.)	030	(T30)	Instant	0	
Mold parameter (P4.)	031	(T31)	Instant	0	
Mold parameter (P4.)	032	(T32)	Instant	0	
Mold parameter (P4.)	033	(T33)	Instant	0	
Mold parameter (P4.)	034	(T34)	Instant	0	
Mold parameter (P4.)	035	(T35)	Instant	0	
Mold parameter (P4.)	036	(T36)	Instant	0	
		...			
Port parameter (P5.)	001	Reset off IO configuration 00~15	Instant		
Port parameter (P5.)	002	Reset off IO configuration 16~23	Instant		
Port parameter (P5.)	003	Start output OUT00~15	Instant		
Port parameter (P5.)	004	Start output OUT16~23	Instant		
Port parameter (P5.)	005	Start output level 00~15	Instant		
Port parameter (P5.)	006	Start output level 00~23	Instant		
Port parameter (P5.)	007	External emergency stop 2 test port No.	Instant		
Port parameter (P5.)	008	External start 2 test port No.	Instant		
Port parameter (P5.)	009	External pause 2 test port No.	Instant		
Port parameter (P5.)	010	Upper dead point input port	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P5.)	011	Feeding signal input port	Instant		
Port parameter (P5.)	012	Single punching stop upper dead point input port	Instant		
Port parameter (P5.)	013	Nibbling stop upper dead point input port	Instant		
Port parameter (P5.)	014	Clutch output port	Instant		
Port parameter (P5.)	015	Foot clamp material input port	Instant		
Port parameter (P5.)	016	Clamp output port	Instant		
Port parameter (P5.)	017	Clamp scanning input port	Instant		
Port parameter (P5.)	018	Positioning block input port	Instant		
Port parameter (P5.)	019	Positioning block output port	Instant		
Port parameter (P5.)	020	Positioning block signal detection input port	Instant		
Port parameter (P5.)	021	Main motor running input port	Instant		
Port parameter (P5.)	022	Main motor output port No.	Instant		
Port parameter (P5.)	023	System oil pump output port No.	Instant		
Port parameter (P5.)	024	Lubricant output port No.	Instant		
Port parameter (P5.)	025	Mold pin input port	Instant		
Port parameter (P5.)	026	Mold pin output port	Instant		
Port parameter (P5.)	027	Mold pin release in-place input port	Instant		
Port parameter (P5.)	028	Mold pin lock in-place input port	Instant		
Port parameter (P5.)	029	Relocation cylinder output port	Instant		
Port parameter (P5.)	030	Positioning cylinder compression test port	Instant		
Port parameter (P5.)	031	Positioning cylinder release detection port	Instant		
Port parameter (P5.)	032	Mold conversion combination output port	Instant		
Port parameter (P5.)	033	Mold conversion combination in-place	Instant		
Port parameter (P5.)	034	Mold conversion disengagement in-place	Instant		
Port parameter (P5.)	035	Mold conversion position in-place input port	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
Port parameter (P5.)	036	Manual X positive input port	Instant		
Port parameter (P5.)	037	Manual X negative input port	Instant		
Port parameter (P5.)	038	Manual Y positive input port	Instant		
Port parameter (P5.)	039	Manual Y negative input port	Instant		
Port parameter (P5.)	040	Manual T positive input port	Instant		
Port parameter (P5.)	041	Manual T negative input port	Instant		
Port parameter (P5.)	042	Workpiece coordinate system clearing input port	Instant		
Port parameter (P5.)	043	Single / consecutive punching input port	Instant		
Port parameter (P5.)	044	Jog / continuous input port	Instant		
Port parameter (P5.)	045	Running light output port	Instant		
Port parameter (P5.)	046	Warning light input port	Instant		
Port parameter (P5.)	047	Punch peak switching output port	Instant		
Port parameter (P5.)	048	Punch peak switching output voltage level	Instant		
Port parameter (P5.)	049	Punch alarm reset output port	Instant		
Port parameter (P5.)	050	X positioning completion input port	Instant		
Port parameter (P5.)	051	Y positioning completion input port	Instant		
Port parameter (P5.)	052	Positioning completion effective voltage level <I>	Instant		
Port parameter (P5.)	053	Insufficient air pressure alarm input port	Instant		
Port parameter (P5.)	054	Mold detection input port	Instant		
Port parameter (P5.)	055	Worktop lower level alarm input port	Instant		
Port parameter (P5.)	056	Y axis safe zone alarm input port	Instant		
Port parameter (P5.)	057	Hydraulic card alarm detection port	Instant		
Port parameter (P5.)	058	Manual fast / slow switch port	Instant		
Port parameter (P5.)	059	X axis safe zone alarm input port 1	Instant		
Port parameter (P5.)	060	X axis safe zone alarm input port 2	Instant		
Port parameter (P5.)	061	Hydraulic system detection port No.	Instant		
Port parameter (P5.)	062	Hydraulic system detection port No. B	Instant		
Port parameter (P5.)	063	System oil pump output port No. B	Instant		

Parameter type	S/N	Description	Effective mode	Default value	Page
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10.2 General parameter (P1.)

001	X axis instruction frequency multiplication ratio
002	X axis instruction frequency division coefficient
003	Y axis instruction frequency multiplication ratio
004	Y axis instruction frequency division coefficient
005	T axis instruction frequency multiplication ratio
006	T axis instruction frequency division coefficient
007	C axis instruction frequency multiplication ratio
008	C axis instruction frequency division coefficient

Range : 1~65535

Unit : None

Authority : Operation admin

Default : 1

Effective : Instant

time

Note : When screws of different pitches and motors of different step angles or servo motors of different pulses are matched, or connected through gears, it allows keeping the program and actual motion distance consistent through electronic gear ratio setting of the system.

$$CMR/CMD = P / (L \times 1000)$$

CMR: gear ratio numerator

CMD: gear ratio denominator

P: Pulses corresponding to one rotation of the motor

L: Machine tool movement corresponding to one rotation of the motor (mm)

CMD/CMR is the pulse equivalent actually, i.e. the motion distance corresponding to every pulse (unit: 0.001mm).

Ex 1: the motor rotates one cycle every 5000 pulses, and the machine tool moves 5mm when the motor rotates one cycle, then

$$CMR/CMD = 5000 / (5 \times 1000) = 1/1$$

Then, CMR=1, CMD=1, the pulse equivalent is 0.001mm

Ex 2: the motor rotates one cycle every 5000 pulses, and the machine

tool moves 10mm when the motor rotates one cycle, then

$$CMR/CMD=5000/(10*1000)=1/2$$

Then, CMR=1, CMD=2, the pulse equivalent is 0.002mm

$$CMR/CMD = P/(L \times 1000)$$

009	X axis rapid traverse rate (mm/min)
010	Y axis rapid traverse rate (mm/min)
011	T axis rapid traverse rate (mm/min)
012	C axis rapid traverse rate (mm/min)
013	X axis start rate (mm/min)
014	Y axis start rate (mm/min)
015	T axis start rate (mm/min)
016	C axis start rate (mm/min)
017	X axis acceleration (Kpps)
018	Y axis acceleration (Kpps)
019	T axis acceleration (Kpps)
020	C axis acceleration (Kpps)

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

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

Authority : Operation admin

Default : 3000,200,1500

Effective time : Instant

Note : This parameter is the trapezoid acceleration/deceleration setting

About start speed, 1-2 rotation motor speed is recommended for step motor; as above, the machine tool 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.

Parameters affected by the acceleration and start speed include:

034: Manual speed

048-051: home speed

Related G code

G70: fast positioning and T axis mold conversion speed

G28: home speed

021	X axis positive soft limit (mm)
022	X axis negative soft limit (mm)
023	Y axis positive soft limit (mm)
024	Y axis negative soft limit (mm)

Range : -9999~9999

Unit : mm

Authority : Operation admin

Default : Maximum positive/negative value

Effective time : Instant

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

If hard limit switch isn't installed, please use soft limit, which uses machine tool coordinate system as the base 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 set distance, which depends on acceleration time and speed. Please keep certain margin when setting this parameter.

025	Feeding speed (mm/min)
026	Initial feeding speed (mm/min)
027	Feeding acceleration (mm/sec)
035	Maximum feeding speed (mm/min)

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

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

Authority : Operation admin

Default : 3000,200,1000,3000

Effective time : Instant

Note : Applicable G code:

The feeding instructions of other codes except G70 and G28 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 speed programming error when transferring processing files.

028	X axis reverse clearance compensation (mm)
029	Y axis reverse clearance compensation (mm)
030	Z axis reverse clearance compensation (mm)
031	4 axis reverse clearance compensation (mm)

Range : 1~20000
 Unit : mm
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Compensate the clearance of processing axis

032	Home mode
-----	-----------

Range : 0~1
 Unit : None
 Authority : Operation admin
 Default : 0 (program)
 Effective time : Instant
 Note : Program home

Mechanical home

Program home is that the coordinates go to home, i.e. in place.

Mechanical home requires external detection switch 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.

033	IO filter level(Restart)
Range	: 0~8
Unit	: None
Authority	: Super admin
Default	: 0
Effective time	: After restarted
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; Related signals: hard limit, servo alarm input, hydraulic card alarm port; Positioning completion detection port, feeding signal port, stop upper dead point port;

034	Manual speed
Range	: 1~9999.999
Unit	: mm/min
Authority	: Operation admin
Default	: 1000, 9000
Effective time	: Instant
Note	: Set manual speed and handwheel speed; The start speed and acceleration in this mode are determined by 013, 014, 015, 016, 017, 018, 019, 020;

036	M code waiting time
Range	: 1~9999
Unit	: ms
Authority	: Operation admin
Default	: 100
Effective time	: Instant
Note	: Set the waiting time (unit: ms) after executing M code

037	X axis home pulse offset (mm)
-----	-------------------------------

038	Y axis home pulse offset (mm)
039	Z axis home pulse offset (mm)
040	A axis home pulse offset (mm)

Range : -9999~9999

Unit : Mm

Authority : Operation admin

Default : 0

Effective time : Instant

Note : Set the compensation home offset (unit: mm) 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.

041	Line number increment
-----	-----------------------

Range : 0~64

Unit : None

Authority : Operation admin

Default : 0

Effective time : Instant

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

042	System baud rate
-----	------------------

Range : 9600~115200

Unit : None

Authority : Operation admin

Default : 115200

Effective time : Restart

Note : The communication rate setting when DNC or other PC software and this controller are in RS232 communication mode

043	Controller ID No.
-----	-------------------

Range : 1~255

Unit : None

Authority : Operation admin
 Default : 1
 Effective time : Restart
 Note : The ID number setting of the controller when DNC or other PC software and this controller are in MODBUS communication mode

044	X axis home direction
045	Y axis home direction
046	T axis home direction
047	C axis home direction

Range : 0~1
 Unit : None
 Authority : Operation admin
 Default : 1,1,0,0
 Effective time : Instant
 Note : Set the mechanical home direction of every processing axis
 0: Positive
 1: Negative

048	X axis home speed
049	Y axis home speed
050	T axis home speed
051	C axis home speed

Range : 0~9999
 Unit : mm/min
 Authority : Operation admin
 Default : 1000
 Effective time : Instant
 Note : Set the home speed of every axis separately
 Related acceleration of this parameter: 067,068,069,070 of the axis configuration parameters
 Start speed depends on comprehensive parameters 013,014,015,016

052	Lubricant pressure schedule open setting (min)
-----	--

053	Lubricant pressure holding time setting (sec)
054	Lubricant control output frequency (Hz)
	<p>Range : :</p> <p>Unit : :</p> <p>Authority : : Operation admin</p> <p>Default : : 0</p> <p>Effective time : : Instant</p> <p>Note : : Set the schedule start and holding time of the automatic oil pump of the system</p> <p>Schedule open setting is that the oil pump outputs (P4.056 Lubricant output port No.) when the timing reaches specified value after the system starts and times.</p> <p>Output signal stops keeping for the seconds specified by P1.053 (reverse phase).</p> <p>If the port for P4.056 Lubricant output port No. isn't configured, the automatic oil supply won't work</p>

055	Lubricant pressure test voltage level
	<p>Range : : 0~1</p> <p>Unit : : LOGIC VOLTAGE LEVEL</p> <p>Authority : : Operation admin</p> <p>Default : : 0</p> <p>Effective time : : Instant</p> <p>Note : : Lubricant pressure test is performed automatically when the lubricant output of the system completes.</p> <p>The system alarms immediately if no oil pressure in place signal is detected after lubricant output.</p> <p>This port is affected by IO configuration.</p> <p>Punch doesn't require this parameter</p>

056	External emergency stop 2 test voltage level
058	External start 2 test voltage level
059	External pause 2 test voltage level
	<p>Range : : 0~1</p> <p>Unit : : LOGIC VOLTAGE LEVEL</p>

Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : External emergency stop button of the system; corresponding ports are
 P1.056-----P5.058
 P1.058-----P5.061
 P1.059-----P5.062

060	Home test enable after alarm
061	System home test enable

Range : 0~1
 Unit :
 Authority : Operation admin
 Default : 0, 1
 Effective time : Instant
 Note : 1. Used to set whether prompt user to home in corresponding occasions, ensuring that the user has performed the home operation;
 2. If it is set to 0, the system will run directly without performing home operation.

062	IP address
063	Subnet mask
064	Default gateway

Range : 0~255
 Unit : None
 Authority : Operation admin
 Default : 192.168.0.123
 255.255.255.0
 192.168.0.1
 Effective time : Restart
 Note : 1. It is used to configure the Ethernet network parameters, which should match the actual network settings, or else it can't be normally accessed.

2. After configuration, test the ping command on the PC in the same network segment (same subnet mask) in the Intranet. If the return times out, the connection has error; please check the physical connection.
3. The network environment requires independent NC network, which shouldn't be connected to office networks and the Internet, because the network broadcast and regular query of Windows will block NC network communication, thus affecting the communication performance.

074

Positioning delay time

Range	:	0~20000
Unit	:	ms
Authority	:	Operation admin
Default	:	0
Effective time	:	Instant
Note	:	After feeding in place, control whether delay by this parameter; if the value is zero, the system performs punching directly after feeding in place; If the value is not zero, the system delays the appropriate time before punching after feeding in place. Note: This parameter is not valid in the continuous mode, that is, invalid in punching mode 1, 2, 3. The clutch actuation of hand punching in step mode depends on this parameter;

075

Clutch delay time

Range	:	0~20000
Unit	:	ms
Authority	:	Operation admin
Default	:	0
Effective time	:	Instant
Note	:	After the feeding process, the output clutch turns on the signal, and controls the clutch ON time through this parameter; after the clutch opens and the delay time is over, the system turns off the clutch control

signal immediately. This parameter is used to ensure the clutching of punch flywheel.

Note: This parameter is not valid in the continuous mode, that is, invalid in punching mode 1, 2, 3.

The clutch actuation of hand punching in step mode depends on this parameter;

076	Punch cycle
-----	-------------

- Range : 0~20000
- Unit : ms
- Authority : Operation admin
- Default : 0
- Effective time : Instant
- Note : The system calculates the flywheel time of the punch through this parameter, i.e.

$$\text{Flywheel time} = \text{punch cycle} * \text{punch cycle ratio} / 100$$

Note: This parameter is valid in the continuous mode, that is, the punching mode is 1.

Punch frequency measurement method:

The step is as follows:

Confirm that the upper dead point detection switch is installed properly and the main motor is turned on;

NCT-03 and NCT-04 need to confirm that the mold pin has been seated;

Press [Diagnosis] [Frequency] to enter punch diagnosis screen;

Switch the operating mode, in [Jog] mode, press [EOB] to turn on the clutch and measure;

Measure several times, get the average value, and enter it into P1.076;

077	Punch cycle ratio (%)
-----	-----------------------

- Range : 0~200
- Unit : %
- Authority : Operation admin
- Default : 0
- Effective time : Instant

Note : This parameter and parameter P1.077 jointly determine the punching interval;
 It is set to 66% typically;
 If the value is too high, it will lead to material problem; formula:

$$\text{Flywheel time} = \text{punch cycle} * \text{punch cycle ratio} / 100$$

 Note: This parameter is invalid in the continuous mode, that is, the punching mode is 1.
 The system will automatically calculate the time of next feeding distance only in mode 1; if it is greater than the flywheel time, you need to turn off the clutch; in this way, the efficiency of continuous punching can be increased;

078	Punching mode
Range	: 0~3
Unit	:
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: The system selects punching control mode through this parameter: Single punch: Non-continuous punching (the clutch signal turns off after every punching; relevant parameters: P1.074 and P1.075); Continuous - Time: Continuous punching (the system automatically determines whether to turn off the clutch signal; relevant parameters: P1.076 and P1.077); Hydraulic - Single punch: Hydraulic punch mode. Continuous - Distance: Maximum step punching (determine whether turn off the clutch to achieve continuous punching via maximum step value of parameter P1.084);

079	Punch peak effective voltage level (upper dead point)
Range	: 0~1
Unit	: LOGIC VOLTAGE LEVEL
Authority	: Operation admin
Default	: 0
Effective time	: Instant

Note : The system determines whether the punch safety effective voltage level is high or low through this parameter:
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

080	Feeding effective voltage level <I>
-----	-------------------------------------

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : When this signal becomes invalid from valid, the punch is lifted to the safe height and allows feeding;
 NOTE: This signal is off-clutch detection switch and turns off the punch clutch while feeding;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

081	Clutch pull effective voltage level <O>
-----	---

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Clutch pull effective voltage level;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

082

Feeding position simulation

Range : 0~1
Unit : None
Authority : Operation admin
Default : 1
Effective time : Instant
Note :

The system determines whether outputs clutch signal based on this parameter.

0: The system does not start clutch after feeding in place and continues to the next position, that is, checks if the feeding position is correct;

The speed of this mode depends on P1.009 and P1.010; acceleration depends on P1.017 and P1.019;

1: The system outputs clutch signal and punches normally after feeding in place;

The feeding speed of this mode depends on P1.025; the acceleration depends on P1.027;

082

Punch motion mode

Range : 0~1
Unit : None
Authority : Operation admin
Default : 0
Effective time : Instant
Note : Feeding mode:

Point position: point movement;

In this mode, the speed depends on P1.009 and P1.010; acceleration depends on P1.017 and P1.019;

Interpolation: linear interpolation

In this mode, the speed depends on P1.025; the acceleration depends on

P1.027;

084	Maximum punching step (mm)
Range	: 0~20000
Unit	: mm
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: If the punching mode of P1.078 parameter is 3, the system will compare with next feeding distance through this parameter; if the feeding distance is larger than this parameter, the clutch turns off; if it is smaller, the clutch doesn't turn off to achieve continuous punching.
	: Note: The setting of this parameter depends on the current speed and punch frequency;
	: For example: punch frequency is 120 times/min
	: The current speed is 30m/min
	: The time required for one punching is 0.5s, and the distance of feeding movement is 250mm (by constant speed);
	: In actual practice, the punch requires less than 0.5s from the safe position to the lower dead center;
	: Because acceleration and deceleration occur after moving some distance, so that the actual constant speed process is less than 30m/min; therefore the maximum continuous punching value is less than 250mm;
	: If the set value is too large, it will cause twice punching or material station;

085	Punch control mode
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: System punch control
	: Mechanical: Mechanical cam control
	: Hydraulic: Hydraulic card punch

086	Mold clamping effective voltage level <I>
Range	: 0~1
Unit	: LOGIC VOLTAGE LEVEL
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Relevant port P5.072 Mold pin lock in-place input port; 0: low level effective 1: high level effective Diagnosis screen input interface, red: 0 Green: 1 Note: The upper turntable and lower turntable use the same clamping detection port; The default is normally open;

087	Mold release effective voltage level <I>
Range	: 0~1
Unit	: LOGIC VOLTAGE LEVEL
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Relevant port P5.071 Mold pin release in-place input port; 0: low level effective 1: high level effective Diagnosis screen input interface, red: 0 Green: 1 Note: The upper turntable and lower turntable use the same clamping detection port; The default is normally open;

088	Positioning block in place effective voltage level <I>
Range	: 0~1
Unit	: LOGIC VOLTAGE LEVEL
Authority	: Operation admin

Default : 0
 Effective time : Instant

089	Foot clamp material effective voltage level <I>
-----	---

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Relevant port P5. 077, Foot clamp material input port;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

Note : Relevant port P5. 078, Positioning block signal detection input port;
 Locating pin drop detection port effective voltage level:
 Check if the positioning block drops down first while starting; otherwise,
 send "locating pin not detected" alarm
 Only apply to the mode that P1.078 punching mode is 2;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

090	Mold pin lock effective voltage level <O>
-----	---

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL

Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Relevant port P5. 070, Mold pin output port;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

091	Mold conversion combination effective voltage level <O>
-----	---

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Upper and lower mold output port effective voltage level
 Relevant port P5. 080, Mold conversion combination output port;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

092	Mold conversion combination in-place effective voltage level <I>
-----	--

Range : 0~1
 Unit : LOGIC VOLTAGE LEVEL
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Relevant port P5. 081, Mold conversion combination in-place;
 0: low level effective
 1: high level effective
 Diagnosis screen input interface, red: 0
 Green: 1

093	Mold conversion disengagement in place effective voltage level <I>
	<p>Range : 0~1</p> <p>Unit : LOGIC VOLTAGE LEVEL</p> <p>Authority : Operation admin</p> <p>Default : 0</p> <p>Effective time : Instant</p> <p>Note : Relevant port P5. 082, Mold conversion disengagement in-place;</p> <p style="padding-left: 40px;">0: low level effective</p> <p style="padding-left: 40px;">1: high level effective</p> <p style="padding-left: 40px;">Diagnosis screen input interface, red: 0</p> <p style="padding-left: 80px;">Green: 1</p>
094	Mold conversion position in-place effective voltage level <I>
	<p>Range : 0~1</p> <p>Unit : LOGIC VOLTAGE LEVEL</p> <p>Authority : Operation admin</p> <p>Default : 0</p> <p>Effective time : Instant</p> <p>Note : Relevant port P5. 083, Mold conversion position in-place input port;</p> <p style="padding-left: 40px;">0: low level effective</p> <p style="padding-left: 40px;">1: high level effective</p> <p style="padding-left: 40px;">Diagnosis screen input interface, red: 0</p> <p style="padding-left: 80px;">Green: 1</p>
095	C-axis rotation switch upper dead point enable
	<p>Range : 0~1</p> <p>Unit : None</p> <p>Authority : Operation admin</p> <p>Default : 0</p> <p>Effective time : Instant</p> <p>Note : 0: Do not need to switch to top dead center before C-axis rotating;</p> <p style="padding-left: 40px;">1: C-axis rotates and switches to the top dead center;</p> <p style="padding-left: 40px;">Diagnosis screen input interface, red: 0</p> <p style="padding-left: 80px;">Green: 1</p>

097	Relocation clamp back distance (mm)
Range	: 0~20000
Unit	: mm
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: The retreat distance after releasing the clamp when the second positioning starts. Note: The clamp retreating speed is determined by P1.121 cylinder relocation speed;
098	Relocation clamp feeding distance (mm)
Range	: 0~20000
Unit	: mm
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: The forward distance of the clamp when the second positioning ends. Note: The clamp forward speed is determined by P1.121 cylinder relocation speed;
099	Back to loading point after processing
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: 0: do not return to the loading point; 1: return to the loading point; The position returning to the loading point depends on P1.100 and P1.101;
100	X-axis loading position (mm)
Range	: -9999.999~9999.999
Unit	: mm

Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : After program running, run to X coordinates of the loading point.
 Note:
 The coordinates are mechanical coordinates;

101	Y-axis loading position (mm)
-----	------------------------------

Range : -9999.999~9999.999
 Unit : mm
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : After program running, run to Y coordinates of the loading point.
 Note:
 The coordinates are mechanical coordinates;

102	Handwheel enable
-----	------------------

Range : 0~1
 Unit : None
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : Retool: Press [Step / Retool], you can only switch to the "retool" mode
 Handwheel: Press [Step / Retool], you can only switch to the "Handwheel" mode, and then connect the handwheel to XS6 port;

103	Punch speed F1 (mm/min)
-----	-------------------------

Range : 1~200000
 Unit : None
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : (This parameter is invalid temporarily) This parameter relates to additional panel [Punch speed F1];

When the additional panel [Punch speed F1] key is pressed, the processing speed is the value of this parameter;

104

Punch speed F2 (mm/min)

Range : 1~200000
 Unit : None
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : (This parameter is invalid temporarily) This parameter relates to additional panel [Punch speed F2];

When the additional panel [Punch speed F2] key is pressed, the processing speed is the value of this parameter;

105

Punch speed F3 (mm/min)

Range : 1~200000
 Unit : None
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : (This parameter is invalid temporarily) This parameter relates to additional panel [Punch speed F3];

When the additional panel [Punch speed F3] key is pressed, the processing speed is the value of this parameter;

106

Single-step increment

Range : -9999.999~+9999.999
 Unit : mm
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : In step mode, the distance that each axis moves in every step;

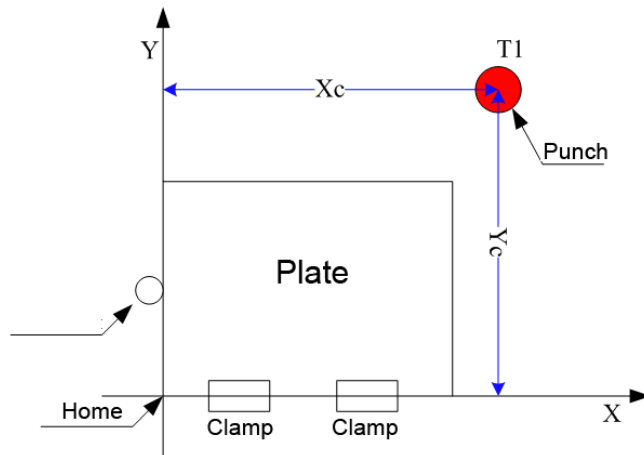
For example:

If this parameter is 360, press T+ in step mode;

The turret will turn 360°;

107	1# mold X direction offset (mm)
Range	: -9999.999~+9999.999
Unit	: mm
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: The offset of 1# mold in X direction; the position of 1# mold relative to mechanical home,

As shown in the figure: If the coordinate system references to the punch, i.e., the movement of the punch indicates the direction indicated by the axis; the offset of 1# mold in X direction is $-|X_c|$; the offset of 1# mold in Y direction is $-|Y_c|$;



Establish Machine Tool Coordinate System (reference to punch)

Note: This parameter does not require manual entry; just change the value in [Coordinates]-G54;

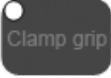
108	1# mold Y direction offset (mm)
Range	: -9999.999~+9999.999
Unit	: mm
Authority	: Operation admin

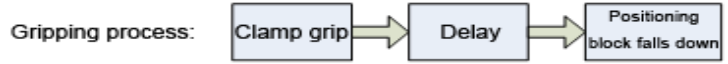
Default : 0
 Effective time : Instant
 Note : Same to the offset of parameter P.0115 1# mold in X direction;

109	Home & back to loading point enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: OFF: do not return to the loading point after manual home; ON: return to the loading point after manual home; The position returning to loading point depends on P1.100 and P1.101 position parameter;

110	Turret retooling debugging enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: After manual retooling, this parameter determines whether insert mold pin automatically to facilitate user debugging; OFF: Auto ON: Manual Note: In manual mode, press the panel key [Mold pin] to insert; In auto mode, it is prohibited to switch to manual.

111	Clamp delay time (ms)
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant

Note :  Clamp grip or external pedal is invalid, the clamp process is:



Gripping process: Clamp grip - Delay - Positioning block falls down

112	Upper dead point stopping effective voltage level <I>
-----	---

Range	:	0~1	
Unit	:	LOGIC VOLTAGE LEVEL	
Authority	:	Operation admin	
Default	:	0	
Effective time	:	Instant	
Note	:	Relevant port P5. 12,P5.013 stops top dead center input port; 0: low level effective 1: high level effective Diagnosis screen input interface, red: 0 Green: 1	

113	Cylinder relocation speed mm/min
-----	----------------------------------

Range	:	1~ 50000	
Unit	:	mm/min	
Authority	:	Operation admin	
Default	:	5000	
Effective time	:	Instant	
Note	:	G75 relocation clamp retreat and X axis offset speed; The start speed and acceleration in this mode depend on 013, 014, 015, 016, 017, 018, 019 and 020;	

114	Detection encoder enable
-----	--------------------------

Range	:	0~1	
Unit	:	None	
Authority	:	Operation admin	

Default : 0

Effective time : Instant

Note : OFF: Feeding open-loop control,
 ON: Feeding closed-loop control,
 Note: after enabled, the system will compare with the system value through the value fed back by external servo motor encoder;
 Before enabling, P1.123 and P1.124 must be set properly;
 Encoder change direction must be same to the coordinate change direction.
 Monitoring method:
 [Monitor] - [Location] - [Comprehensive]
 Manually move the machine tool, and observe the encoder change direction and coordinate change direction;
 If not, change the encoder logic direction in [Parameters] - [Axis Configuration] -079,080
 Restart

116

X axis encoder pulse ratio p/mm

Range : 0~20000

Unit : p/mm

Authority : Operation admin

Default : 1000

Effective time : Instant

Note : P: Pulses of one rotation of the motor
 L: Machine tool movement (mm) of one rotation of the motor
 X axis encoder pulse ratio =P/L

116

Y axis encoder pulse ratio p/mm

Range : 0~20000

Unit : p/mm

Authority : Operation admin

Default : 1000

Effective time : Instant

Note : The settings are same to P.123,X axis encoder pulse ratio

117	X axis position deviation
Range	: 0~10
Unit	: mm
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: The maximum allowable deviation of X-axis motor encoder feedback value when compared with the system; Too small values may cause feeding failure;
118	Y axis position deviation
Range	: 0~10
Unit	: mm
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: The maximum allowable deviation of Y-axis motor encoder feedback value when compared with the system; Too small values may cause feeding failure;
119	Serial / Modbus switching
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 1
Effective time	: Instant
Note	: Serial: Serial communication is enabled Moudbus: Moudbus communication is valid
120	Delay time before moving (ms)
Range	: 0~20000
Unit	: ms
Authority	: Operation admin
Default	: 0

Effective time : Instant
 Note : The time delay from feeding signal effective to the beginning of the feeding

121	Single punch off clutch delay time (ms)
122	Nibbling off clutch delay time (ms)

Range : 0~20000
 Unit : ms
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : The time delay before clutch turns off;

123	Clutch detection delay time (ms)
-----	----------------------------------

Range : 0~20000
 Unit : ms
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : The time delay before clutch is turned off when the feeding signal is used as clutch off signal;

124	Manual punching times
-----	-----------------------

Range : 0~100
 Unit : ms
 Authority : Operation admin
 Default : 1
 Effective time : Instant
 Note : The punching times after the manual punch is pressed; it can be used to manually debug the position to stop the top dead center of single punch and nibbling;
 Note: if it is 1, the port stopping the top dead center depends on the port corresponding to P5.105;

If it is greater than 1, the port stopping the top dead center depends

on the port corresponding to p5.106;

125	T axis home mode
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Sensor switch mode when T-axis performs mechanical home operation <p style="margin-left: 40px;">Twice home: rely on an external sensor switch; when the sensor is in place, the home operation is finished if the repeated sensing is successful.</p> <p style="margin-left: 40px;">Once home: rely on an external sensor switch; when the sensor is in place, the home operation is finished;</p>
126	Breakpoint memory function enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Breakpoint memory function enable <p style="margin-left: 40px;">OFF: power memory function is invalid</p> <p style="margin-left: 40px;">ON: Breakpoint memory function is valid;</p> <p style="margin-left: 40px;">Note: Breakpoint processing is invalid when the punch is locked;</p>
127	Positioning completion detection enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Positioning completion detection enable; <p style="margin-left: 40px;">OFF: do not check the completion signal after feeding;</p> <p style="margin-left: 40px;">ON: check before the feeding is completed;</p> <p style="margin-left: 40px;">The preparation work before enabling:</p>

Connect the positioning completion signal line and any input port;

Relevant port : P5.111 “X positioning completion input port”

P5.112“Y positioning completion input port”

P5.113 “Positioning completion effective voltage level ”

128	Pre-reading program enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Punch stopping on top dead center suitable for pneumatic brakes; (invalid for hydraulic type)
	Note: this feature is enabled if stopping on top dead center position is in advance of feeding signal;
	Restart after enabled;
	This feature only supports one mode of stopping on top dead center;

129	Encoder filter level (1~20)
Range	: 0~20
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: Valid when using encoder feedback;
	Can effectively prevent the positioning error caused by vibration;

130	Ejector control enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: 0: blowing feed control is valid, corresponding macro variable address is:

500 - # 505

1: blowing feed control is invalid

Working mode 0: always blow materials while processing

Working mode 1: in the punching process, when "blowing begins (travel switch)" signal is detected, start blowing material for set period of time "t1".

Working mode 2: in the punching process, when "blowing begins (travel switch)" signal is detected, start blowing material until "blowing ends (travel switch)" signal is detected.

Working mode 3: in the punching process, when "blowing begins (travel switch)" signal is detected, start blowing material until "blowing ends (travel switch)" signal is detected.

If "t2" still hasn't detected "blowing ends (travel switch)" signal after blowing for some time, the punching pauses.

131	Clamp avoidance enable
Range	: 0~1
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: 0: Clamp avoidance function is invalid 1: Clamp avoidance function is valid To enable, set "Coordinates" - "Clamp Parameters" properly;

132	Blanking detection alarm times
Range	: 0~20
Unit	: None
Authority	: Operation admin
Default	: 0
Effective time	: Instant
Note	: 0: blanking detection function is not enabled > 1: If blanking isn't detected when the system punching frequency is in the range set by this parameter, the system alarms

133

Trajectory simulation over-travel detection enable

Range	:	OFF/ON
Unit	:	None
Authority	:	Operation admin
Default	:	OFF
Effective time	:	Instant
Note	:	ON: [Track] - [Preview] The system will automatically detect whether the processing code exceeds the soft limit OFF; No;

134

Velocity curve adjustment segments

Range	:	0-7
Unit	:	None
Authority	:	Operation admin
Default	:	0
Effective time	:	Instant
Note	:	Set different initial velocity, acceleration, and processing speed according to the feeding distance of each axis 0: Turn off the velocity curve adjustment segments function Nonzero: Enable the function Related macros address: First paragraph: #900-#909 Second paragraph: #910-#919 ... Seventh paragraph: #960-#969 The first paragraph of X-axis parameters for example: The first paragraph of X-axis parameters: #900-#904 #900: X-axis start speed (min/min) #901: X-axis acceleration (Kpps) #902: X-axis rapid traverse speed (mm/min) #903: X-axis maximum feeding distance (mm) The first paragraph of Y-axis parameters for example: The first paragraph of Y-axis parameters: #905-#909 #905: Y-axis start speed (min/min)

#906: Y-axis acceleration (Kpps)

#907: Y-axis rapid traverse speed (mm/min)

#908: Y-axis maximum feeding distance (mm)

Note: maximum feeding distance: the first paragraph to the seventh paragraph must be monitored in sequence;

To back up macro variable parameter, press "S" in the "Monitor Mode", and press "O" to load

This process applies to "point" motion mode;

135	Punching center distance X(mm)
136	Punching center distance Y(mm)

Range : 0-9999

Unit : mm

Authority : Operation admin

Default : +0.000

Effective time : Instant

Note : Punching center distance X: the distance from positioning block to punch center in the X direction;

Punching center distance Y: the distance from clamp to punch center in the Y direction;

This feature requires support of header file; please request the header file from the vendor;

Note: Depend on the equipment;

137	Lubricant pressure schedule open B(min)
138	Lubricant pressure holding time B(sec)
139	Lubricant control frequency B (Hz)
140	Lubricant pressure test voltage level B

Range : None

Unit : mm

Authority : Operation admin

Default :

Effective time : Instant

Note : Volumetric lubrication system parameters

See Test Manual for details

10.3 Axis Parameter Configuration (P2.)

001	Effective voltage level for servo X axis alarm
002	Effective voltage level for servo Y axis alarm
003	Effective voltage level for servo T axis alarm
004	Effective voltage level for servo C axis alarm
005	Effective voltage level for servo X axis reset
006	Effective voltage level for servo Y axis reset
007	Effective voltage level for servo T axis reset
008	Effective voltage level for servo C axis reset

Range : 0~1

Unit : LOGIC VOLTAGE LEVEL

Authority : Super admin

Default : 0, 1

Effective time : Instant

Note : Adapt to the interface parameters of selected servo drive; please refer to interface voltage level description of servo for specific parameter settings.

009	Servo X axis Z phase home enable
010	Effective voltage level for servo X axis Z phase
011	Servo Y axis Z phase home enable
012	Effective voltage level for servo Y axis Z phase
013	Servo T axis Z phase home enable
014	Effective voltage level for servo T axis Z phase
015	Servo C axis Z phase home enable
016	Effective voltage level for servo C axis Z phase

Range : 0~1

Unit : LOGIC VOLTAGE LEVEL

Authority : Super admin

Default : 0

Effective time : Instant

Note : When this parameter is enabled, encoder Z phase positioning of corresponding axis will be enabled automatically in mechanical home

mode, i.e. the “servo home” positioning; in this mode, the accuracy of repeated home positioning depends on servo positioning accuracy, and therefore it is recommended to enable this function for servo motor. Step motor doesn’t have encoder and can’t enable this option, or else the signals can’t be scanned during mechanical home operation and will move constantly.

017	X hardware positive limit enable <●>
...	...
022	Y hard limit effective voltage level <●>

Range : 0~1

Unit : None

Authority : Super admin

Default : 0

Effective time : After restarted

Note : Hard limit has two modes, i.e. hardware response and software scanning; Hardware response mode is integrated by the motion chip, and is triggered by the effective voltage level of the circuit test limit pin. Therefore, it is highly real-time, but it also has a defect. If the external interference is serious, the normal pulse will be affected and the system doesn’t alarm because it can’t read the error state in time, which will cause loss; therefore, this function requires that the wiring switch uses normally closed connection, i.e. high effective level; this function considers the complexity of field environment and the default value is off.

Scanning mode is integrated by the system and can’t be shielded. The scanning mode input signal by accessing specified function number, and uses software anti-interference detection technology to check whether limit alarm occurs or has no interference. This requires certain time to check, and thus the real time isn’t as well as interrupted limit. However, in most cases (at 10mm/min processing speed), it can meet the requirement on processing safety check.

The hardware response function of hard limit is prior to scanning response function, i.e. if the hardware response is enabled, it will quicken the response speed directly. It should be noted that the hardware response function only can stop pulse in instant mode. Therefore, the instant stop

mode may cause mechanical vibration if the speed is too high. While software scanning mode uses maximum acceleration mode and decelerates according to the maximum acceleration set to every axis by the user (parameter P2.074~077), and therefore overshoot will occur.

023	X pulse command format (Restart)
024	Y pulse command format (Restart)
025	T pulse command format (Restart)
026	C pulse command format (Restart)

Range : 0~1

Unit : None

Authority : Super admin

Default : 1

Effective time : Restart

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: Pulse + pulse

1: Pulse + direction

027	X pulse logic direction(Restart)
028	Y pulse logic direction(Restart)
029	T pulse logic direction(Restart)
030	C pulse logic direction(Restart)

Range : 0~1

Unit : None

Authority : Super admin

Default : 1

Effective time : Restart

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

037	Effective voltage level for X external home
038	Effective voltage level for Y external home

039	Effective voltage level for T external home
040	Effective voltage level for C external home

Range : 0~1

Unit : LOGIC VOLTAGE LEVEL

Authority : Super admin

Default : 0

Effective time : Instant

Note : Set the effective voltage level of external home sensor switch during home operation.

0: Low level

1: High level

035	X axis ROUND settings (Restart)
036	Y axis ROUND settings (Restart)
037	T axis ROUND settings (Restart)
038	C axis ROUND settings (Restart)

Range : 0~9999999

Unit : Pulse

Authority : Super admin

Default : 0

Effective time : Restart

Note : Round function is available on hardware version 1.5 or later only;

This function is used to prevent the logic counting of axis exceeding the maximum counting range (2147483648) and causing overflow error; Generally, overflow occurs only when the axis is set to rotary. The system will calculate the corresponding pulse limit according to the gear ratio of current axis and assign to the ROUND parameter of corresponding axis, if current axis is set to rotary and uses 360° display mode after the system getting P2.062~P2.069 parameters. The user can check the change of this parameter when the rotary axis display function is enabled. The user can modify the changed parameters, and the finally displayed number will be effective.

This parameter requires restart to take effect; the corresponding axis must be rotary and set to 360° display (P2.062~069);

039	X axis specified interface axis No.(Restart)
040	Y axis specified interface axis No.(Restart)

041	T axis specified interface axis No.(Restart)
042	C axis specified interface axis No.(Restart)

Range : 0~4

Unit : Pulse port sequence No.

Authority : Super admin

Default :

Effective time : Restart

Note : In default mode, the actual number of every axis corresponds to the silk screen number on the shell. If certain function axis is abnormal, you can replace the axis through this function. For example, set P2.045 to 4, P2.048 to 1, then, any operation to X axis will be the operation to A axis encoder port on the shell.

0: no such axis

1~4: corresponding to 1#-4# axis

043	X axis encoder wire number
044	Y axis encoder wire number
045	T axis encoder wire number
046	C axis encoder wire number

Range : 0~9999

Unit : Wire number

Authority : Super admin

Default : 2500

Effective time : Instant

Note : Set the encoder wires connected to every pulse port (AB phase pulse). Since four times frequency division is performed for internal transfer, the value of this parameter should be the pulses collected by the encoder for one cycle divided by 4.

051	X axis pulse logic voltage level (Restart)
052	Y axis pulse logic voltage level (Restart)
053	T axis pulse logic voltage level (Restart)
054	C axis pulse logic voltage level (Restart)

Range : 0~1

Unit : LOGIC VOLTAGE LEVEL

Authority : Super admin

Default : 0

Effective time : Restart

Note : Set the normal voltage level when the pulse is working. If the setting is different from the normal voltage level required by motor drive, a direction will have accumulative error during every positive and negative motion (independent of pulses). Therefore, if the positioning axis of the machine has accumulative error in a direction, please check whether this parameter matches.

055	X axis characteristics (rotation: 0, linear: 1)
056	Y axis characteristics (rotation: 0, linear: 1)
057	T axis characteristics (rotation: 0, linear: 1)
058	C axis characteristics (rotation: 0, linear: 1)

Range : 0~1

Unit : None

Authority : Super admin

Default : 1

Effective time : Instant

Note : Set axis characteristics.
 0: Rotary axis
 1: Linear axis

The setting of this parameter and P2.059~062 axis will affect the setting of P2.035~038. Please refer to the parameter description of P2.035~038 for details.

059	X axis rotation display mode
060	Y axis rotation display mode
061	Z axis rotation display mode
062	A axis rotation display mode

Range : 0~1

Unit : None

Authority : Super admin

Default : 0

Effective time : Instant

Note : Set the coordinate display mode of the axis. This parameter is valid when P2.055~P2.058 is set to 0
 0: 0~360° display
 1: -9999.999~9999.999° display
 The setting of this parameter and P2.059~062 axis will affect the setting of P2.035~038 Please refer to the parameter description of P2.035~038 for details.

063	X axis rotation path optimization
...	...
066	C axis rotation path optimization

Range : 0~1
 Unit : None
 Authority : Super admin
 Default : 1
 Effective time : Instant
 Note : This parameter is valid when P2.059~P2.062 and P2.055~P2.058 are set to 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: Do not optimize the path
 1: Enable the shortest path
 Note: If processing is required during the motion, the shortest path may be not your desired processing track.

067	X axis maximum acceleration
...	...
070	C axis maximum acceleration

Range : 100~8000
 Unit : Kpps(Kilo Pulse Per Second)
 Authority : Super admin
 Default : 2000
 Effective time : Instant
 Note : Set the maximum acceleration of every axis. This setting will affect the track speed optimization of pretreatment to every 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 value.

071	X servo home direction
072	Y servo home direction
073	T servo home direction
074	C servo home direction

Range : 0~1

Unit : None

Authority : Super admin

Default : 0

Effective time : Instant

Note : This parameter determines the Z phase search direction when servo Z phase enable parameter is enabled in P2.009~P2.016.

0: Positive

1: Negative

075	X axis external home enable
076	Y axis external home enable
077	T axis external home enable
078	C axis external home enable

Range : 0~1

Unit : None

Authority : Super admin

Default : 1

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 P2.009~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: No

1: Yes

079	X axis encoder pulse logic direction
-----	--------------------------------------

080	Y axis encoder pulse logic direction
081	T axis encoder pulse logic direction
082	C axis encoder pulse logic direction

Range : 0~1

Unit : None

Authority : Super admin

Default : 0

Effective time : Restart

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

Handwheel encoder reuses A axis encoder.

Principal axis encoder reuses X axis encoder.

0: Positive

1: Negative

083	X axis home deceleration speed
084	Y axis home deceleration speed
085	T axis home deceleration speed
086	C axis home deceleration speed
087	X axis home scanning speed
088	Y axis home scanning speed
089	T axis home scanning speed
090	C axis home scanning speed

Range : 1~20000

Unit : mm/min

Authority : Super admin

Default : 100, 60

Effective time : Instant

Note : Used to set different speed parameters for mechanical home; the specific effect is as follows:

Home speed - (when external switch home is detected) Deceleration

speed - Scanning speed.

091	Effective voltage level of servo X axis enable
092	Effective voltage level of servo Y axis enable
093	Effective voltage level of servo T axis enable
094	Effective voltage level of servo C axis enable

Range : 0~1

Unit : LOGIC VOLTAGE LEVEL

Authority : Super admin

Default : 0

Effective time : Instant

Note : Servo enable controls the effective voltage level of output ports.

0: Low

1: high

095	Servo X axis enable delay time (ms)
096	Servo Y axis enable delay time (ms)
097	Servo T axis enable delay time (ms)
098	Servo C axis enable delay time (ms)

Range : 0~1

Unit : LOGIC VOLTAGE LEVEL

Authority : Super admin

Default : 0

Effective time : Instant

Note : The time delay from signal output enabled to the host machine sending pulses;

Different drives have different delay time;

If the delay time is too short, the pulse sent to the servo by the controller may be lost;

099	Servo X axis enable control
100	Servo Y axis enable control
101	Servo T axis enable control
102	Servo C axis enable control

Range : 0~1

Unit : None

Authority : Super admin

Default : 0

Effective time : Instant

Note : 0: Servo enable always valid
 1: Servo enable is controlled by the host computer

Control ports are output board OUT20 ~ OUT23

Note:

For T axis, when servo T axis enable control is valid

T axis retooling process is:



Management Parameters (P3.)

001	Type password to select management mode
002	Edit super user password
003	Edit operation user password

Range : None

Unit : None

Authority : None

Default : None

Effective time : Instant

Note : Type password to select management mode:

In “Edit” mode, press [EOB] to enter management mode selection interface;

Select the management mode, press [EOB] to save and exit, or press [Cancel] to cancel;

Super user: Super admin mode;

Operator: Operator mode;

Guest: Guest mode;

The default password of super admin and operator is 0

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

004	Initialize comprehensive parameters to default <●>
005	Initialize IO configuration to default <●>

Range : None

Unit : None
 Authority : Super user
 Default : None
 Effective time : Instant
 Note : Initial parameter table only in super user mode

006	Reset all parameters <●>
-----	--------------------------

Range : None
 Unit : None
 Authority : Super user
 Default : None
 Effective time : Restart
 Note : Clear all system parameters

007	Back up parameters
-----	--------------------

008	Restore parameters
-----	--------------------

Range : None
 Unit : None
 Authority : Super user
 Default : None
 Effective time : Instant
 Note : The parameters are 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 restart automatically.

009	Generate password file
-----	------------------------

Range : None
 Unit : None
 Authority : None

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 clicking mode
-----	--------------------

Range : 0~1

Unit : None

Authority : None

Default : 0 (click)

Effective time : Instant

Note : The function is to be developed

011	Clear accumulated processing pieces
-----	-------------------------------------

012	Clear current processing pieces
-----	---------------------------------

Range : None

Unit : None

Authority : None

Default : None

Effective time : Instant

Note : Clear the accumulated value of current processing pieces

013	Import CSV system configuration
-----	---------------------------------

Range : None

Unit : None

Authority : None

Default : None

Effective time : Restart

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

014	Default boot screen
-----	---------------------

Range : Select

Unit : None

Authority : Operation admin

Default : ABS
Effective time : Instant
Note : Select default boot screen from absolute position, relative position and comprehensive position.

015

System language packs

Range : 0~1
Unit : None
Authority : Operation admin
Default : 0 (Chinese)
Effective time : Instant
Note : Select system language
Chinese
English

016

Macro keyword effective enable

Range : 0~1
Unit : None
Authority : Operation admin
Default : 0 (Chinese)
Effective time : Instant
Note : Macro keyword effective parameter is used to set whether the macro expression symbol set on the face is valid; 1: valid, 0: invalid.

017

Boot screen mode

Range : 0~6
Unit : None
Authority : Operation admin
Default : 1S
Effective time : Instant
Note : 1. Used to configure logo display mode; if it is set to 0, press any key to enter the system; for non-zero value, it enters into the system automatically after corresponding time delay.

This feature is invalid for this version

018	System debugging info enable
Range	: 0~1
Unit	: None
Authority	: Super user
Default	: OFF/
Effective time	: Instant
Note	: <ol style="list-style-type: none">1. Used to configure whether RS232 of current system outputs debugging information during running.2. This parameter is dedicated for programmers, and users are not recommended to enable this parameter.3. If debugging information is enabled, the system performance will deteriorate, so that it is disabled in the normal process.4. If networking is enabled, this feature must be turned off, or else the networking will crash.

019	Axis control composite key enable
Range	: 0~1
Unit	: None
Authority	: Super user
Default	: ON/
Effective time	: Instant
Note	: <ol style="list-style-type: none">1. Used to configure whether enable the key for axis motion on the controller panel.2. This parameter is used to shield the composite function of the axis motion control button on the NC panel when use additional panel; if additional panel isn't used, it must be enabled or else axis movement cannot be controlled through the buttons.

020	Additional panel enable
Range	: 0~1
Unit	: None
Authority	: Super user

Default : OFF/0

Effective time : Instant

Note : ON: Used to configure whether NC uses additional panel, which must match ADT series, or compatible with the same protocol interface.

To use additional panel, the system debugging information must be disabled (P3.19).

OFF: Turn off additional panel

021	System tool magazine external enable
-----	--------------------------------------

Range : 0~1

Unit : None

Authority : Super user

Default : OFF/0

Effective time : Instant

Note : ON: Used to configure whether call T_FUNC.NC to achieve ATC function of the system. Tool magazine files should be obtained from the vendor

OFF: Tool magazine files are compressed in the system;

022	Program header file running enable
-----	------------------------------------

Range : OFF/ON

Unit : None

Authority : Super user

Default : OFF

Effective time : Instant

Note : OFF: Do not run HDR_FUNC.NC file automatically before processing files;

ON: run HDR_FUNC.NC file automatically before processing files;

023	System positioning mode
-----	-------------------------

Range : Manual/Auto

Unit : None

Authority : Super user

Default : Manual

Effective time : Instant

Note : Manual: In this mode, G54 coordinates can be set manually;
 Auto: In this mode, G54 coordinates only can be set in super administrator mode;

10.4 Mold parameter (P4.)

The user needs to set P6.002 Total turret tools (> 0) to show mold database parameters;

001	T1
...	...
100	T100

Range :
 Unit :
 Authority : Operation admin
 Default :
 Effective time : Instant
 Note : [Turret Position]: the angle of each tool corresponding to the turret; T1 is 0;
 [Diameter]: Maximum tool size;
 [Shape]: 0: round; 1: square;
 [Whether switch tool]: 0: No 1: Yes;
 [X Size]: length of square tool;
 [Y Size]: width of square tool;
 [Installation Angle]: The angle to install the tool;
 [Additional Output]: Output port corresponding to cylinder type retooling;
 [Disengagement Detection]: Port number for cylinder type disengagement detection;
 [Clamp Detection]: Port number for cylinder type clamp detection;
 [Spare]: None;
 [Spare]: None;
 Note:
 1: Before preview, set up the mold diameter and X, Y size correctly or else the simulation results will be affected;
 2: During trajectory simulation, the simulation size of circular tool relates to [X Size]
 Square and rectangle are related with [X Size] and [Y Size];

10.5 Port Configuration (P5.)

Note: Ports mustn't be assigned to unused IO; please enter "8888" to disable the IO to avoid system stability being affected by outside influence;

001	Reset off IO configuration 00~15
002	Reset off IO configuration 16~23

Range : 0~65535

Unit :

Authority : Super admin

Default : 64438
143

Effective time : Instant

Note : 1. Used to configure reset; when alarm, the system needs to reset the IO signal.
2. Use binary system for pin configuration.

For example: the binary expression of 83:65404 is 1,111,111,101,111,100;

Represents that 0#, 1# and 7# ports won't be reset by system pause or alarm.

For example: Clamp control pin is IN6 and high level effective, to avoid resetting the port when press the reset key

The setting is as follows:

The original value of the parameter -2^6 ;

003	Start output OUT00~15
004	Start output OUT16~23
005	Start output level00~15
006	Start output level 16~32

Range : 0~65535

Unit :

Authority : Super admin

Default : 0

65535

Effective time : Instant

Note : Used to configure the default output level of the output port;

Binary system is used for pin configuration.

For example: Configure IN0 to output high level

IN1 output low level

IN2 output high level

Others do not output

003, Start output OUT00~15: input 7, binary expression is 0000 0000

0000 0111

1: Output enabled

0: Output disabled

005, Start output level 00~15: input 5, binary expression is 0000 0000

0000 0101

1: High

0: Low

007	External start 2 test port No.
008	External pause 2 test port No.
009	External emergency stop 2 test port No.

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 007: External start button port settings

008: External pause button port settings

009: External emergency stop button port settings

Default effective level is 0, normally open;

010	Upper dead point input port
011	Feeding signal input port
012	Single punching stop upper dead point input port

013	Nibbling stop upper dead point input port
014	Clutch output port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 010: Top dead center switch port number, effective voltage level P1.079
 011: Feeding signal (safe height) switch port; effective voltage level P1.080
 012: Single punch stopping on top dead center switch port; effective voltage level: P1.112
 013: Nibbling stopping on top dead center switch port; effective voltage level: P1.112
 014: punch clutch relay port; effective voltage level; P1.081

015	Foot clamp material input port
016	Clamp output port
017	Clamp scanning input port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 015: Foot switch port number, effective voltage level 0
 016: Clamp relay port number,
 017: Clamp position scanning switch port number, effective voltage level 0

018	Positioning block input port
019	Positioning block output port

020	Positioning block signal detection input port
	<p>Range : 0~33</p> <p>Unit : IRQ</p> <p>Authority : Super admin</p> <p>Default : Port Comparison Table in the Manual</p> <p>Effective time : Instant</p> <p>Note : 018: External positioning block control switch port number; 019: Positioning block relay control port number, 020: Positioning block state detection switch input port, effective voltage level 0</p>
021	Main motor running input port
022	Main motor output port No.
	<p>Range : 0~33</p> <p>Unit : IRQ</p> <p>Authority : Super admin</p> <p>Default : Port Comparison Table in the Manual</p> <p>Effective time : Instant</p> <p>Note : 021: External main motor control switch port; 022: Main motor control relay port number,</p>
023	System oil output port No.
024	Lubricant output port No.
	<p>Range : 0~33</p> <p>Unit : IRQ</p> <p>Authority : Super admin</p> <p>Default : Port Comparison Table in the Manual</p> <p>Effective time : Instant</p> <p>Note : 023: Automatic lubrication port number; 024: Lubrication port number,</p>
025	Mold pin input port

026	Mold pin output port
027	Mold pin release in-place input port No.
028	Mold pin lock in-place input port No.

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 025: Port number of the switch for external control mold access;
 026: Port number of the switch for mold relay control,
 027: Port number of the switch to detect whether the mold is loose;
 028: Port number of the switch to detect whether the mold is locked;

029	Relocation cylinder output port
030	Positioning cylinder compression test port
031	Positioning cylinder release detection port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 029: Second positioning cylinder relay control output port;
 030: Port number of the switch to detect whether the cylinder is pressed;
 031: Port number of the switch to detect whether the cylinder is lifted;

032	Mold conversion combination output port
033	Mold conversion combination in-place
034	Mold conversion disengagement in-place
035	Mold conversion position in-place input port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 032: Port number that controls integration and disengagement of the upper and lower mold;

033: Port number of the switch to detect whether the mold conversion is combined;

034: Port number of the switch to detect whether the mold conversion is dragged;

035: Port number of the switch to detect whether the current position is for mold conversion;

036	Manual X positive input port
037	Manual X negative input port
038	Manual Y positive input port
039	Manual Y negative input port
040	Manual T positive input port
041	Manual T negative input port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 037: Port number of the external X+ hand switch;

038, 039, 040, and 041 are same as above;

The default effective voltage level is 0;

042	Workpiece coordinate system clearing input port
043	Single / consecutive punching input port
044	Jog / continuous input port

045	Running light output port
046	Alarm lamp input port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 042: Manual clear port number;
 043: Single punch / continuous switch input port;
 044: Single step / manual mode switch input port;
 045: Running light output
 046: Alarm lamp output

047	Punch peak switching output port
048	Punch peak switching output voltage level
049	Punch alarm reset output port

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual

Effective time : Instant

Note : 047: Control whether the punch is in the top dead center;
 048: Effective voltage level corresponding to 047;
 049: Punch alarm reset port; "Reset" or "Cancel" control;

050	X positioning completion input port
051	Y positioning completion input port
052	Positioning completion effective voltage level

Range : 0~33

Unit : IRQ

Authority : Super admin

Default : Port Comparison Table in the Manual
 Effective time : Instant
 Note : 050: X-axis servo positioning completion port;
 051: Y-axis servo positioning completion port;
 052: 050, 051 port effective voltage level

053	Insufficient air pressure alarm input port
054	Mold detection input port
055	Worktop lower level alarm input port
056	Y axis safe zone alarm input port
057	Hydraulic card alarm detection port

Range : 0~33
 Unit : IRQ
 Authority : Super admin
 Default : Port Comparison Table in the Manual
 Effective time : Instant
 Note : 053-056: Alarm pause
 057: Alarm emergency stop

058	Manual fast / slow switch port
-----	--------------------------------

Range : 0~33
 Unit : IRQ
 Authority : Super admin
 Default : Port Comparison Table in the Manual
 Effective time : Instant
 Note : To one-touch switch;

059	X axis safe zone alarm input port 1
060	X axis safe zone alarm input port 2

Range : 0~33
 Unit : IRQ
 Authority : Super admin
 Default : Port Comparison Table in the Manual

Note : 056Y axis safe zone alarm input port
 Alarm if either 059 or 060 and 056 are triggered;
 Initialization connected to normally closed switch;

061	Hydraulic system detection port No.
-----	-------------------------------------

Range : 0~33
 Unit : IRQ
 Authority : Super admin
 Default : Port Comparison Table in the Manual
 Effective time : Instant
 Note : (Progressive) detect whether the oil pressure is normal
 Effective level: 055 Lubricant pressure test voltage level;

062	Hydraulic system detection port No. B
-----	---------------------------------------

Range : 0~33
 Unit : IRQ
 Authority : Super admin
 Default : Port Comparison Table in the Manual
 Effective time : Instant
 Note : (Displacement) detect whether the oil pressure is normal
 Effective level: P1.140 system oil pressure detection level B

10.6 Turret Parameters (P6.)

001	Current mold No.
-----	------------------

Range : 1-100
 Unit : None
 Authority : Operation admin

Default : 1
 Effective time : Instant
 Note : Current mold station number under the punch.

002	Total turret molds
-----	--------------------

Range : 1~100
 Unit : None
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : System mold station value
 Note: Total molds cannot be zero

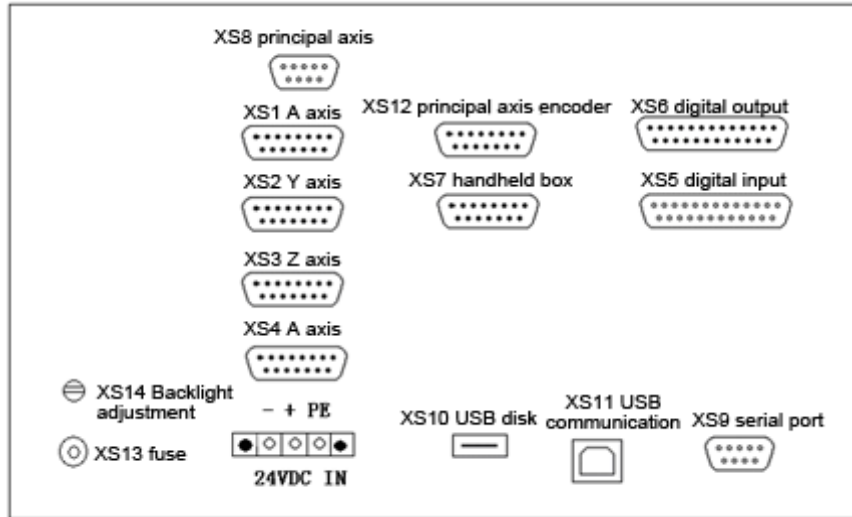
003	NCT-02 cylinder tool magazine enable
-----	--------------------------------------

Range : 0-1
 Unit : None
 Authority : Operation admin
 Default : 0
 Effective time : Instant
 Note : 0: Disable
 1: Enable

11 Hardware Interface Definition and Connection Instructions

11.1 Installation Layout

11.1.1 External Interface Diagram



(1) X axis, Y axis, Z axis, A axis:

15-core D-pin socket connects to step motor drive or digital AC servo drive

(2) XS5 digital input:

25-core D-pin socket inputs signals for every axis limit and other switching quantity

(3) XS6 digital output:

25-core D-pin socket outputs signals for switching quantity

(4) USB and serial port exchange files between PC and NCT-XX controller and realize other functions.

(5) NCT-XX controller uses 24V DC power supply, and the internal power consumption is about 5W.

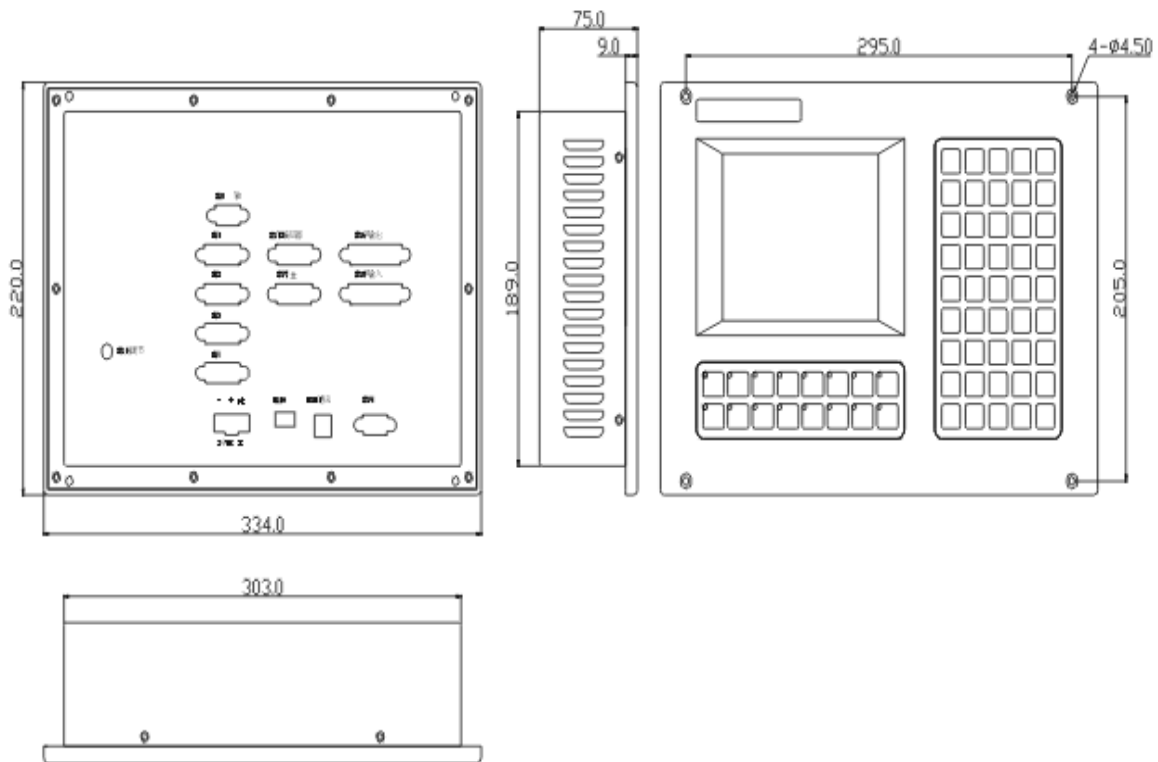
(6) XS7 accessory panel:

15-core D-pin socket connects to handwheel

(7) XS8 principal axis:

9-core D-pin socket connects to principal axis inverter

11.1.2 Mounting Dimensions



11.1.3 Installation precautions

Installation condition for electric cabinet

- (1) The cabinet must be able to effectively prevent dust, coolant and organic solution entering;
- (2) 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°C;
- (3) The cabinet should be installed with fan to ensure interior ventilation;
- (4) The display panel should be installed at the position can't be sprayed by the coolant;
- (5) 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 in certain degree. To ensure system stability, please take the following measures to install and connect the system:

- (1) 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 switching power supply should be connected to a filter to improve the anti-interference of CNC (as in Fig.1-4);

(2) To supply power to the system through isolation transformer, the machine tool must be grounded, CNC and drive must be connected to separate earth wire.

To suppress interference

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

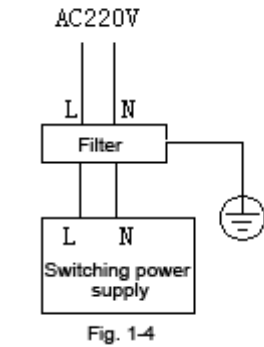


Fig. 1-4

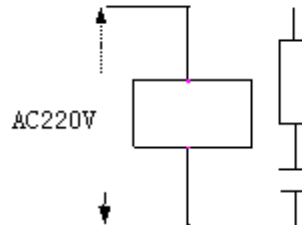


Fig. 1-5

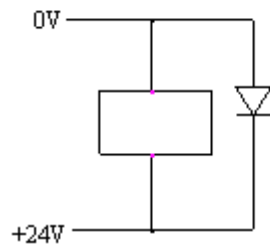


Fig. 1-6

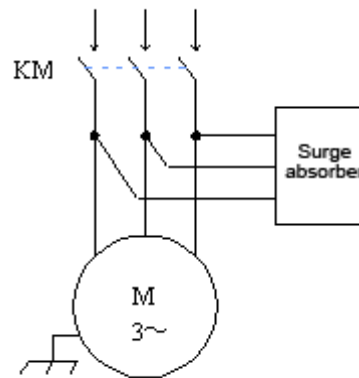


Fig. 1-7

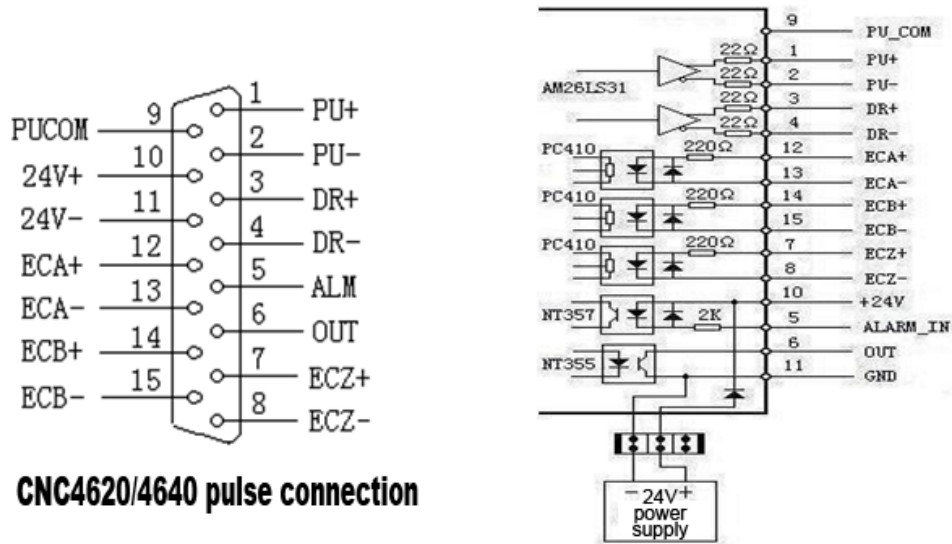
To reduce the interference between CNC signal cables and strong current cables, the wiring shall follow the principles below:

Group	Cable type	Wiring Requirement
A	AC power cord	Bundle the cables of group A separately from group B and C, keep at least 10cm clearance, or make electromagnetic shielding for group A
	AC coil	
	AC contactor	
B	AC coil (24VDC)	Bundle the cables of group B separately from group A or shield group B; group B and group C should be as far as possible
	DC relay (24VDC)	
	Cable between system and strong current cabinet	
	Cable between system and machine tool	
C	Cable between system and servo drive	Bundle the cables of group C separately from group A, or shield group C; keep at least 10cm clearance between group C and group B and use twisted pair
	Position feedback cable	
	Position encoder cable	
	Handwheel cable	
	Other cables for shielding	

11.2 Interface Definition

11.2.1 Motor Drive Control Interface (XS1...XS4)

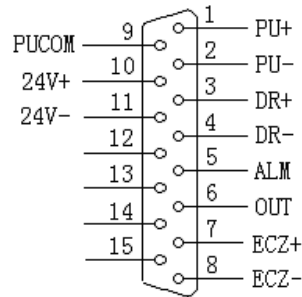
Four drive interfaces are available (XS1 X axis, XS2 Y axis, XS3 Z axis, XS4 A axis), and they have the same definition, as shown below:



Simple Internal Circuit Diagram for Pulse Output

Wire 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 X axis: IN34, Y axis: IN35, Z axis: IN36, A axis: IN37
6	OUT	Axis alarm reset output signal X axis: OUT24, Y axis: OUT25, Z axis: OUT26 A, axis: OUT27
7	ECZ+	Encoder phase Z input +
8	ECZ-	Encoder phase Z input -
9	PUCOM	Controller for single end input
10	24V+	Internally provided 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 -

Standard pulse wiring diagram

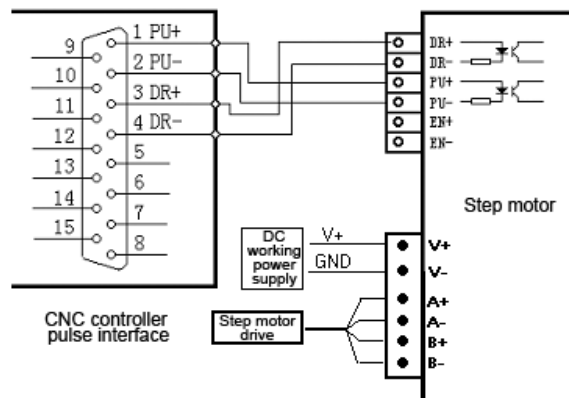


XS1 ... XS4 Pulse Interfaces Standard

This wiring is suitable for NCT-XX controller;

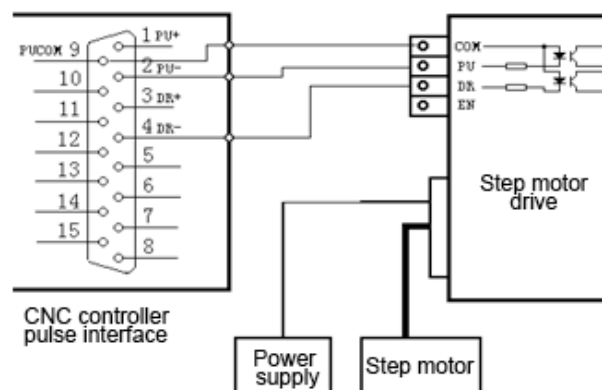
Step motor drive cable to differential input

Adtech CNC drive is for reference, all of which use differential input mode. This mode has strong anti-interference and is recommended. Please refer to the figure below for the connection of CNC with step motor drive and step motor



Step motor drive wiring diagram for single-ended input

Certain 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.



Wiring Diagram for Step Motor Drive with Common Anode Input

Servo motor drive wiring diagram

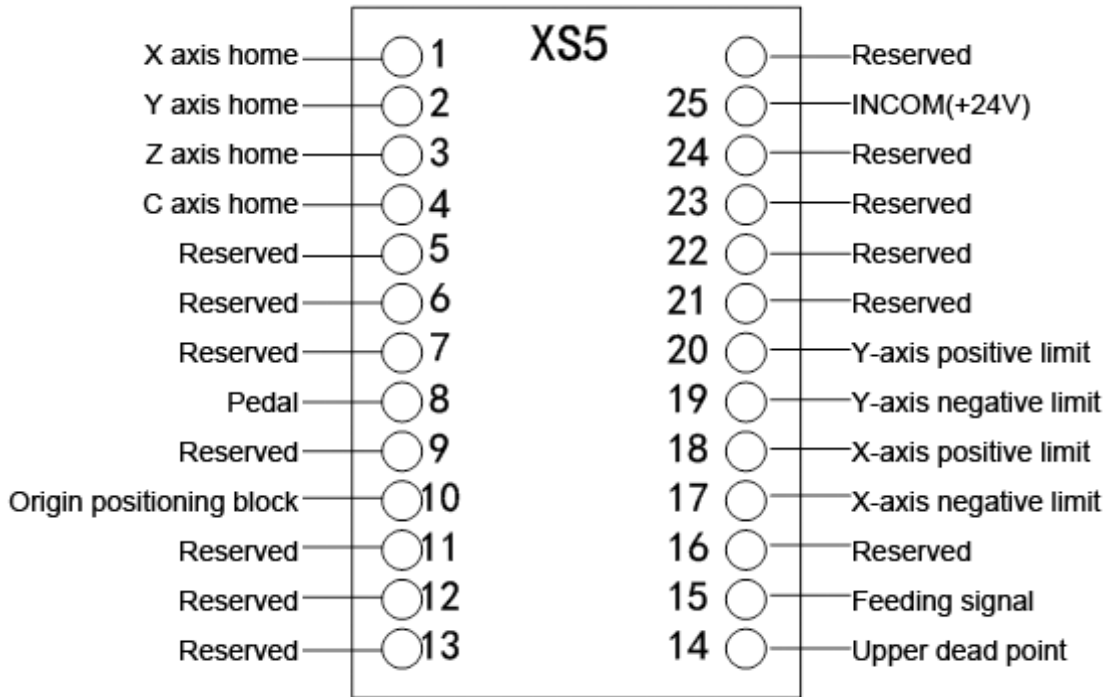
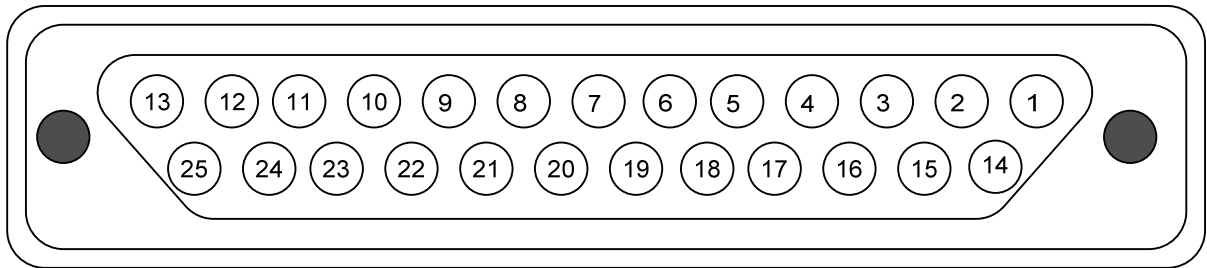
Since differential connection is used in most cases, please refer to differential mode for the pulse connection. Most servo drives require 12-24V power supply, and the 24V power provided by pin 10, 11 is available. The specific connection depends on servo drive. Please contact us if you have any question.

Caution

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

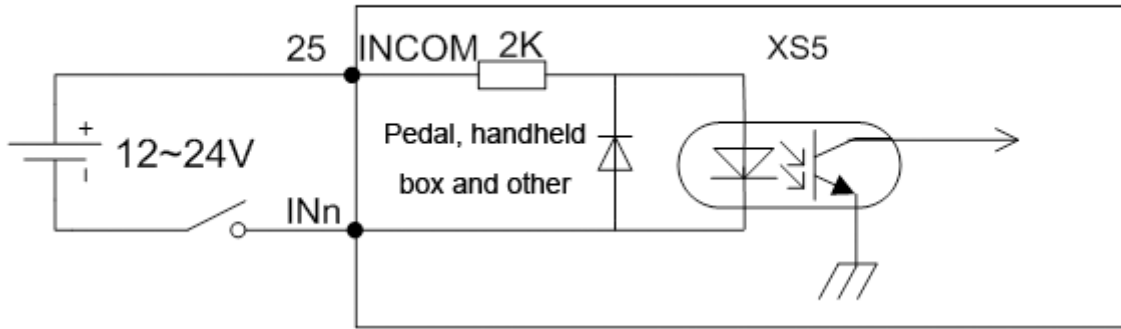
11.2.2 Digital input interface (XS5)

The digital input interface pin and definition

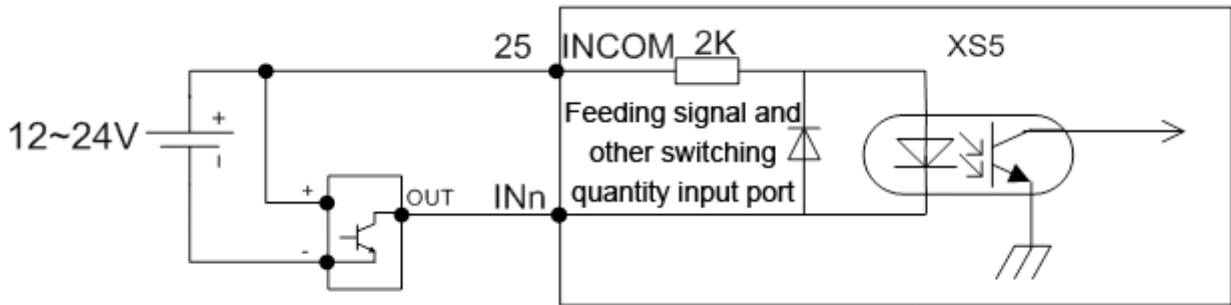


Wire No.	IRQ Definition	Function (default)		
		NCT-2	NCT-3	NCT-4
1	IN0	X axis zero point		

2	IN1	Y axis zero point		
3	IN2	Z axis zero point		
4	IN3	A axis zero point		
5	IN4	Clear coordinate system	Mold pin loose detection	Mold pin loose detection
6	IN5	Reserved	Mold pin tight detection	Mold pin tight detection
7	IN6	Reserved		
8	IN7	Pedal switch input		
9	IN8	Reserved		
10	IN9	Positioning block switch		
11	IN10	Reserved		
12	IN11	Reserved		
13	IN12	Reserved		
14	IN13	Upper dead point detection input		
15	IN14	Feeding signal		
16	IN15	Reserved		
17	IN16(XLMT-)	X-axis negative limit		
18	IN17(XLMT+)	X-axis positive limit		
19	IN18(YLMT-)	Y-axis negative limit		
20	IN19(YLMT+)	Y-axis positive limit		
21	IN20(ZLMT-)	Reserved		
22	IN21(ZLMT+)	Reserved		
23	IN22(ALMT-)	Reserved		
24	IN23(ALMT+)	Reserved		
25	INCOM	INCOM(24V+, 12V+) is connected to internal or external power supply		
Remark: The following ports shouldn't be occupied IN0, IN1, IN2, IN3, IN16, IN17, IN18, IN19				



Mechanical Switch Wiring Diagram

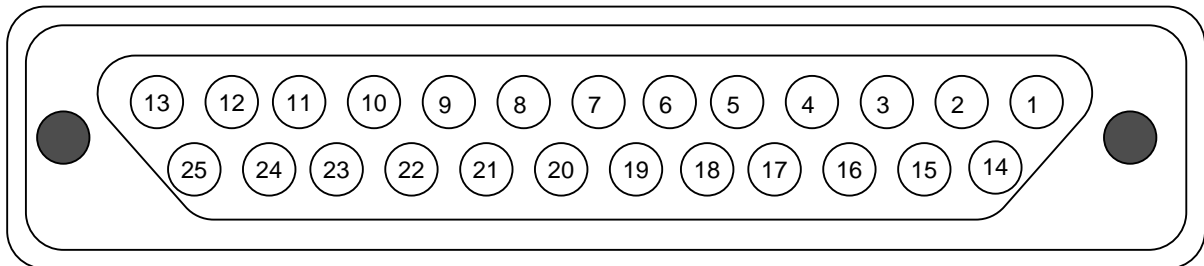


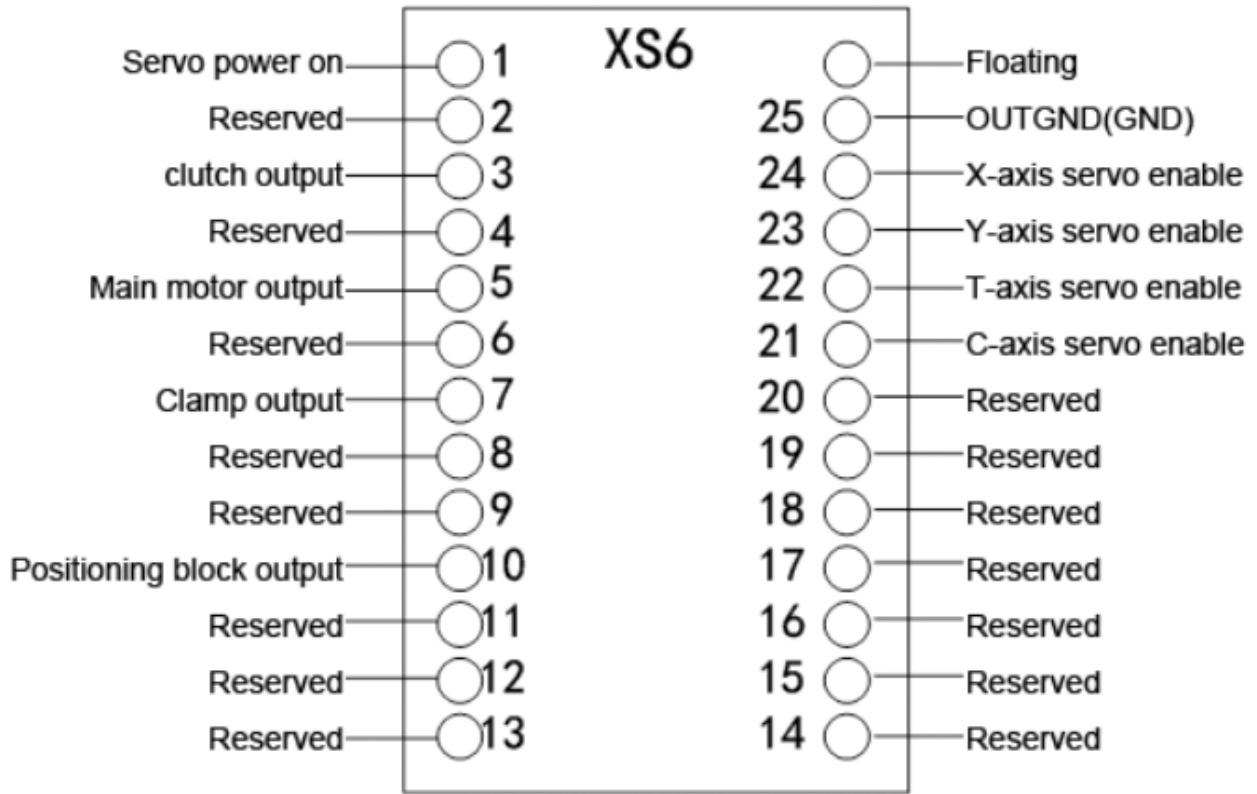
Approach Switch Wiring Diagram

+ is the anode of approach switch, - is the earth wire, and OUT is output signal. For common approach switch, please select 10-30V power supply and NPN output. Photoelectric switch is similar.

11.2.3 Digital Output Interface (XS6)

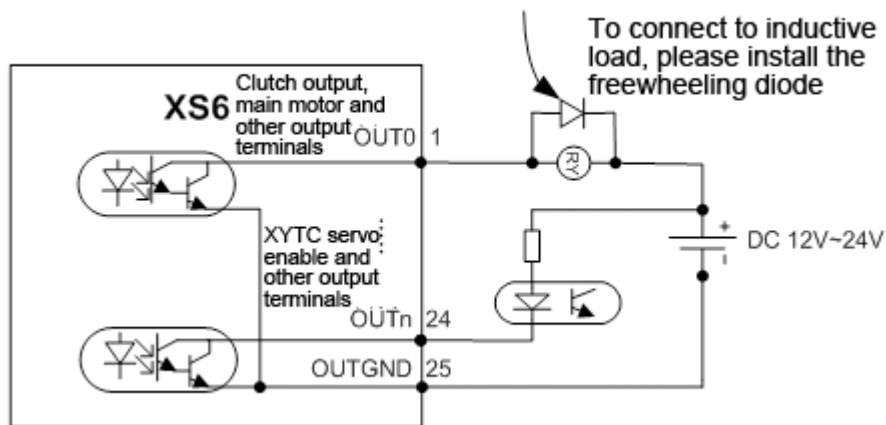
The wiring of digital output interface follows:





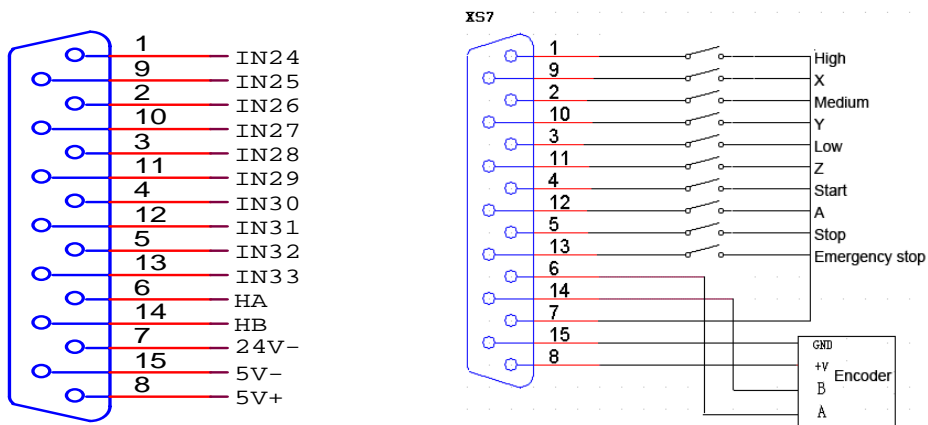
Wire No.	Definition	Function (default)		
		NCT-020	NCT-03	NCT-04
1	OUT0	Servo power on		
2	OUT1	Reserved		
3	OUT2	Punch signal clutch output		
4	OUT3	Reserved	Mold pin output	Mold pin output
5	OUT4	Main motor output		
6	OUT5	Reserved		
7	OUT6	Clamp output		
8	OUT7	Reserved	Relocation cylinder	Relocation cylinder
9	OUT8	Reserved	Reserved	Mold conversion combination
10	OUT9	Positioning block output		
11	OUT10	Reserved		
12	OUT11	Reserved	Reserved	Punch alarm output

13	OUT12	Reserved
14	OUT13	Reserved
15	OUT14	Reserved
16	OUT15	Reserved
17	OUT16	Reserved
18	OUT17	Reserved
19	OUT18	Reserved
20	OUT19	Reserved
21	OUT20	X-axis servo enable
22	OUT21	Y-axis servo enable
23	OUT22	T-axis servo enable
24	OUT23	C-axis servo enable
25	OUTGND	External output port power supply GND



Simple Wiring Circuit of Digital Output

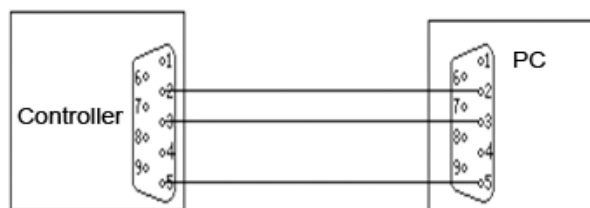
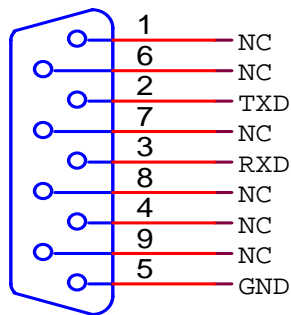
11.2.4 Extended Input Interface (XS7)



Wire No.	Definition	Function
1	(IN24) position switch	0.1---High speed
2	(IN26) position switch	0.01---Medium speed
3	(IN28) position switch	0.001---Low speed
4	(IN30) button	Cycle start
5	(IN32) button	Pause
7	24V-	Cathode of internal 24V power supply
9	(IN25) axis selection	X axis
10	(IN27) axis selection	Y axis
11	(IN29) axis selection	Z axis
12	(IN31) axis selection	A axis
13	(IN33) button	Emergency stop
6	HA	Hand encoder A phase input signal
14	HB	Hand encoder B phase input signal
15	5V-	Cathode of internal 5V power supply
8	+5V	Anode of internal 5V power supply
7	24V-	Cathode of internal 24V power supply

11.2.5 RS232 Transmission Interface (XS9)

Serial communication interface ---9-core signal socket (male)



RS-232 communication mode

11.2.6 USB Memory Connection Interface (XS10)

Standard USB memory (e.g. USB disk) interface;

11.2.7 PC USB Communication Interface (XS11)

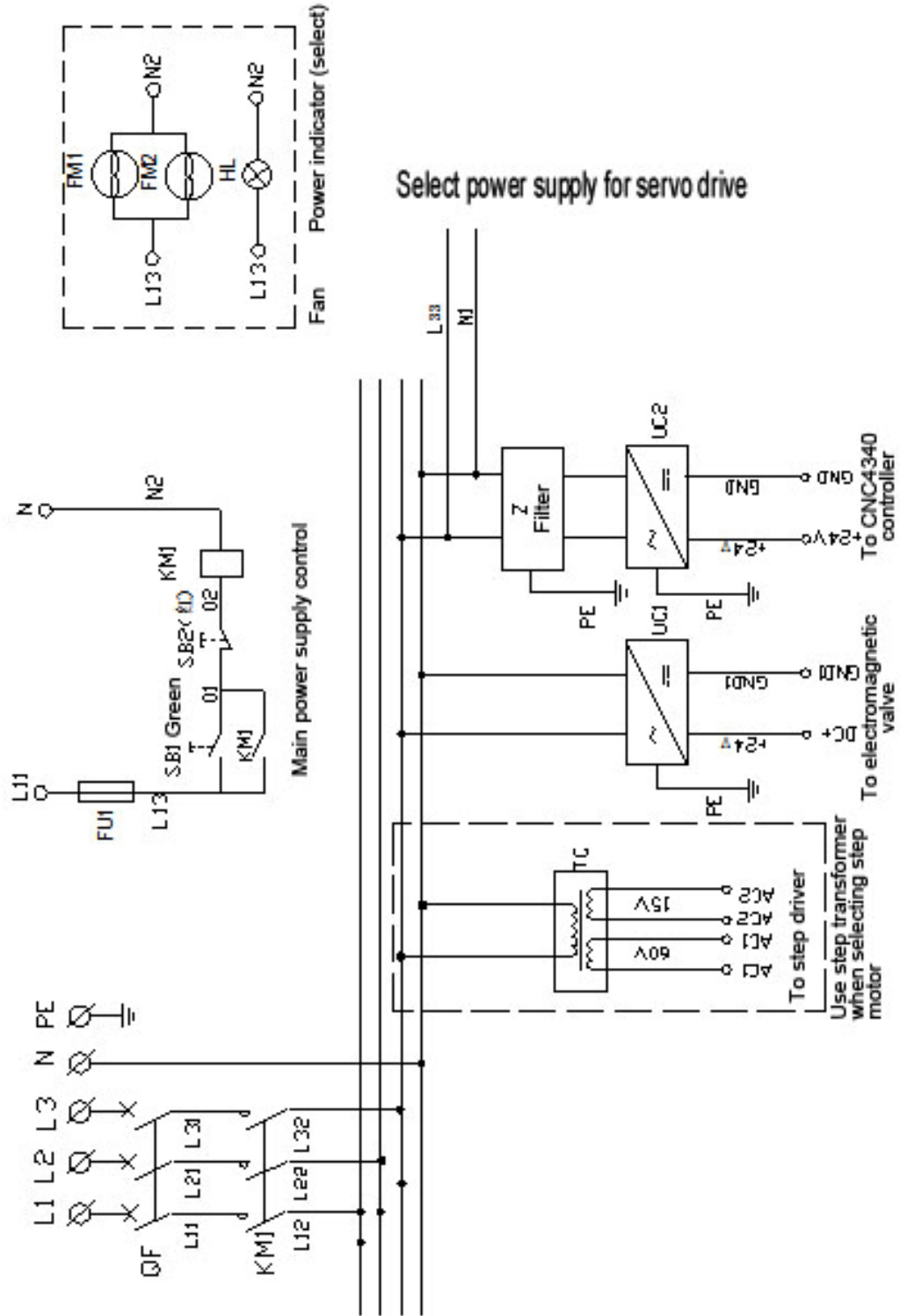
Standard USB communication interface;

11.3 Electrical Connection Diagram

11.3.1 Symbol Schematic Diagram

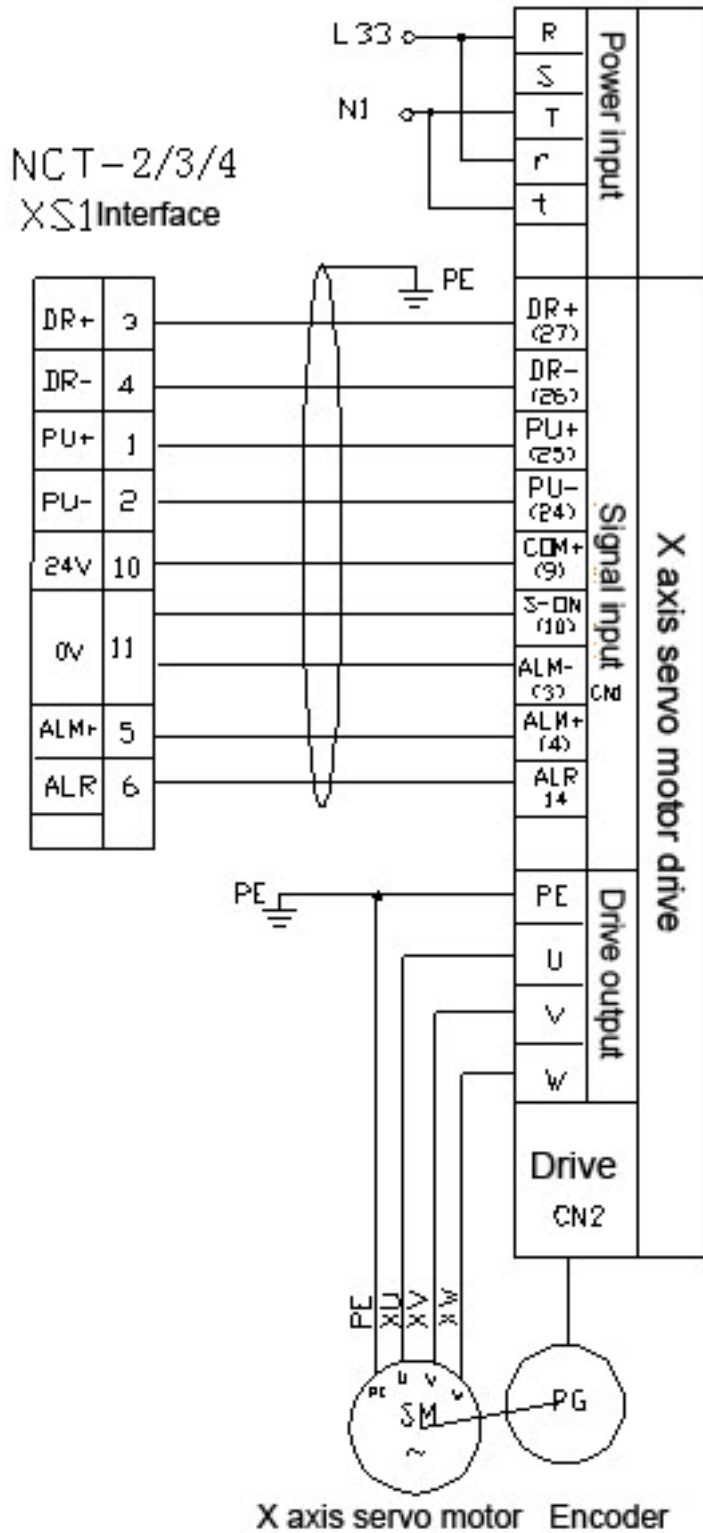
Symbol ^①	Name ^②	Figure ^③	Symbol ^④	Name ^⑤	Figure ^⑥
QF	Breaker ^⑦		SM ^⑧	Servo motor ^⑨	
KM	Contact ^⑩		M ^⑪	Step motor ^⑫	
UF	Inverter ^⑬		SQ ^⑭	Approach switch ^⑮	
M ^⑯	Motor ^⑰		SA ^⑱	Foot switch ^⑲	
TC ^⑳	Transformer ^㉑		YB ^㉒	Motor brake ^㉓	
Z ^㉔	Filter ^㉕		FR ^㉖	Thermal relay ^㉗	
FU ^㉘	Fuse ^㉙		UC ^㉚	Switching power supply ^㉛	
SB ^㉜	Button ^㉝		VV ^㉞	Electromagnetic valve ^㉟	
FM [㉠]	Fan [㉡]		C [㉢]	Capacitor [㉣]	
HL [㉤]	Indicator [㉥]		R [㉦]	Resistor [㉧]	
QS [㉨]	Touch switch [㉩]		QS [㉪]	Travel switch [㉫]	
PG [㉬]	Encoder [㉭]		KA [㉮]	Relay [㉯]	

11.3.2 Power Connection Diagram



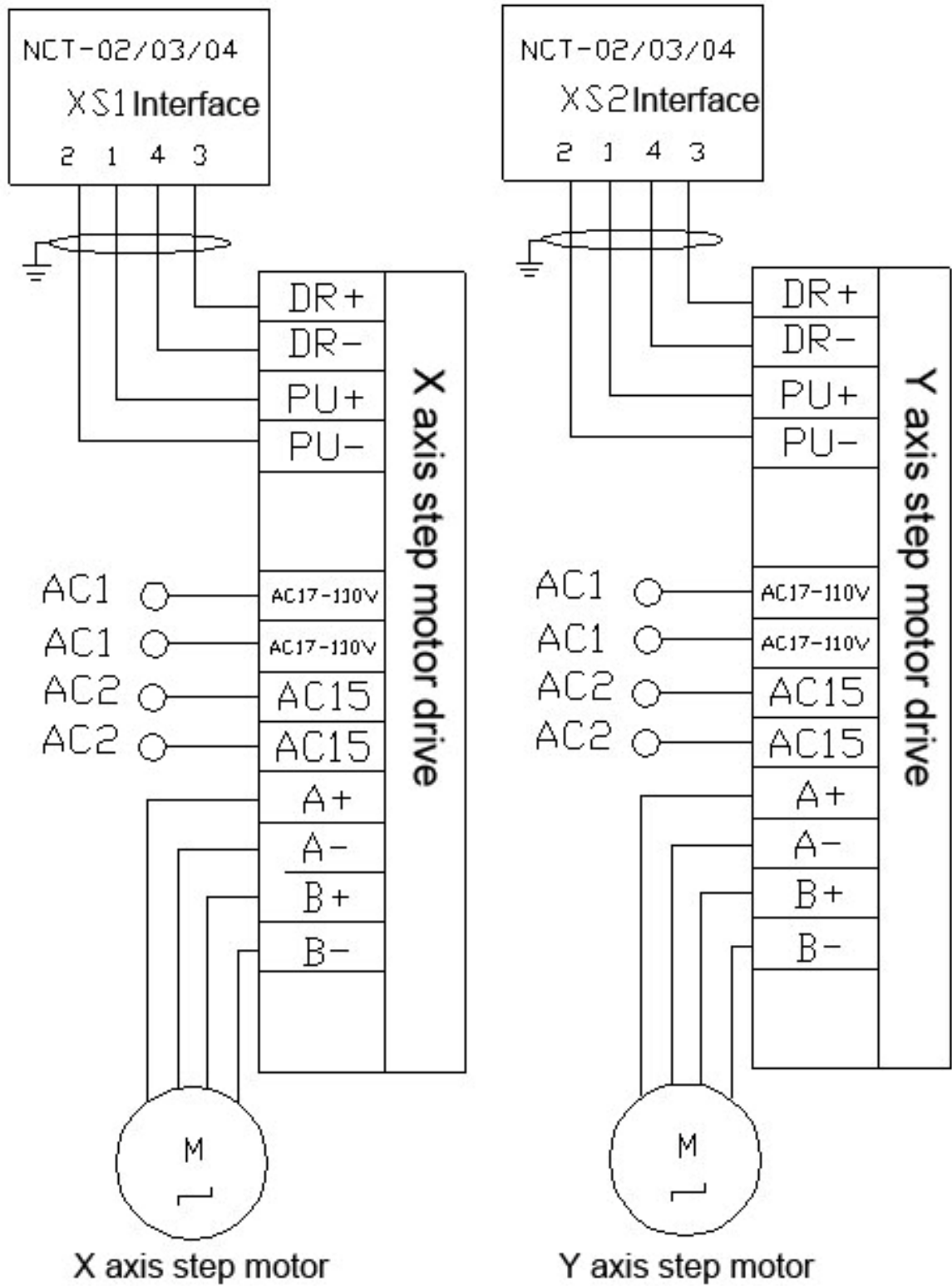
11.3.3 Servo Drive Connection Diagram

Servo Drive Connection Diagram



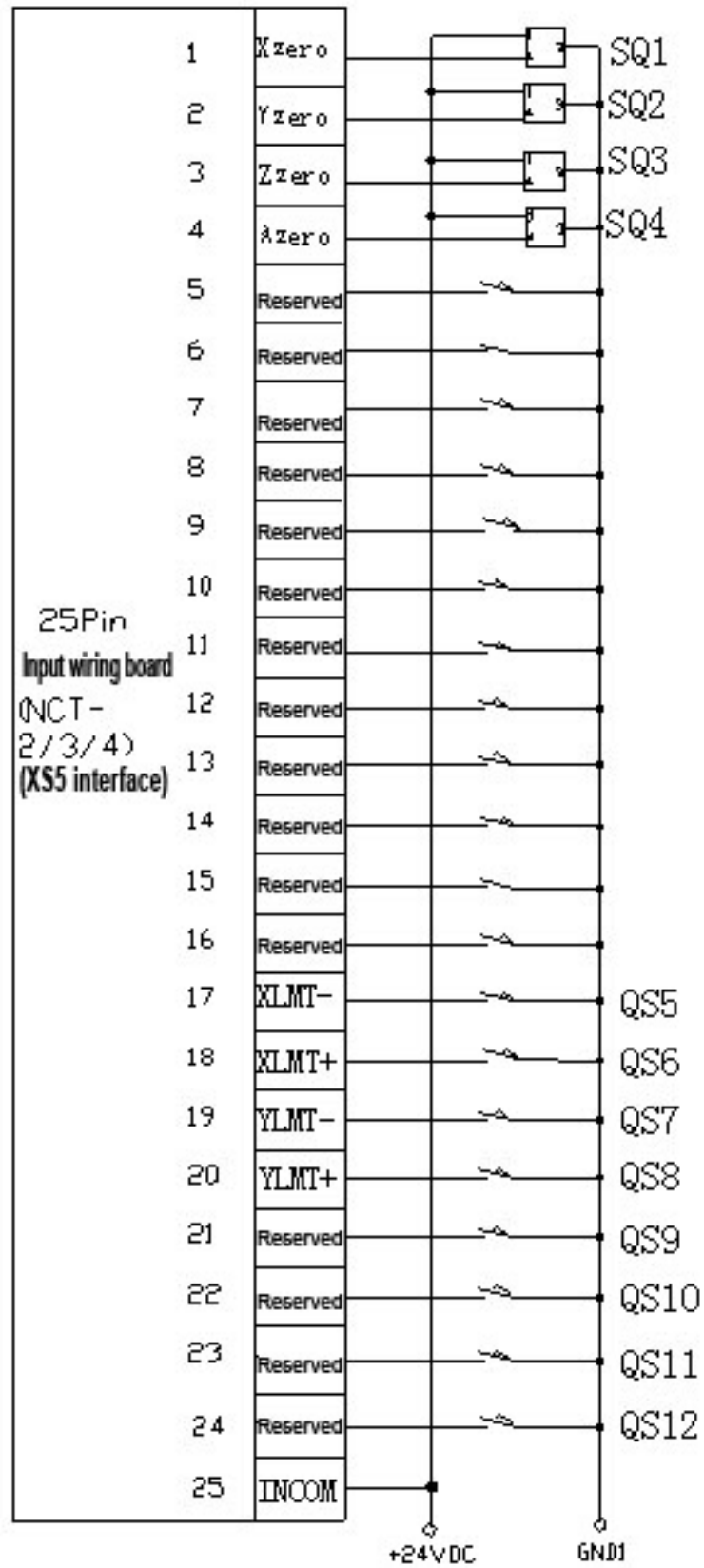
Select servo wiring

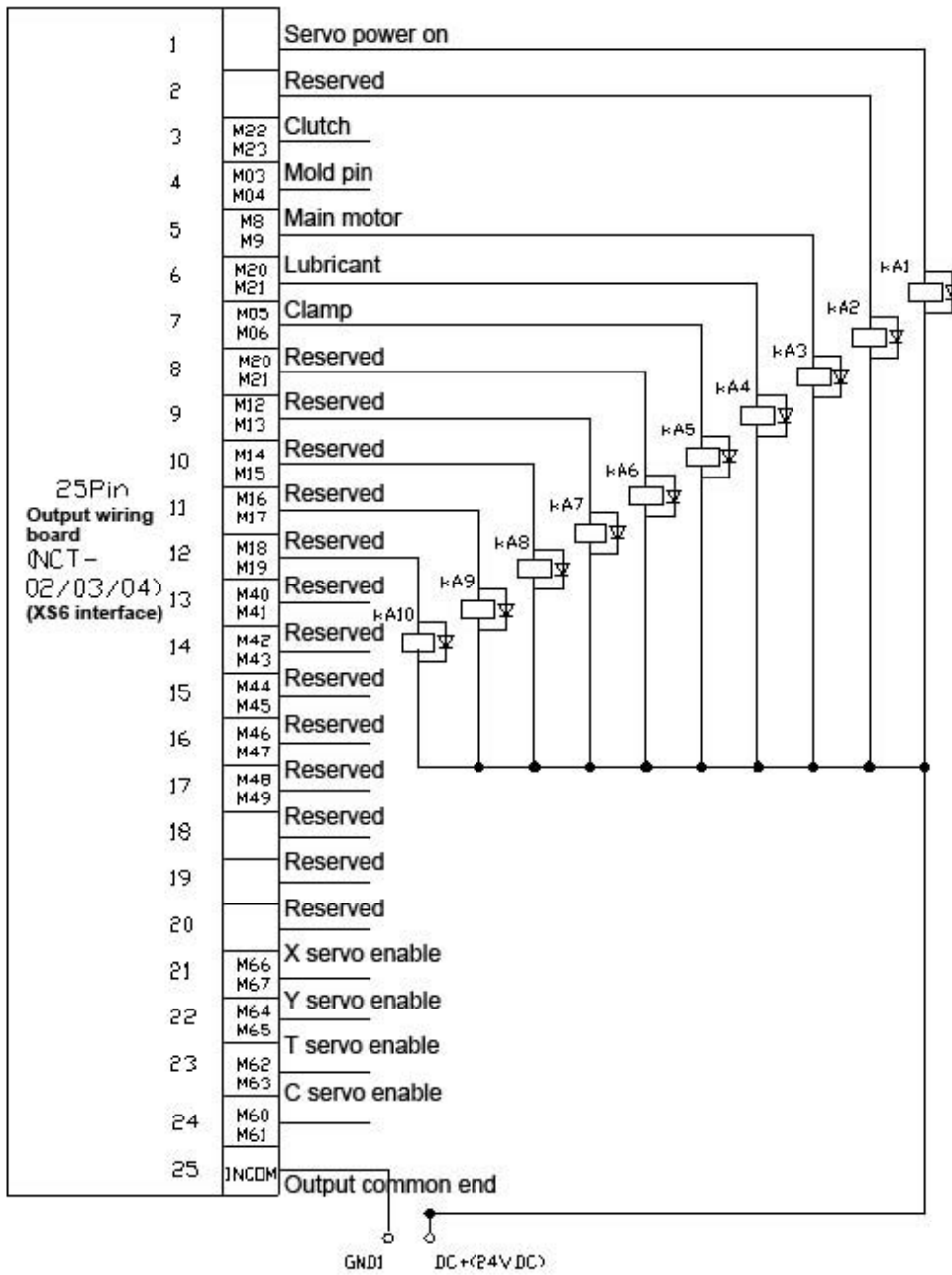
11.3.4 Step Connection Diagram



Q2BYG1106M Step System

11.3.5 IO Electrical Connection Diagram





12 Fault 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
16385~	Punch alarm info

12.1 NC Program Execution Alarm

0000	:	Please reset
0001	:	Program ends
0004	:	Changing tool fails
0005	:	Tool is invalid
0006	:	G block repeat error
0007	:	G block program No. error
0008	:	G7x8x complex instruction code can't run normally
0009	:	Abnormal program termination error
0010	:	Specify M01 code program pause
0011	:	M98 format error
0012	:	Motion transfer fails
0013	:	This block doesn't need compensation
0014	:	G block invalid format
0015	:	M99 instruction transfer abnormal; M99 transfer is prohibited in current position
0016	:	Abnormal motion alarm
0017	:	Illegal character
0018	:	Note symbol format error or no symmetric note symbol
0019	:	Illegal G code
0020	:	G code radius compensation number or value error
0021	:	Undefined G code radius compensation error
0022	:	Arc programming error
0023	:	Specify illegal plane, exceed G17, G18, G19
0024	:	M98 transfer error, may exceed the maximum value
0025	:	Principal axis specifying hardware axis No. error
0026	:	M code execution error
0027	:	Specifying principal axis fails
0028	:	Motion repeats request

0029	:	Specified arc doesn't exist
0030	:	X instruction missing error
0031	:	Y instruction missing error
0032	:	Z instruction missing error
0033	:	A instruction missing error
0034	:	B instruction missing error
0035	:	C instruction missing error
0036	:	D instruction missing error
0037	:	R instruction missing error
0038	:	F instruction missing error
0039	:	T instruction missing error
0040	:	S instruction missing error
0041	:	P instruction missing error
0042	:	M instruction missing error
0043	:	G instruction missing error
0044	:	I instruction missing error
0045	:	J instruction missing error
0046	:	K instruction missing error
0047	:	Q instruction missing error
0048	:	Screw distance repeat designation error
0049	:	System alarm occurs and exits abnormally
0050	:	Exit through human intervention
0051	:	G code parameter source isn't specified
0052	:	G code program No. table storage address isn't specified

12.2 System Environment Alarms

1024	:	The controller isn't reset
		1. The system doesn't perform home action after started
1025	:	A axis negative soft limit
1026	:	A axis positive soft limit
1027	:	Z axis negative soft limit
1028	:	Z axis positive soft limit

1029	:	Y axis negative soft limit
1030	:	Y axis positive soft limit
1031	:	X axis negative soft limit
1032	:	X axis positive soft limit
1033	:	A axis negative hard limit
1034	:	A axis positive hard limit
1035	:	Z axis negative hard limit
1036	:	Z axis positive hard limit
1037	:	Y axis negative hard limit
1038	:	Y axis positive hard limit
1039	:	X axis negative hard limit
1040	:	X axis positive hard limit

The system has corresponding 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 in manual mode and check the state of the input port in diagnosis mode. If the state is valid, please eliminate in sequence. Pull out 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
------	---	----------------

Emergency stop button of the handheld box interface is valid.

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

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

1042	:	Servo X drive alarm
1043	:	Servo Y drive alarm
1044	:	Servo Z drive alarm
1045	:	Servo A drive alarm

Servo alarm; if the servo doesn't alarm, parameter P2.001~004 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 No. definition internal repeat error
------	---	---

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

1047	:	Principal axis isn't reset
------	---	----------------------------

1048	:	Mold isn't clamped
------	---	--------------------

1049	:	System safety signal not in position error
------	---	--

1051	:	System air pressure insufficient
------	---	----------------------------------

1052	:	System material clamping signal invalid alarm
------	---	---

12.3 Punch Alarm

16385	:	The system does not start clamp scanning
		<p>If “Coordinates”-“Clamp Parameters”-“16: Whether scan clamp after restarted” is set to 1 This alarm occurs if clamp isn’t scanned while processing Solution: X-axis mechanical home - clamp scan - process</p>
16386	:	X axis is not home
		<p>X-axis isn’t at mechanical home, i.e. X-axis home switch is invalid; Solution: X-axis mechanical home;</p>
16387	:	Pin locking signal detection error
		<p>Mold pin is not inserted Possible reason: Mold pin port allocation error; Mold pin voltage level is set incorrectly; Mold pin is not inserted; Solution: Set P5.028 parameter correctly; Set P1.086 parameter correctly; Manually insert the mold pin;</p>
16388	:	Pin loose signal detection error
		<p>Mold pin is pulled out Possible reason: Mold pin port allocation error; Mold pin voltage level is set incorrectly; Mold pin is not inserted; Solution: Set P5.027 parameter correctly; Set P1.087 parameter correctly; Manually pull out the mold pin;</p>
16389	:	Punch ready signal detection error
		<p>Positions that alarm signals may appear: 1: Hydraulic punch; occur when the punching mode is 2; 2: Occur when the flywheel control mode is 0, punching mode is 3 Solution: 1: Confirm appropriate pin assignment (P5.011: Feeding signal input port), and effective voltage level (P1.080: Feeding effective voltage level), 2: Adjust the position of detection switch;</p>
16390	:	Positioning pin signal is not detected
		<p>Positions that alarm signals may appear: 1: Occur when the flywheel control mode is 1, punching mode is 2 Solution: 1: Confirm appropriate pin assignment (P5.020, Positioning block signal detection input port), effective voltage level (P1.088: Positioning block in-place effective voltage level), and wiring are accurate; 2: Switch to “Diagnosis”-“Input” interface, and check the voltage level of input signal;</p>
16391	:	Clamp safe zone alarm
		<p>Positions that alarm may appear: 1: In manual punching mode, punch is above the clamp; 2: Before feeding, the next feeding position to clamp safe zone; Solution: 1: Move the plate to other position for punching; 2: Check if the clamp safe zone is proper;</p>
16392	:	Punch peak signal is not detected
		<p>Positions that alarm may appear: 1: Retooling starting position; 2: Run M23 to stop on the top dead center 3: The punch presses down when T-axis is in motion; 4: Before C-axis rotating; 5: Flywheel control: 1. Punching mode: twice, feeding completes and punch opens; 6: Starting position of T-axis home; Solution: 1: Confirm appropriate pin assignment (P5.010, Upper dead point input port), effective voltage level (P1.079: Punch peak effective voltage level), and wiring are accurate;</p>

		2: Switch to “Diagnosis”-“Input” interface, and check the voltage level of input signal;
16393	:	<p>Upper and lower molds are not disengaged!</p> <p>Positions that alarm may appear: Upper and lower molds are not disengaged before retooling; Solution: 1: Confirm appropriate pin assignment (P5.034, Mold conversion disengagement in-place), and effective voltage level (P1.093: Mold disengagement in-place effective voltage level), and wiring are accurate; 2: Determine whether the mold release signal has been output; 3: Switch to “Diagnosis”-“Input” interface, and check the voltage level of input signal;</p>
16394	:	<p>Upper and lower mold unbound!</p> <p>Positions that alarm may appear: 1: Before C-axis movement in manual mode; 2: During retooling; before rotating mold and home; 3: After retooling; 4: Before C-axis movement; 5: Before C-axis to reference point; Solution: 1: Confirm appropriate pin assignment (P5.033, Mold conversion combination in-place), effective voltage level (P1.092: Mold combination in-place effective voltage level), and wiring are accurate; 2: Determine whether the mold combination signal has been output; 3: Switch to “Diagnosis”-“Input” interface, and check the voltage level of input signal;</p>
16395	:	<p>Not yet reached the mold transfer position!</p> <p>Hasn’t reached the mold transfer position before retooling; Upper and lower mold combination signal output is allowed only when reached the mold transfer position;</p>
16396	:	<p>Current mold is non-rotatable!</p> <p>This mold features alarm when a non-rotating mode rotates around C-axis;</p>
16397	:	<p>Mold detection alarm!</p> <p>Mold exception Emergency stop when alarm</p>
16398	:	<p>Insufficient air pressure alarm!</p> <p>Insufficient air pressure, alarm and pause</p>
16399	:	<p>Worktop lower level alarm!</p> <p>After this alarm, pause if the system runs automatically;</p>
16400	:	<p>Y-axis safe zone alarm!</p> <p>After this alarm, pause if the system runs automatically;</p>
16401	:	<p>Relocation cylinder is not pressed!</p> <p>Relocation action: Cylinder is not pressed Possible reason: Detection switch is not connected; Detection level is reverse; Mounting position of detection switch is wrong;</p>
16402	:	<p>Relocation cylinder is not lifted!</p> <p>After the relocation action: The cylinder isn’t lifted Possible reason: Detection switch is not connected; Detection level is reverse; Mounting position of detection switch is wrong;</p>
16403	:	<p>Main motor isn’t started!</p> <p>Flywheel main motor isn’t started</p>
16404	:	<p>Feeding signal is not detected!</p>

	Positions that alarm may appear: Flywheel control: 1. Punching mode: twice, punch opens but hasn't reached feeding signal;
16405	: Blowing timeout alarm Solution: Press the Reset key to restart If breakpoint processing is started, the system will automatically run to the breakpoint;
16406	: Punch alarms when goes through clamp safe zone When P1.131 Clamp avoidance enable is ON, alarm if the punch is above clamp safe zone; Solution: Reset, modify the program, re-process
16409	: Blanking does not detect system pause In required punching times, alarm if blanking signal is not detected; Press "Cancel" to clear the alarm; Press "Start" to restore processing;
16410	: External key press timeout! If the external button has been pressed and held for more than 5 seconds, the alarm will be triggered; Please check the settings of effective voltage level and wiring (normally open / normally closed) of the switch;
16411	: Clamp under mold alarm! Please check if the voltage level corresponding to port: P5.056, P5.059 and P5.060 is triggered (default: NC)
16412	: System oil pressure B Alarm! After the holding time of lubrication, the oil pressure is not detected;

12.4 Troubleshooting

12.4.1 Troubleshooting Index

No.	Description	Page
001	Servo X-axis driver alarms when starts the first time	
002	The problem still exists after the system file has been copied to the controller of an earlier version	
003	Mold pin action doesn't match the state displayed in the main interface	
004	Hard limit false alarm while processing (not overrun)	
005	Mechanical home speed of certain axis is too slow	
006	System crashes while loading CAD file	
007	The system can't be started and screen is black when the boot screen saver is changed	
008	After X-axis negative hard limit alarm, the machine tool continues to run to the negative direction when press "X-"	
009	Can't enter the main interface after started, and display "can't load cncfile, system error!"	
010	Punch with material (punch in feeding process)	
011	Punch twice in the same position in continuous mode	

No.	Description	Page
012	Punch can't stop at the top dead center	
013	Punch pressure error, inaccurate positioning	
014	Insert pin when retooling starts, and pull out the pin when ends	
015	Miss punching occasionally	
016	"External key press timeout" alarm	

12.4.2 Troubleshooting Details

001	:	Servo X-axis driver alarms when starts the first time
-----	---	---

Possible reason:

- 1: 1: Effective voltage level of servo drive alarm isn't set properly;
- 2: Servo drive alarms;

Solution:

- 1: Change P2.001 Servo X-axis alarm effective voltage level;
- 2: Exclude the servo drive fault, and press the "Reset" button to cancel;

The alarm processing of other axes is same as above;

002	:	The problem still exists after the system file has been copied to the controller of an earlier version
-----	---	--

Possible reason:

- 1: The system file isn't copied to the appropriate position;
- 2: "Diagnosis" - "System Info" compilation date is the date of earlier version;

Solution

- 1: Copy the system files to D/ADT folder
- 2: Restart the system, press and hold "Cancel" for 3 seconds and enter into BISO interface:

1——BISO settings

1——Program area;

Press "Y" to confirm writing

After programming, press "Cancel" to return the BISO interface

Press “.” “9” to restart;

003	:	Mold pin action doesn't match the state displayed in the main interface
-----	---	---

Possible reason:

- 1: Mold output effective level setting error;

Solution :

- 1: Reset output effective level, the parameter is: P1.090 Mold pin lock effective level <O>;

004	:	Hard limit false alarm while processing (not overrun)
-----	---	---

Possible reason:

		<p>1: Hard limit switch is normally closed, and the wiring is disconnected;</p> <p>2: Outside interference;</p> <p>Solution:</p> <p>1: Re-check the lines, and check the wiring with the system self-diagnostic function;</p> <p>2: Shield the signal lines, add filtering measures or increase controller IO filtering level for the switching power supply (P1.033 IO filtering level (1~8);</p>
005	:	<p>Mechanical home speed of certain axis is too slow</p> <p>Possible reason:</p> <p>1: System gear ratio or drive gear ratio setting error;</p> <p>2: Home speed setting is too low;</p> <p>3: External home switch is effective, and the system has reached the position of home switch;</p> <p>Solution:</p> <p>1: Reset system and servo gear ratio parameters, go a certain distance in step mode;</p> <p>2: Reset the value of P1.048 - P1.051 parameter;</p> <p>3: Change P2..31 External home effective voltage level in "Axis Configuration"; Restart to take effect;</p>
006	:	<p>System crashes while loading CAD file</p> <p>Possible reason:</p> <p>1: CAD layer selection error;</p> <p>Solution:</p> <p>1: Re-power, create a new layer ADTLAYER1, and place the layer to be punched under this layer;</p>
007	:	<p>The system can't be started and screen is black when the boot screen saver is changed</p> <p>Possible reason:</p> <p>1: LOGO image format is not correct;</p> <p>Solution</p> <p>1: Attributes of boot screensavers picture: 24 bit BMP, file name: LOGO</p>
008	:	<p>After X-axis negative hard limit alarm, the machine tool continues to run to the negative direction when press "X-"</p> <p>Possible reason:</p> <p>1: X positive/negative limit switch is installed reversely;</p> <p>Solution :</p> <p>1: Install limit switch properly;</p> <p>Other axes are similar;</p>
009	:	<p>Can't enter the main interface after started, and display "can't load cncfile, system error!"</p> <p>Possible reason:</p> <p>1: The user processes online with USB disk, and shuts down abnormally in the process, resulting</p>

ferroelectric memory data corruption;

Solution:

Format ferroelectric memory;

Re-power, press and "Cancel" to enter the BIOS interface

"3 --- System self-test" - "3 --- Check ferroelectric memory" - "Y" key

Until the display is normal;

Return to the BIOS screen, and press "." "9" to restart the system;

010 : Punch with material (punch in feeding process)

1: (Single punching with material) When check feeding validity by hand climbing, if the punch position has disengaged from the plate;

2: Check if the feeding effective voltage level is set correctly;

3: (Continuous punching with material) If the step is too big or feeding speed is too slow, the feeding time will be much longer than the punch cycle, and the punch presses down before the feeding is finished;

011 : Punch twice in the same position in continuous mode

Possible reason: the system does not detect stopping top dead center (punch OFF) signal after feeding in one punching cycle;

1: The mounting position of OFF clutch detection switch is wrong;

2: In continuous punching, the off clutch signal is valid due to system with material; while the off clutch signal detection starts from the end of feeding; (increase feeding speed or decrease step)

3: OFF clutch signal effective voltage level is set reversely

012 : Punch can't stop at the top dead center

1: Adjust the position of top dead center sensor switch;

2: Increase the contact area of top dead center sensor switch to increase the hit rate;

3: Pressure is instable, leading to the clutch brake failure

013 : Punch pressure error, inaccurate positioning

1: Reduce the speed appropriately;

2: Adjust the servo rigidity, and increase servo follow performance;

3: Connect the servo AB feedback line and closed loop control

014 : Insert pin when retooling starts, and pull out the pin when ends

1: Mold pin control output level is set reversely;

2: Output relay is reversed

015 : Miss punching occasionally

Possible reason: Feeding signal has interference, and the system mistakes feeding in place is effective;

Solution:

1: Connect 0.1uf capacitor filter between input port and the ground;

2: Increase sampling frequency of software filtering; specific parameter is P1.033 IO filtering level (1-8);

016

: “External key press timeout” alarm

1: Check if the switch has been pressed: (positioning block control / mold pin control / pedal control / single/continuous switch button / coordinates clear key)

2: Check if the switch effective level is set incorrectly;

12.5 Self-diagnosis

CNC system sometimes stops even there is no alarm. The reason may be that the system is running processes, and the self-diagnostic function is available for checking.

The self-diagnostic steps of the system are as follows:

1. In the main menu, press [Diagnosis] to enter the diagnosis screen;
2. Select [Input] to enter the input diagnosis screen, or select [Output] to enter the output diagnosis screen;
3. Output diagnosis: Press the direction keys select the output port, and press [EOB] to switch the output level corresponding to the output port;
4. Input diagnosis: When certain input signal is valid, the corresponding screen flashes.

13 Document Revision History

Date of Revision	Content	Revised by
2011-12-3	Draft released	Shi Tingliang
2012-05-25	Official version v1.0 released	Zhang Qinggang
2012-07-26	Added blowing material control instructions	Zhang Qinggang
2012-8-23	Port parameters refreshed	Zhang Qinggang
2012-09-06	Documentation system uploaded	Zhang Qinggang
2012-10-22	Added description	Zhang Qinggang
2012-11-07	Documentation system uploaded	Zhang Qinggang
2012-12-26	Added alarm and other description	Zhang Qinggang

Revision History (I)

Fed back by		Date		Current version / Total pages	133
Description of the problem	On December 3, 2011, the content about punch was added to CNC4640 Maintenance Manual, which was renamed to NCT-XX Maintenance Manual;				
Approved by	Zhang Qinggang				
Revised version	1-0	Total pages after revision	141	Revised by	Zhang Qinggang