TV5600-B01 Series
Dispensing Control System
User Manual

Foreword

TV5600-B01 series CNC system is a multi-functional embedded dispensing CNC system developed by ADTECH (Shenzhen) Technology Co., Ltd. for the dispensing process. The models of this series include DJ904V1-A01, DJ904V2-A01, DJ904V3-A01, DJ904V4-A01, DJ8849V1-A01, DJ8849V2-A01, DJ8849V3-A01, DJ1600V1-A01, DJ1600V2-A01 and DJ1600V3-A01 dispensing control system.

About the textbook:

- ☞ This textbook is the user manual for TV5600-B01 series; OMC Series Development Manual is used for secondary development.

Content of the Manual:

- ☞ According to this manual, you can install the TV5600-B01 series dispensing CNC system and carry out corresponding maintenance.
- ☞ According to this manual, you can complete the operation of the TV5600-B01 series dispensing CNC system.

Readers:

- ☞ Project design engineer, electrical technician and installer
- ☞ Repair and operation personnel

Instructions and reading conventions for this manual:

When using this CNC system for the first time, please read every chapter of this manual carefully to better use the system functions.

Note on terminologyin this manual and reading conventions:

The combined model refers to a set of split-type dispensing CNC system consisting of the handheld box hardware model TV5600-B01 and the controller hardware models MCD904, ADT-8849 and AMC1600P.

The input terminals DI and IN in this manual havethe same definition. For example, DI22 and IN22 represent the 22nd input port of the controller, and DO12 and OUT12 represent the 12th output port of the controller.

The ADT-8849 serial port definition in this manual is consistent with the silkscreen on the controller housing starting from COM0.

Note indicates that the operator should be cautious when performing related operations or settings, or else the operation may fail or an action may not be performed.

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 permission;
- ☞ Keep power OFF if not in use for a long time;
- ☞ Pay close attention to keep dust and ferrous powder away from control;
- ☞ Fix freewheel diode on relay coil in parallel if non-solid state relay is used as output relay.
- ☞ Check whether power supply meets the requirement to ensure not burning the control.
- ☞ Install cooling fan if processing field is in high temperature, due to close relationship between service life of the control and environmental temperature.
- ☞ Keep proper operative temperature range for the control: 0℃ ~ 60℃.
- ☞ Avoid using the product in the overheating, humid, dusty, or corrosive environments;
- ☞ Add rubber rails as cushion on the place with strong vibration.

◆ **Maintenance**

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

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

Table of Contents

Chapter 1
Basics of Dispenser

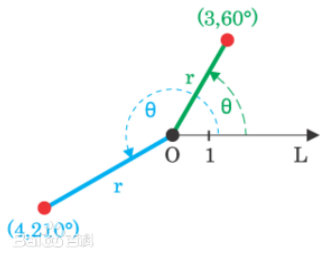
1.01 About the coordinate system

The dispenser operates according to the space position of the program points in the program file. Teaching space position of edit point is to record the coordinates of the program point relative to the coordinate system.

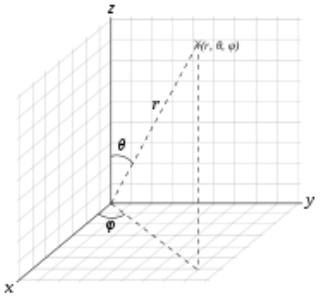
Coordinate system: In order to explain the position of the particle, the speed of the motion and the direction, the coordinate system must be selected. In the frame of reference, an ordered set of data selected according to the prescribed method to determine the position of a point in spaceis called “coordinates”. The method of specifying coordinates in a problem is the coordinate system used for the problem.

There are many types of coordinate systems. The commonly used coordinate systems are: polar coordinate system, Cartesian coordinate system, etc.

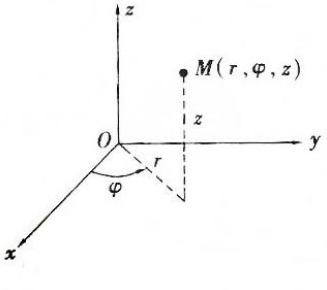
Polar coordinate system: Refers to the coordinate system composed of pole, polar axes and polar diameters in the plane, denoted as P(ρ, θ), as shown below. The spherical coordinates can be regarded as the spatial generalization of the polar coordinate system. It takes the coordinate origin as the reference point and is composed of azimuth, elevation and distance,denoted as P(r, θ, ϕ), as shown below. The cylindrical coordinate system can also be regarded as a spatial extension of polar coordinates, as shown below.



Plane polar coordinate system



Spherical coordinate system

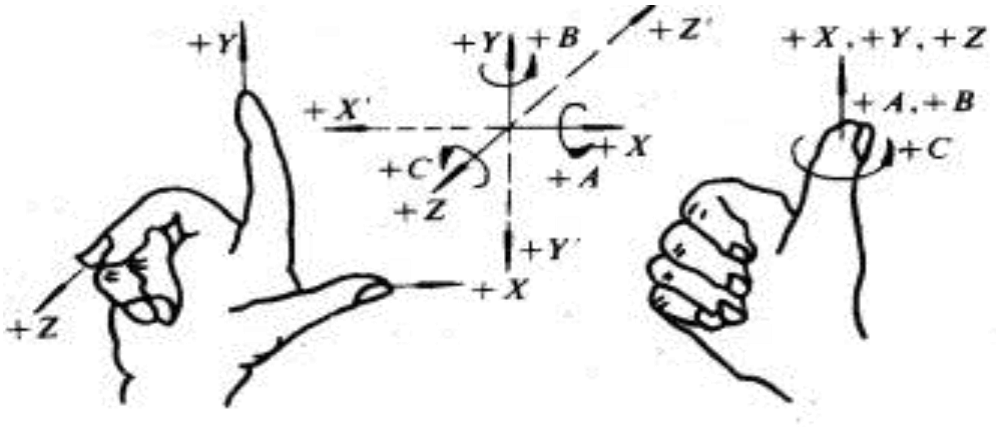


Cylindrical coordinate system

Cartesian coordinate system: The three non-coplanar number axes intersecting at the origin form the affine coordinate system of the space. An affine coordinate system with equal units of measure on three axes is called a space Cartesian coordinate system. The Cartesian coordinate system in which the three axes are perpendicular to each other is called the space Cartesian rectangular coordinate system, or else it is called the space Cartesian oblique coordinate system.

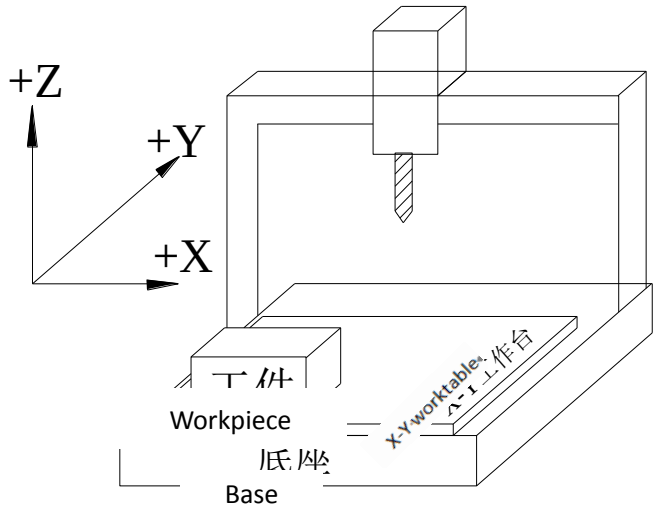
The machining of CNC machine tools is done by program control, so the determination and use of the coordinate system is very important. According to the ISO 841 standard, the CNC machine tool coordinate system is determined using the right-hand Cartesian coordinate system as a standard. The CNC lathe is parallel to the main axis direction, that is, the longitudinal direction is

the Z axis, perpendicular to the main axis direction, that is, the lateral direction is the X axis, and the tool away from the workpiece is the positive direction. The right-hand Descartes coordinate system is as follows:

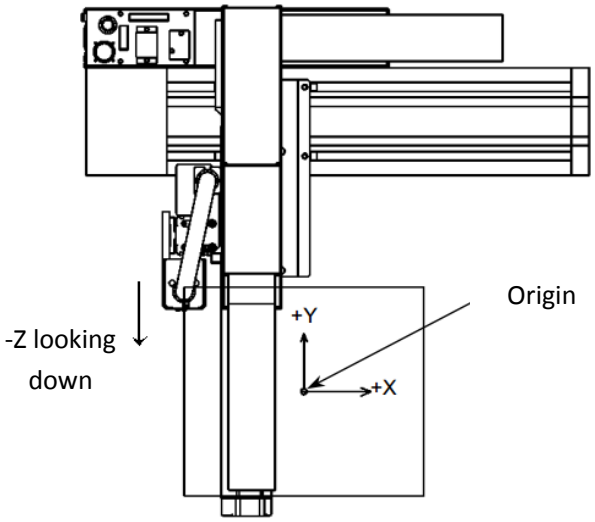


1.02 Dispenser coordinate system

After getting the dispenser, we will find the coordinates of each axis are displayed on the interface of the handheld box. The structure of the coordinate system of the general dispenser mechanism is shown as figure below.



Due to the combination of the modules and the combination style, the dispenser mechanism also has the following structure:



1.03 Dispenser related terms

Assume that every revolution of the screw or pulley is L mm and the required pulse per revolution is P.

Pulse equivalent: the length a pulse travels in millimeters, i.e. L/P.

Speed: Indicates the speed of the axis movement, unit: mm/s

Acceleration: Indicates the speed of the axis speed change, unit: mm/s^2

Starting speed: The starting speed of general stepping motor should be less than 3L mm/s, and the starting speed of servo motor should be less than 5L mm/s.

Maximum speed: 20L mm/s for stepping motor, 50L mm/s for servo motor

Chapter 2

System Overview

TV5600-B01 series dispensing control system is composed of TV5600-B01 handheld box + offline motion control card based on OMC system. The two are connected by Modbus serial communication. TV5600-B01 completes the work of human-machine interface, offline motion control card completes the motion control and IO port operations, and constitutes a set of split, full three-dimensionaland high-precision dedicated motion control system.

<table>
<tr><th>Product model</th><th>Number of axes</th><th>Digital input</th><th>Digital output</th><th>Controller</th><th>Handheld box</th><th>HMI (optional)</th></tr>
<tr><td>DJ904V1-A01</td><td>3</td><td>24</td><td>6</td><td rowspan="2"> 
MCD904</td><td rowspan="6"> 
TV5600-B01</td><td rowspan="6">  </td></tr>
<tr><td>DJ904V2-A01
DJ904V3-A01
DJ904V4-A01</td><td>4</td><td>24</td><td>6</td></tr>
<tr><td>DJ8849V1-A01</td><td>3</td><td>34</td><td>18</td><td rowspan="2"> 
ADT-8849</td></tr>
<tr><td>DJ8849V2-A01
DJ8849V3-A01</td><td>4</td><td>34</td><td>18</td></tr>
<tr><td>DJ1600V1-A01</td><td>5</td><td>36</td><td>24</td><td rowspan="2"> 
AMC1600P</td></tr>
<tr><td>DJ1600V2-A01
DJ1600V3-A01</td><td>6</td><td>36</td><td>24</td></tr>
</table>

※Note: HMI is optional, and if provided, only WEINVIEW touch screen and its interface project files are provided to achieve the burning function.

2.01 Hardware features

Hardware indicators:

- Number of controllable axes: 2-6
- Highest pulse frequency: 2MHz
- Encoder: MCD904 not available, ADT-8849 not available, AMC1600P available
- Pulse output: 5V differential output, output mode: pulse + direction or pulse + pulse
- Cache interpolation function: Yes
- Communication interface: RS232 communication module, USB disk function, USB communication, network port
- Handheld box screen pixels: 480X272, color
- Storage space: handheld box 128MB, offline card 128MB

IO:

- Digital input: All optocouplers isolated, input voltage: 12-24V
- Digital output: All optocouplers isolated, NPN open collector 5-24VDC, rated current 0.5A, single channel maximum current 1A.

Application environment:

- Working voltage: 24V DC
- Working temperature: 45°C
- Storage temperature: -40°C - 55°C
- Working humidity: 40%-80%
- Storage humidity: 0% - 95%

2.02 Software features

- 2-6 axis interpolation, support space line, space arc, and spline curve
- Speed look ahead algorithm, automatic arc corner speed, and automatic rounding inflection point
- Support standard Modbus ASCII, Modbus RTU and Modbus TCP communication protocols
- Support rich processing instructions such as idletravel, straight line, spline curve and file call, as well as open user-defined instructions (written by customers)
- Rotary axis rotation radius compensation
- PLT files and G code files can be imported from computer
- Graphic preview and real-time dynamic display of processing tracks
- Cycle processing, single processing, automatic processing, single-step processing and other methods
- Processing files can store 10,000 machining points
- Dynamically display the processing track in real time
- Convenient and friendly document teaching and editing function, advanced editing

functions such as batch modification, array copying, graphic translation, graphic zooming and automatic rounding; common graphics library is available for customer calls.

2.03Scripting

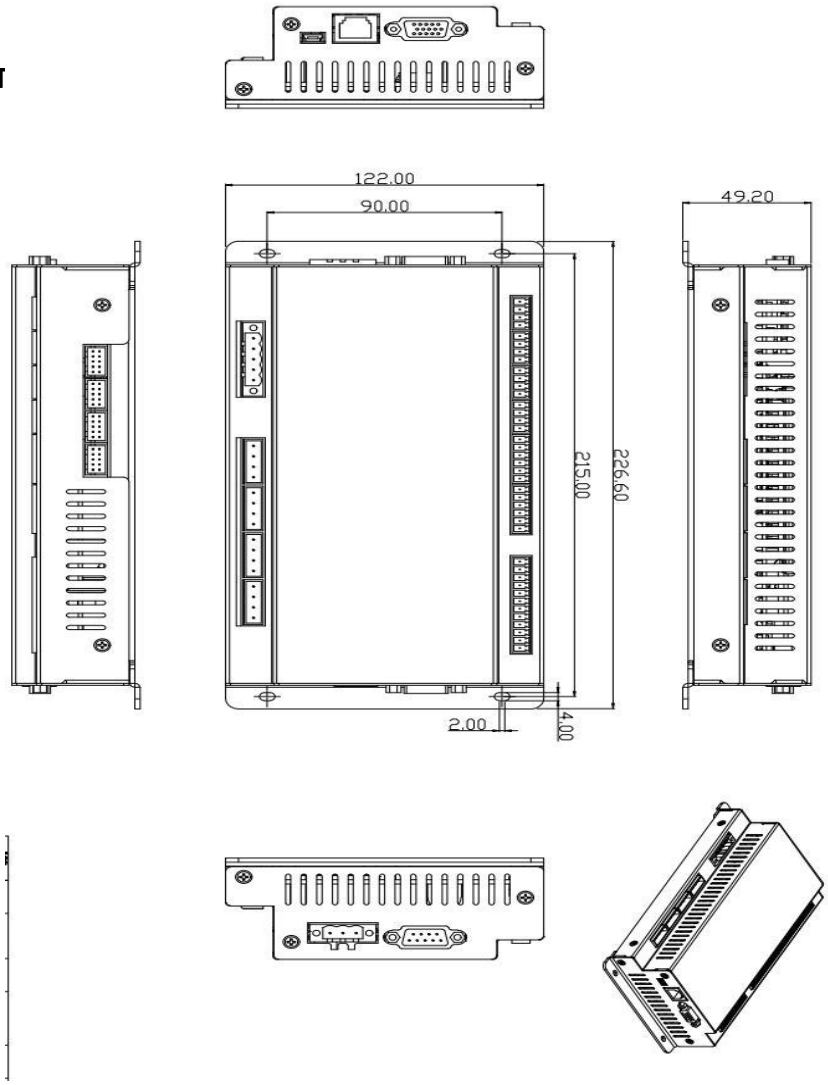
- Support Lua scripting function designed to solve non-standard processes
- Lua script is named after main.lua and is stored in the root directory of the controller disk
- Scripting is supported by the following product models

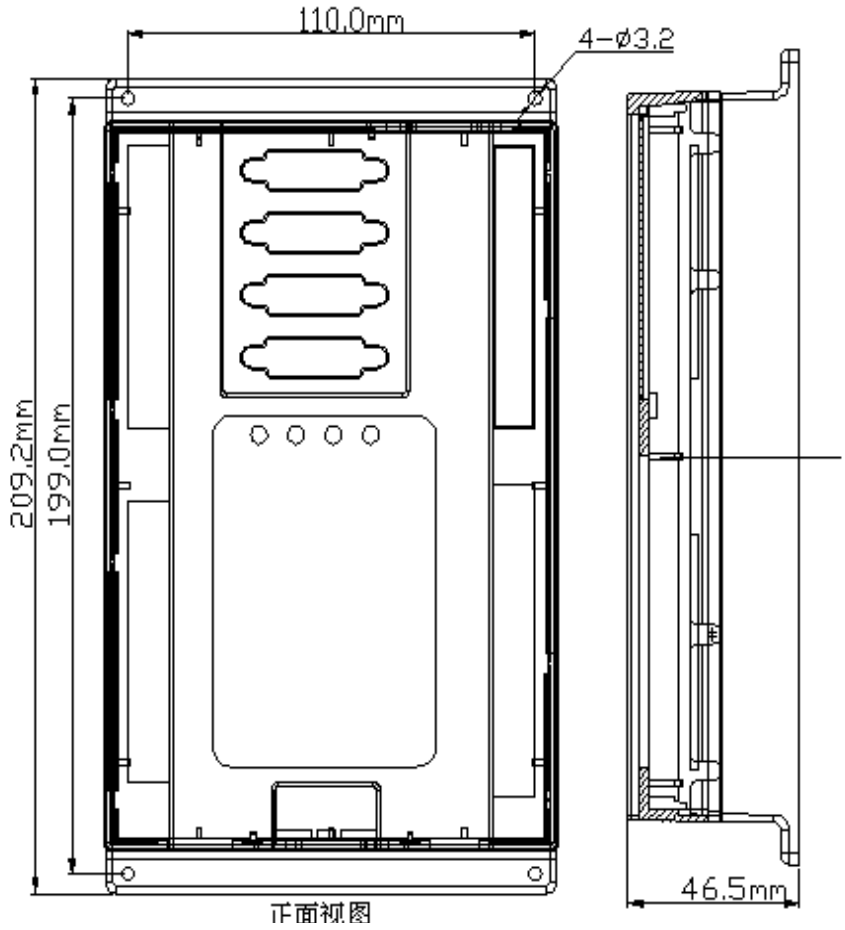
DJ904V3-A01/A02	DJ904V4-A01/A02	DJ8849V1-A01/A02	DJ8849V2-A01/A02	DJ8849V3-A01/A02	DJ1600V1-A01/A02	DJ1600V2-A01/A02	DJ1600V3-A01/A02

2.03 Structure size

2.03.01 MCD904 structure diagram

2.03.02 ADT





正面视图

Front view

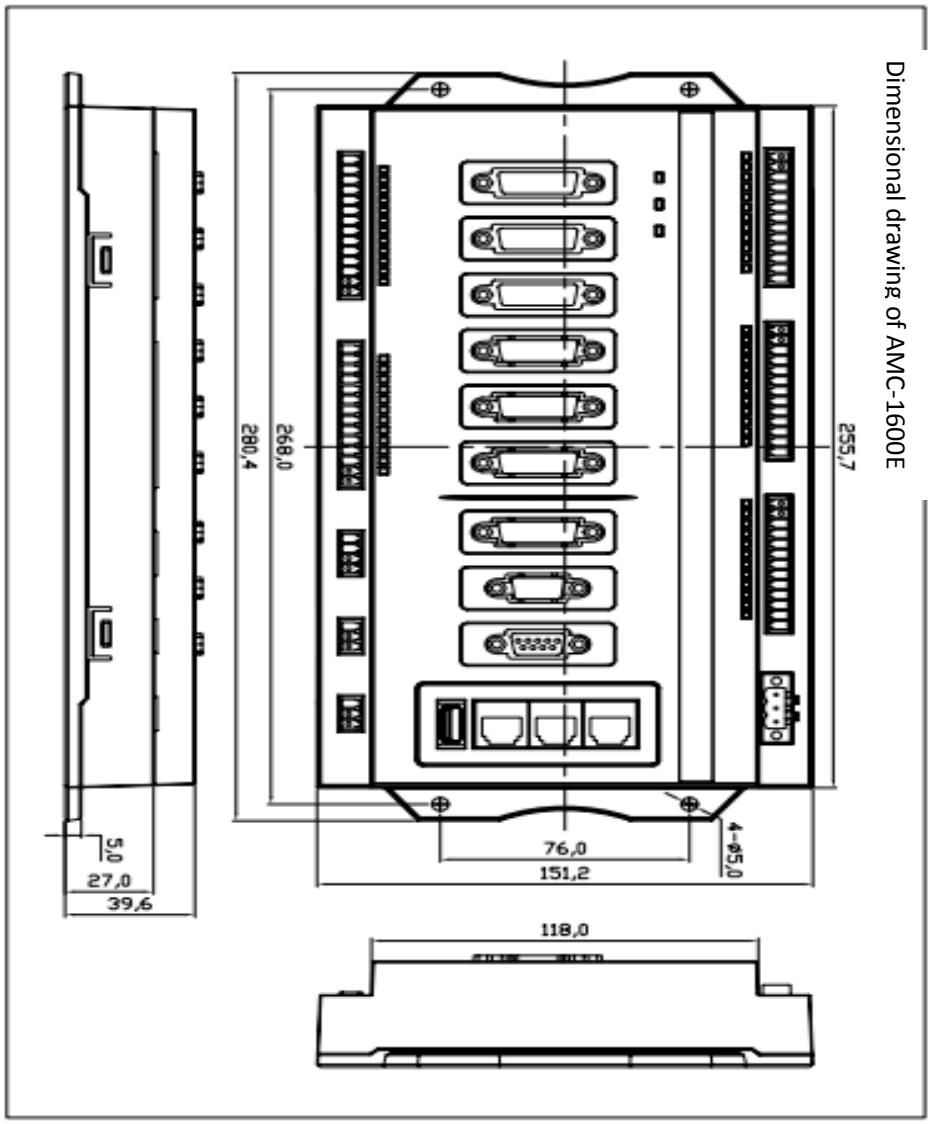
侧面视图

Side view

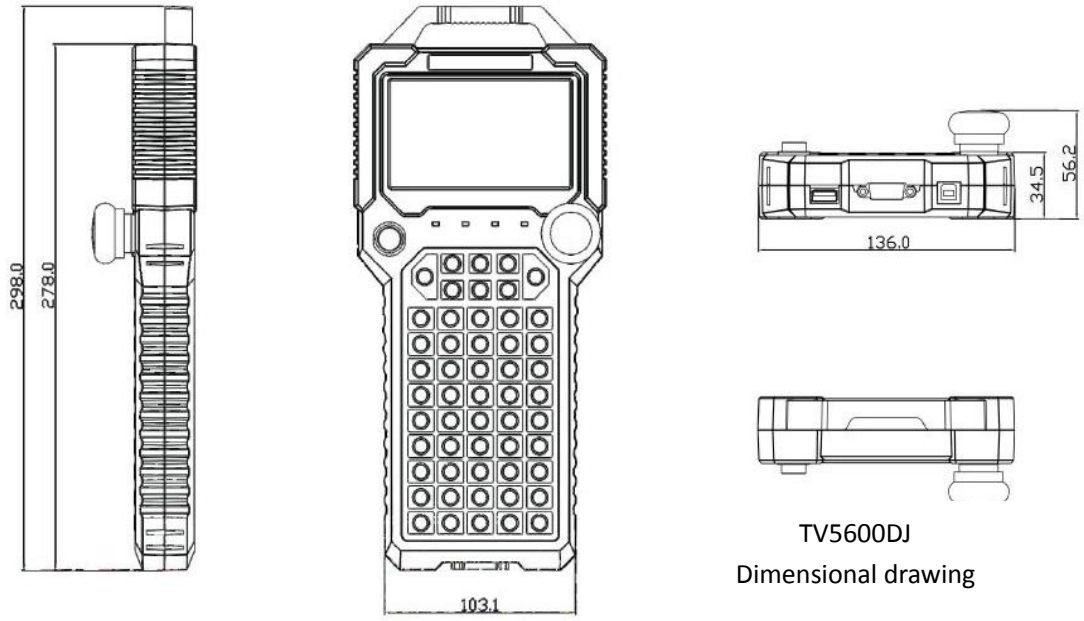
侧面视图

Side view

2.03.03 AMC-1600structure diagram



2.03.04 TV5600-B01structure diagram



TV5600DJ
Dimensional drawing

2.04 Description of handheld box buttons

Keypad layout

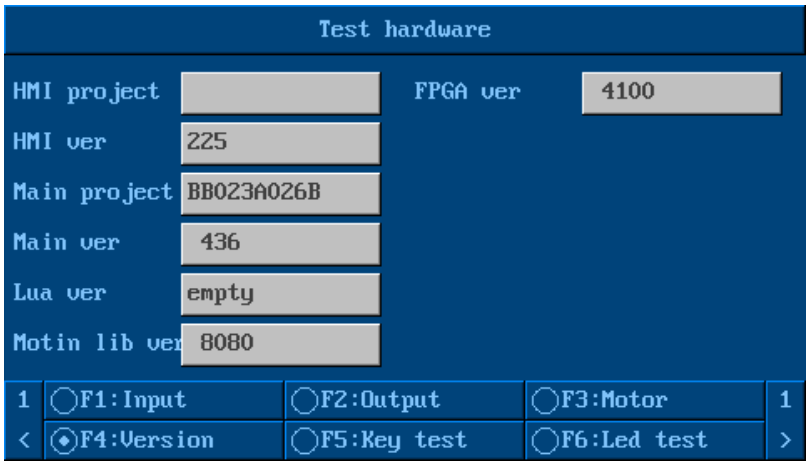
Name	Icons and functions
Function keys	 : corresponding to the menu function below the display interface, such as the main interface  : Previous page of function menu  : Next page of function menu
Motion control keys	 : X-axis manual low speed positive direction  : X-axis manual low speed negative direction  : Y-axis manual low speed positive direction  : Y-axis manual low speed negative direction  : Z-axis manual low speed positive direction  : Z axis manual low speed negative direction  : A-axis manual low speed positive (counterclockwise) direction  : A-axis manual low speed negative (clockwise) direction  : B axis manual low speed positive direction  : B axis manual low speed negative direction  : C axis manual low speed positive direction  : C axis manual low speed negative direction  : Manual high speed when any axis is pressed at the same time  : Positioning to the coordinate position of the current instruction  : Save current coordinates to the specified data
Edit arrow keys	Select the lines to be edited in the edit state  : Move the selected line up/down  : Turn page to left/right

Numeric keys/ Instruction shortcuts	 :Used to enter numbers or letters, and to quickly select the type of instructions. For details of the instruction type, please refer to the appendix*List of Processing Instructions*
Edit keys	 : Insert a point before the current point  : Delete current point or currently entered data  : Save the machining program file
Enter/ESC key	 : Confirm or select  : Cancel current operation
Other keys	 : Under the monitoring/editing interface, find the instructions that meet the conditions according to the requirements  : Display processing file graphic in the monitoring/editing interface
Global menu keys	 : Switch between monitoring and editing interface  : Manage processing program files  : Set file related parameters  : Set system parameters  : Test the status of the offline card signal input and signal output, and test whether the handheld box button is normal  : Display related help information of the corresponding interface
	 : Home button, each axis motor returns to the home  : Start button, start processing  Stop button, system stops processing

2.05 Software version

After turning on the controller and entering the main interface, press the []keyto enter the

diagnosis interface, and then press the [F4] key to enter the version information interface, as shown below:



Generally only the handheld box version number and the controller version number need attention.

Chapter 3

Introduction to Interface

Before using the system, you must have a basic understanding of the page.

System settings: The parameters used as the system are the same for any file, such as the parameters corresponding to the mechanical structure (motor characteristics, etc.), or some basic system configuration (password, port configuration) and other parameters not related to the processed product.

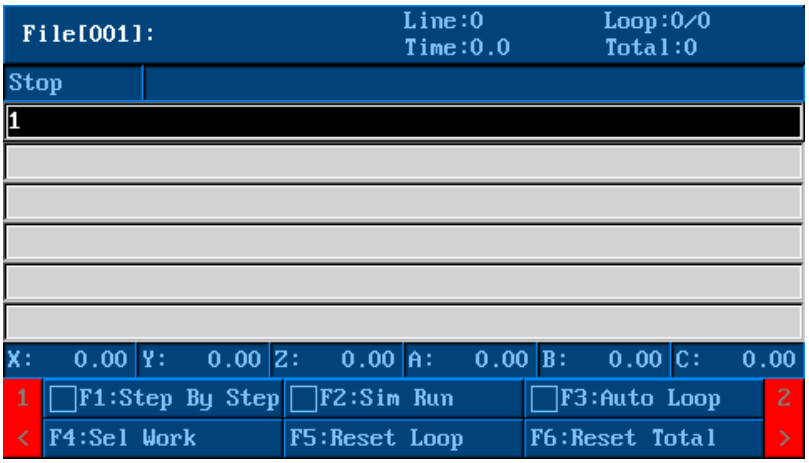
File parameters: For different processed products, the required processing speed (trajectory speed) is different, the number of processing times is different, and the glue on/off time is different, which leads to different parameters for different processed products. This type of parameters is classified as file parameter. Therefore, the location of the parameter can be found according to the characteristics of the parameter.

In monitoring operation, you can set the monitoring mode or edit mode. Press 

to switch modes.

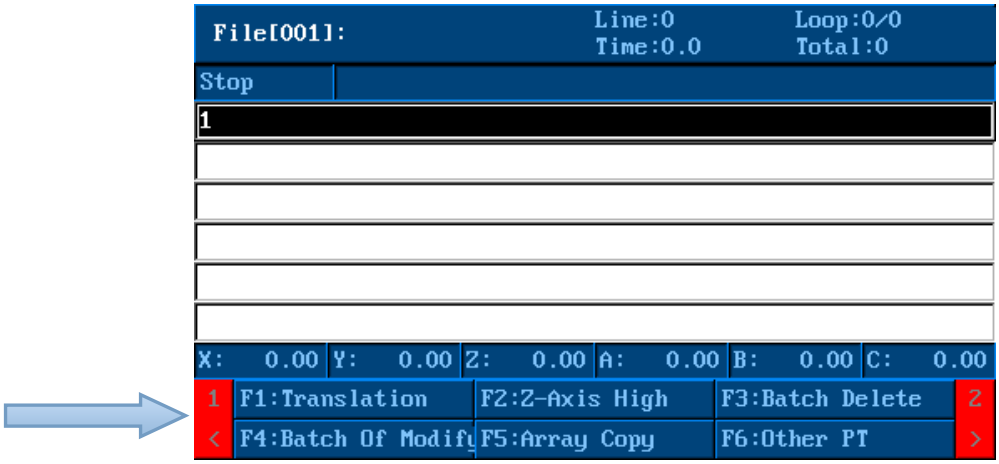
Monitoring mode: Only machining can be monitored, and machining points can't be modified.

The background of the monitoring mode is gray:



Edit mode: The machining point can be edited. For safety reasons, the external signal is invalid in this state.

The background of the editmode is white:



When the function menu shows red, you can press  to scroll up and down.

Chapter 4

Function Configuration of Mechanical Structure

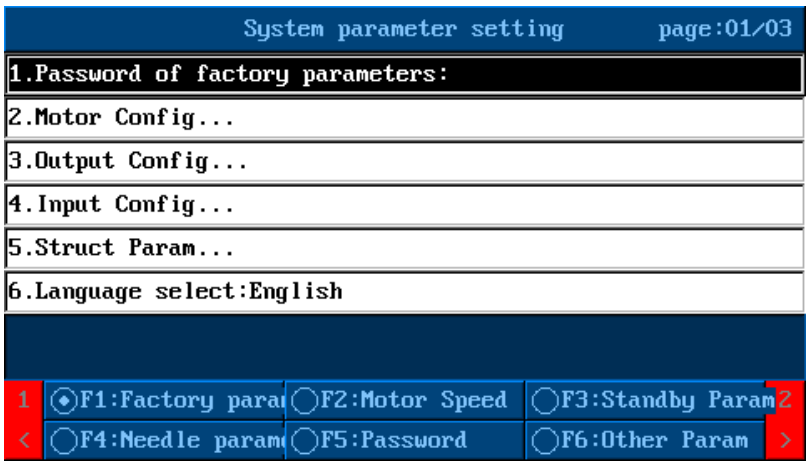
The current system supports the dispensing and extrusion mode.The default is the dispensing system. To set to the extrusion mode, you need to set the appropriate parameters. The editing and processing points of the dispensing and extrusion modes are the same, and only one axis following system performs the extrusion movement.

4.01 Extrusion function configuration

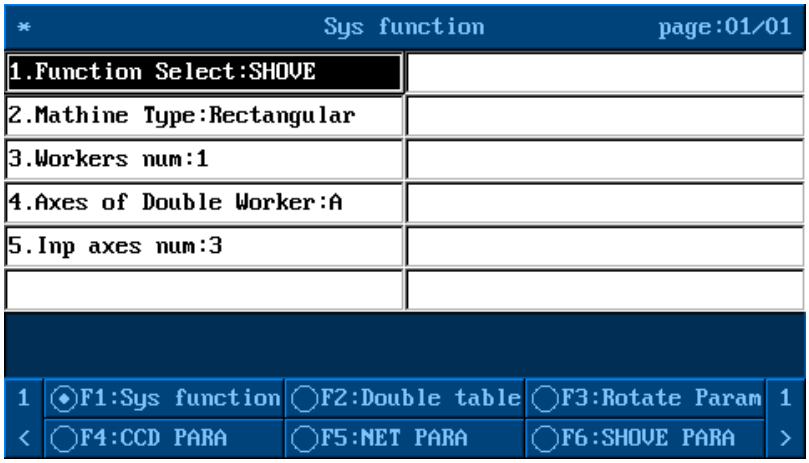
The three-axis system does not support the extrusion function. When the four-axis system is set to extrusion, the A-axis is the extrusion axis.The six-axis system is freely selectable when used as in extrusion mode.

The extrusion axis has no origin, but it must have positive and negative limits. The extrusion axis must be set to increase the coordinate inpositive direction when moving downward (or the direction of the extrusion) and to decrease the coordinate when moving upward (retraction). After the above settings are met, the extrusion function can be configured.

1. ->Press [System] key on the handheld box -> enter system parameter setting interface -> press [F1 Factory parameters] -> select “Structure configuration” ->

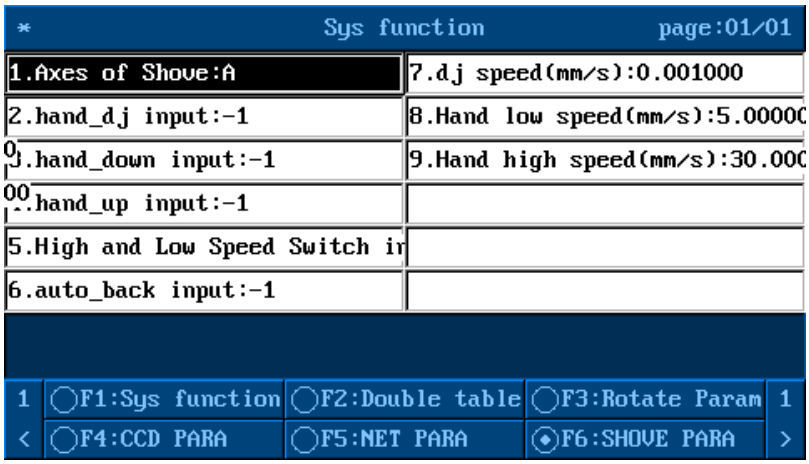


After entering the structure configuration, switch dispensing to extrusion:



Set the number of interpolation axes to 4, which is the extrusion function.

Press F6 to select the extrusion axis parameter.

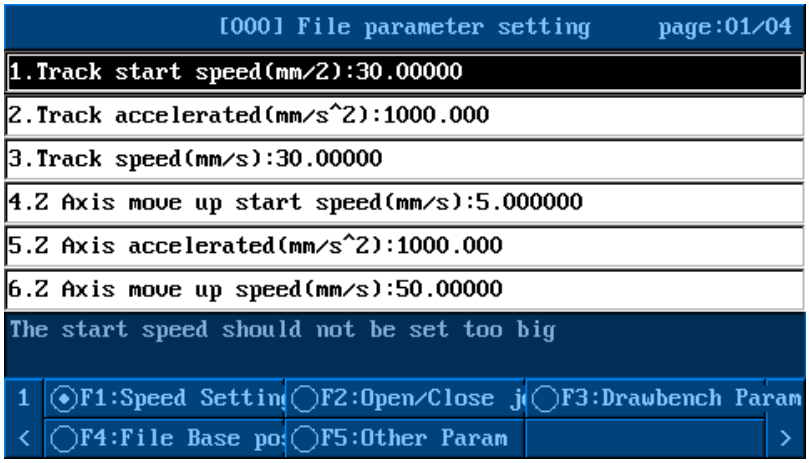


First set the extrusion axis number. The A-axis is used as the extrusion axis by default, and the X, Y, and Z axes can't be used as the extrusion axis. After setting these parameters, the setting of the extrusion function is basically completed. The parameter configuration of the extrusion axis is described below.

Parameter	Description
Extrusion parameter configuration	1) Axes of Shove: Shaft number used for extruding shaft 2) hand_dj input: Manual drippingbutton, After the button is pressed, the configured glue gun is opened first, and then the glue axis is extruded at the dripping speed. -1 means not used. 3) hand_down input: Downward manual button, When the button is pressed, the extrusion axis moves downward (coordinates increase), the speed is manual low speed, and the speed switching button can be used to change the manual speed. 4) hand_up input: Upward manual button, When the button is pressed, the

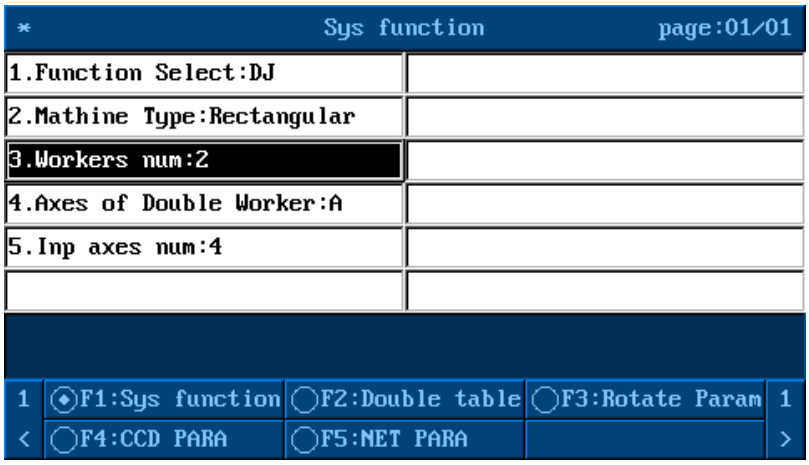
	extrusion axis moves upward (coordinatesdecrease), and the speed is manual high speed. 5) High and Low speed switch in downward: Downward speed switching button, Switch the manual downward speed; press it down to select high speed and release it to select low speed 6) auto_back input: Push-to-return button,When the button is pressed, the extrusion axis automatically returns to the negative limit 7) dj speed: Dripping speed, The speed of the extrusion axisduring manual dripping and automatic dripping 8) Hand low speed: Extrusion shaft manual low speed 9) Hand high speed: Extrusion shaft manual high speed

After the above parameters are configured, the processing file can be edited. The editing method of the extrusion processing file is the same as that of dispensing. There is no need to set the coordinates of the extrusion axis. After the operation, the extrusion axis will extrude at the set running speed. The speed is set in the file parameters:



It can be used after setting.

4.02 Dual position function configuration



1. In the factory parameters of the standard system parameters, find the number of positions and the dualposition axis number, and set the dual position function [e.g.: number of positions 2, dual position axis number: Y/R (1600P dualposition axis number Y, C];

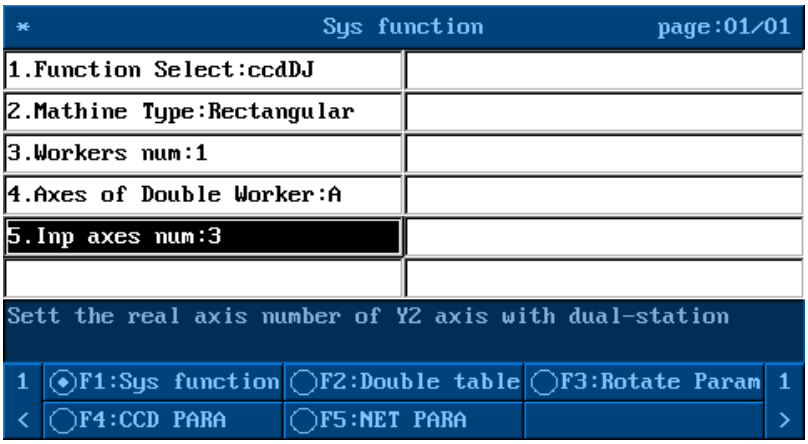
2. If the system supportsdualposition function, exit the handheld box to the editing interface, and you can see two orange left and right on the current function file; theseare the corresponding dual positionand corresponding file.

1. There is a position switching function on the corresponding menu, which can be switched to another position for editing.

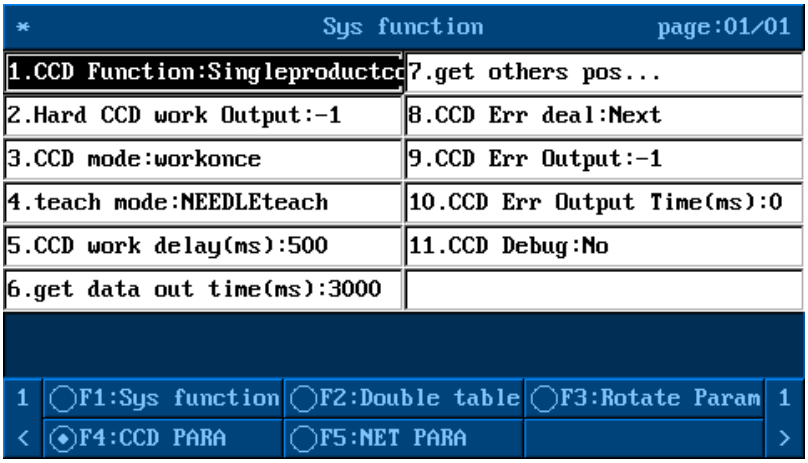
2. There is corresponding loading and unloading position setting to improve the efficiency of dual position processing.

4.03 Visual dispensing function configuration

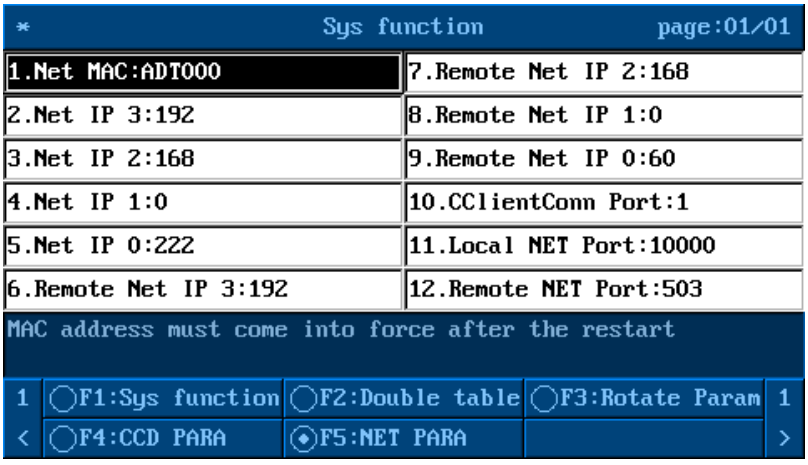
1. System setting - Factory parameters - System configuration,change function to visual dispensing



2. Then configure the corresponding parameters.

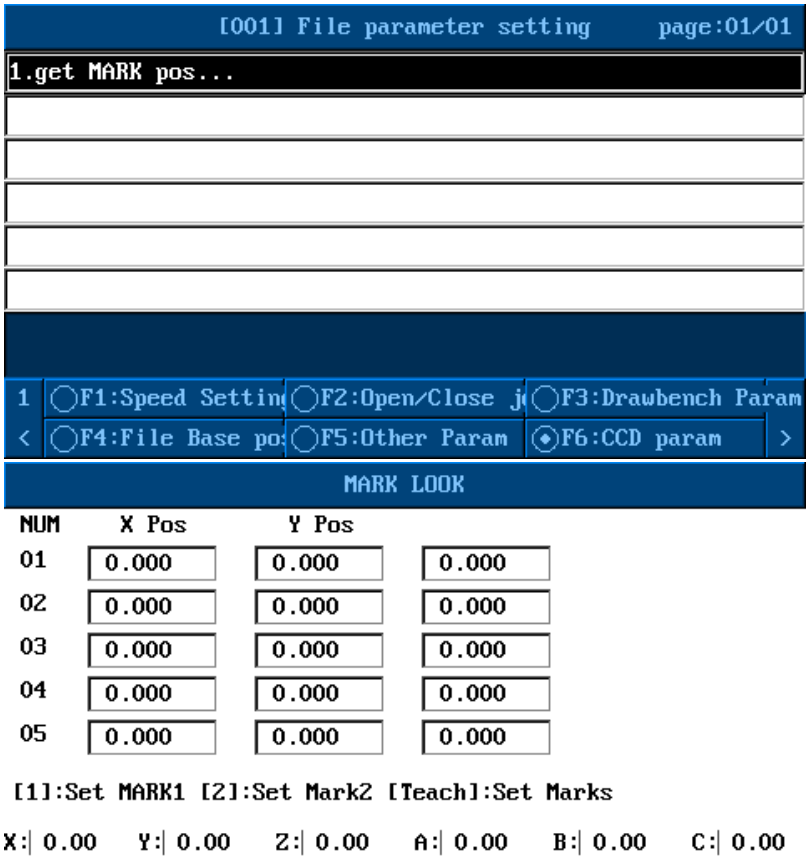


3. Configure the corresponding network information:



Based on the above default values.

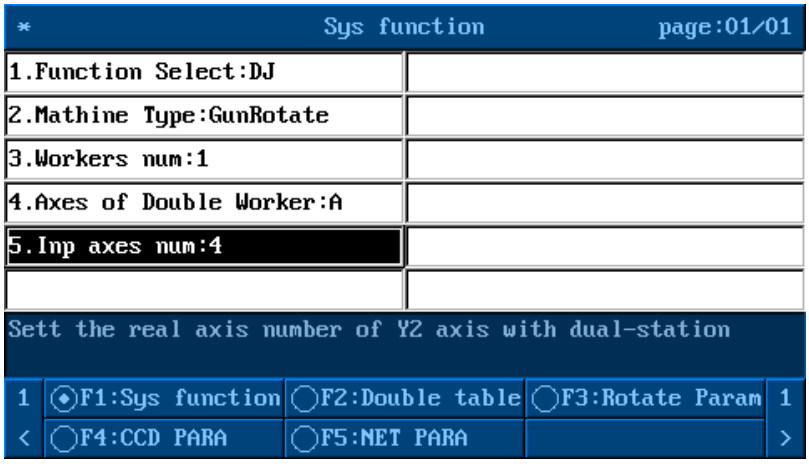
4.Then find the camera parameters in file parameters (set the corresponding mark point data):



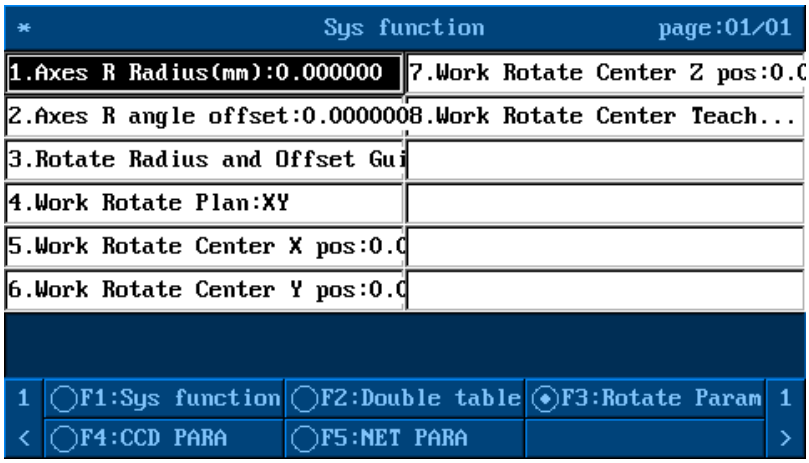
4.04 Glue gun rotation, workpiece rotation function configuration

Background requirements: Standard Cartesian coordinate system.

Facing the machine: With the glue gun as the reference object, the glue gun to the right is X positive, close to you is Y positive, downward is Z negative, and rotating counterclockwise is R positive;



Corresponding parameters need to be set for the glue gun and workpiece rotation(setin the installation wizard):



Chapter 5

Reset Settings

5.01 Explanation of reset parameters

After wiring and installation, the first step is to reset the dispenser. To complete the reset function, you need to complete the relevant settings. Relevant parameter nouns are explained below.

- Pulse equivalent: Refers to the distance ofa pulse corresponding to the actual movement of the motor. This parameter determines whether the speed value and coordinate value of each axis are consistent with the actual settings. For example, the X-axis speed value is 30mm/s, and the current coordinate value is 25.02mm. If the pulse equivalent setting is not accurate, the actual X-axis speed will not be 30mm/s, and the distance between current position and the origin is not 25.02mm.

  Calculation method:

  Pulse equivalent = the distance traveled by the screw or pulley for one revolution / the pulses for one revolution

  - Number of pulses per revolution of the motor M:
    With stepping motor, M=subdivision*200
    With servo motor, check the servo parameters to get M
  - Motor movement distance per revolution L
    Drive with pulleys: L = pulley circumference
    Drive with screw rod: L= screw pitch
  - Pulse equivalent = L/M. After setting according to this value, the manual axis moves 10mm ahead (coordinates increase 10mm); measure whether the actual distance is also 10mm with a caliper, and it is correct if yes; if not, please find the cause of the error.
- **Origin port:** The origin signal is connected to the controller port number (not the line number). The above wiring diagram is the default setting. If the wiringis made according to the above diagram, there is no need to change.
- **Origin signal effective level:** The level of the origin switch input when the motor is at the origin. In [Input Detection] of the [Test] screen, you can check the origin input level value.
- **Reset mode:** There are seven modes: reciprocating reset, circumferential reset, no reset, logic reset, positive/negativereset, intermediate origin reset, and auto reset. Reciprocating reset is generally used for transmission methods such as screw rods and belts; circumferential reset is generally used for transmission modes such as turntables and cams; if no reset is selected, the current position is directly used as the origin for resetting; logic reset means returning to 0 coordinates and then reciprocating reset; autonomous reset (servo reset) is used to sendsignal to the servo and the servo drives the motor to reset; the intermediate origin reset is used to edit the position of the origin to positive or negative; positive/negative reset is used whenhalf of the rotation axis has origin signal while the other

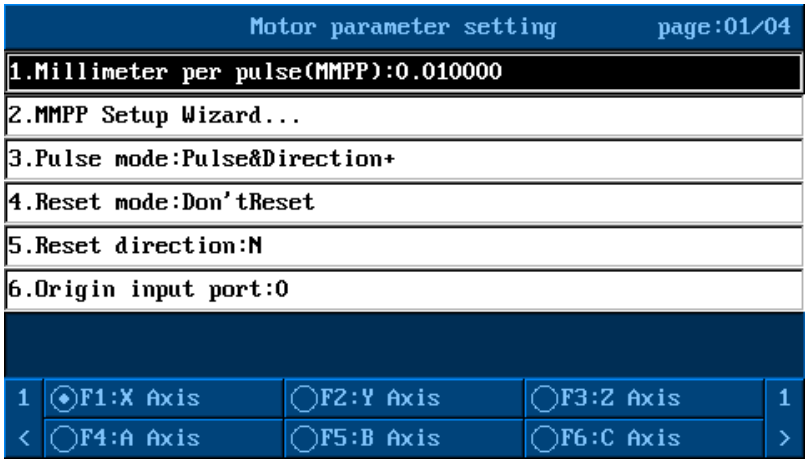
half doesn't (like a cam).

- ❖ Reset direction: If the coordinates increase when motor approaches to the origin, the reset direction is positive, or else it is negative. Before setting this parameter, please make sure that the moving direction of the motor after the direction key of the hand-held box motor is pressed is the same as the direction indicated by the motor direction key on the hand-held box. See the description of the handheld box keys for the positive and negative direction keys of each axis button on the handheld box.
- ❖ Reset high speed: The motor and speed approach to the origin.
- ❖ Reset low speed: After approaching the origin, capture the origin signal at this speed.
- ❖ Reset acceleration: The speed of the motor fromreset high speed to reset low speed. Use the default value.

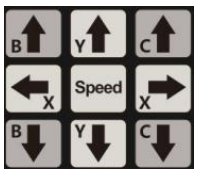
※Note: If the number of axes used by the dispenser is less than the inherent number of axes of the controller, simply set the "Reset mode" of the "Motor feature" parameter of the unused axis to "no reset".

After wiring and installation, the first step is to reset the dispenser. To complete the reset function, you need to complete the relevant settings. Below is a brief description of the reset settings:

The reset settings are configured in [System Settings] -> [Factory parameters] -> [Motor Features]. You can switch and set the parameters of different axes by pressing [F1] - [F6].



5.01 Pulse transmission mode setting

Main interface of the handheld box: When the manual button 

of the handheld box motor is pressed to move the positive direction of the mechanical structure, check whether the real-time coordinate change of the main interface of the handheld box meets the requirements (real-time coordinates from 0 to negative or from 0 to positive), if not, change to pulse transmission mode (pulse & direction+ is in the same group as pulse & direction-; pulse & pulse+ is in the same group as pulse & pulse-). If the direction of the manual key of the hand-held box motor is opposite to the actual direction, change [Whethersameas the direction of Cartesian

coordinate system] to No. At this time, the motor manual key is matched with the actual direction.

5.02 Reset direction setting

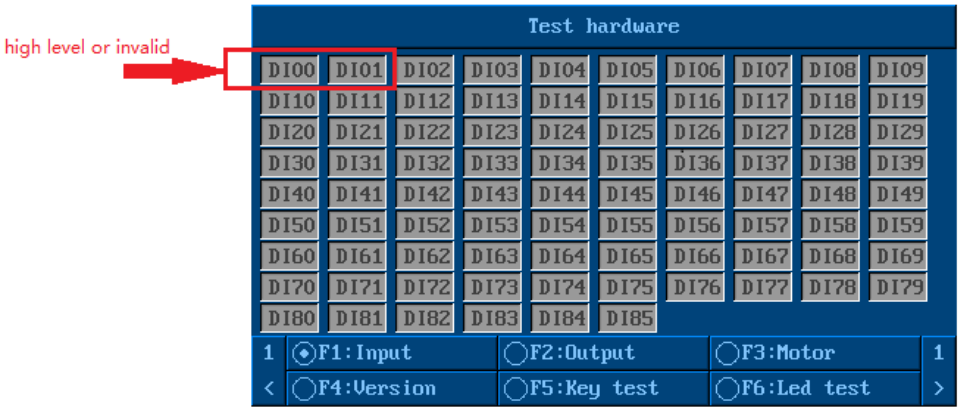
The reset direction is judged by the real-time coordinates. If the manual key is pressed to the origin direction, the real-time coordinates change from large to small, then the reset direction is [negative], or else it is [positive].

5.03 Pulse equivalent setting

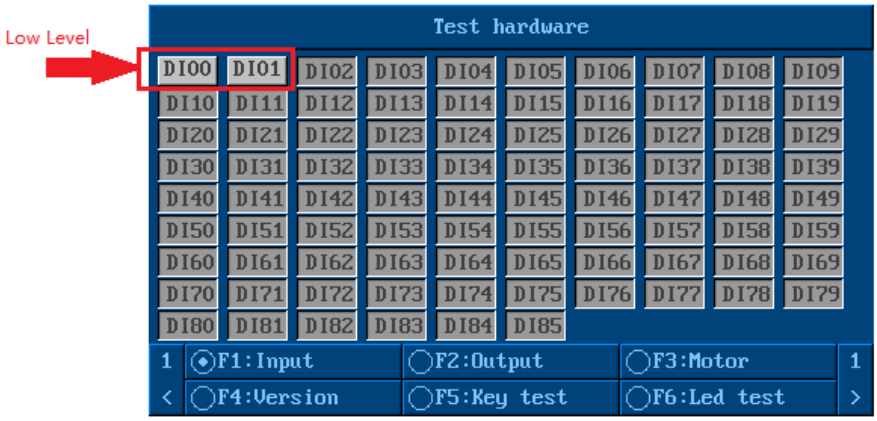
The setting of the pulse equivalent is related to the correspondence between the edited coordinates and the actual coordinates, which is a very important parameter. It can be set according to the pulse equivalent setting wizard. The formula is the actual motion distance of the axis divided by the number of pulses sent. For example, if the X axis moves by 10mm and 10,000 pulses are sent, then the pulse equivalent = 10/10000 = 0.001. (The number of pulses can be viewed in [Test] -> [Motor Control])

5.04 Origin and limit signal test

1. ->Main interface of handheld box -> press [Test] button -> enter the test interface ->



--> Block the origin and the limit switch with a baffle or press the mechanical switch with a foreign object to make the origin and limit switch have signal input, so as to test whether the external switches such as the origin and the limit are installed properly.



※Note: The effective level of the origin is the signal value from the input of the origin sensor switch when the origin switch is blocked. The origin switch is in different states when it iscovered and uncovered, or else the origin switch has been damaged.

5.05 Reset

1. -> Main interface of handheld box -> Press [Reset] button 

-> system reset -> the following may occur:

2. -> Main interface of touch screen -> Press [Reset] button -> system reset -> the following may occur:

- Reset direction is wrong: Please modify the “Motor features” of the axis –> “Reset direction” parameter
- Origin not detected: Please check whether the origin signal and the “origin effective level” setting are correct
- Reset overshoot: Please increase the reset low speed and reduce the reset high speed reasonably, and increase the reset acceleration
- Reset jitter: Please reduce the reset low speed reasonably; reduce the reset acceleration, which is generally set at 800~15000
- When resetting, the motor of one axis does not move, but the coordinates of the axis change on the interface, please check the motor wiring.

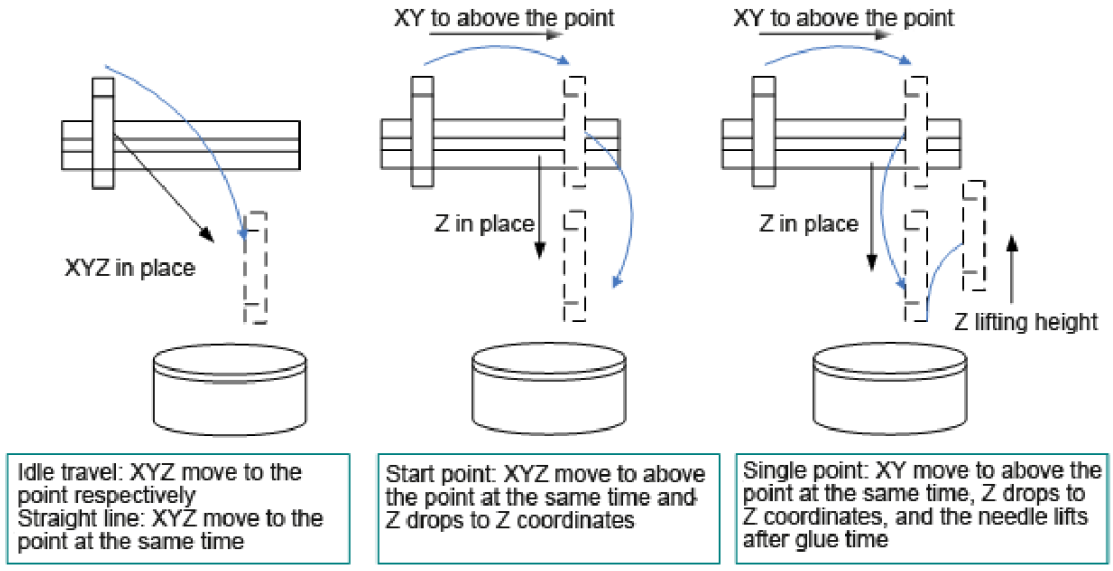
Chapter 6

Basic Teaching Methods

6.01 Dispensing program operation mode

The operation of the dispensing program executes the action of each programming point from the sequence number 1 in the order of the dispensing programming point until the dispensing programming point ends or the “Emergency stop” button is pressed. In addition to

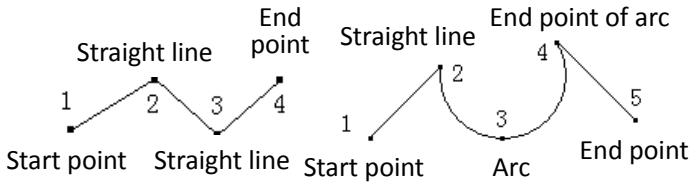
on the handheld box keypad, the programming points (machining instruction) type also includes motor reset, selecting glue gun, defining label, program call, etc. Please refer to the appendix “List of Processing Instructions” for the description of all types. The general editing point (machining instruction) operates as follows:



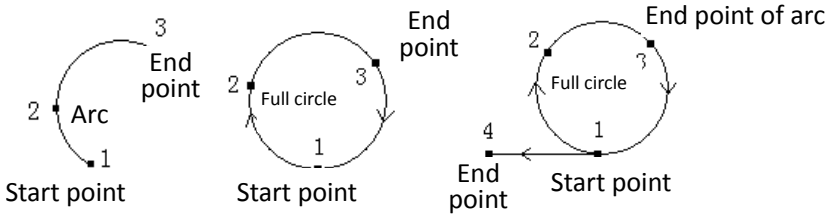
6.02 Constraints of dispensing path composition

The basic path of dispensing has single point, spatial straight line, circular, and spatial spline. The types of programming points that make up these basic paths are: start point, straight line, end point, single point, arc, full circle, spline, etc. They have certain constraints when programming.

1) A continuous trajectory needs to start with a “start point” and end with an “end point”. There may be a machining point type such as straight line, arc and ellipse in the middle;

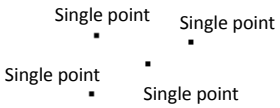


2) Arc, full circle, arc, clockwise arc, counterclockwise ellipse, and clockwise ellipse can't exist alone. They must be combined with the previous point and the latter point to form a graphics.



※Note: The actual arc end point of "Full circle" coincides with the start point of the arc, and the set "end pointof arc" only plays a supporting role.

3) The teaching of "single point" is relatively simple, but "single point" can't be combined with an arc or ellipse command.

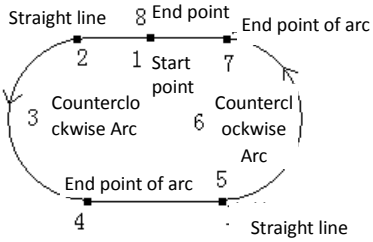


4) The "idle travel" command function is to quickly position the XYZ axis to the specified coordinate position at the same time, without generating glue opening or closing action.

※Note: The "Start point" command firstly locates the XY axis to the specified position quickly, and then the Z axis quickly locates to the specified position and generates a glue opening action.

5) The "CounterclockwiseArc" and "ClockwiseArc" commands only specify the radius of the arc. The arc start point and the arc end point coordinates are indicated by the previous point and the next point.

6) The radius set by "ClockwiseArc" and "Counterclockwise arc" can't be less than half of the distance between the two points before and after, or else an arc can't be formed.



6.03 Example of editing dispensing path

We have completed the reset function. Based on this, we will explain how to complete the teaching of a dispensing path through examples.

Sample demonstration steps:

① Select a program file.

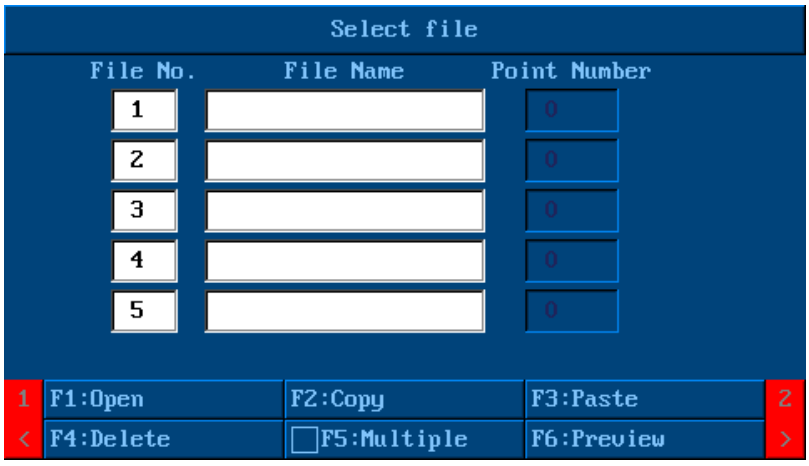
② Create a programming point or a machining instruction.

③ Set the process parameters, known as file parameters; each program file has its file parameters.

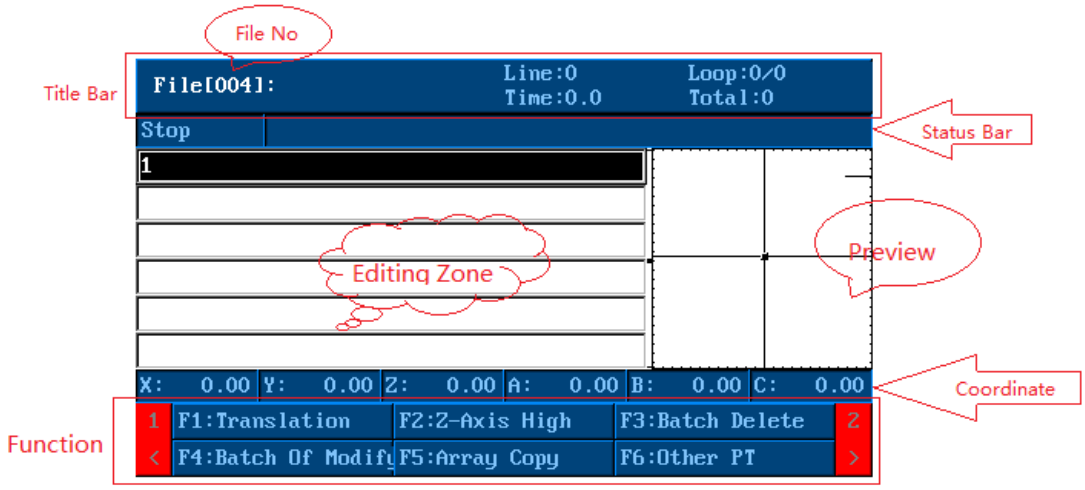
④ The first machining

6.03.01 Select program file

1. ->In handheld box monitoring interface,press [File Manage] button -> enter the file management interface ->

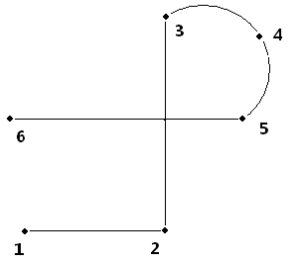


-> Press  to move the cursor (for example, move to the line of file No. 4) -> press [F1] to open -> enter the file editing interface -> press [Monitor / Edit] again to set it to the editmode (white background).

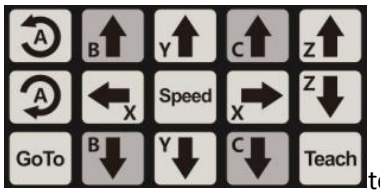


6.03.02 Teaching dispensing path

The actual machining path is as shown in the figure:

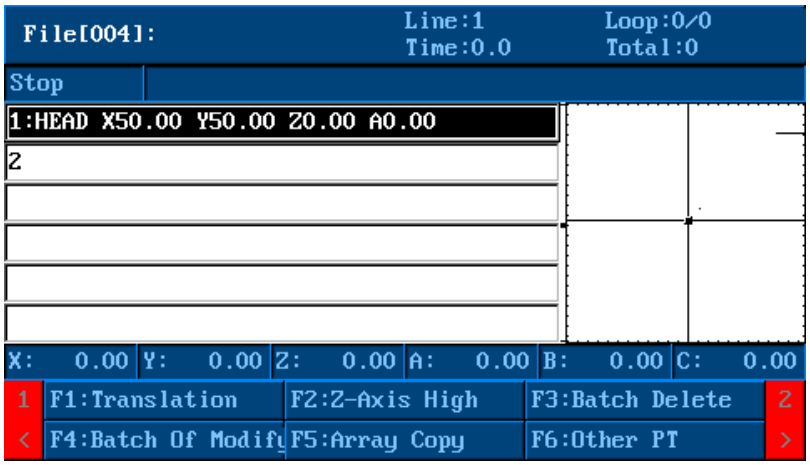


->Press Reset key 

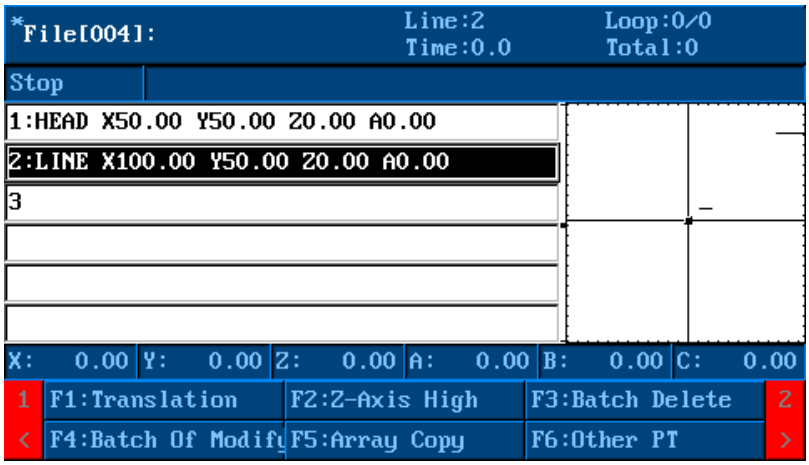
to finish the resetting ->Press the motor manual key 

to move the needle to the “1” point position——>Press the [Start] key 

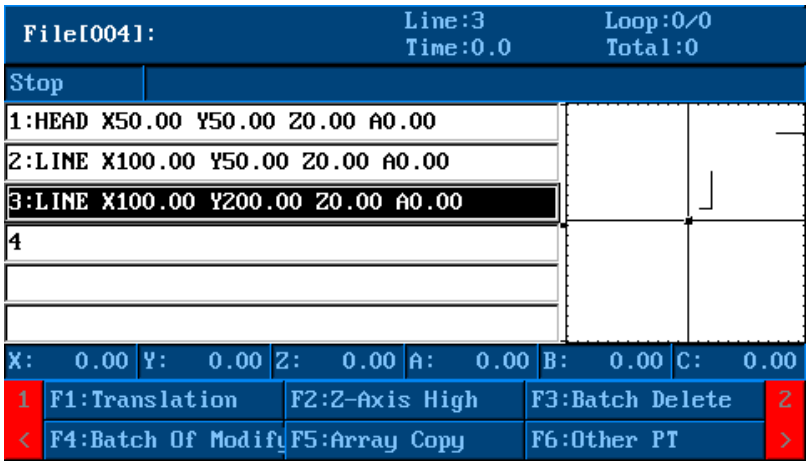
->Teach the first programming point



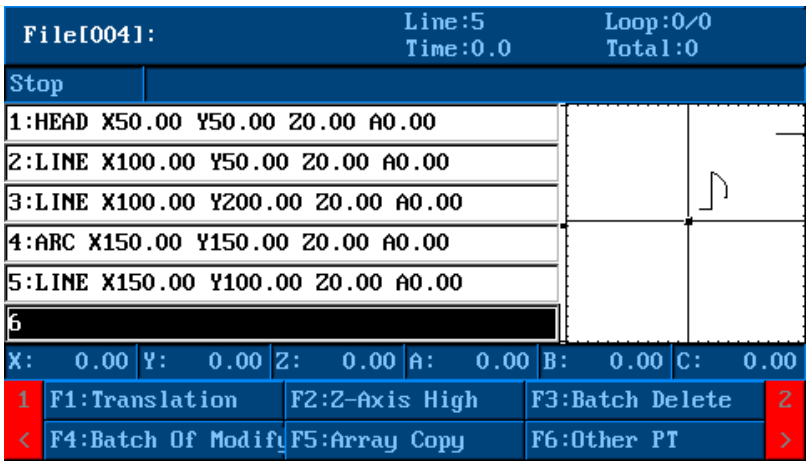
-> Press the motor manual key to move the needle to the “2” point position>Press the [Line 2 abc] key >Teach the second programming point ->



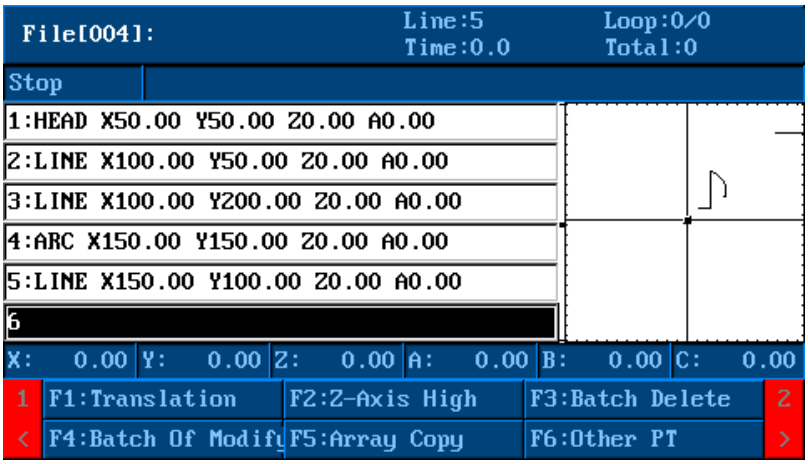
->Similarly, press the motor manual key to move the needle to the “3” point position> press the [Line 2 abc] key -> teach the third programming point ->



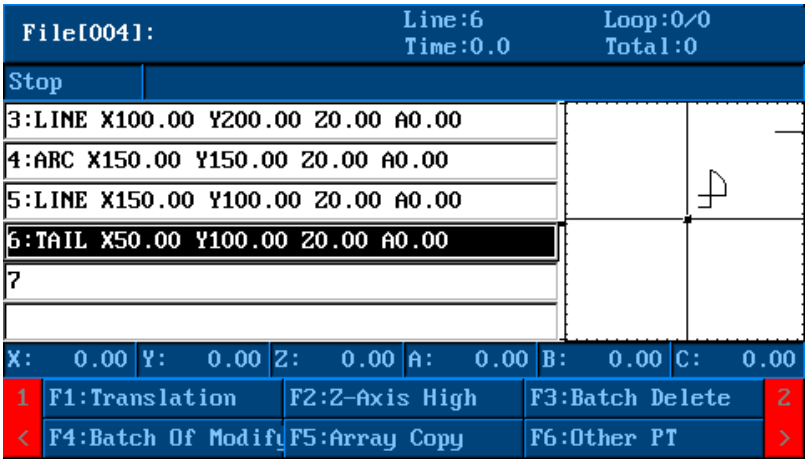
->Press the motor manual key to move the needle to the “4” point position——>Press the [Arc 5 jkl] key -> teach the 4th programming point ->



->Press the motor manual key to move the needle to the “5” point position——>Press the [Line 2 abc] key -> teach the 5th programming point ->



->Press the motor manual key to move the needle to the “6” point position——>Press the [Tail 3 def] key -> teach the 6th programming point ->



Press the [Save] button ->Save the program file to complete the dispensing path teaching

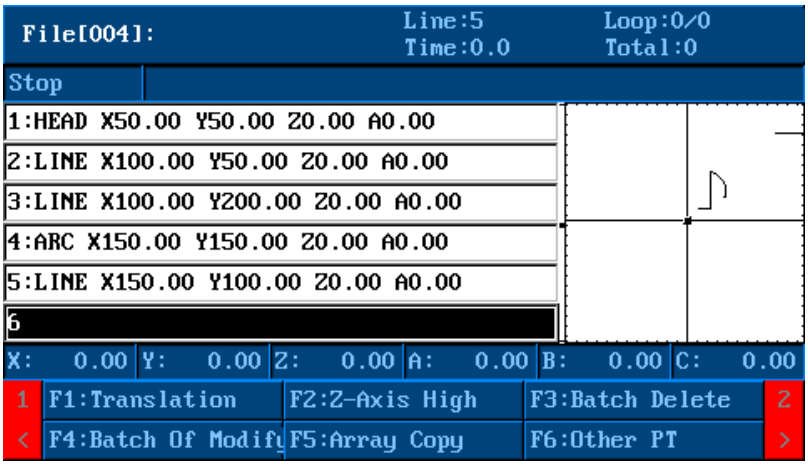
6.03.03 Modify programming point

After teaching a dispensing path, sometimes it needs to set the parameters of the programming point (machining command), such as manually input coordinates, whether to close the glue in advance, whether to delay glue opening, single point opening time, the end point and the lifting height after single point closing.

Please refer to the List of Processing Instructions for the detailed meaning of each parameter of the type programming point (machining command).

1) Modify the programming point coordinates

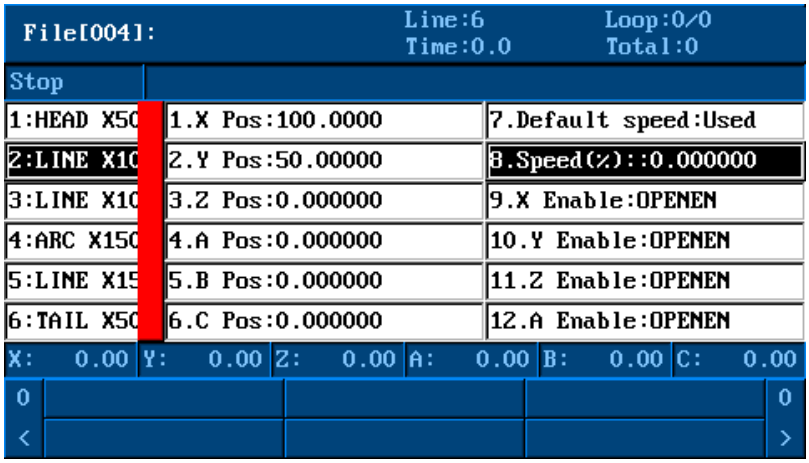
In edit interface -> press  to select the programming point to be modified -> press [] key to update the programming point coordinates to the current coordinates ->



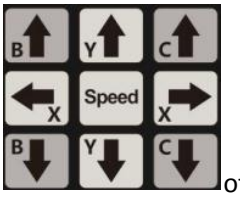
2) Modify other parameters of the programming point

In edit interface -> press  to select the programming point to be modified -> press []

to open the point parameter -> press the numeric keypad  , [] key to modify the parameters ->



6.03 Correction of motor manual direction

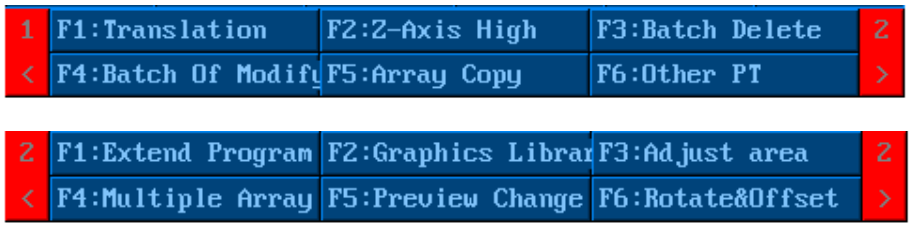
1.Main interface of the handheld box: Press the manual key 

of the hand-held box motor. If the motion direction of the motor does not match the direction of the button on the hand-held box, please modify the “pulse transmission mode” in the “motor feature” parameter of the axis. Refer to the above illustration for the parameter setting method.

※Note: In pulse + direction mode, the default is“pulse & direction+”; if the direction is reversed, change it to “pulse&direction-”.

6.04 Advanced editing features

The advanced file editing function of the handheld box has the following items:

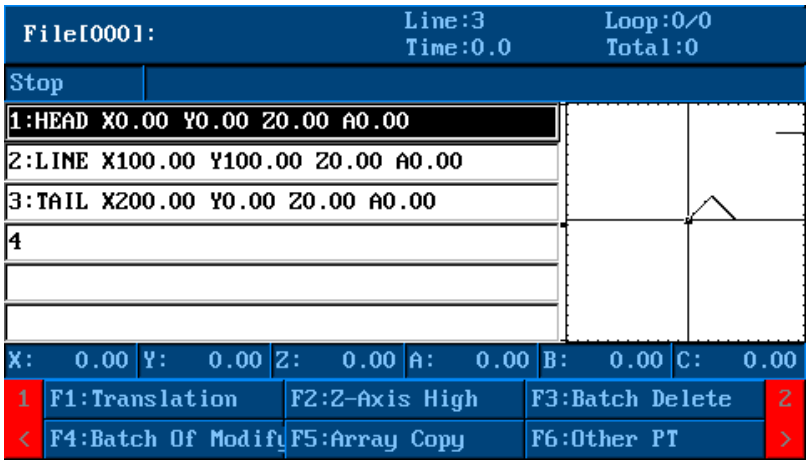


The advanced feature in the touch screen interface is only “array function”.

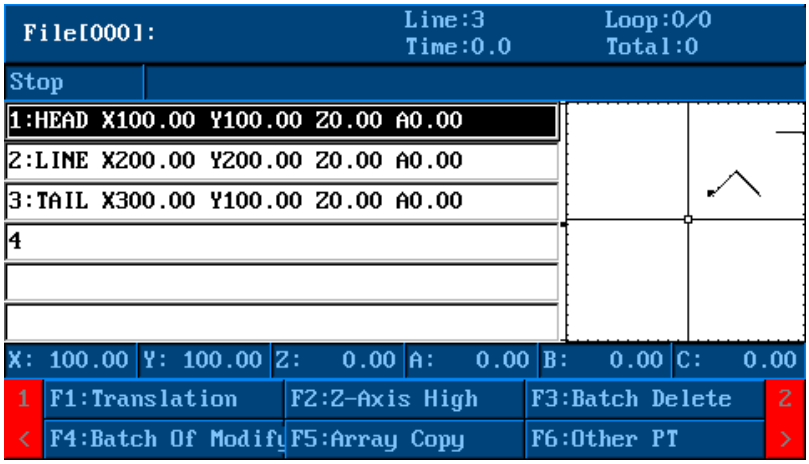
6.04.01 Graphics translation

This function adjusts the XY coordinate position of the graphic uniformly according to the current cursor position. First determine the point of the graph, and then move the XY coordinates to the desired coordinate position. After calling this function, the entire graph is automatically translated to the current position.

1.Move XY to the desired position first



2. Move the cursor to the point you want to moveand press F1 to translate (point 2 is the translation point)



6.04.02 Z-axis height adjustment

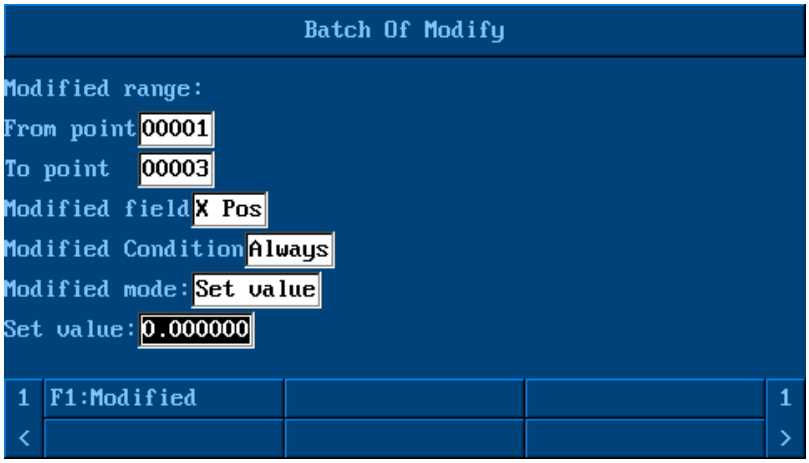
This function is mainly used to uniformly adjust the Z-axis coordinates of the graph. First determine the start point of the graph, and then move the Z axis to the desired coordinate position. After calling this function, the Z coordinates of the entire graph will be adjusted according to the value of the current Z coordinates. (When using this function, please note that the needle height after offset should not exceed the limit, or else it will not operate normally and will produce an overrun error). (The Z-axis height adjustment is used in the same way as the graphic translation).

6.04.03Batch deleting

First select the range of machining points that need to be deleted, and press [F1] to delete.

6.04.04 Batch editing

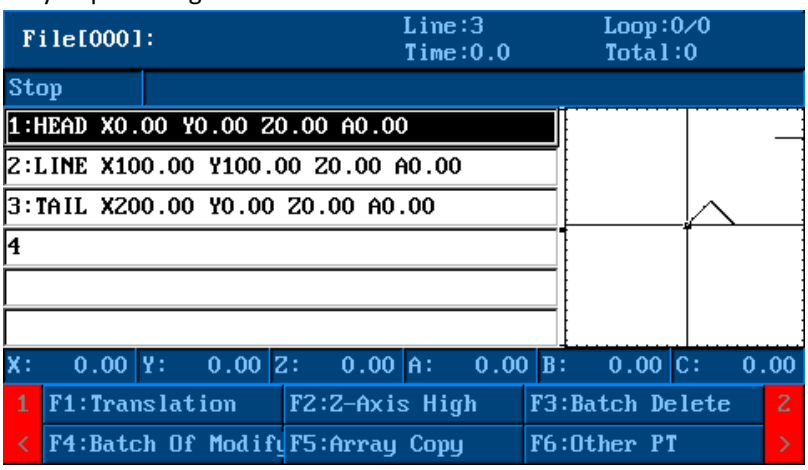
The batch edit function is mainly used to modify a large amount of data.



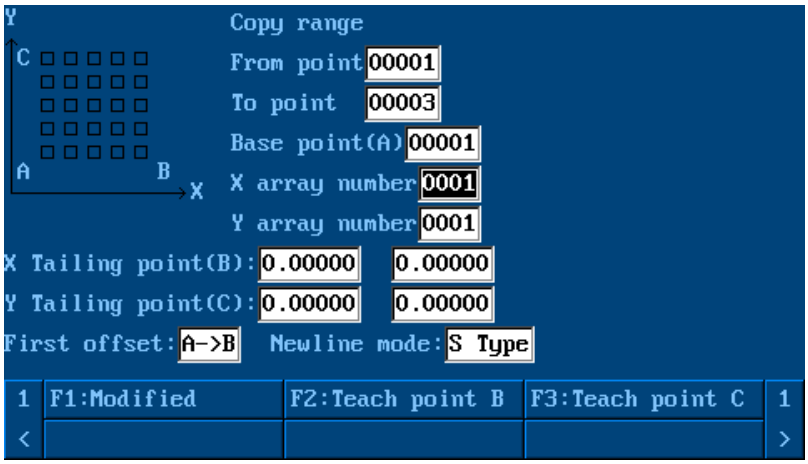
- Range: Start machining point number and end machining point number to be modified
- Content: Select the content that needs to be modified
- Condition: Specify that the data to be modified is equal to, not equal to, greater than or less than a specified value.
- Method: Three methods are available: Set value, set increment, and set ratio. Setting value is to directly set the specified value to the content to be modified; setting increment is to add a value to the original value (decrease if the specified increment is negative); setting ratiois to multiplythe original value by a value.

6.04.05 Array copy

The array copy function is mainly used to copy a single graphic into multiple copies in an array, or to generate an array of parallelograms.



Enter the array copy interface:

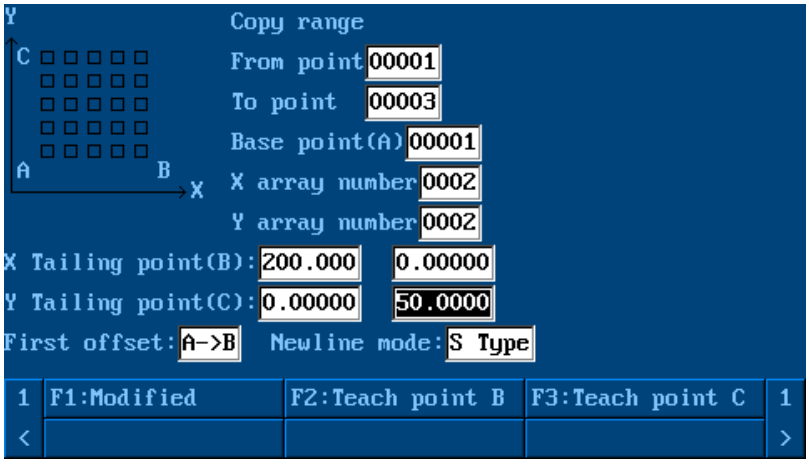


Set X direction array to 2 to generate2 arrays from A to B

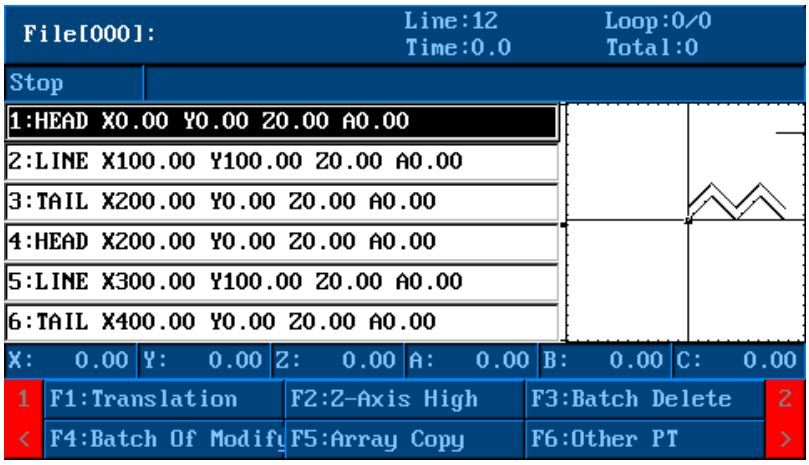
Set Y direction array to 2 togenerate 2 arrays fromA to C

2*2 arraysgenerated in total

X end point coordinate is set to 200,0,indicating that N points with the same interval are generated as the points of each array between the reference point and the X end point, and N is the size of the array in the X direction; the Y end point is the same;



Perform editing



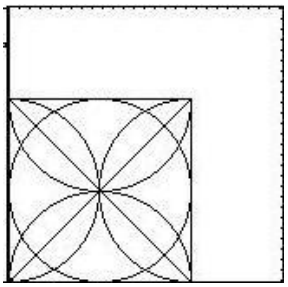
6.05.06 Program expansion

This function is mainly used to directly nest the file content of the file call instruction into the instruction location.

6.05.07 Common graphics

0) Test graphics

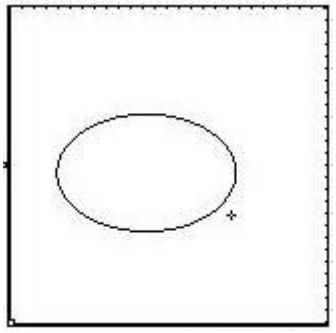
- ❖ Step 1: Select the plane where the test pattern is located;
- ❖ Step 2: Enter the side length of the test pattern;
- ❖ Step 3: Teach the third axis coordinates;
- ❖ Step 4: Generate the following graphic:



※Note: The graphic can be moved to the appropriate position by translation or batch editing.

1) Ellipse

In ellipse generating interface, press the number keys 1-4 to teach each vertex of the ellipse (teach at least one vertex in each direction of XY to generate an ellipse), press the first time to teach coordinates, and press the second time to cancel the coordinates. After teaching the start point and the end point, press the number key 7 to select the ellipse direction, and press [F1] to generate the ellipse. The data of each vertex of the interface is always saved, even if it exits the interface, so when the ellipse is taught, it is able to exit from the interface halfway, and the data taught still exists.



Generated ellipse graphic

6.05.08 Partial adjustment

This function is mainly applied to the partial adjustment of an area in the graphics array, and the adjustment range of the graphics array can be set.

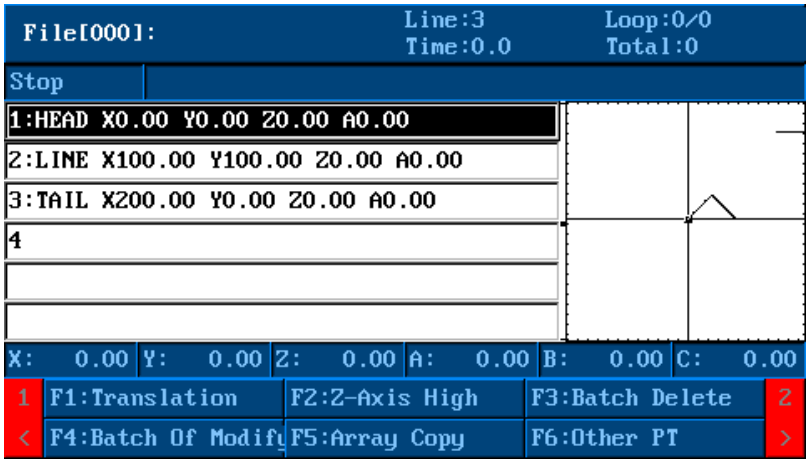
1. Move the motor to the position where adjustment is required.
2. Press F3 to enter the partialadjustment interface and set the adjustment range:
3. Perform the modification

Note: Partial adjustment and graphics translation are different. After graphics translation,only the position changes, whileafter partial adjustment, the shape of the graphic may change.

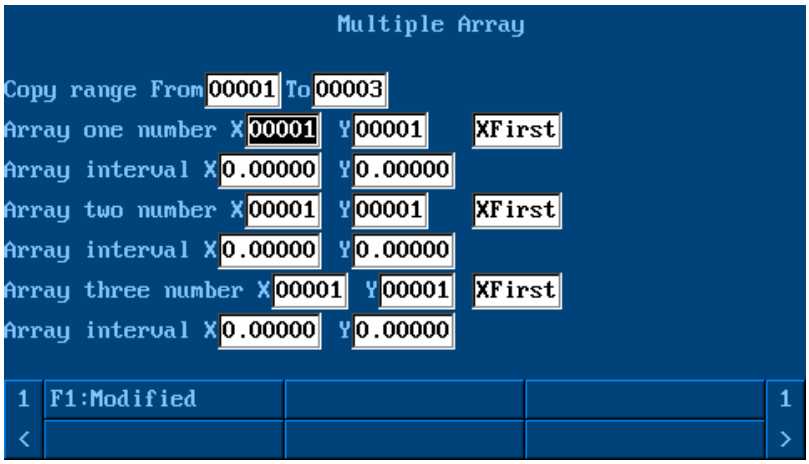
6.05.09 Multiple array

The multi-array is to perform the second array on the graphics after the primary array, and then perform the third arrayafter obtaining the pattern.

- Copy range: The start machining point number and end machining point number of the graphic to be copied.
- Number of groups in primary array: The number of groups in the XY direction of the primaryarrayof current graph
- Array spacing: The distance between each graphic in the XY direction of the primaryarray
- Number of groups in second array: The number of groups in the XY direction for the second array when the primaryarray is completed
- Array spacing: The distance between each graphic in the XY direction of the second array
- Number of groups in secondarray: The number of groups in the XY direction for the third array when the secondarray is completed
- Array spacing: The distance between each graphic in the XY direction of the third array
- Array direction: X direction array first and Y direction array first
- Press Turn page, and press [F4] key to execute the array.



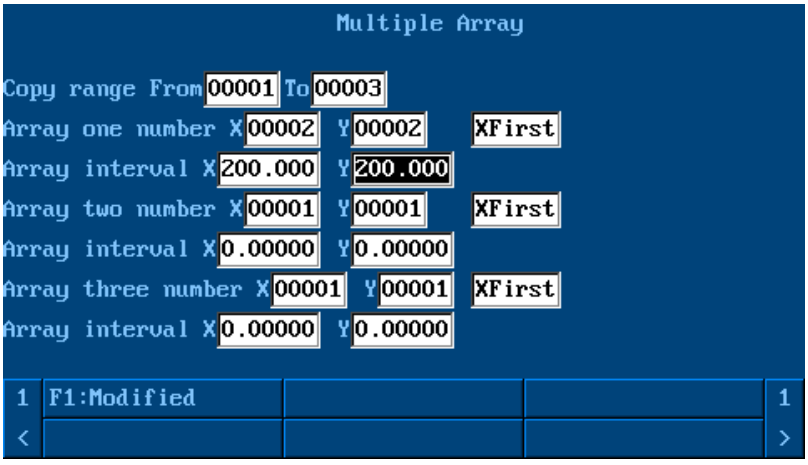
Enter the multi-array interface



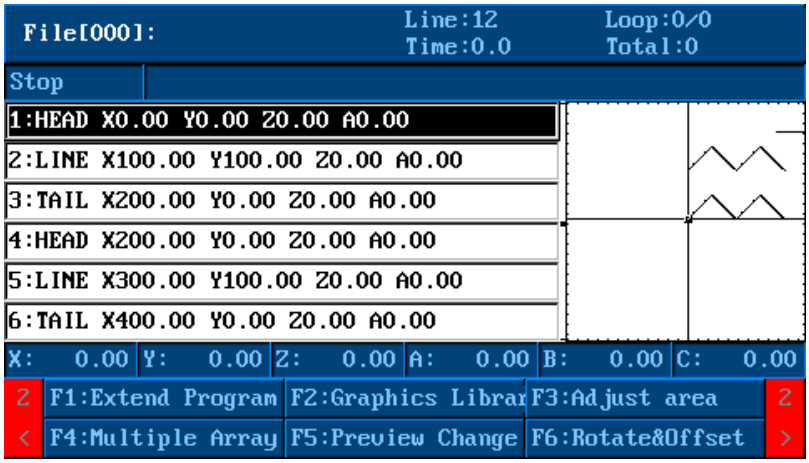
The array row number setting indicates the number of arrays that will be copied in the X, Y direction

Set the number of rows X to 2 and Y to 2, indicating that 4 arrays will be copied.

The spacing X Y means that the array is copied every XY coordinate



Implement the modification:

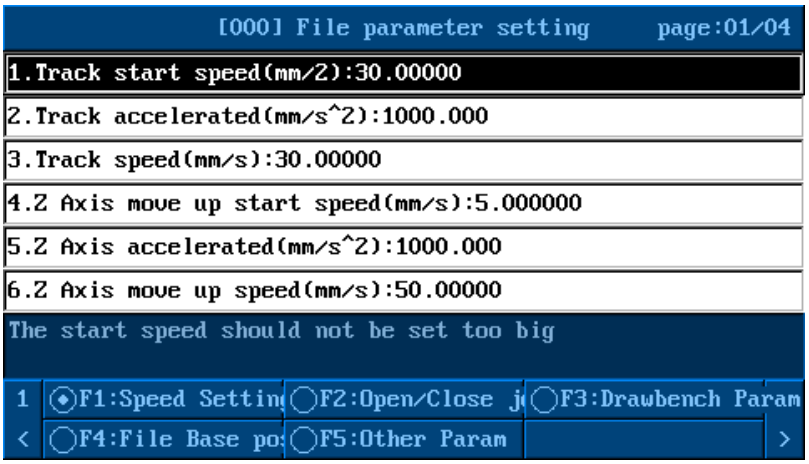

File[000]:
Line:12
Time:0.0
Loop:0/0
Total:0
Stop
1:HEAD X0.00 Y0.00 Z0.00 A0.00
2:LINE X100.00 Y100.00 Z0.00 A0.00
3:TAIL X200.00 Y0.00 Z0.00 A0.00
4:HEAD X200.00 Y0.00 Z0.00 A0.00
5:LINE X300.00 Y100.00 Z0.00 A0.00
6:TAIL X400.00 Y0.00 Z0.00 A0.00
X: 0.00
Y: 0.00
Z: 0.00
A: 0.00
B: 0.00
C: 0.00
F1:Extend Program
F2:Graphics Librar
F3:Adjust area
F4:Multiple Array
F5:Preview Change
F6:Rotate&Offset

Chapter 7

File Parameter Settings

Each dispensing program of the dispenser has its corresponding file parameters. After teaching the dispensing path, it is generally necessary to set the dispensing process parameters (i.e., file parameters).

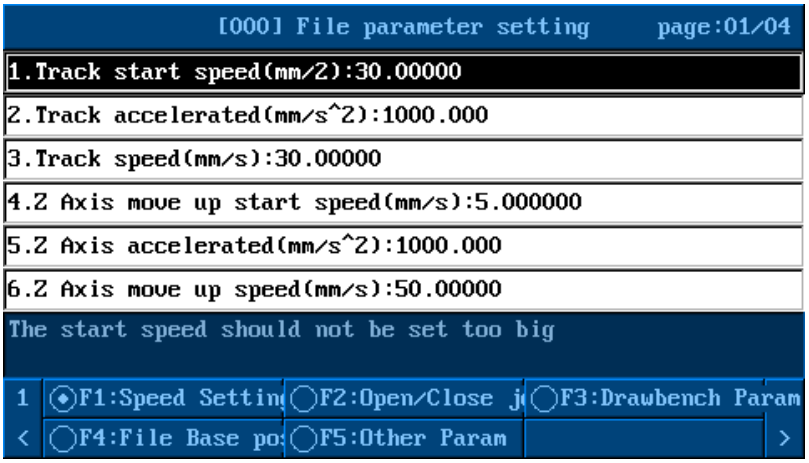
1. -> Press [File Param] on the handheld box -> enter the file parameter setting interface; the parameters are explained as follows:



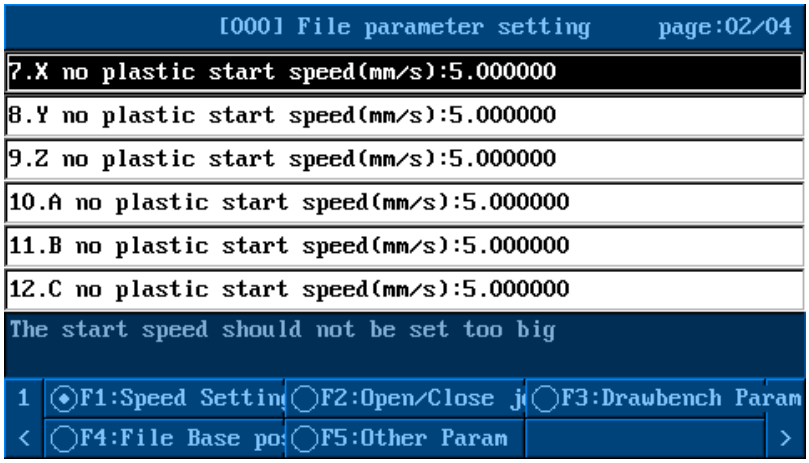
File parameter settings are mainly divided into 5 categories: speed setting, glue open/close setting, drawing parameters, file matching point, other parameters, and camera parameters (available only when the system function is set to visual dispensing). The details are as follows.

7.01 Speed related parameters

1. ->In handheld box file parameter interface -> Press [F1 Speed setting] ->> enter parameters



Press  to switch among different speed setting interfaces

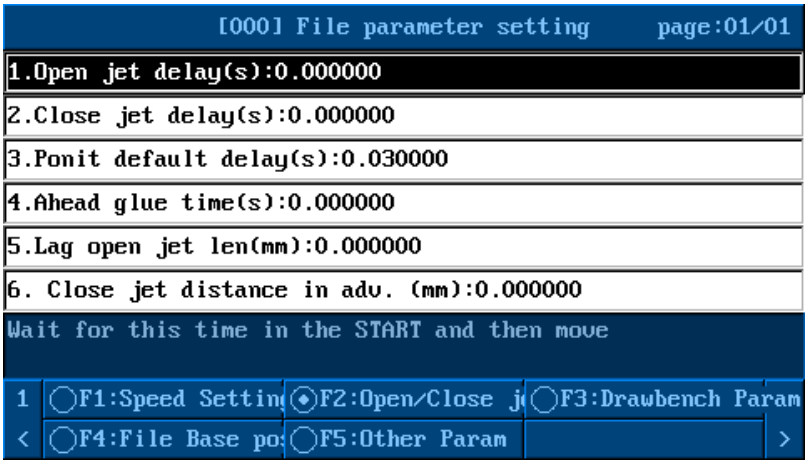


Idle travel speed: the speed at which each axis moves when no glue is dispensed.
Track speed: The speed of the interpolation movement when dispensing.

Parameter	Description
Idle travel speedsetting	1) Idle travelstarting speed: the speed when idle travelstarts; it should not be set too large 2) Acceleration: The acceleration required from the starting speed to the idling speed. If set to 0, the track speed is used for uniform processing 3) Idle travelspeed: the speed duringidle travel
Track related parameters	1) Track starting speed: Starting speed when performing track processing 2) Track speed: The speed at which the track is interpolated 3) Track acceleration: The acceleration required from the starting speed to the track speed. If set to 0, the processing is performed at a constant speed
Z-axis speed parameter	1) Z-axis lifting start speed: The starting speed that Z-axis lifts 2) Z-axis lifting acceleration: The acceleration that Z-axis lifts 3) Z-axis lifting speed: The speed that Z-axis lifts 4) Z-axis descending speed: The speed at which the Z-axis descends

7.02 Glue open/close parameters

1. ->In handheld box file parameter interface -> press [F2 Open / Close glue] -> enter parameters

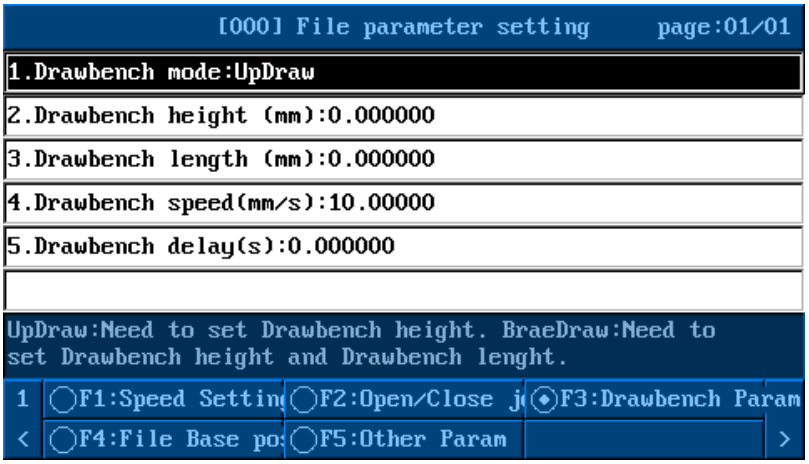


Parameter	Description
Glue open/close related parameters	1) Open jet delay(s): Open waiting time，The response time required for the glue gun to open (cylinder). Wait for thisperiod of time after opening glue and then move the axis to the next point 2) Close jet delay(s): Close waiting time, The response time required for the glue gun to close (cylinder). Wait for thisperiod of time after closing glue and then move the axis to the next point (the processing is completed if there is no next point) 3) Point default delay(s): Default single point time, Default open duration of single point instruction 4) Ahead glue time(s): Lag/advance opening time, The lag/advance opening time of the glue gun when the function is used at the start point ※Note: Improper setting of the delay time (for example, the delay is very large, even if the time of the dispensing path has not been reached) may cause glue not open on certain track 5) Lag open jet len(mm): The lag opening distance is calculated from the starting point. When this length is reached, the glue gun is opened. 6) Close jet distance in adv.(mm): Advance closing distance, The distance at which the glue gun is closed in advance, that is, the needle is closed before it has reached the end point ※Note: Improper setting of this distance (for example, the value is larger than the dispensing path) may cause glue not open on certain track

7.03 Drawing related parameters

1. ->In handheld box file parameter interface -> Press [

Drawing parameters] -> enter parameters

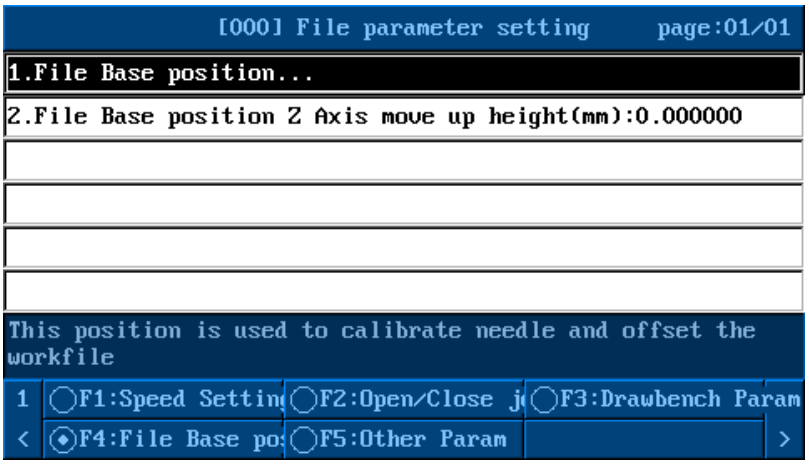


2. -->In touch screen file parameters interface -> select “Other parameters” ->

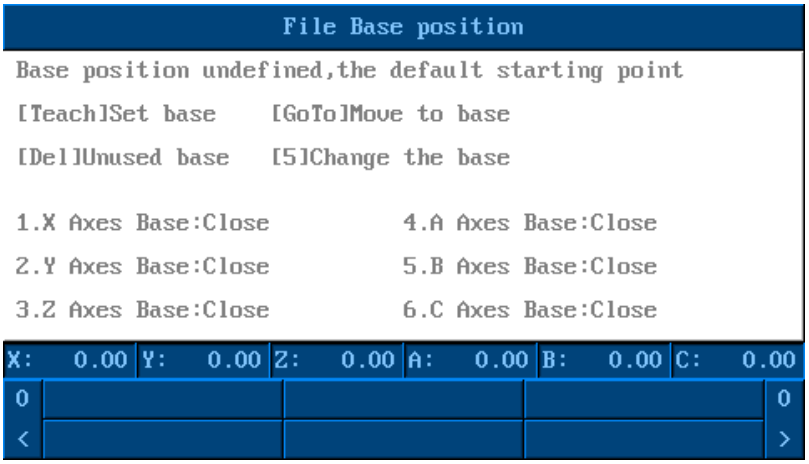
Parameter	Description(blue characters indicatethe parameters open to the simplified interface)
Drawing related parameters	1) Drawing mode: Upward drawing (Z-axis uplifting), diagonal drawing (drawing according to the track) 2) Drawing height: Lift a small distance at low speed and then continue to retract the gun. If set to 0, the drawing function is turned off 3) Drawing distance: The distance from the diagonal drawing 4) Drawing speed: This speed is generally set to be small, used for slow drawing 5) Drawing delay: The dwell time after the end of drawing

7.04 File base

1. ->In handheld box file parameter interface -> Press [F4 File base position setting]

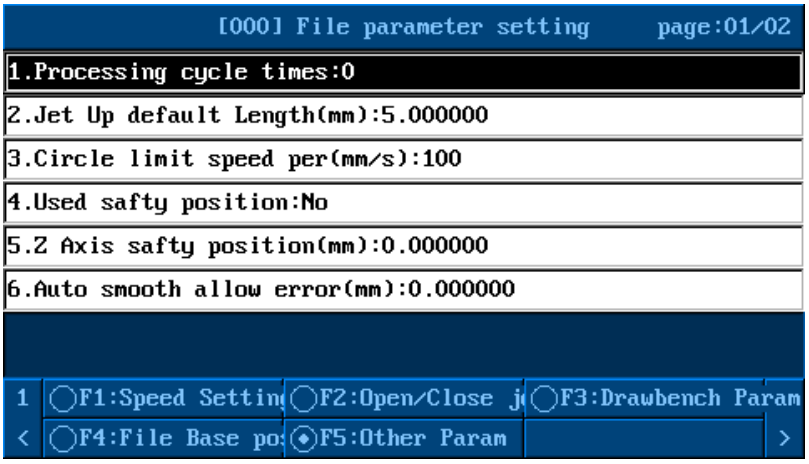


Select “File base position” ->> enter parameters



7.05 Other file parameters

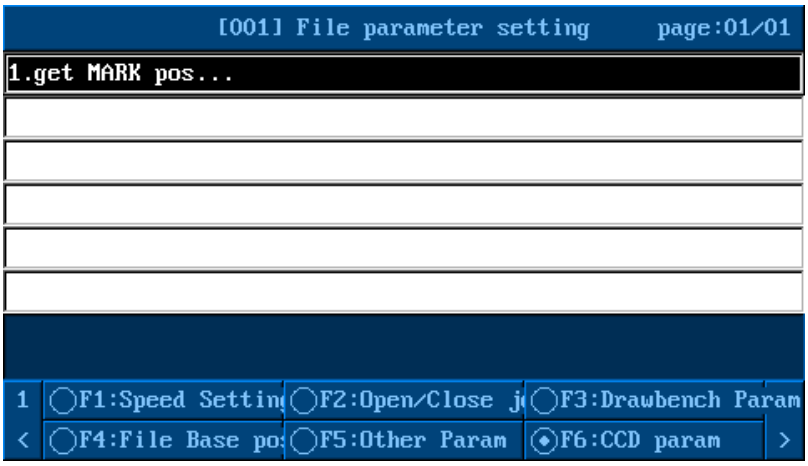
1. ->In handheld box file parameter interface -> Press [F5 Other parameters] ->>  enter parameters



Parameter	Description(blue characters indicatethe parameters open to the simplified interface)
Other parameters	1) Cycle processing times: The number of products processed in the current file cycle. 0 indicates unlimited time. To achieve cyclic machining, set the machining mode to cycle 2) Default needle lift height: The default needle height for the end point and single point command 3) Arc speed clamping factor: Arc clamp speed 4) Whether to use safe height function: Whether the Z-axis safe height function is enabled 5) Z-axis safe height: Safe height in Z machining 6) Automatic fillet error range: The distance between the maximum cut edge and

	the corner of the fillet after the corner is automatically rounded 7) Gun layer setting: This parameter is used to select the layer of the glue gun (1~8 layers). The corresponding input signal set in the input port configuration of the factory parameters can be used to select a layer separately 8) Restore default parameters: Restore the defaultif default file parametershave been set, or elserestorethe factory settings.

7.06 Camera parameter settings



Set Mark-1 point: the coordinates of Mark-1 required for camera positioning; press “1” to teach. Note that the teaching will trigger ccdshooting. If the shootingfails, the teaching will also fail. This position corresponds to the position that ccd1 takes pictures; the same as ccd2

Multiple MARK points:

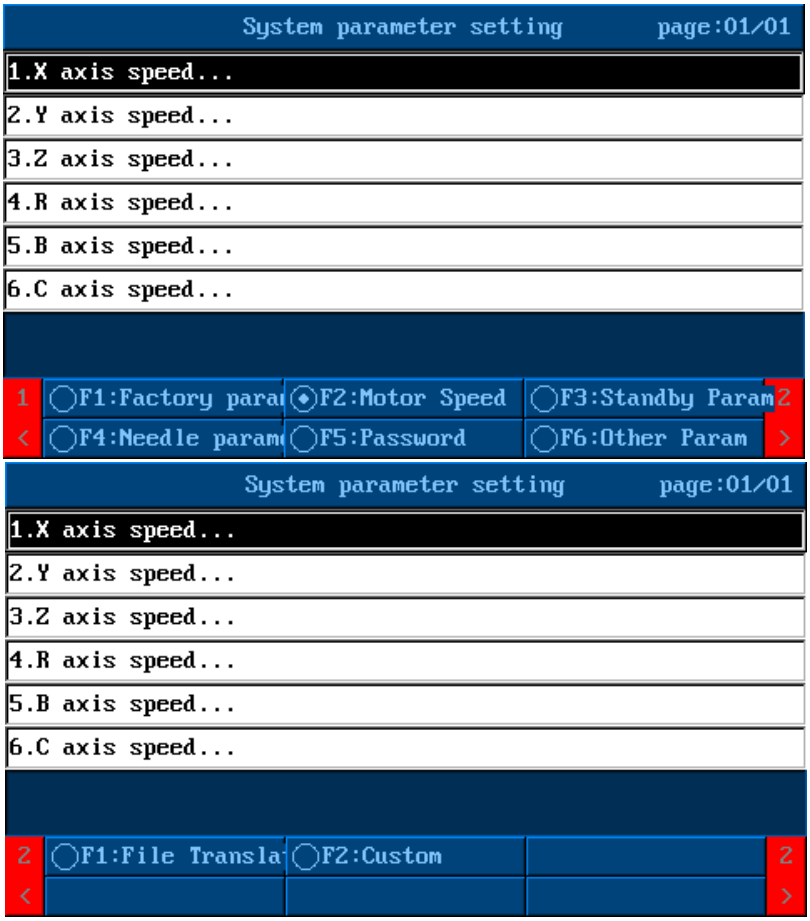
For the camera mode 1, the file can have multiple CCD1/CCD2 shooting commands. After the file is edited, performthe file parameters-camera parameters-mark settings. When the mark point is shot, the entire file is traversed, all CCD1/CCD2 are shot, and then get all mark point data. For processing, the deviation for the corresponding CCD-mark will be corrected[Note: When adding and reducing the CCD shooting commands, you need to re-teach the mark]

Chapter 8

System Settings

As a dispensing device, the dispenser has its parameters for equipment and non-machining operations, which are system parameters. After installing the device, the first operation is to set up the system.

1. -> Press [System] on the handheld box -> enter the system parameter setting interface; the parameters are explained as follows:

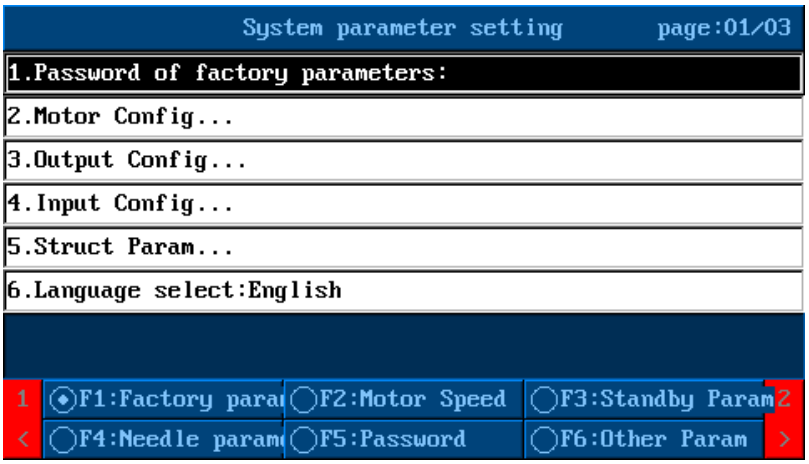


System parameter settings are mainly divided into 8 categories: factory parameters, motor speed, standby parameters, automatic needle, password management, other parameters, file conversion, and custom functions. The details are shown in the table below.

8.01 Factory parameters

1. ->In handheld box system parameter interface -> Press [F1 Factory parameters] -> 

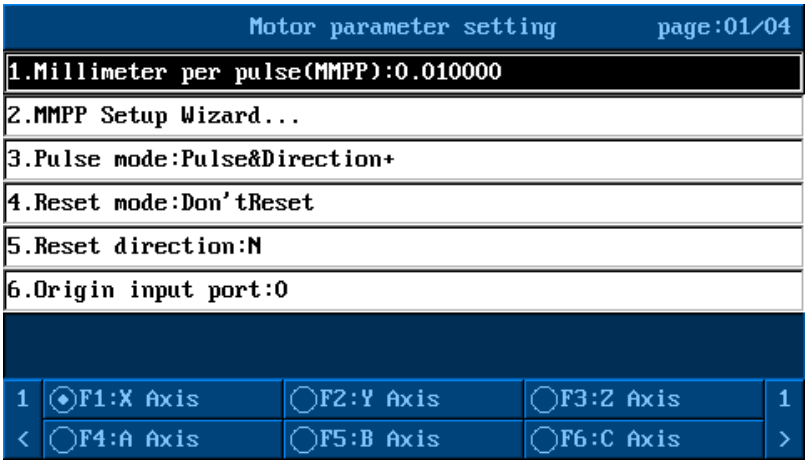
Enter parameters ->



Factory parameters include some basic configurations such as input and output, motor features, and configuration

8.01.01 Motor feature parameters

1. ->In handheld box system parameter interface -> Press [F1 Factory parameters] ->   enter motor feature parameters ->



Parameter	Description
Motor features	1) Pulse equivalent: Refers to the distance of a pulse corresponding to the actual movement of the motor 2) Pulse equivalent setting wizard: The pulse equivalent can be calculated according to the step settings of the wizard 3) Pulse transmission mode: According to the driver setting mode, it can be divided into pulse + direction and pulse + pulse 4) Reset mode: There are seven modes: reciprocating reset, circumferential

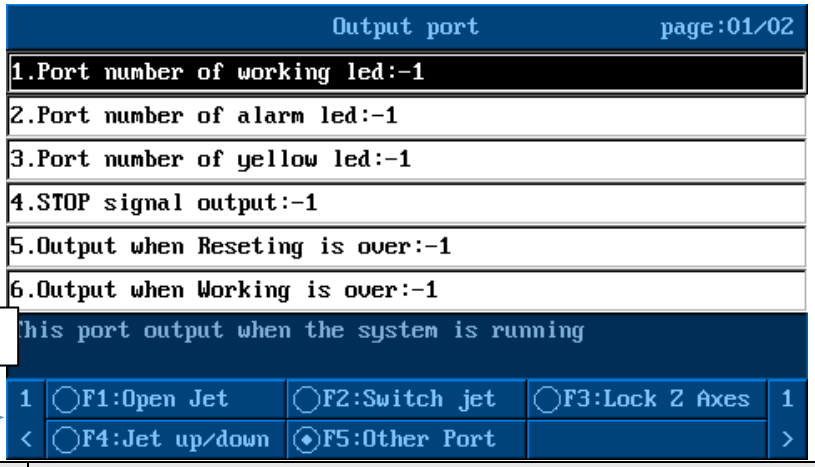
	reset, no reset, logic reset, positive/negative reset, intermediate origin reset, and auto reset.Reciprocating reset is generally used for transmission methods such as screw rods and belts; circumferential reset is generally used for transmission modes such as turntables and cams; if no reset is selected, the current position is directly used as the origin for resetting; logic reset means returning to 0 coordinates and then reciprocating reset; autonomous reset (servo reset) is used to send signal to the servo and the servo drives the motor to reset; the intermediate origin reset is used to edit the position of the origin to positive or negative; positive/negative reset is used when half of the rotation axis has origin signal while the other half doesn't (like a cam) 5) Reset direction: Before setting this parameter, please make sure that the motion direction of the motor is the same as the direction of the manual button of the motor on the handheld box 6) Origin input port: Specify the input port number corresponding to the origin sensor (by default, XYZABC axis corresponds to the input port0, 1, 2, 3, 17, and 18 respectively) 7) Origin switch effective level: The effective level of the origin can be checked in the hardware test. If the corresponding origin input signal is low when the motor is not at the origin, the effective level of the origin is high, or else it is low 8) Whether to use origin limit: Whether the origin is used for the limit detection 9) Positive/negative limituse mode: Set which limit is valid as needed 10) Limit switch effective level: The effective level of the limit can be checked in the hardware test. If the corresponding limit input signal is low when the motor is not in the limit, the effective level of the limit is high, or else it is low. After the parameter is modified, it will take effect whenthe controller isrestarted 11) 12) Software positive/negative limit: This parameter will affect the graphic display range and the area where the motor can be moved. If the effective travel of the motor can't be determined in advance, you can enter the file editing interface to manually control the motor movement and then determine the effective travel of the motor bychecking the coordinates 13) Maximum speed: The maximum speed of the stepping motor is generally 15 rev/sec and that of the servo motor is generally 50 rev/sec. The actual value needs to be tested 14) Servo alarm input port: Axis servo alarm input signal 15) Servo alarm level: Effective level when servo motor alarms 16) Positioning enable: Whether to participate in positioning action 17) Whether consistent with Cartesian coordinate system: Whether the positive and negative direction of the actual running of the motor is consistent with Cartesian coordinates 18) Whether support teaching: Whether to teach the corresponding axis coordinates into the instruction parameters

	19) Autonomous reset output port: Used to control Autonomous reset 20) Z-phase signal input port: The input port of the motor Z-phase signal. After the above reset process, the motor searches for Z-phase signal to achieve higher reset accuracy 21) Z-phase signal effective level: The level at which the Z-phase signal is triggered

8.02.02 Output port configuration

The output port configuration includes configuration of the glue gun port, gun change switch, lock Z-axis, cylinder gun forward/backward, and other operational indication output ports. The simplified interface only has configurations of glue gun port, gun change switch and basic running indicator port.

1. ->In handheld box system parameter interface -> Press [F1 Factory parameters] ->   Enter Output port configuration parameters ->



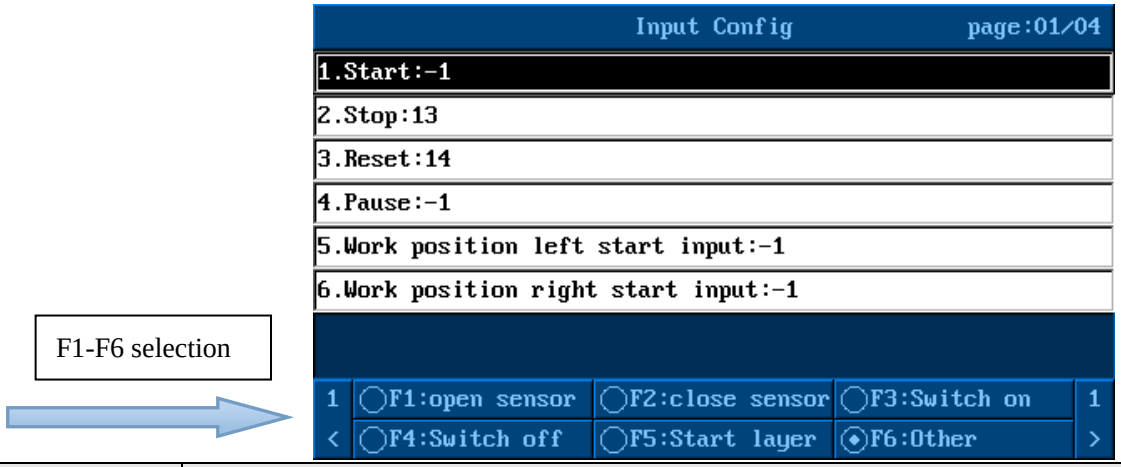
Parameter	Description
Output port configuration	※Note: You can set the port number corresponding to the common output function. Setting to -1 will disable this function. 1) Runningindicator port: This signal outputs low level when the program is stopped or in dripping state, and outputs high level when running 2) Alarm indicator port: Indicates that the parameter setting is abnormal, etc. 3) Standby indicator port: Indicates that the system is in standby mode 4) Emergency stop output: When the emergency stop button is pressed, the signal outputs at high level. When it is reset, it outputs at low level. This signal can be used to lock the axis. 5) Outputafter resetting: The motor outputs at high level after completing a reset, and the signal outputs at low level after pressing the emergency stop 6) Outputafter processing: The program outputs at high level after completing

	one cycle processing, and outputs at low level when it enters the next processing. 7) Outputfrom standby position: This signal outputs at high level when the motor is in the standby position, and outputs at low level when the position is moved. 8) Motor enable: Motor motion enable control port F1 9) Glue gun switch 1-16 output: Correspond to the opening and closing of the 1-8 glue gun F2 10) Glue gun change 1-16 output: Correspond to the gun change signal of 1-8 glue gun F4 11) Delay of gun forward/backward: If the “Cylinder gun forward/backward output” in “Output port configuration” is set to a non-negative number, the gun forward/backward delay becomes valid. It limitscylinder gun forward/backward action together with gun forward/backward in-position signal, waits for gun forward/backward in-position signal, and the waiting timeis not less than the set gun forward/backward delay time before proceeding to the next step 12) Cylinder gun forward/backward output: This parameter needs to be configured when the cylinder is used in cylinder mode, or else it is set to -1 13) Gun change delay: The time required for the cylinder to change the gun until the gun is replaced F3 14) Lock Z-axis output port: Output port locks Z-axis 15) Lock Z-axis output port effective level: Lock Z-axis level 16) Lock Z-axis time: Z-axis locking time

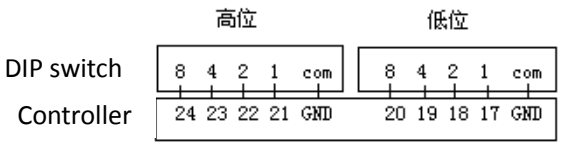
8.02.03 Input port configuration

1. ->In handheld box system parameter interface -> Press [

Vendor parameter] -> select “Input port configuration” ->



Parameter	Description
Input port configuration	※Note: You can set the port number corresponding to the common input function. Setting to -1 will disable this function. 1) Start: External start button port (valid for single position system) 2) Stop: External emergency stop button port 3) Reset: External reset button port 4) Pause: External pause button port 5) Left position start: External left position start button configured when it is a dual position system 6) Right position start: External right position start button configured when it is a dual position system 7) Safe gate: Safety light gridRight 8) Left table safe gate: Left safety light grid 9) Right table safe gete: Right safety light grid 10) Safe gate electrical lever: Safety grating active level 11) Step key:Single step button input 12) External alarm input: When the signal level is low, the machining stops and generatesalarm output 13) External needle aligning button: When the button is pressed for the first time, XY moves to the aligning position, and when it is pressed again within 3 seconds, the Z axis moves to the aligning position 14) Back to standby position button: When the button is pressed, it moves to the set standby position 15) Cycle machining switch button: When the button is pressed, it enters the cycle machining state, and when it is lifted, it enters a single machining state 16) External glue gun control button: Manual glue open/close control 17) BCD DIP switch input start point: You can use two-digit BCD8421 DIP switches to select files. The two-digitDIP switch occupies8 continuously input points. For example, if the input start point is set to 17, the wiring method is as follows: High position Low position



18) BCD button digit selection: 4 digits and 8 digits can be selected, and the customer can configure according as needed
19) External file selection button: Set the port separately to quickly select the 8 processing files of file number 0-7, and can directly start the processing file after selection
20) Gun forward in-place signal: The corresponding gun forward in-place signalwhen using cylinder gun feeding
21) Gun backward in-place signal: The corresponding gun backward in-place signal when using cylinder gun feeding
22) Gun forward/backwardin-place signal effective level: low level or high level
23) Glue gun switch in place signal effective level
24) Glue gun change gun in place effective level

F1

25) Glue gun 1-8open in-place signal: If this signal is used, the glue gun will detect whether the signal is valid when it is opened, and proceed to the next step when the signal is valid

F2

26) Glue gun 1-8 close in-place signal: If this signal is used, the glue gun will detect whether the signal is valid when it is closed, and proceed to the next step when the signal is valid

F3

27) Gun switch in-place signal effective level: low level or high level
28) Glue gun 1-8 change forward in-place signal: When using multiple glue guns in dispensing, it will detect whether the signal is valid beforechanging the gun, and proceed to the next step when the signal is valid

F4

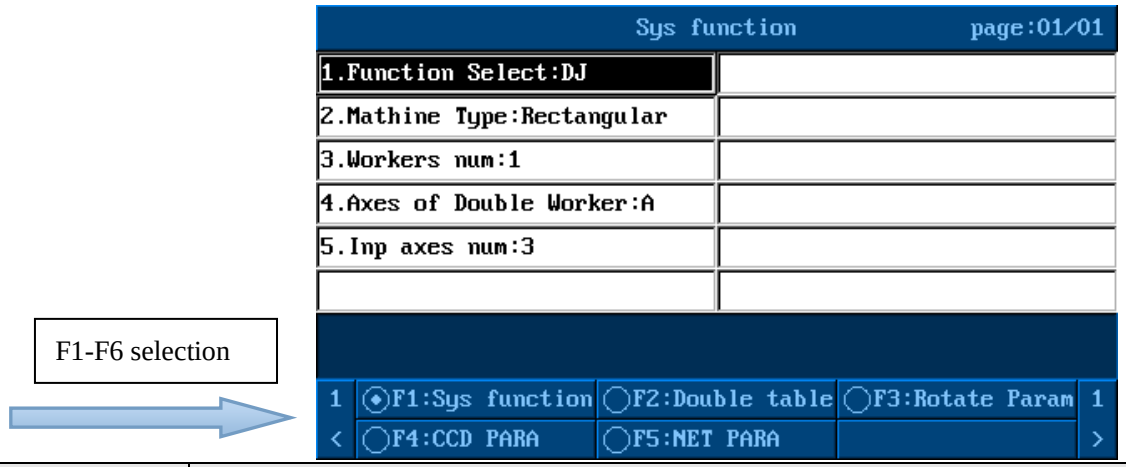
29) Glue gun 1-8 change backward in-place signal: When using multiple glue guns in dispensing, it will detect whether the signal is valid beforechanging the gun,and proceed to the next step when the signal is valid
30) Glue gun change in-place signal effective level: low level or high level

F5

31) Layer 1-8 start signal: Perform layering operation of multiple glue guns in dispensing, and use the specified start signal to select a layer to be processed separately; for glue gun layering setting, please select “Settings of glue gunlayer” in the file parameters
32) Stop button effective level: Effective level when the external stop button is pressed (stop button is fixed to the 13th input port)

8.02.04 Structure configuration

1. ->In handheld box system parameter interface -> Press [F1 Factory parameters] -> Select "Structure configuration" ->



Parameter	Description
System function settings	1) Function selection: including dispensing, extrusion, visual dispensing (only available for DJ8849V3-A01 and DJ1600V3-A01;camera parameters in the file parameters will be available) 2) Machine type: including Cartesian coordinates, glue gun rotation, and workpiece rotation. Three-axis system and dual position system need to be configured as Cartesian coordinates; after selecting glue gun rotation or workpiece rotation, the rotation parameters need to be configured. Glue gun rotation and workpiece rotation can't be used at the same time. 3) Number of positions: 1 and 2 respectively according to single and dual position 4) Dual position axis number: The Y-axis of the right position corresponds to the actual axis number of the controller 5) Number of interpolation axes: Three-axis system and dual position system are generally set to 3. Glue gun rotation and workpiece rotation generally need to be set to 4
Double position parameter (not available for DJ904V1-A01 and DJ8849V1-A01)	1) Whether to use the loading/unloading position: When Yes is selected, the processing flow starts on the left,left position startsprocessing, and then go to the unloading position to wait for the left position unloading completion signal. After the unloading, it will automatically go to the loading position and wait for the left position start signal for the next processing, so reciprocating cycles 2) Left position unloading complete: Left position unloading complete signal input; it will go toleft position loadingposition only after receiving this signal 3) Right position unloading complete: Right position unloading complete signal input; it will go to right position loading position only after receiving this signal 4) Position unloading time: If there is no unloading completion signal input, you

	can use this time as the delay. When the time is up, it will automatically return to the loading position. Only one of the two modes can be selected 5) Loading position: The position where the Y axis arrives before starting; the left and right positions are the same; the actual coordinates are input 6) Unloading position: The position where the Y axis arrives after the machining is completed; the left and right positions are the same; the actual coordinates are input
Rotation parameters (not available for DJ904V1-A01 and DJ8849V1-A01)	1) Glue gun rotation radius: The angle of the circle drawn by the needle when the glue gun is tilted and the R axis rotates one revolution 2) Offset angle of glue gun rotation: The angle between the needle and the positive X direction after the R axis is reset 3) Glue rotation parameter setting wizard: According to the teaching steps of this interface, the teaching of the rotation radius of the glue gun and the offset angle of the glue gun rotation can be completed 4) Workpiece rotation plane: There are three rotation planes: XY, XZ and YZ. The plane perpendicular to the rotation axis is selected as the rotation plane 5) XYZ coordinate of workpiece rotation center: Important parameters of workpiece rotation, need to be set before editing the machining file, or elseprocessing will have error 6) Workpiece rotation center teaching: According to the teaching steps of the interface, the teaching of the workpiece rotation center can be completed
Visual dispensing parameters (not available for DJ904V1-A01 and DJ8849V1-A01)	1) Correction function: Single product correction is to correct the deviation of a product, and multiple product correction is to correct some products separately 2) CCD shooting mode: One correction applies to the camera with high pixel. Two correctionsneed totake two MARK points 3) File teaching mode: The camera teaching point is to teach the track through the center point in the camera's field of view, and the teaching precision is high. The needle teaching point is taught according to the actual needle position, and the teaching speed is fast 4) Photo debounce time (ms): The delay before taking picture when the camera moves to the shooting position 5) Data receiving timeout (ms): Timeout period for the controller to receive visual data 6) Calibration position setting: Calibrate the needle with the camera to obtain the distance between the two 7) CCD debugging switch: Usually used by developers to turn on visual script debugging switch
Network parameter configuration	1) Network MAC: Set the MAC address 2) Local IP: Set the IP address of the local controller 3) Remote network IP: Set the IP address of the visual controller [for visual dispensing] 4) Client network port number: Network port number [for visual dispensing] 5) Local network port: Local network port number

	6) Remote network port: Network port number for visual communication

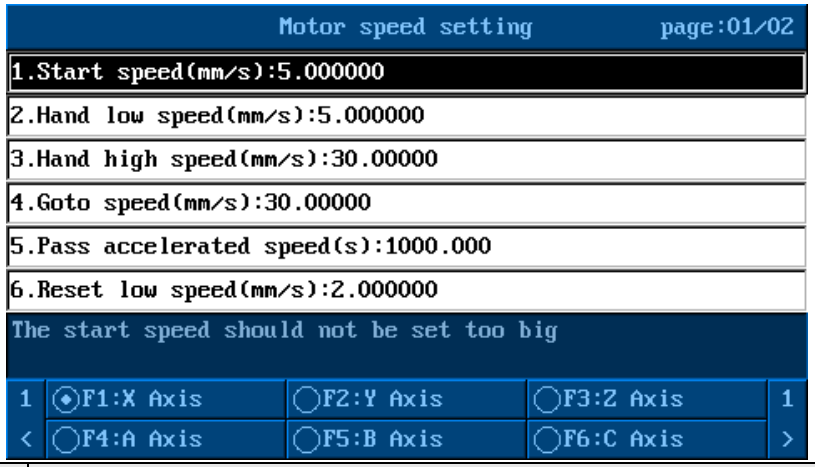
8.02.04 Otherfactory parameters

	Description
	1. Vendor parameter password setting 2. Language selection 3. Stop button lift reset: Set whether the motor is reset at the same time when the stop button is lifted. Generally, it refers to the external emergency stop self-locking button 4. Start button plus pause function: Press the start button to pause in the running process 5. Extended IO settings: Connect to external expansion IO board, external input and output portscan be added 6. Jog distance: The distance of manual jog 7. Corner speed smoothing level: Increasing the corner speed smoothing level will improve the overall processing efficiency and motion stability, but will also cause a large single-axis start-stop speed at the corner 8. Track splitting accuracy: The controller divides all the graphics into small line segments of equal length0. The track splitting precision is the length of the small line segments. If the setting is too small, the controller will calculate too much and affect the motion effect. It is generally recommended that the value be greater than the distance that the motor rotates by 1/50 of a turn 9. Z-axis lift during positioning: Whether Z is raised when positioning 10. Automatic speed smoothing: Motion smoothing 11. Vendor service period setting 12. User service periodsetting 13. Restore backup system parameters 14. Restore parameters to factory defaults

8.02 Motor speed related parameters

1. ->In handheld box system parameter interface -> Press [

Motor speed] ->  enter parameters ->



Parameter	Description
Motor speed	1) Starting speed: The starting speed of stepping motor should be less than 3 rev /sec, and the starting speed of servo motor should be less than 5 rev /sec 2) Manual low speed: Used for precise positioning during manual teaching 3) Manual high speed: Used for quick positioning during manual teaching 4) Positioning speed: The speed during motionpositioning 5) Acceleration: The larger the value, the faster the change from the starting speed to the idle speed is. If it is set to 0, it is uniform 6) Reset low speed: Reset speed when approaching the machine origin 7) Reset high speed: Reset speed when moving away from the machine origin 8) Reset acceleration: The speed changes faster during reset. If set to 0, it is uniform

8.03 Standby parameters

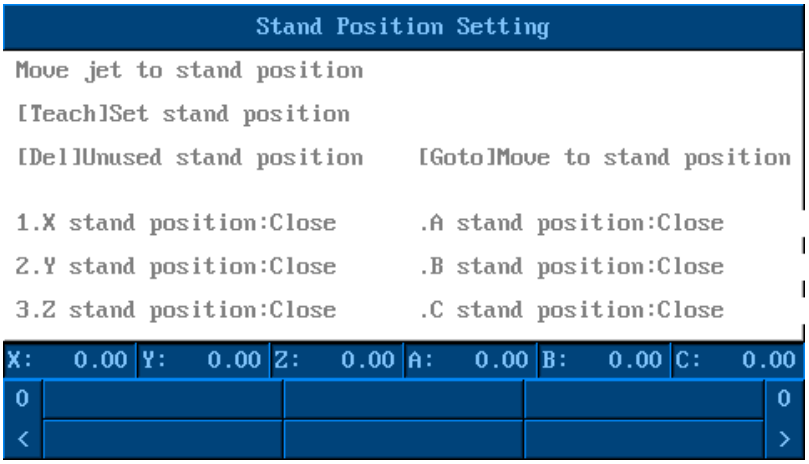
The standby parameter sets the standby position and its automatic dispensing parameters.

8.03.01 Standby position setting

1. ->In handheld box system parameter interface -> Press [

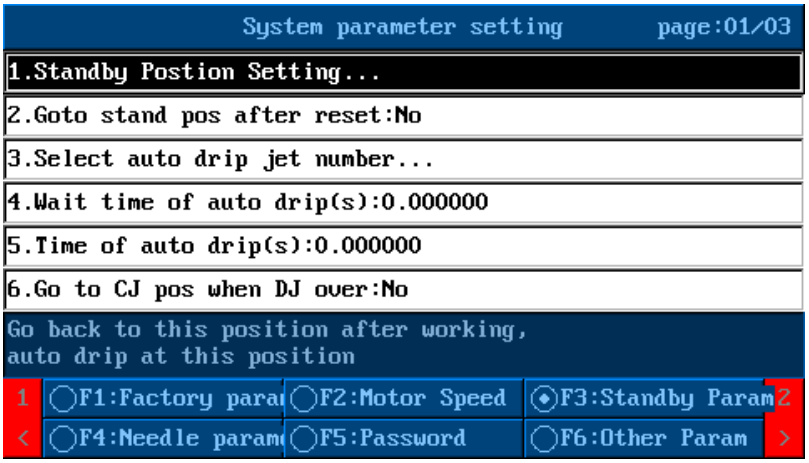
Standby parameters] -> 

enter parameter ->



8.03.02 Automatic dispensing related parameters

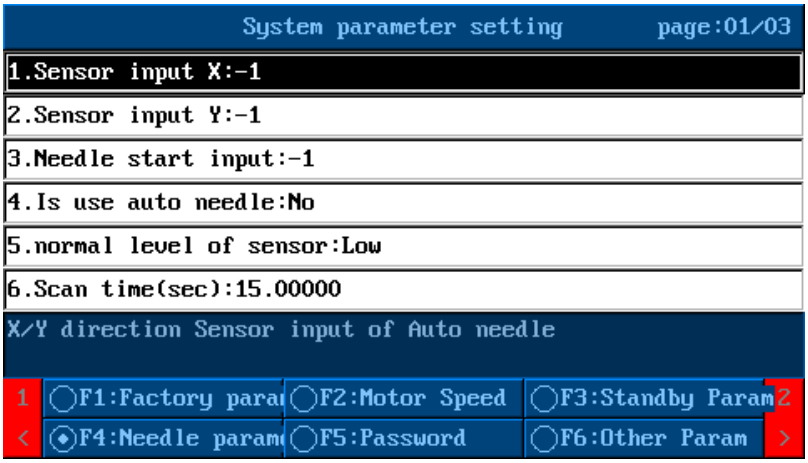
2. ->In handheld box system parameter interface -> Press [F3 Standby parameters] ->  enter parameter ->

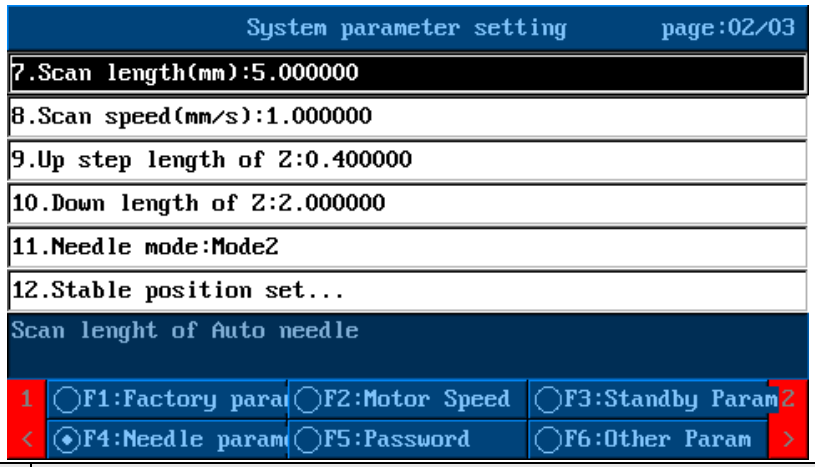


Parameter	Description
Dripping related parameters	1) Standby position setting: Set the automatic dispensing position 2) Automatic drippinggun selection: Select the glue gun that needs automatic glue dispensing 3) Automatic dispensing waiting time: Enter automatic dispensing state when there is no operationin the set time 4) Automatic dispensing open time: The time when the glue gun is opened duringautomatic dispensing 5) Return to standby position after reset: Return to standby position after reset ※Note: The automatic dispensing should set the standby position, and the glue must be dispensed in the standby position

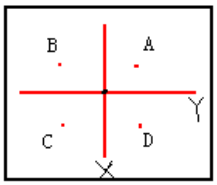
8.04Automatic needle aligning setting

The needle aligning parameter is automatically set in the system parameters.



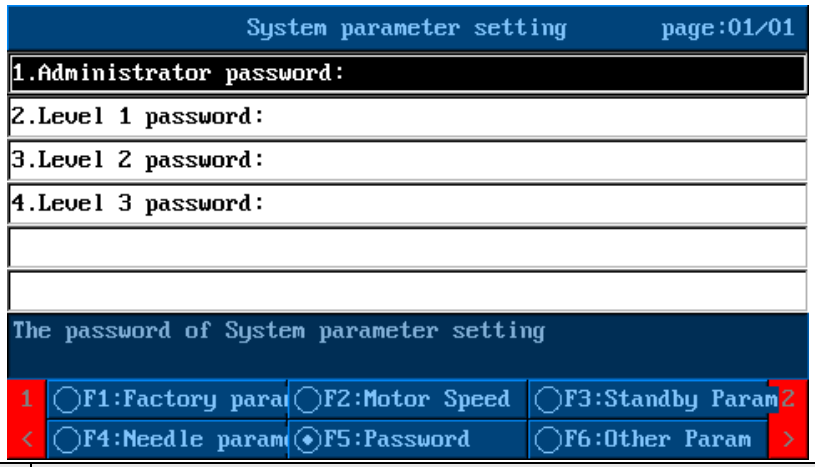


Parameter	Description
Automatic needle aligning parameter	1) X sensor port: Sensor access port for automatic needle aligning in X direction 2) Y sensor port: Sensor access port for automatic needle aligning inY direction 3) Auto needle aligning activationport: Press to start automatic needle aligning 4) Whether to use automatic needle aligning 5) Sensor normal level 6) Scanning timeout: Set the maximum time for the axis scanning when the needle is automatically aligned. If the axis scanning is not completed at the time, the needle aligning will fail, the automatic needle aligningends and the alarm will display scanningtimeout 7) Scanningdistance: Set the range ofneedle scanning 8) Scanning speed: The speed of needle scanning. In order to ensure the scanning accuracy, the speed should be set to be relatively small 9) Z-axis ascending step: The distance that the Z-axis ascends each time during scanning 10) Z-axis descending step: The distance that the Z-axis descends each time during scanning. This parameter should be slightly larger than the ascending step

	11) Needle aligning mode: Select the mode for needle aligning(generally default to mode 1 for different needle scanning methods) 12) Needle position setting: Set the fixed initial scanning position of automatic needle aligning Needle aligning position setting: Set the fixed initial scanning position for the needle aligning. The fixed initial scanning position is generally set in the A point area, as shown in the figure below. In the figure, X and Y indicate the sensing signals of the X and Y axes. The needle should be below the sensing line, but not too deep, or else the needle will time out and cause a failure.  Result of needle aligningposition: The position after the needle aligning is completed. Scanning timeout: Set the maximum time for the axis scanning when the needle is automatically aligned. If the axis scanning is not completed at the time, the needle aligning will fail, the automatic needle aligning ends and the alarm will display scanning timeout.

8.05 Password management

1. ->Insystem parameters interface -> -> [F5Password management] ->



Parameter	Description
Password management	You can set adminpassword, level-1, level-2, and level-3 password. The level of the password from high to low: Vendor parameter password, adminpassword, level-1 password, level-2 password, and level-3 password. System parameter setting and file management require admin password. File parameter setting and file editing require level-2 password, PLT file

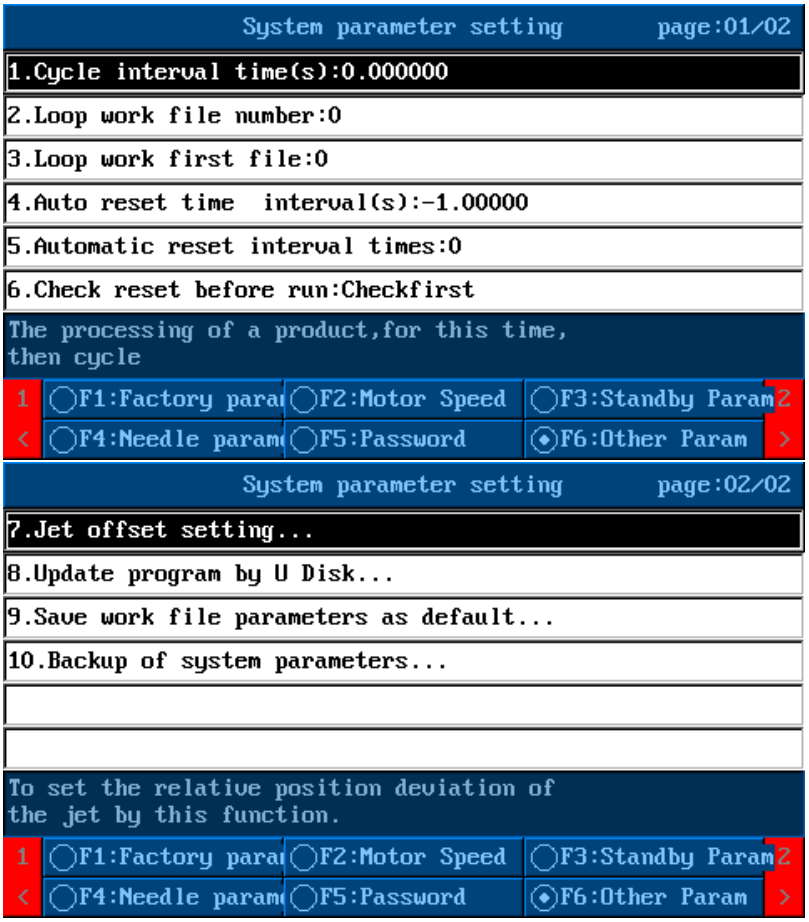
	conversion requires level-2 password, and processing file selection requires level-3 password.

8.06 Introduction to other system parameters

1. ->In handheld box system parameter interface -> Press [

Other parameters] to enter other parameters ->

1->In other parameters interface of handheld box, press 
to switch parameters ->



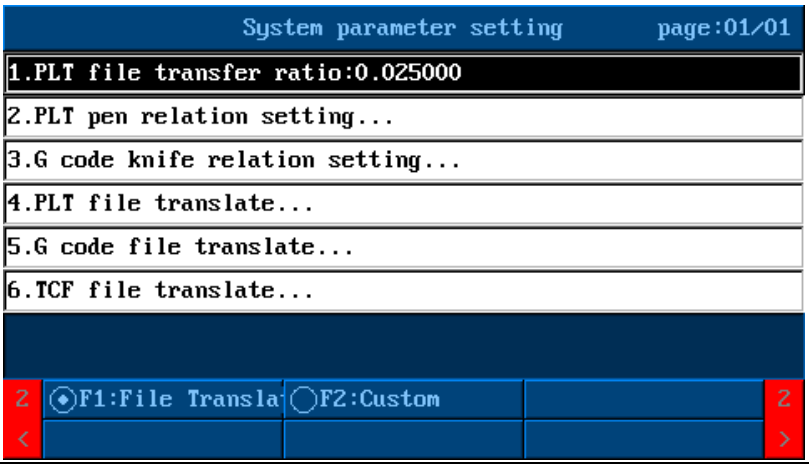
Parameter	Description
Other parameters	1) Cycle processing interval: Waiting time after processing a product 2) Number of cycle processing files: The number of processing files for connection processing (file numbers must be connected) 3) Cycle processing start file number: The file number of the first file processed

	continuously 4) Power-on automatic reset interval: Delay a period of timebefore automatic resettingafter the controller is powered on. If the parameter is set to a negative value, automatic resettingwill not be performed 5) Automatic reset interval times: After products are processed, the motor is automatically reset to eliminate the accumulated error 6) Origin detection before operation 7) Glue gun offset setting: The relative position of the eight glue guns is deviated. This function is used to set the position deviation 8) USB update remote program: Place a file named “motion” in the root directory of the USB flash drive, and place the controller application “A9Rom.bin”. The update step can be completed according to the prompt of the handheld box. Controller programs, scripts, and motion libraries can be updated 9) Save current processing file parameters as default: Save as the default value of new files 10) Backup current system parameters: Backup current system parameters

8.07 File conversion

1. ->In handheld box system parameter interface -> Press  and [ File conversion] ->

 enter parameter ->

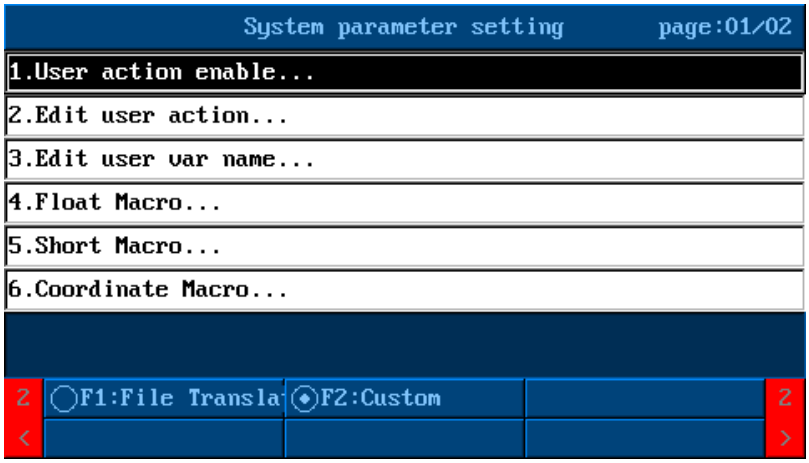


Parameter	Description
File conversion related parameters	1) PLT file conversion ratio: Since the coordinate unit of the PLT file is inconsistent with the coordinate unit of the processing file, it needs to be multiplied by the conversion ratio to correct; the specific value is related to the setting of the software that generates the PLT file 2) PLT gun and pen correspondence setting: The pen of each color in the PLT

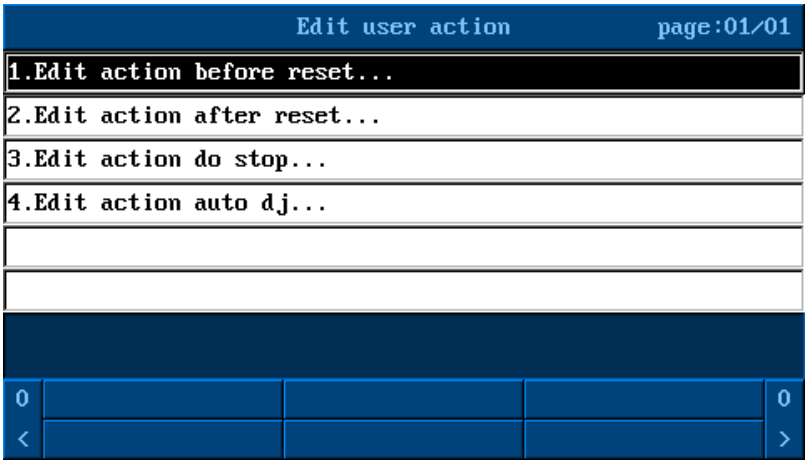
	file corresponds to a pen number, and there are eight glue guns (1-8) in the processing file. This function is used to set the correspondence between pen number and the glue gun number 3) G code knife and pen correspondence setting: set the correspondence between the knife number of the G code and the glue gun 4) PLT file conversion: Convert PLT file to processing file 5) G code file conversion: Convert G code file to processing file 6) TCF file conversion: Convert TCF file to processing file

8.08 Custom functions

1. ->In handheld box system parameter interface -> Press  and then press [ Custom function] ->  Enter parameters ->



2. Custom actions include emergency stop action and automatic dispensing action before and after resetting. After editing and enabling the action, the following editing actions are performed when these actions are executed.



3. The script editor can also be used to edit scripts directly on the handheld box.

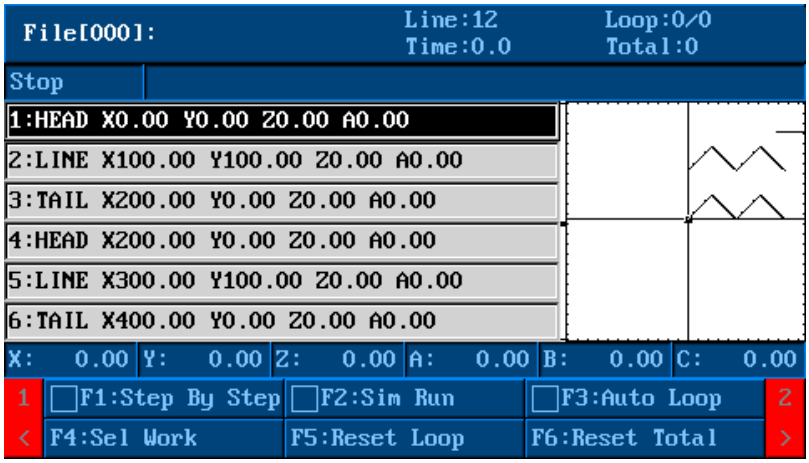
Parameter	Description
Custom Functions	1) Custom action enable: Enable custom actions 2) Custom action editing: Editable actions include actions before and after resetting, emergency stop action and automatic dispensing action 3) Custom variable name: define variable name 4) Floating-point macro variable: This function can be used to set the floating-point macro variable used by the script when using the script (DJ904V1-A01, DJ904V2-A01 models do not support this function) 5) Floating-point macro variable: This function can be used to set the floating-point macro variable used by the script when using the script(DJ904V1-A01, DJ904V2-A01 models do not support this function) 6) Short integer macro variable: This function can be used to set the short integer macro variable used by the script when using the script(DJ904V1-A01, DJ904V2-A01 models do not support this function) 7) Coordinate type macro variable: This function can be used to set the coordinate type macro variable used by the script when using the script(DJ904V1-A01, DJ904V2-A01 models do not support this function) 8) Script editing interface setting: Set script editing parameters(DJ904V1-A01, DJ904V2-A01 models do not support this function) 9) Script editor: Editable script(DJ904V1-A01, DJ904V2-A01 models do not support this function) 10) Reload the script(DJ904V1-A01, DJ904V2-A01 models do not support this function)

Chapter 9
Monitoring Operation

We have already completed the reset setting, dispensing path editing, system setting, and file parameter setting. The next is the monitoring operation, which is to observe the actual motion effect.

1. -> Press [Monitor/Edit] 

button on the handheld box -> enter the monitoring interface (gray background;press again if it isn't the monitoring interface) ->



Parameter	Description
File number	"File[000]" indicates that current file number is 0
Processing time	Display the time taken by the current program to complete processing
Error code	Current error message "err=21". For details, please refer to the appendix "List of Error Codes"
Batch production	The number in front of "/" indicates the number of products that have been processed, and the number after "/" indicates the number of planned production
Total production	Display the current total processing
Total number of lines	Display the current number of file instructions
Prompt message	The content includes the current working status and system error prompts. The current working status includes "Run", "Stop", "Pause", "Reset", "Cycle" and "Dispense"
F1 single step processing	Select to enable single-step machining mode. In this mode, only one programming point is run each time the start button is pressed
F2 simulation run	Do not open the glue after selecting
F3 cycle processing	Select to enable cycle processing mode; the number of cycles needs to

	beset in the file parameters
F4 position switch	Press to switch the left and right positions; take effect in dual position system
F5 batch production clear	Press to clear the batch output value from the cycle processing
F6 total production clear	Press to clear the current total processing output
F1 specified point processing	Set processing range

Chapter 10

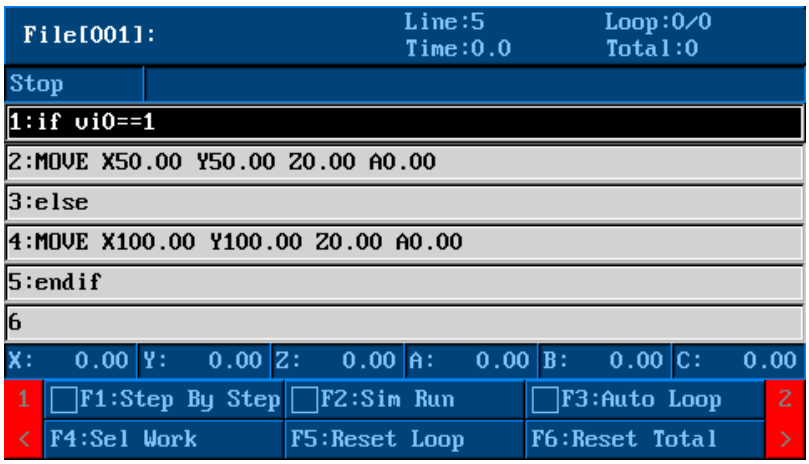
Common Functional Operation Guidelines

1.IF instruction set

If instruction is similar to the if in C language.Different branch operations can be performed according to the conditions.

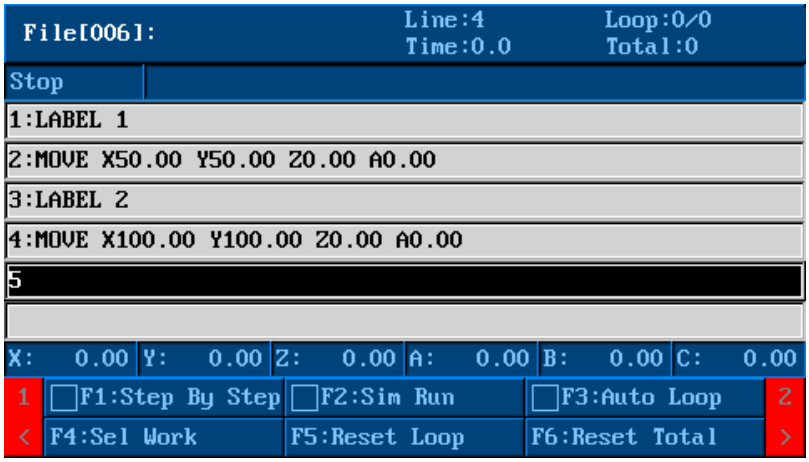
Add endif to the end of if instruction to end the if operation.

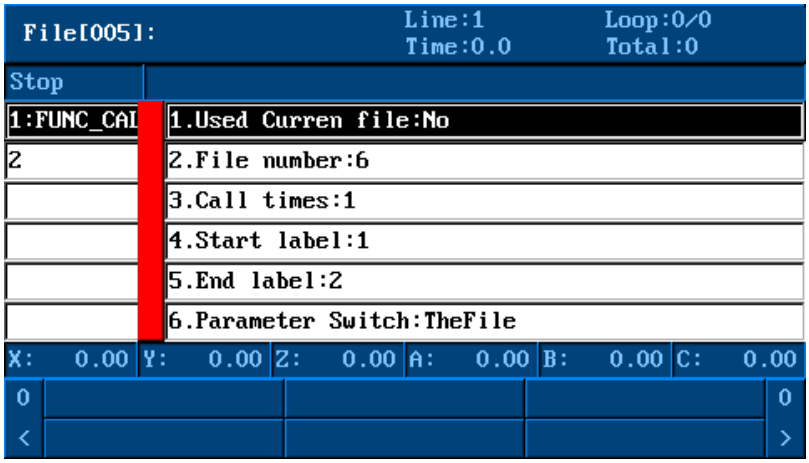
Variables include: Input (vixx, representing the state of the xxth input port, read only), output (voxx, representing the state of the xxth output port, read only), global variables (vxx, a certain number of variables definedin the system, used to store data, participate in calculations, etc.), logical position (vcxx, corresponding to the logical position of the xx axis, read only, unit: mm), actual position (vbxx, corresponding to the actual position of the xx axis,read only, not used yet)



2.Program call

The following figure shows file number 6, which defines the label 1, 2.

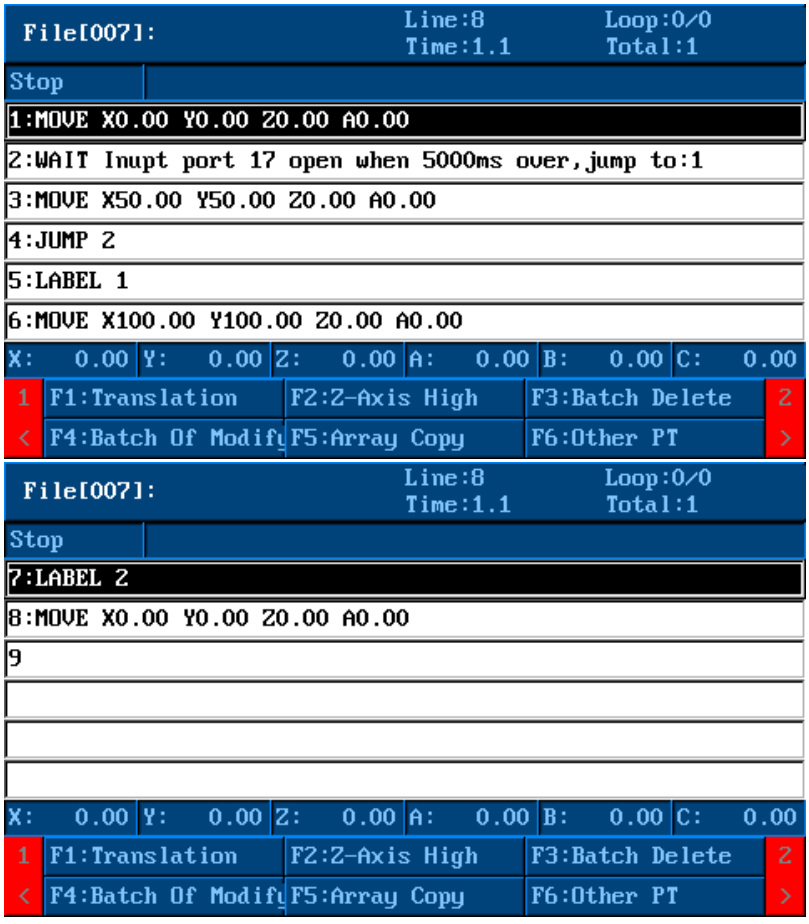




When the program is called, the entire file is called if the start and end labels are not set. If the start and end labels are set, the program between the labels is called.

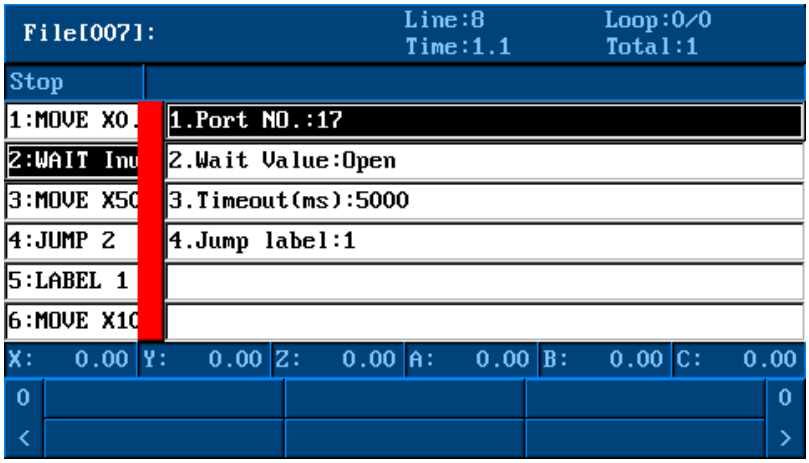
3.Wait input

Wait input can make different actions depending on input conditions:



In the above figure, execute the first straight line when there is input, or else execute the second straight line

Wait input settings are as follows:

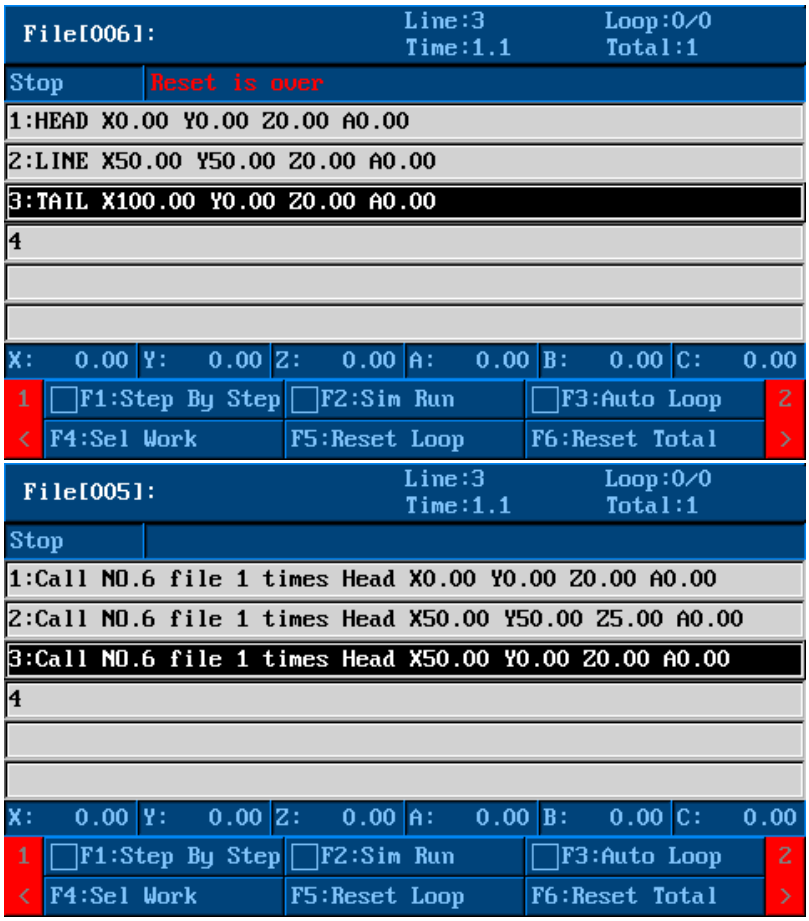


Different actions can be made according to input conditions by defining different tags and making different jumps in different situations.

4.File call

Note when using file call

The starting point set in the file call parameter will offset the called file to the set starting point



As shown in the above figure, the first file call will go to file number 6 at 0,0,0, and the second will go to file number 6 at 50,50,5...

The starting point of the file call setting is similar to the graphic translation operation.

5.Automatic needlealignment

1. Set needle alignmentparameters

Enter system parameters - other parameters – autoalignment, andset the following parameters:

Needlealignmentscanning timeout: (scanningtime,needlealignment will fail ifno signal is sensed atscanningtime; generally set to 30 seconds

Needlealignmentscanningdistance: (the maximum value is 10 to prevent the sensor from being damaged, so the fixed position should be as close as possible to the middle of the sensor, but not within the sensor range)

Induction level of needle alignment sensor: Refers to the input level when the sensor does not sense the object

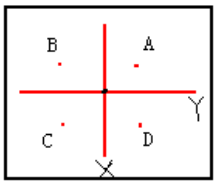
Whether use autoalignment: (default is no; if it is used, change to yes)

Needlealignmentscanningspeed: (default is 1mm/s, which can be set according to the actual situation; do not set it too large, so as not to the speed too fast)

Needle alignmentstep distance/needlealignment Z-axis drop distance: According to the accuracy requirements, if the step size is small, the needle scanning timeout should be set larger, and the drop distance should be0.1~0.5mm higher than the lift distance

Needle alignmentmode: Mode 1: Through the X sensor signal, roughly find the Z highest point, home, find the X, Y midpoint, and reset. Mode 2: directly find the X, Y midpoint, find the Z highest point, and reset

Needlealignment fixed position setting: Set the fixed initial scanning position for needlealignment. The fixed initial scanning position is generally set in the A point area, as shown in the figure below. In the figure, X and Y indicate the sensing signals of the X and Y axes. The needle should be below the sensing line, but not too deep, or else the needle will time out and cause a failure.



Needlealignmentscanning distance, if there is still a sensor signal at this time, it will prompt the needlealignment failure, so the Z axis fixed position should not be too low.

Needlealignmentstatus: The coordinates of the automatic matching point are displayed after the needle is successfully aligned, and display not setif thealignment is unsuccessful.

2. Setting port

System parameters - input port, configure X, Y sensor signal and needle alignment start port input port

Automatic needle alignmentstart port: Set this option if external button control is used; use “positioning” directly in the machining interface if it isn’tneeded.

6.USBflash drive parameters, file backup

First insert the USB flash drive into the handheld box, enter the file management by pressing the file manage on the handheld box, and press the right button next to F1-F6 in the file

management to enter the second page. Press F3 again to enter the file operation. Enter the interface shown in Figure 1-1.

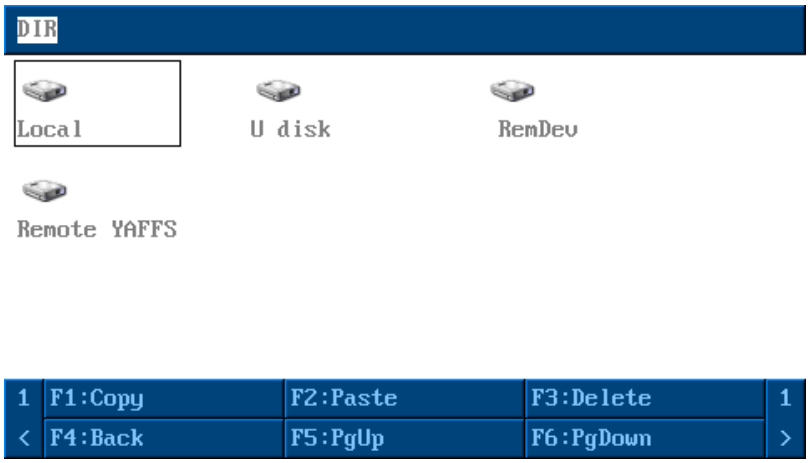


Figure 1-1

Press the up, down, left and right buttons in the lower right corner of the handheld box to move, select the controller flash, and press the Enter button. Enter the controller flash interface as shown in Figure 1-2:

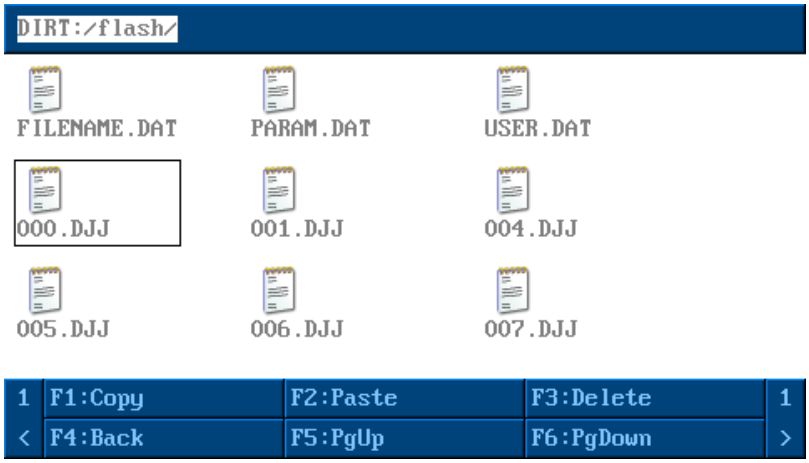


Figure 1-2

Move by pressing the up, down, left and right buttons in the lower right corner of the handheld box, select a file (as shown), and press F1 to copy. The copy is successful if there is a sound when F1 is pressed. Then press F4 to return to the interface of Figure 1-1. Then move by pressing the up, down, left and right buttons in the lower right corner of the handheld box to select removable disk. Press the Enter button to enter the interface of the USB flash drive. Press F2 again to paste. This will copy the files to the USB flash drive (only one file can be copied at a time).

Then copy these files from the USB flash drive to another controller:

First insert the copied file USB flash drive into the handheld box connected to the controller to be pasted. Press File Manage -> press the right button next to F1-F6, and then press F4 to enter the file operation and return to the interface of Figure 1-1. Move by pressing the up,

down, left and right buttons in the lower right corner of the handheld box to select removable disk. Press the Enterbutton to enter the USB flash drive interface 1-3:

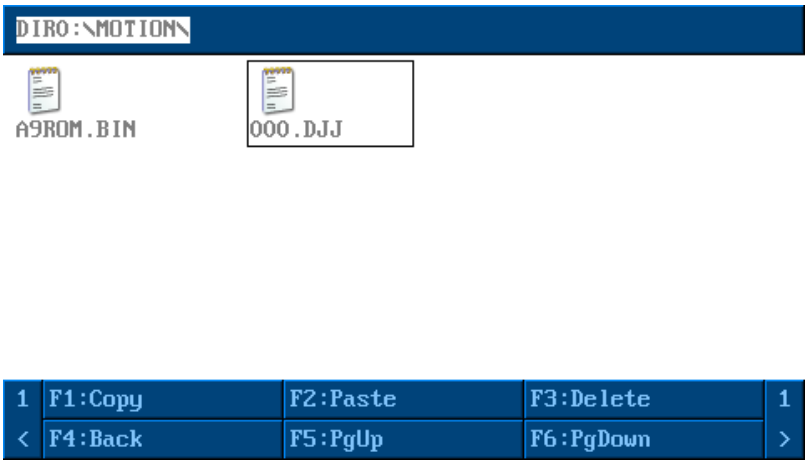


Figure 1-3

Select the file you just copied by moving the up, down, left and right buttons in the lower right corner of the handheld box. Then press F4 again to return to the interface of Figure 1-1. Move by pressing the up, down, left and right buttons in the lower right corner of the handheld box, select the controller flash, and press the Enter button to enter the controller flash folder. Paste by pressing F2; overwrite if the file already exists.

The controller needs to be restarted after the copy is complete.

7.Glue gun offset function

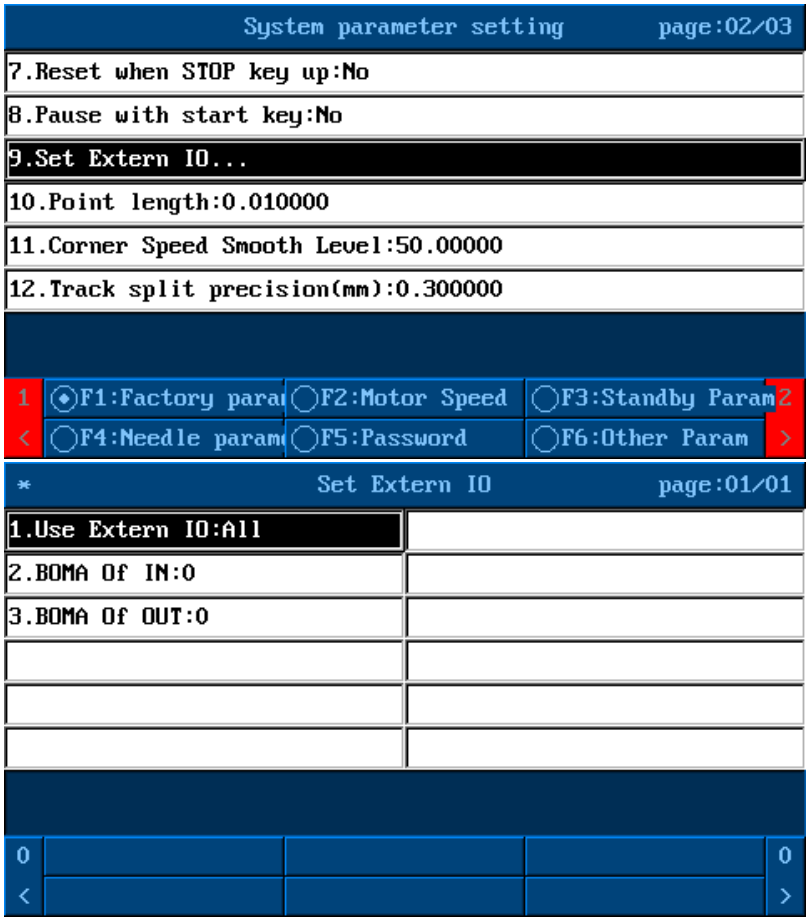
In system parameters - system parameters, set the offset position of the corresponding glue gun and the reference point, and then trigger the glue gun offset function by selecting the glue gun command during file editing (select the corresponding glue gun, and thenapply the offset value and the reference point difference to the machining point)

8.Cycle processing function

Set the corresponding cycle processing times in File parameters - Other parameters (0 means infinite loop), then select cycle processing on the main interface, and then the next processing will trigger cycle processing function, which can be matched with System parameters - Other parameters - Automatically reset interval times

9.Extended IO function

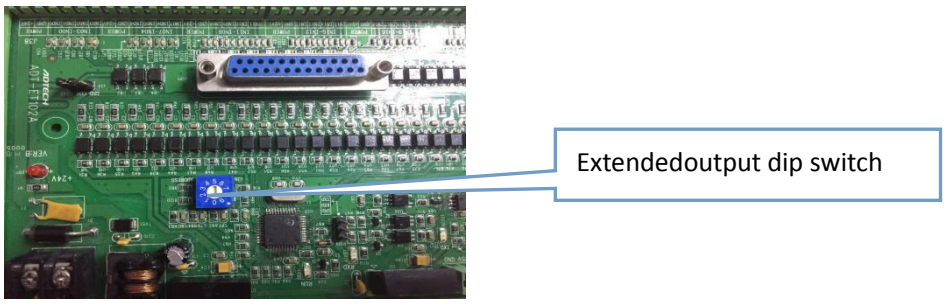
Parameter setting: System parameters - Factory parameters:



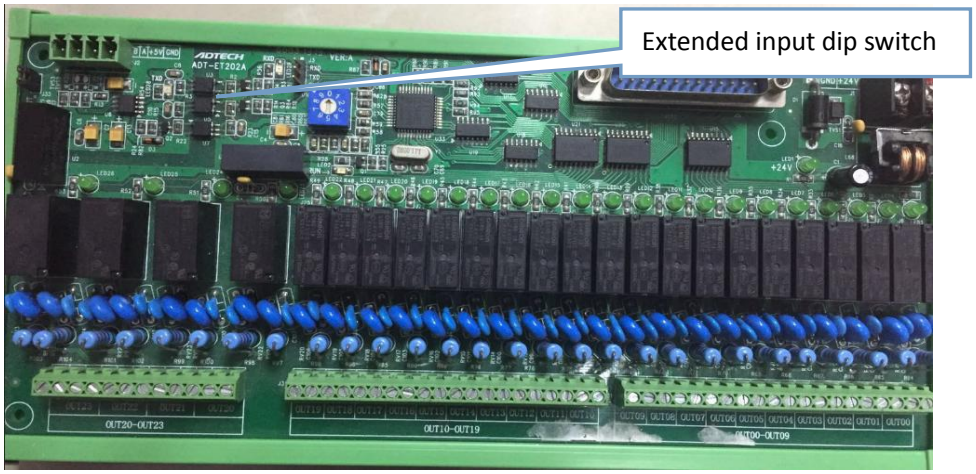
Whether to use extended IO: Whether touse extended input, output, or both

Input /outputDIP switch: judge the DIPnumber on the hardware

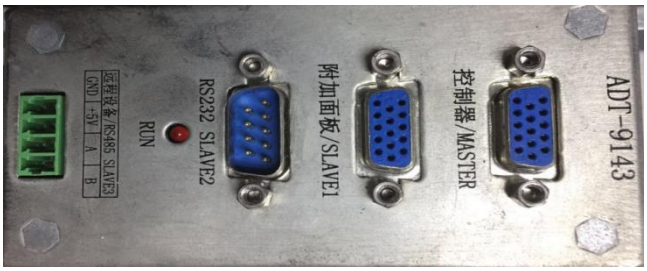
The actual object is as follows: (output is ADT-ET102A, input is ADT-ET202A, 232-to-485 is ADT-9143)



ADT-ET102A

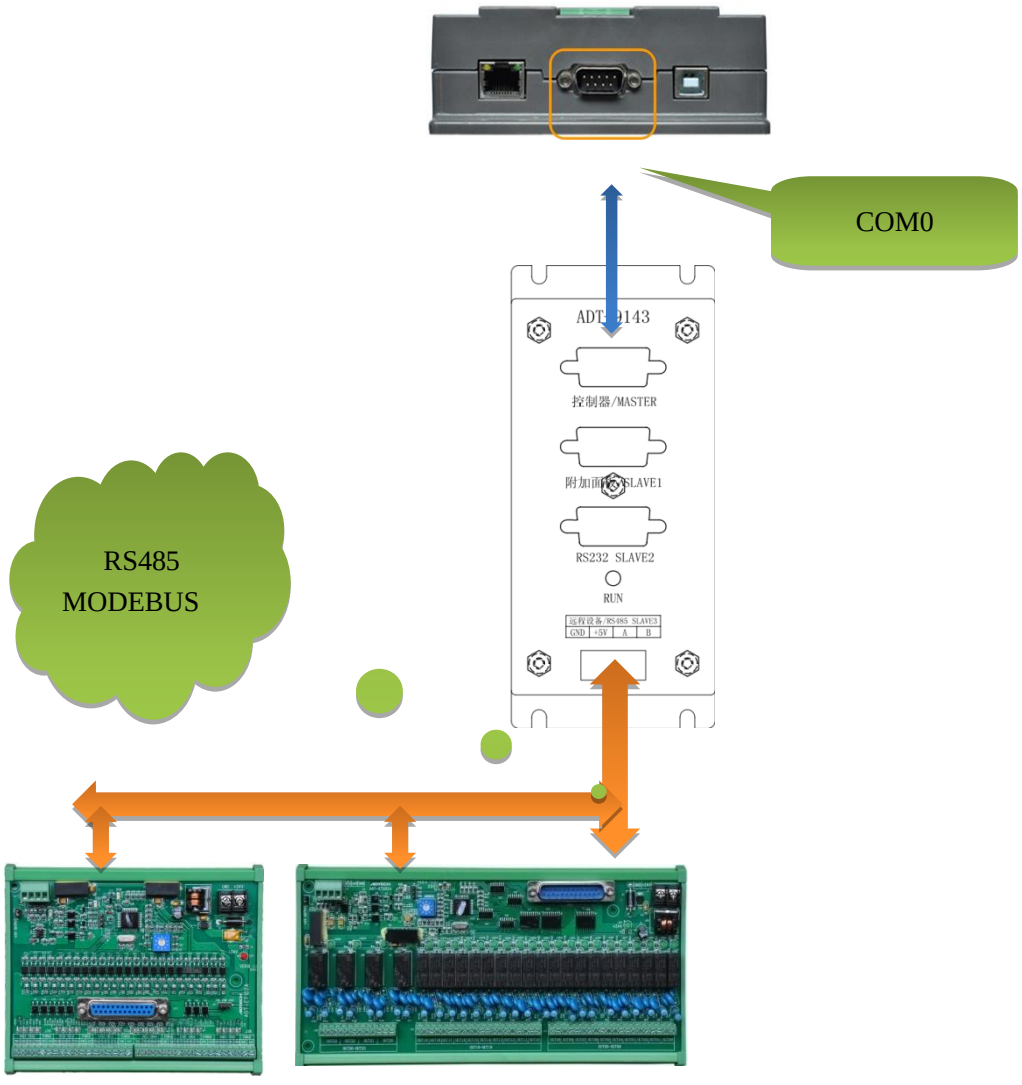


ADT-ET202A



ADT-9143

The cable connections of 8849, 1600 and ADT-9143 are defined as follows



ADT-9143 (DB15 needle,3 pins)		Connection	8860(DB9 female)	
Pin	Function		Function	Pin
1	GND	⟷	GND	5
2	RXD	⟷	TXD	2
3	TXD	⟷	RXD	3
15	VCC (5.0V)	⟷	VCC(5.0V)	8(or 7)

10.Transition arc instruction

New instruction: transition arc instruction[Edit status - Other instructions--- Transition arc]

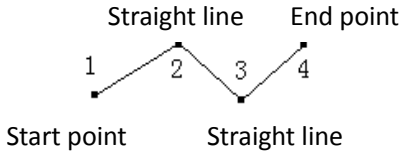
Parameters:

1. Transition speed mode: follow, custom [follow: follow the track speed to make the corner; custom: use the set speed]
2. Transition speed: Custom corner speed
3. Transition error: Custom corner angle

Function: Customized automatic fillet operation for the next corner

Eg:

1.

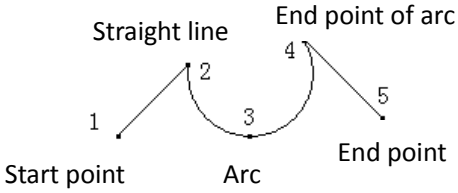


The track is: Start point - straight line - straight line - end point

If a custom fillet is added to the corner of “3”, the instruction becomes:

Start point - transition arc - straight line - straight line - end point

2.



Track: Start point - straight line - arc - end point of arc - end point

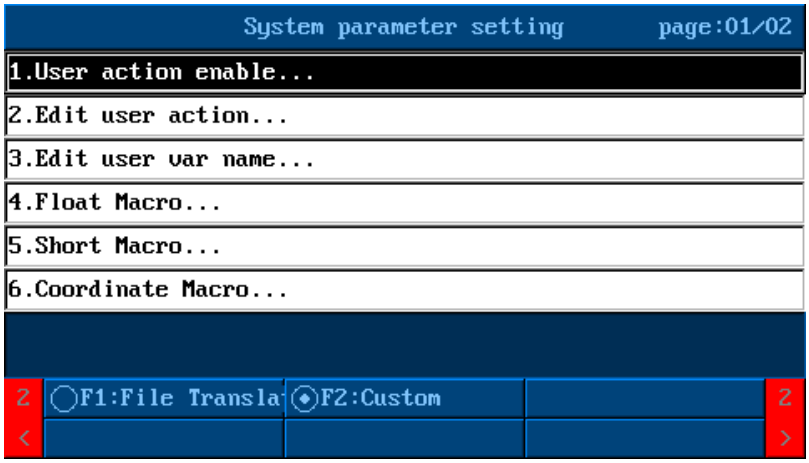
If a custom fillet is added to the corner of “4”,the instructionbecomes:

Start point - straight line - arc - transition arc - end point of arc - end point

11.Settings of script custom address content

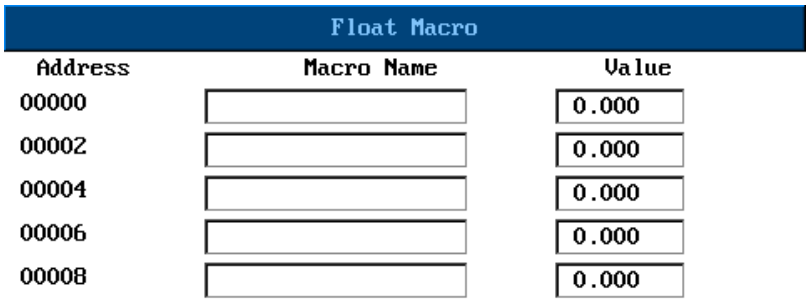
Function: Cooperate with script to develop non-standard items (requires custom variables)

Location: System settings - Custom functions:



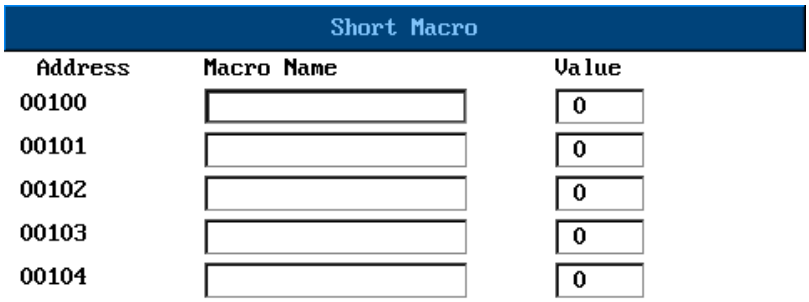
After entering, you can find the following three directories:

Floating point variable:



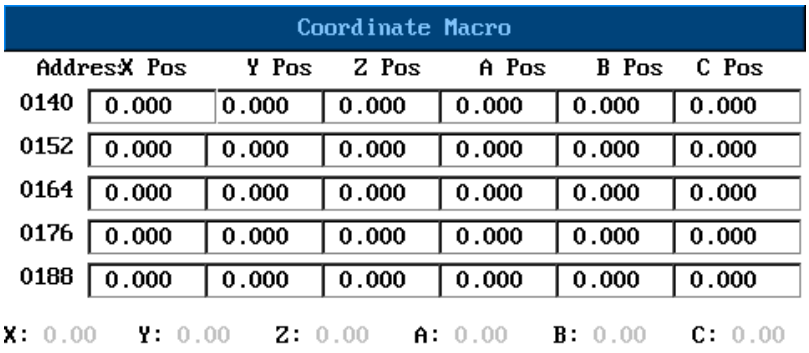
The first column is the corresponding system parameter, the user-defined floating-point variable address; the second column allows naming your variable; the third column is the value of the variable at the corresponding address. Each variable occupies 2 addresses

Short integer variable



The first column is the corresponding system parameter, the user-defined short integer variable address; the second column allows naming your variable; the third column is the value of the variable at the corresponding address. Each variable occupies 1 address

Coordinate variable



The first column is the corresponding system parameter, the user-defined coordinate start address (the address saved by the X coordinate); other columns represent the coordinates corresponding to each axis, and support the teaching and modification functions.

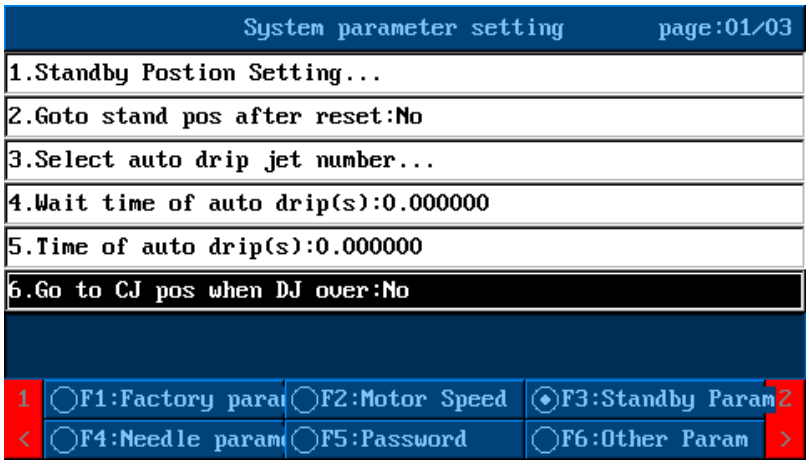
12.Boot interface logo production

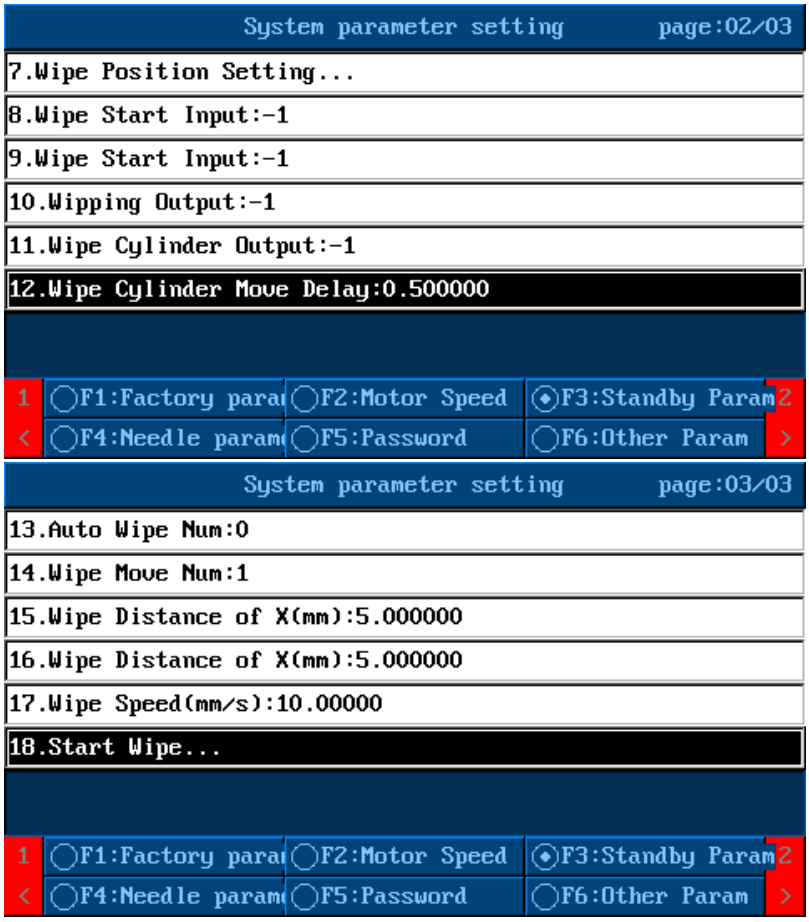
You can create a24-bit picturewith 480*272 pixels and a resolution at least 96 with the “Brush” program of Windows. The boot screen is named “logo.bmp” and is placed in the TV5600B01 handheld box disk under the “ADT\” directory.

13.Wiping function operation

Function: Clean and wipe glue gun, two modes: 1. Wipe:wipe glue by XY movement; 2. Custom: after reaching the position, output in-place signal to wipeglue [for cylinder, PLC wiping]; can be set by parameters

Parameter position: System settings - Standby parameters:





a) Wipe after dispensing: Automatically start wipingwhen the dispensingis finished
b) Wipingposition: The initial position of wiping(cleaning)
c) Wipingstart input signal: Corresponding input signal configuration of external start and PLC start
d) Wipingend input signal: Input signal of custom wipingend
e) Wipingrunning status output signal: Output signal of wipingrunning
f) Wipingin-place output signal: Output port to wipingposition [configure this port to determine the wiping mode used; initial setting is -1; if the port is configured, the custom wipingmodeis used]
g) Auto wipinginterval times: The times of processing before the wipingis performed automatically [0 indicate that the process will not automatically trigger wiping]
h) Number of wipingactions: The times of action repeatedin XY directionwhen wiping
i) Wiping in-place output time: Response time when customizing wiping
j) Wiping movement distance in X direction: X movement distance when wiping
k) Wiping movement distance inY direction: Y movement distance when wiping
l) Wiping speed: Speed of XY movement when wiping
m) Start wiping: Trigger wiping actionon the hand-held box, used for debugging

Chapter 11

Common fault analysis

Common faults and solutions are as follows:

1) After the system is powered on, the normal status is that the Power indicator is always on, and LED0 of ADT-8849 flashes normally. If not, the program is abnormal or the software in the controller is not started.

2) If the controller displays “Failed to load systemparameters =-27”after powering on, it means that the controller is not connected to the handheld box or the controller does not match the handheld box program. Please check the software version and check if the wiring is secure. If the cable is damaged, please contact the supplier.

3) If the motor only runs in one direction when it is manually rotated, the direction line of the motor may not be connected. Please check the line.

4) If the motor does not runbut the coordinates of the “machining interface” have changed, it indicates that there is a problem with the motor line. Please check the line.

5) If the system reset fails, please determine if the reset signal exists and whether the high and low levels are set correctly.

6) If the system reset fails, reduce the reset acceleration time and increase the reset low speed.

7) If the reset direction is incorrect when the system is reset, set the reset direction in the motor feature parameter.

8) If the idle travel jitter is too large or the motor is out of step when the system is processing, reduce the idle travel acceleration in the system parameters -> motor parameters

9) If the jitter is too large or the motor is out of step when the system is traversing, reduce the track acceleration in the file parameters.

Appendix 1: List of System Error Code Definitions

Error code	Error message	Error code	Error message
15	Straight line instruction error	51	Error in getting the file number of the current instruction
16	Arc instruction error	52	Number of called files exceeds the upper limit
17	Ellipse instruction error	53	File loading error
18	No end instruction	54	Label redefinition
19	No start point instruction	55	Unknown error
20	Arc instruction lacks arc end point	56	Instruction out of range
21	Ellipse instruction lacks ellipse end point	128	Real time clock failure
22	Arc instruction can’t form an arc	129	Emergency stop button pressed
23	Ellipse instruction error	130	Trial period expires
24	Abnormal stop	131	Incorrect parameter setting
25	Too few spline points	132	Alarm input valid
32	X axis exceeds forward travel	133	Update program error
33	Y axis exceeds forward travel	144	Xaxis positive limit
34	Z axis exceeds forward travel	145	Yaxis positive limit
35	A axis exceeds forward travel	146	Zaxis positive limit
36	B axis exceeds forward travel	147	Aaxis positive limit
37	C axis exceeds forward travel	148	Baxis positive limit
40	X axis exceeds negative travel	149	Caxis positive limit
41	Y axis exceeds negative travel	152	Xaxis negative limit
42	Z axis exceeds negative travel	153	Yaxis negative limit
43	A axis exceeds negative travel	154	Zaxis negative limit
44	B axis exceeds negative travel	155	Aaxis negative limit
45	C axis exceeds negative travel	156	Baxis negative limit
48	Error in getting the current instruction tag address	157	Caxis negative limit
49	Number of defined tags exceeds the upper limit	160	Processing file loading error
50	Coordinate system number exceeds the maximum number	161	LUA script error

Appendix II: List of Processing Instructions

Instruction ID	Instructionname	Function
1	Start point	Other axes except the Z axis are first set to the start position, then the Z axis is lowered to the start position and the valve is opened 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above 6) Delayopening mode: By default, the delayopening time in the file parameter is used, or else the time set below is used 7) Delayopening time: Use this time when the delay opening mode is in delay mode, or else this value is meaningless 8) Advance opening time: Use this time when the delay opening mode is in advance mode, or elsethis value is meaningless
2	End point	After XYZ moves to the end point, the valve is closed and the Z axis is lifted to the needle height 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above 6) Use default advance closing distance: Select Yes to use the advanceclosing distance gun file parameters, and select Noto use the following advanceclosingdistance 7) Advance closingdistance: This value is meaningful when the default value is not used as above 8) Default needle height: Select Yes to use the needle height in the file parameters, and select No to use the needle height below 9) Needle height: This value is meaningful when the default value is not used as above
3	Straight line	XYZ moves to the specified position by linear interpolation, and other axes follow the movement to the specified position 1) XYZABC coordinates: Coordinates of each axis

		2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above
4	Single point	Other axes except the Z axis are first set to the single point position, then the Z axis is lowered to the start position and the valve is opened. Afterdelaying the specified dispensing time, the valve is closed, and the Z axis is lifted to the needle height 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above 6) Delay opening mode: By default, the delay opening time in the file parameter is used, or else the time set below is used 7) Delay opening time: Use this time when the delay opening mode is in delay mode, or else this value is meaningless 8) Advance opening time: Use this time when the delay opening mode is in advance mode, or else this value is meaningless 9) Default needle height: Select Yes to use the needle height in the file parameters, and select No to use the needle height below 10) Needle height: This value is meaningful when the default value is not used as above 11) Default single point time: select Yes to use single point time in file parameters, or else use the following single point time 12) Single point time: This value is meaningful when the default value is not used as above
5	Clockwise arc	XYZ moves to the specified position in clockwise arc interpolation mode, and the arc radius and the end point coordinates need to be given.Other axes are synchronized to move to the specified position 1) Arc type: Arc size 2) Plane of the arc: Determine the arc interpolation axis 3) Arc radius 4) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
6	Inverse arc	XYZ moves to the specified position in clockwise arc interpolation mode, and the arc radius and the end point coordinates need to be given. Other axes are synchronized to move to the specified position

		1) Arc type: Arc size 2) Plane of the arc: Determine the arc interpolation axis 3) Arc radius 4) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
7	Arc	XYZ reaches the specified end point through a specified point by arc interpolation.Other axes follow the movement to the specified position 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
8	Full circle	XYZ returns to the start point through two specified points in arc interpolation.Other axes follow the movement to the specified position 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
9	End point of arc	Specify the end point coordinates of the three-point arc interpolation 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above
10	Clockwise ellipse	XYZ moves to the specified position in clockwise ellipse arc interpolation. It is necessary to give the long and short axis radiusof the ellipse, the coordinates of the circle center and the coordinates of the end point, and other axes follow the movement to the specified position 1) Plane of the ellipse: Ellipse interpolation axis 2) Circle center coordinate 1: The circle center coordinates of the 1st axis of the plane where the ellipse is located 3) Circle center coordinate 2: The circle center coordinates of the 2nd axis of the plane where the ellipse is located 4) Ellipse radius 1: Radius of the first axis of the ellipse plane 5) Ellipse radius 2: Radius of the second axis of the ellipse plane 6) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
11	Inverse ellipse	XYZ moves to the specified position in inverse ellipse arc interpolation. It is necessary to give the long and short axis radiusof the ellipse, the coordinates of the circle center and the coordinates of the end point, and other axes follow the movement to the specified position 1) Plane of the ellipse: Ellipse interpolation axis

		2) Circle center coordinate 1: The circle center coordinates of the 1st axis of the plane where the ellipse is located 3) Circle center coordinate 2: The circle center coordinates of the 2nd axis of the plane where the ellipse is located 4) Ellipse radius 1: Radius of the first axis of the ellipse plane 5) Ellipse radius 2: Radius of the second axis of the ellipse plane 6) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
12	End point of ellipse	Specify the end point coordinates of the ellipse 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above
13	Idle travel	Each axis moves to the specified position at the idle speed 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above
16	Spline	Move to the specified position by Bezier spline interpolation 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above
17	End point of spline	End point of the Bezier curve 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis participates in motion 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing 4) Use default speed: Select Yes to run at the speed set in the file parameter, or else use the speed set in speed ratio * file parameter 5) Speed ratio (%): This value is meaningful when the default value is not used as above

32	Motor reset	Reset the specified axis 1) Whether to reset XYZABC: Set the reset axis 2) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
48	Port output	Specified port outputs specified level 1. Port number: The port that controls the output 2. Output value: Open or close the port 3. Output time: The action completesafter the port outputs this time 4. Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
49	Wait for input	When the specified input port is at the specified level, the next action is performed. When it is an offline instruction, it can be specified to go to the specified label, and the waiting timeout can be set 1) Port number: The port waiting for input 2) Waiting value: High or low 3) Waiting time: The waiting time. 0 means infinite wait, non-zero means waiting for the time before going to the following label 4) Timeout go-tolabel: Go to this label after timeout 5) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
50	Delay	Delay specified time; 0 means to suspend processing until the start button is pressed again 1) Delay time: The initial delay time of this instruction 2) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
51	Select glue gun	Select the specified glue gun for processing 1) Select whether glue gun 1~8 is involved in dispensing 2) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
52	Glue gun control	Control the specified valve to open or close 1) Open or close the glue gun 2) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
128	Define label	Label to be used when calling or going to a program 1) Labelname: Define the name of the label 2) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
130	End processing	Stop instruction analysis and wait for all instructions to be executed
160	Set offset	Set the coordinate offset 1) XYZABC offset: Sets the offset of XYZABC axis increased by this instruction 2) XYZABC enable: Whether each axis participates in this offset 3) Whether the instruction is executed: Whether this programming point

		(processing instruction) is executed during processing
161	Increase offset	Set to a positive value to increase the offset and a negative value to decrease the offset 1) XYZABC offset: Set the increase or decrease of the offset of XYZABC axis 2) XYZABC enable: Whether each axis participates in this offset 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
162	Set reference point	The reference point is only used for marking and can't be used for positioning. 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis is valid 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
163	Set start point	Set the start point before the file call or subroutine call to start the movement from the set start point. To restore the original start point, cancel the start point setting with the "Cancel start point" instruction 1) XYZABC coordinates: Coordinates of each axis 2) XYZABC enable: Whether each axis is valid 3) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
224	Program call	Call the program between two labels and set the number of calls 1) Whether to call this file: Select to callthe file label, or else call the following file label 2) Call file number: This file number is meaningful when the above option is No 3) Number of calls: The number of times the two labels are called directly to execute the program 4) Start label: The program startsexecutionafter callingthis label 5) End label: The program ends after executing this label 6) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
225	File call	Calls the program between the two labels of the specified file. If the labelis not specified, the entire file is called. The number of calls can be set.
226	Go-to label	Go to the specified label 1) Label name: The program goes to this labelname 2) Whether the instruction is executed: Whether this programming point (processing instruction) is executed during processing
64-95	User-defined instructions	The instructions in this scope are open to the customers. When executed, the corresponding script function is called. The name is fixed to command_xxx and check_command_xxx. xxx represents the id value of the instruction. For details, see the *OMC Series Development Manual*. Instructions within this range allow teaching and positioning

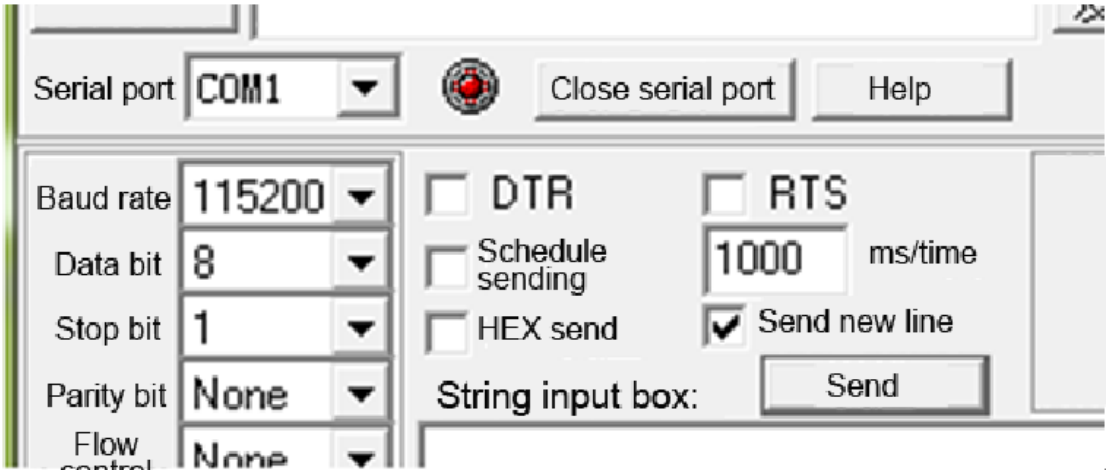
96-127	User-defined instructions	The instructions in this scope are open to the customers. When executed, the corresponding script function is called. The name is fixed to command_xxx and check_command_xxx. xxx represents the id value of the instruction. For details, see the *OMC Series Development Manual*. Instructions within this range don't allow teaching and positioning
80	CCD1	This isa new instruction to the visual dispensing system for mark1 shooting
81	CCD2	This isa new instruction to the visual dispensing system for mark2shootingmark2. Generally, for the accuracy of the visual positioning, we use two mark points for positioning, and this instruction is the shooting instruction of the second mark point, and the processing will be offset after this instruction is executed
96	Matrix function	This isa new instruction to the visual dispensing system and works with the end of the matrix First type: The number of XY groups is greater than 1, the program will copy the matrix and the MARK point, and the CCD shooting instruction will be executed before correctingthe processing points. The MARK point corresponding to the first template needs to be set. Second type: The number of XY groups is less than or equal to 1, and there may be multiple CCD shooting instructions. The program will only extract the CCD shooting instructionto run preferentially before correcting the processing points. The MARK point corresponding to the first template needs to be set.
227	Transition arc	Insert a transition arc in arc or straight line
228	Point macro	Execute the specified script after reaching the set point
229	Global variable assignment	Set a global variable and assign it a value
230	Go-to macro	Go to the corresponding label according to the return value
231	Macro	Execute scripts written by users
232	IF instruction set	Similar to the C language instruction; refer to Appendix VII for details

Appendix III: MCD904, ADT-8849 and AMC1600 Program Update Method

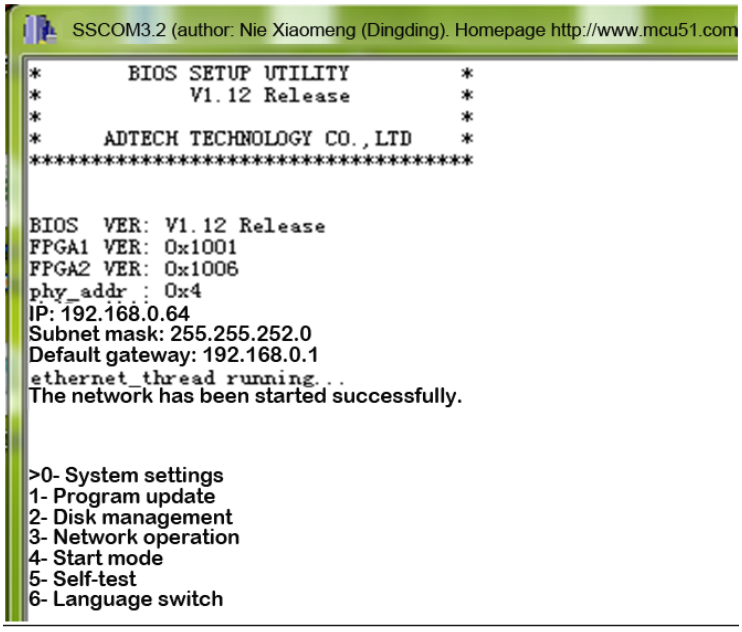
Tools: Crossover cable (T568B on one end, T568A on the other), 9-pin serial cable (pin 2 to 2, 3 to 3, 5 to 5), serial debugging tool, desktop or laptop PC (for laptop, provide USB-to-serial adapter and its driver) Note: first turn off the computer's firewall.

Update steps:

1. Connect network port and serial port to the computer and ADT8849 controller. Open the serial communication software on the computer, and set the baud rate and other parameters on the serial port as follows:

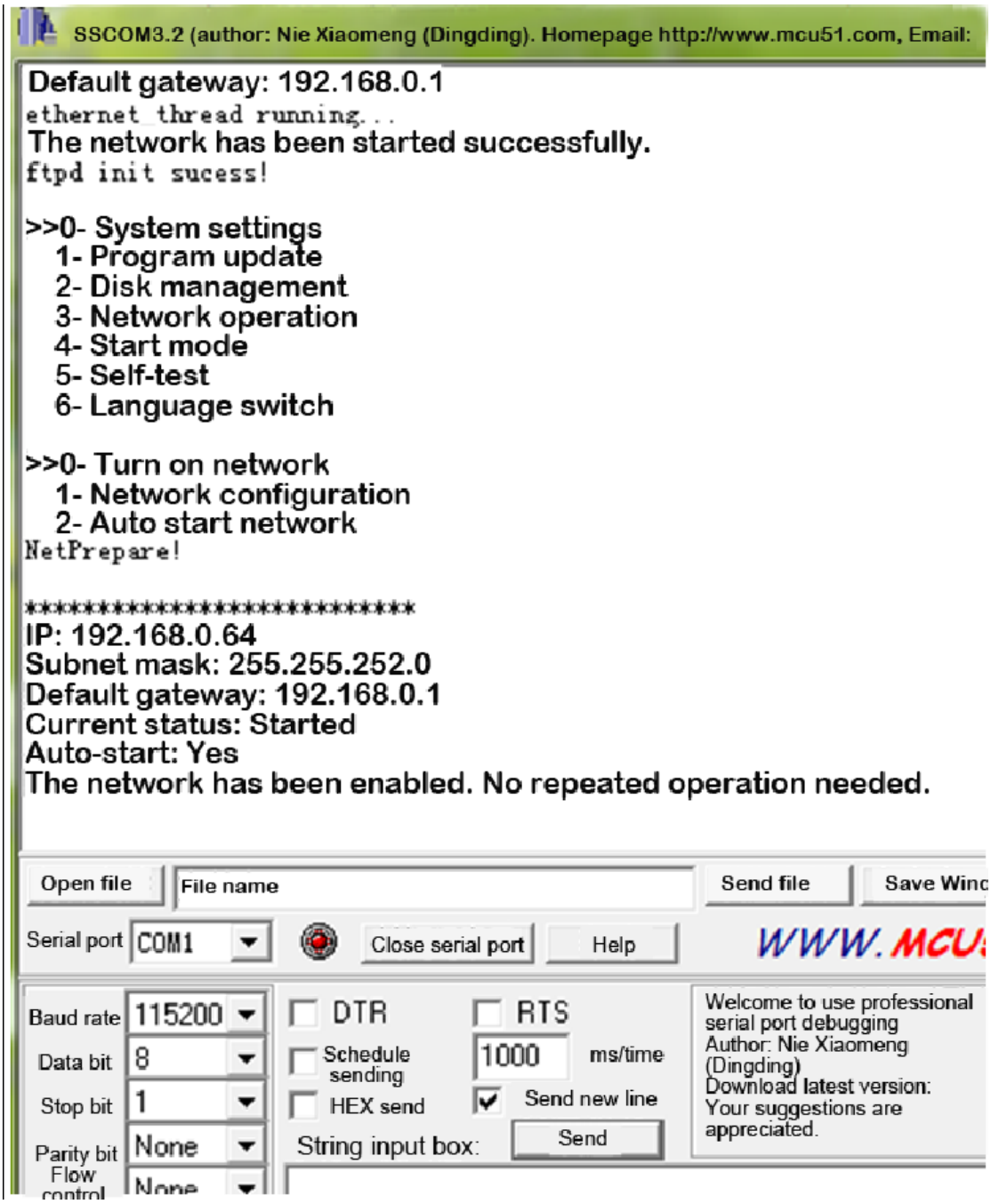


2. At power-on, press the "Esc" button on the computer keyboard repeatedly until the serial communication software displays a string of passwords. Release the button and enter 26722719 to enter the BIOS interface:

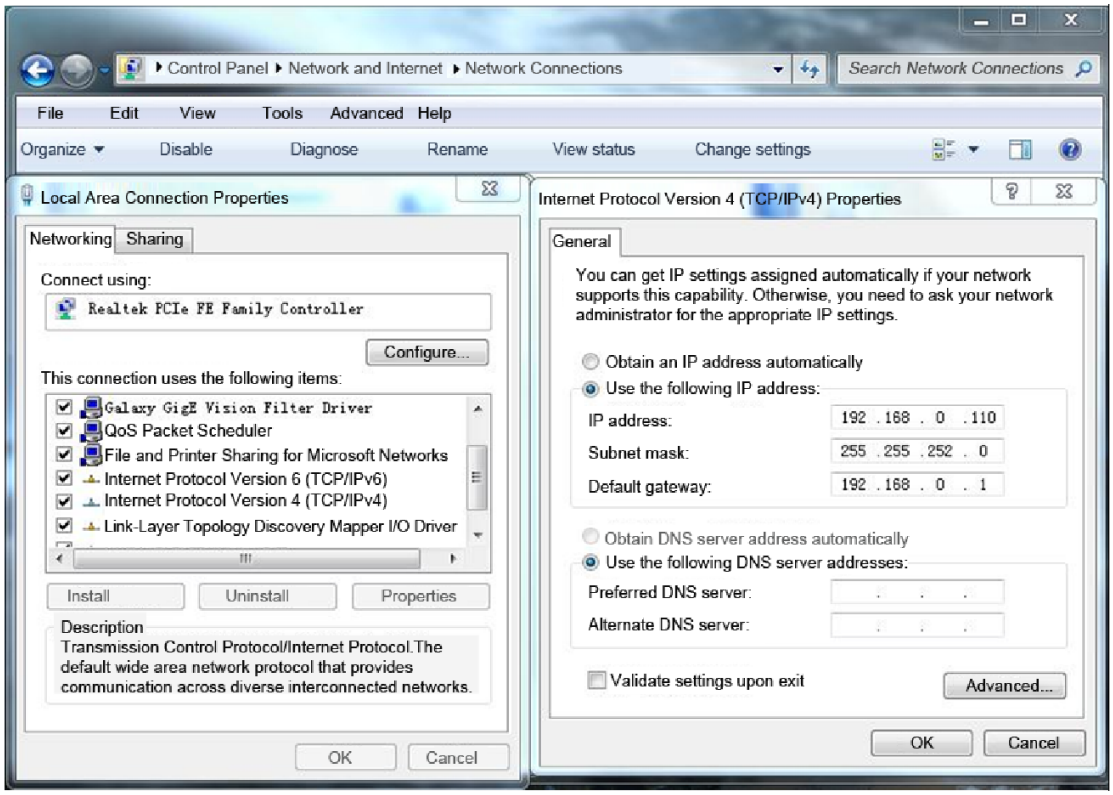


3. (Format selectable) Press the number “2” to enter the disk management. Press “1” to format all disk partitions, and press the “ESC” key to return to the previous menu after formatting.

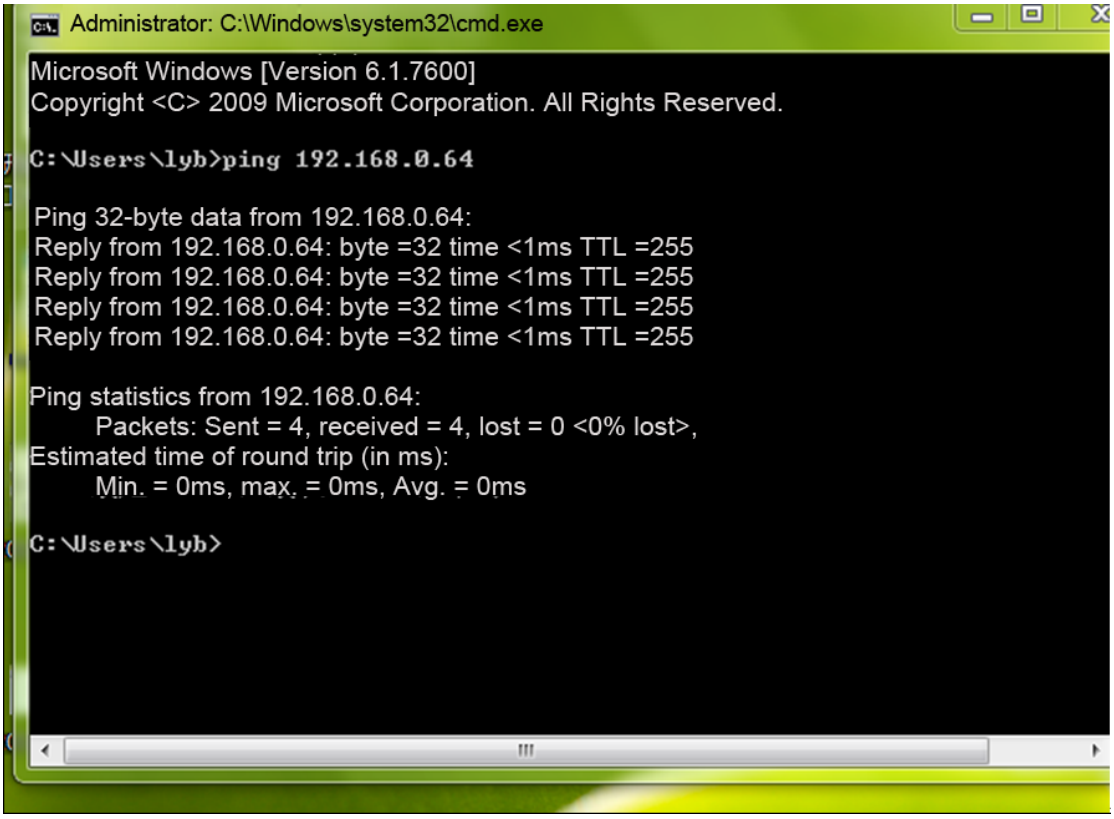
4. Press the button “3”and“0” to open the network port, as shown below:



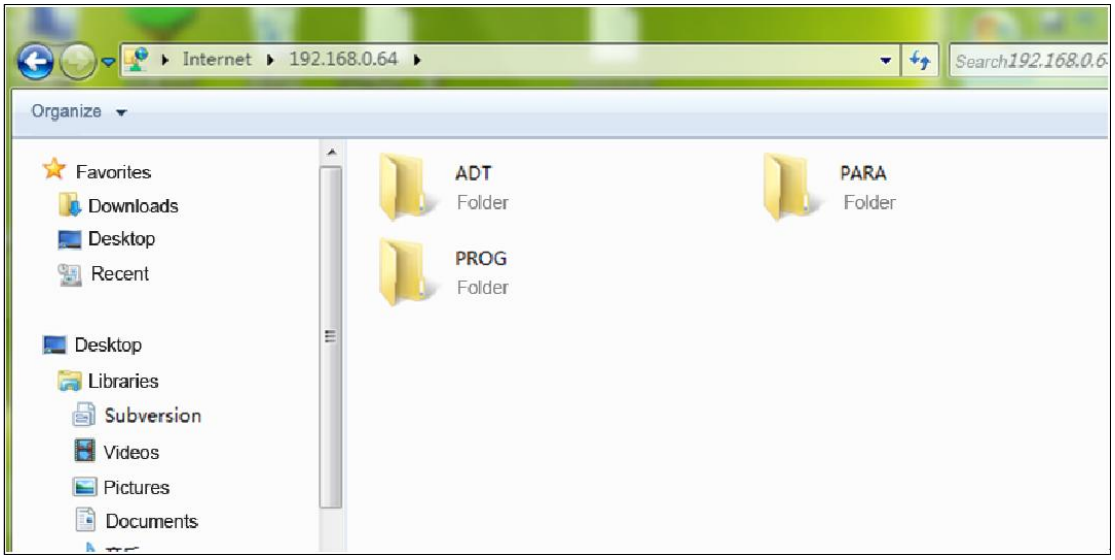
Through the serial port information, the IP of this ADT8849 is 192.168.0.64. The following operations are all based on this address. In order to enable the network port to communicate with the ADT8849 controller, we need to modify the IP of the computer and set the gateway to 192.168.0.1 and the subnet mask to 255.255.252.0.



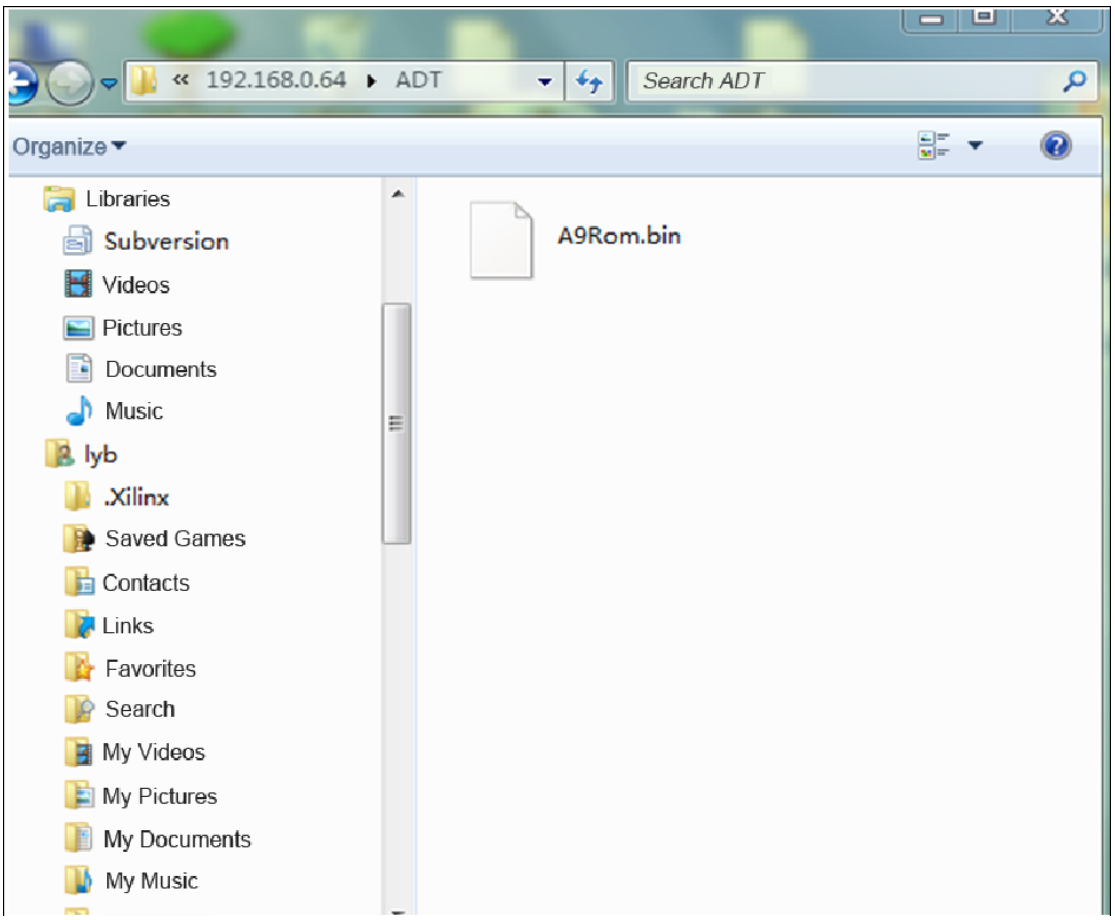
5. In order to ensure normal network ofthe computer and ADT8849 controller, open cmd (input: ping 192.168.0.64) and test whether it is connected to the glue controller; the following picture shows normal state:



6. After the network is connected, open “My Computer” on the desktop and enter the corresponding address (ftp://192.168.0.64) to show the following screen:

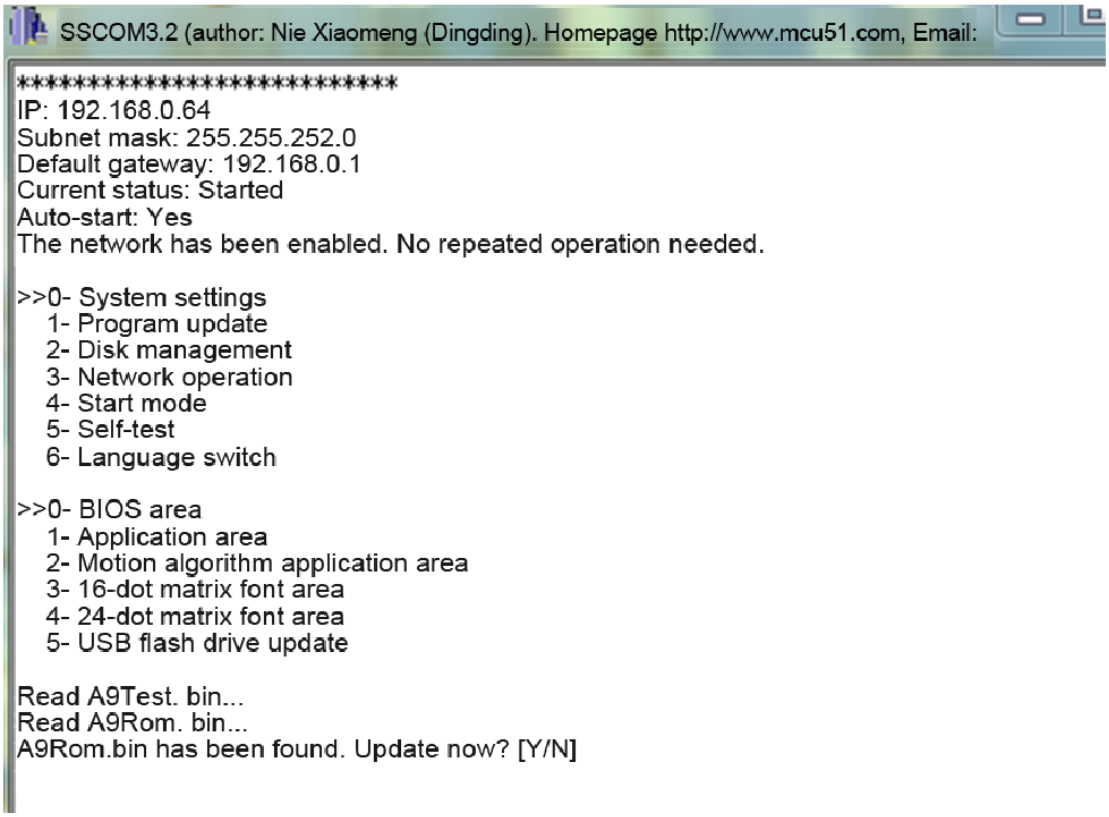


7. Open the “ADT”folder and find an A9Rom.bin file, then replace the file with the A9Rom.bin file in the motion folder in your client (if there is Motion.bin and A9Bios.bin in the motion folder, you need to update the motion algorithm program area and BIOS area, and put Motion.bin and A9Bios.bin in the “ADT” directory)



8. Return to the previous serial port software, press the “ESC” button to enter the previous interface, and then press “1” to enter the program update interface; the prompt will be as

follows:



9. If there is A9Bios.bin, you need to update the BIOS area.Press “0” to enter the BIOS area, and then press the “Y” key on the computer keyboard, waiting for the update to complete. Press “1” to enter the application area, and press the “Y” key on the computer keyboard toupdate the application, waiting for the update to complete. If there is Motion.bin, you need to update the motion algorithm program, press “2” to enter the motion algorithm program area, then press the “Y” key on the computer keyboard, wait for the update to complete, then power off and restart the controller.

Appendix IV: TV5600-B01 Handheld Box Program Update Method

Update TV5600-B01 via USB flash drive

1. Create a \ADT directory on the USB flash drive
2. Copy the client program (USERAPP.bin) of TV5600-B01 to the \ADT directory of the USB flash drive through the computer.
3. Insert the USB flash drive into the handheld box and turn on the power. Press the [Cancel/Back] button on the handheld box immediately to enter the BIOS interface.
4. Use the Up and Down key to select “E. Program Update” and press the [Enter] key in the upper left
5. Select “1. Update Application” and press the [Enter] key in the upper left to start the update.
6. Turn off the power and restart after update.
7. View version information:

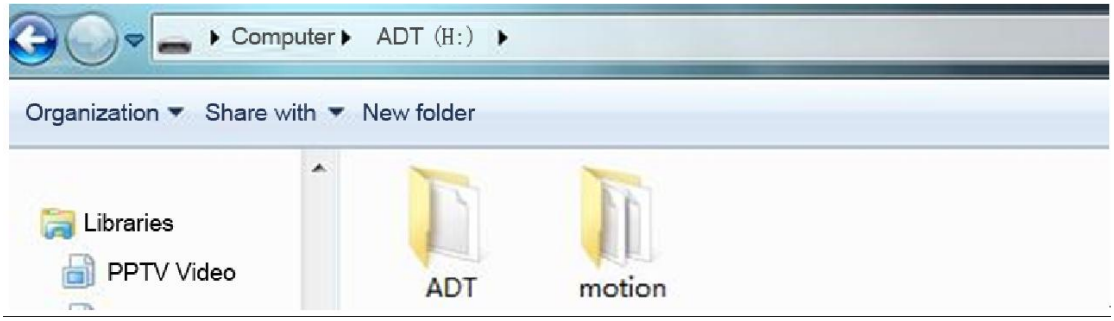
Go to “Test” and select “Version Information”

Check whether the handheld box item number and version number have been updated successfully. If the information is correct, the update is successful.

Appendix 5: UpdatingRemote Program viaHandheld Box USB Flash Drive

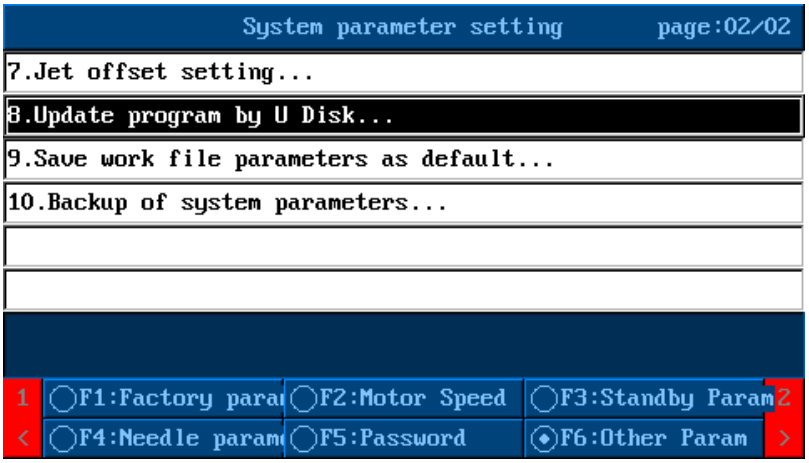
1) Copy program filesto the USB flash drive

Place two folders under the root directory of the USB flash drive. One folder is named “motion”, where the controller application “A9Rom.bin” file is placed. If you need to update the script, put the “main.lua” script;to update the motion library,put it in the “motion.bin” file.
Another folder is named “ADT”, where the handheld box application “USERAPP.bin” is placed. Then insert the USB flash drive into the handheld box TV5600-B01.



2) Update program

--> Press [System] to enter the system setting interface -> press [F6 Other parameters] -> press  to enter the parameter “USBflash drive update remote program...” ->

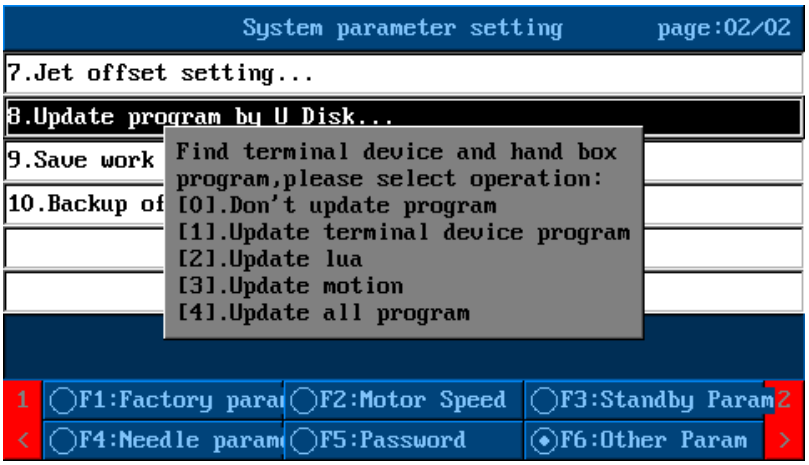


-> Press the [Enter] key -> system detects the USB flash drive insertion, and then the following update prompt appears:

1. Do not update: Press the number key [0] to exit without updating
2. Update terminal controller application only: Press the number key [1] to update the

controller application only, i.e."A9Rom.bin"

3. Update script only: Press the number key [2] to update the script "main.lua" only
4. Update motion library only: Press the number key [3] to update the motion library "motion.bin" only
5. Update all: Update all three files above



-> Press the up and down keys  -> select the desired operation -> press the [Enter] key -> the system starts to update the program

->Restart when the controller update is complete

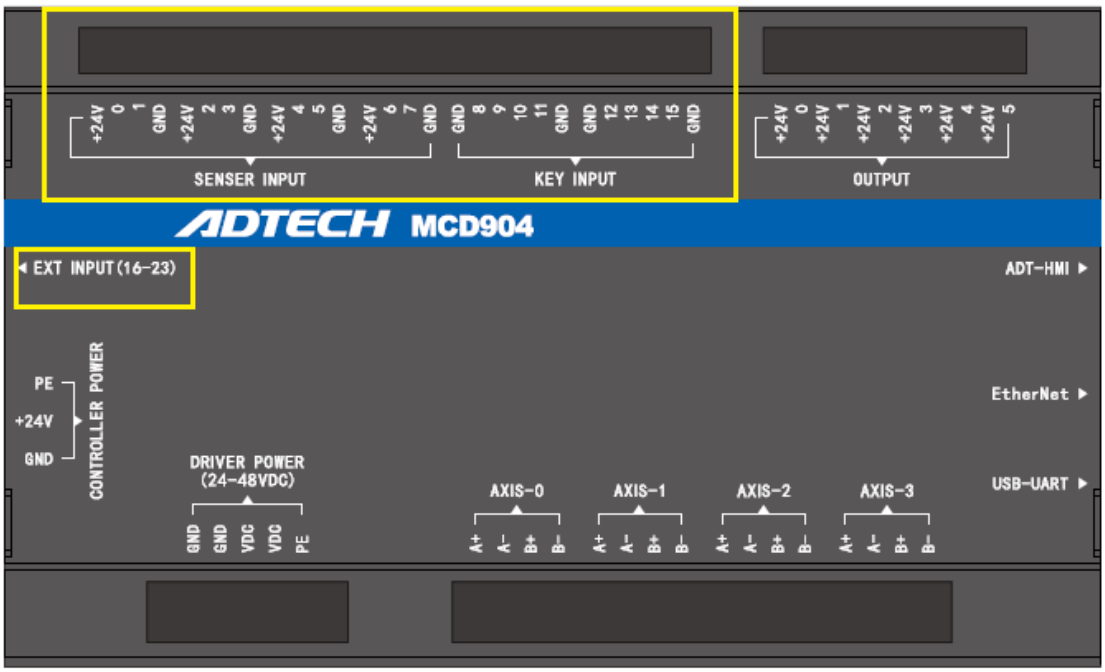
3) View the program version

-> Press [Test] on the handheld box to enter the test interface -> press [F4] again to enter the version information interface, as shown below:

Appendix 6: MCD904 Wiring Instructions

1. Input port wiring instructions

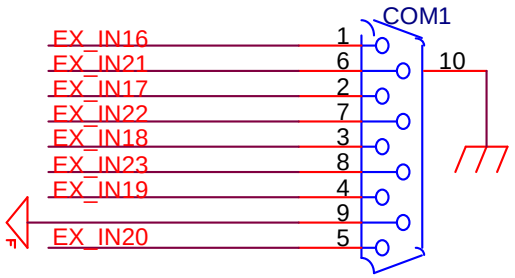
1.01 Common input ports



SENSER INPUT	Function	KEY INPUT	Function
+24V	Input common (+24V power supply)	**GND**	Internal 24V power ground
0	Xhome	**8**	Custom
1	Yhome	**9**	Custom
GND	Internal 24V power ground	**10**	Custom
+24V	Input common (+24V power supply)	**11**	Custom
2	Z home	**GND**	Internal 24V power ground
3	R home	**GND**	Internal 24V power ground
GND	Internal 24V power ground	**12**	Start, system configuration required
+24V	Input common (+24V power supply)	**13**	Emergency stop, allow configurationand modification
4	Xtravel limit	**14**	Reset, allow configurationand modification
5	Ytravel limit	**15**	Pause, system configuration required
GND	Internal 24V power ground	**GND**	Internal 24V power ground
+24V	Input common (+24V power supply)		
6	Ztravel limit		

7	Rtravel limit
GND	Internal 24V power ground

1.02 EXT INPUT (16-23) terminal pin description



DB9 angle, female connector, welded plate

Wire No.	Definition	Function
1	EX_IN16	Universal input signal 16
2	EX_IN17	Universal input signal 17
3	EX_IN18	Universal input signal 18
4	EX_IN19	Universal input signal 19
5	EX_IN20	Universal input signal 20
6	EX_IN21	Universal input signal 21
7	EX_IN22	Universal input signal 22
8	EX_IN23	Universal input signal 23
9	24VGND	Internal 24V power ground
10	PE	Protective earth

※Note: Multiple +24V and GND terminals on the common input port are convenient for multiple sensor wiring. Only one set of +24V and GND need to be connected.

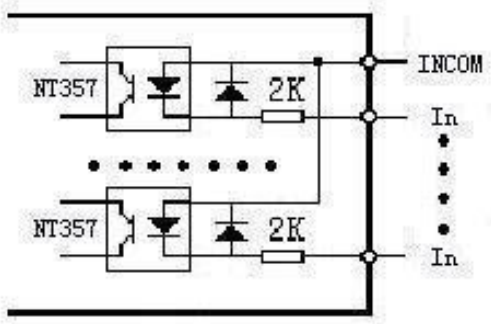
※Note: The home port of each axis is configured in “Parameter settings” ->“Motor features” ->“Homeport”. The above home port wiring uses the default port.

※Note: All the above input ports are universal input ports. To occupy the home and limit ports, simply turn the home and limit configuration function of the corresponding axis.

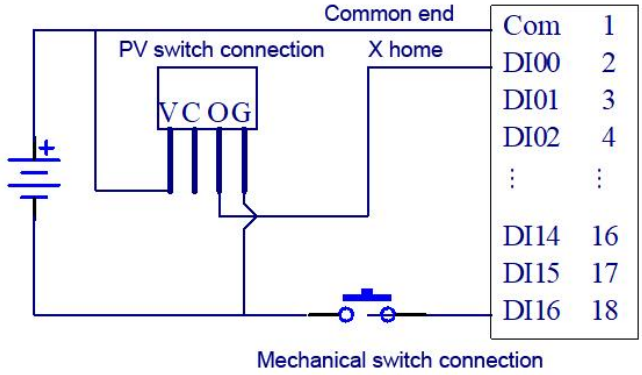
※ Note: The input points are all low level effective.

1.03 Input port wiring method

Controller internal input port diagram:



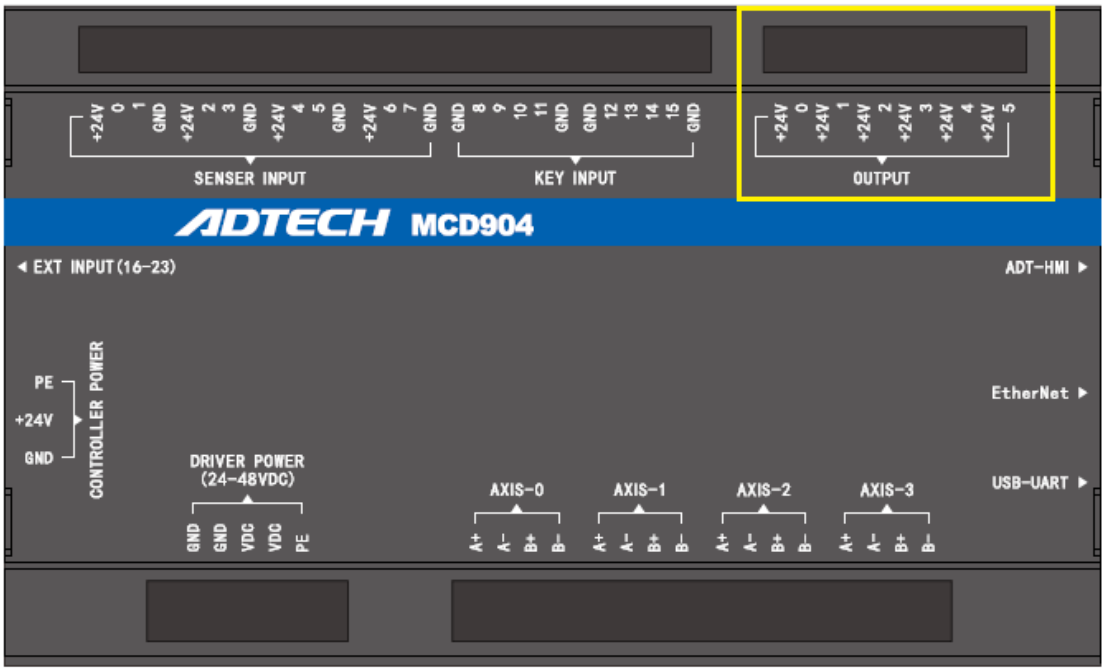
Controller general input connection: (PV switch V means VCC, G means GND, O means output)

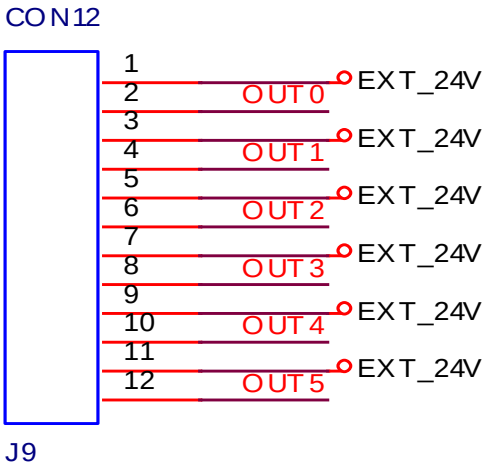


The INCOM terminal is connected to the positive terminal of the external power supply, and the input signal is connected to the corresponding terminal pin. The common end of IN0-IN16 is INCOM1; the common end of IN17-IN33 is INCOM2; when used, the common end needs to be connected to +24V power supply, the input point is low level effective, and the current of single input does not exceed 15mA and isn'tless than 5 mA.

2. Output port wiring instructions

2.01 Common output ports





OUTPUT	Function
+24V	Internal 24V power supply
0	Universal output signal 0
+24V	Internal 24V power supply
1	Universal output signal 1
+24V	Internal 24V power supply
2	Universal output signal 2
+24V	Internal 24V power supply
3	Universal output signal 3
+24V	Internal 24V power supply
4	Universal output signal 4

+24V	Internal 24V power supply
5	Universal output signal 5

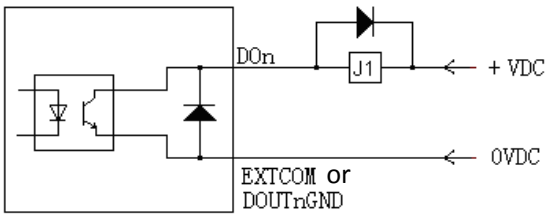
※Note: The output point is low level effective.

※Note: It is recommended to connect multiple output signal wires to +24V terminals respectively, and the load voltage is stable with respect to the same terminal.

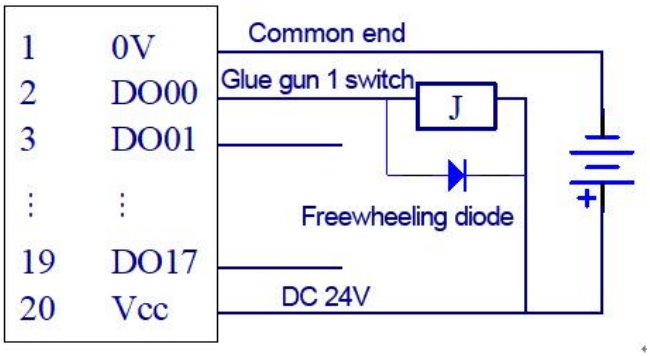
2.02 Output port wiring method

The switching output of this control system is the open collector output. The common terminal is the first pin of JC1, which is also the GND of the load power supply. When using, please connect the pin 20 of JC1 to the +24V power supply, and the output point is low level effective.

Connect the load between +24V and the output point. The internal output circuit has relatively complete protection measures: overcurrent protection, overvoltage protection, short circuit protection, overheat protection, and freewheeling protection measures, but if inductive loads such as relays are connected, connect the both ends of the relay coil to freewheeling diodes, as shown below:



Controller internal output structure diagram

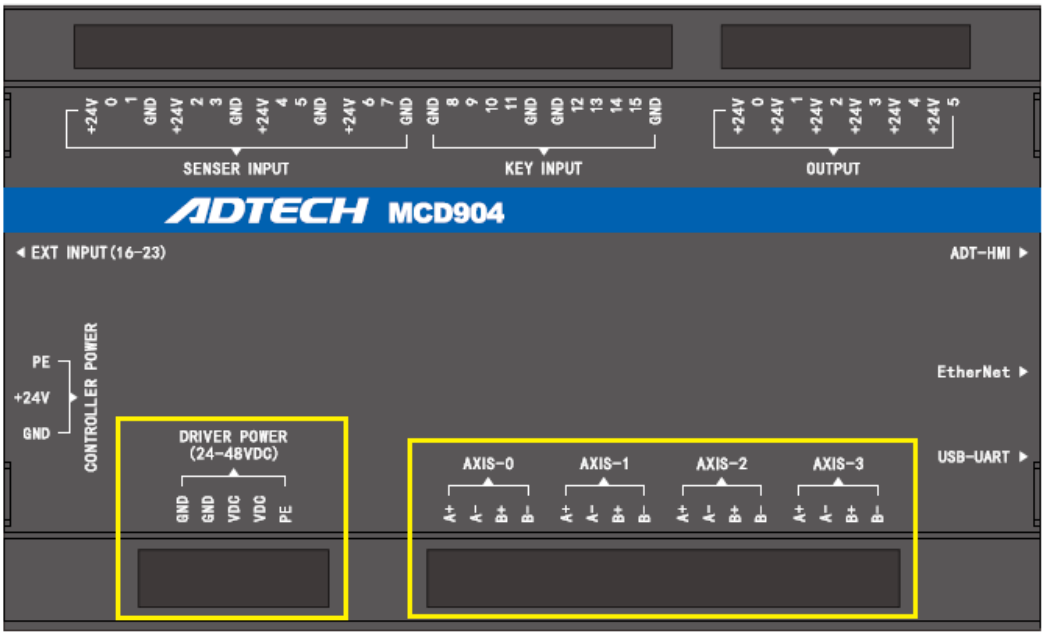


Controller output port general wiring

※Note: The recommended power supply voltage is 24V, preferably not more than 30V. The positive and negative poles must not be reversed, and the load should not be short-circuited, or else it will cause accidents!

3. Stepping motor interface

3.01 Motor Interface



DRIVER POWER	Function
GND	+ 24V power ground
GND	+ 24V power ground
VDC	+ 24V power supply
VDC	+ 24V power supply
PE	Earth

System X axis

AXIS-0	Function
A+	Stepping motor A+end
A-	Stepping motor A-end
B+	Stepping motor B+end
B-	Stepping motor B-end

System Y axis

AXIS-1	Function
A+	Stepping motor A+end
A-	Stepping motor A-end
B+	Stepping motor B+end
B-	Stepping motor B-end

System Z axis

AXIS-2	Function
A+	Stepping motor A+end
A-	Stepping motor A-end
B+	Stepping motor B+end
B-	Stepping motor B-end

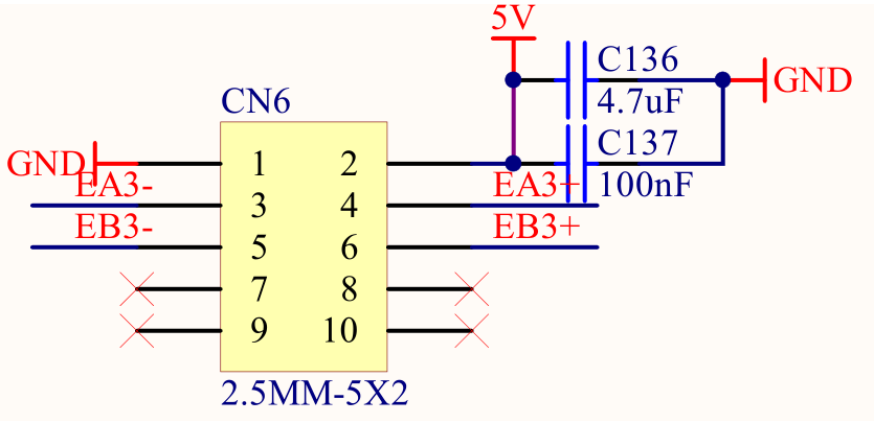
System R axis

AXIS-3	Function
A+	Stepping motor A+end
A-	Stepping motor A-end
B+	Stepping motor B+end
B-	Stepping motor B-end

※Note: The DRIVER POWER terminal is the drive motor power supply, and only one set of VDC and GND needs to be connected.

3.02 Four-axis closed-loop feedback signal input wiring definition

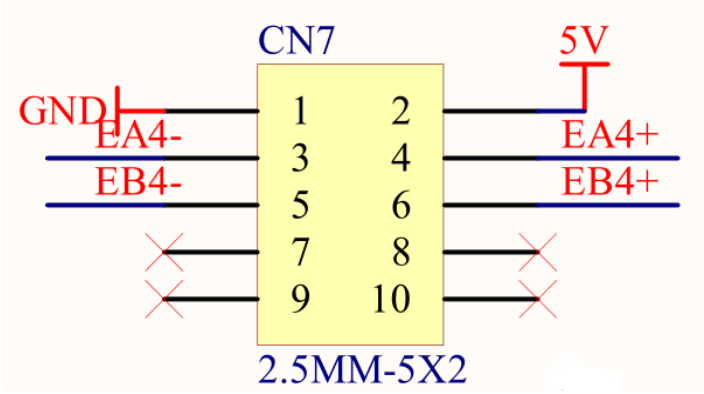
EN-0 terminal pin description:



Wire No.	Definition	Function
1	GND	Negative pole ofclosed loop feedback power supply
2	5V	Positive pole ofclosed loop feedback power supply
3	EA3-	A-phase negative pole ofZ-axis closed loop feedback signal
4	EA3+	A-phase positive pole ofZ-axis closed loop feedback signal
5	EB3-	B-phase negative pole ofZ-axis closed loop feedback signal
6	EB3+	B-phase positive pole ofZ-axis closed loop feedback signal

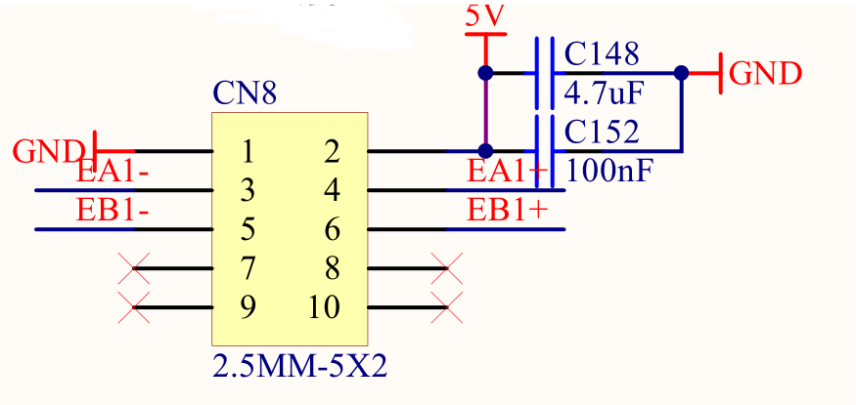
7	NC	NC
8	NC	NC
9	NC	NC
10	NC	NC

EN-1 terminal pin description:



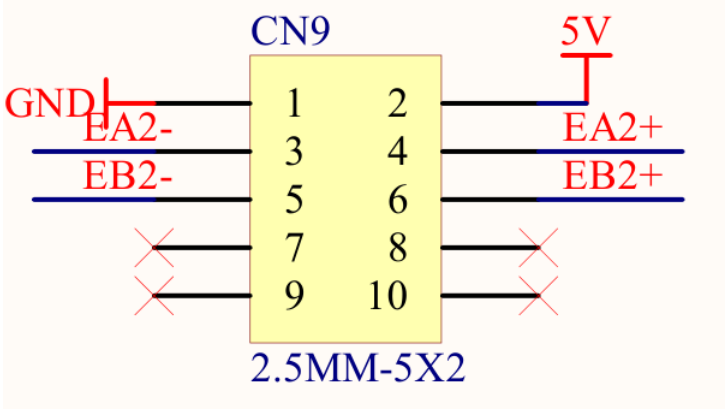
Wire No.	Definition	Function
1	GND	Negative pole ofclosed loop feedback power supply
2	5V	Positive pole ofclosed loop feedback power supply
3	EA4-	A-phase negative pole ofR-axis closed loop feedback signal
4	EA4+	A-phase positive pole ofR-axis closed loop feedback signal
5	EB4-	B-phase negative pole ofR-axis closed loop feedback signal
6	EB4+	B-phase positive pole ofR-axis closed loop feedback signal
7	NC	NC
8	NC	NC
9	NC	NC
10	NC	NC

EN-2 terminal pin description:



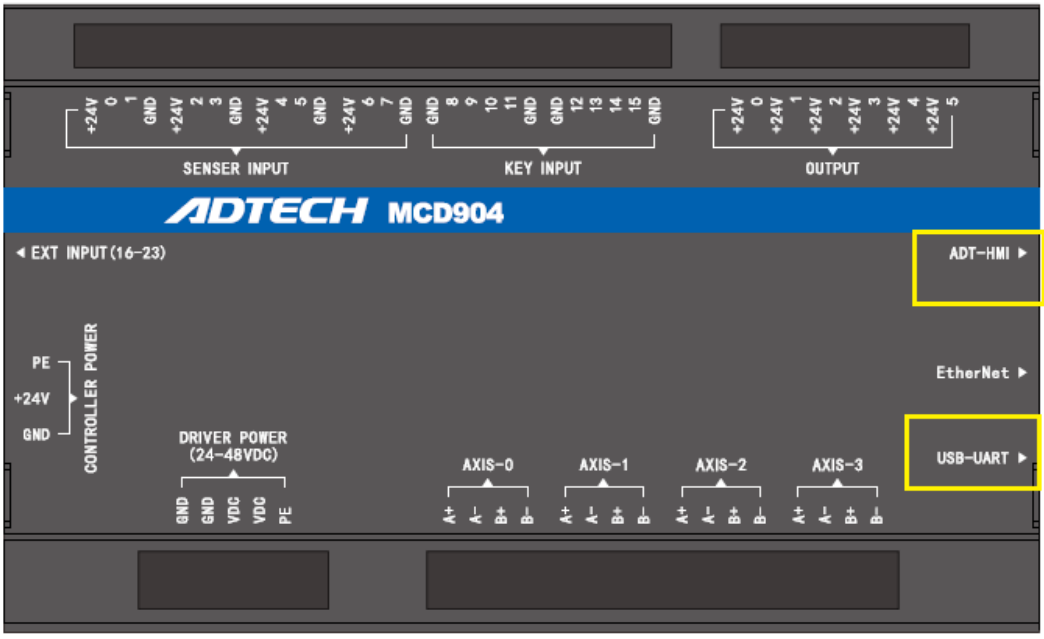
Wire No.	Definition	Function
1	GND	Negative pole ofclosed loop feedback power supply
2	5V	Positive pole ofclosed loop feedback power supply
3	EA1-	A-phase negative pole ofX-axis closed loop feedback signal
4	EA1+	A-phase positive pole ofX-axis closed loop feedback signal
5	EB1-	B-phase negative pole ofX-axis closed loop feedback signal
6	EB1+	B-phase positive pole ofX-axis closed loop feedback signal
7	NC	NC
8	NC	NC
9	NC	NC
10	NC	NC

EN-3 terminal pin description:

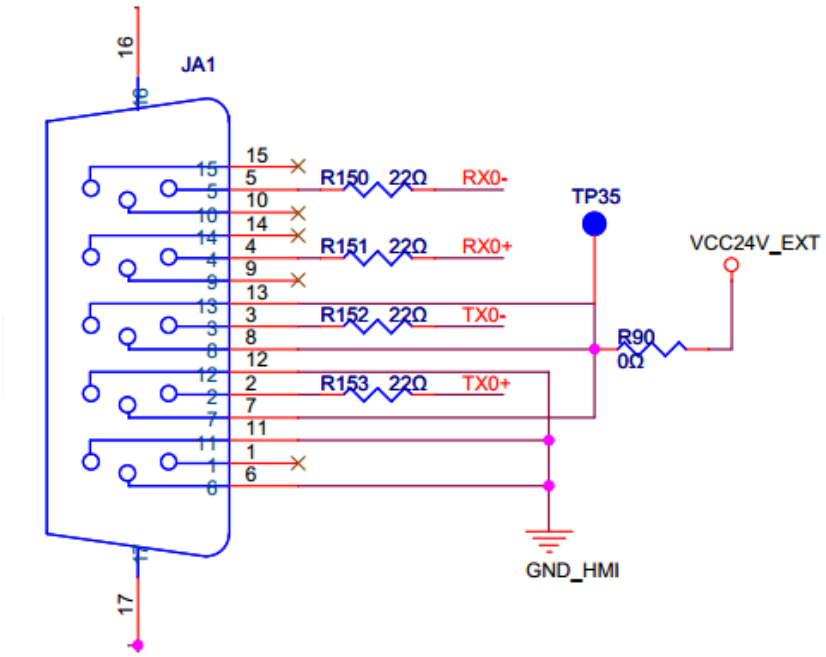


Wire No.	Definition	Function
1	GND	Negative pole ofclosed loop feedback power supply
2	5V	Positive pole ofclosed loop feedback power supply
3	EA2-	A-phase negative pole ofY-axis closed loop feedback signal
4	EA2+	A-phase positive pole ofY-axis closed loop feedback signal
5	EB2-	B-phase negative pole ofY-axis closed loop feedback signal
6	EB2+	B-phase positive pole ofY-axis closed loop feedback signal
7	NC	NC
8	NC	NC
9	NC	NC
10	NC	NC

4.ADT-HMI and USB-UART pin wiring instructions



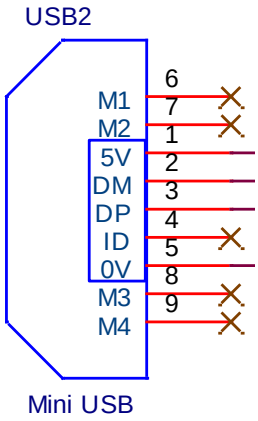
MCD904 HMI Handheld Box Port and RS232 Serial Port



ADT-HMI is used to connect the handheld box TV5310

Wire No.	Definition	Function
1	NC	NC
2	HAND_TX1+	Controller sends signal 1+
3	HAND_TX1-	Controller sends signal 1-
4	HAND_RX1+	Controller receives signal 1+
5	HAND_RX1-	Controller receives signal 1-
6	GND_HMI	Hand-held box power supply ground
7	VCC24V_EXT	Handheld box power supply 24V
8	VCC24V_EXT	Handheld box power supply 24V
9	NC	NC
10	NC	Protective earth
11	GND_HMI	Hand-held box power supply ground
12	GND_HMI	Hand-held box power supply ground
13	VCC24V_EXT	Handheld box power supply 24V
14	NC	NC
15	NC	NC

RS232 serial port

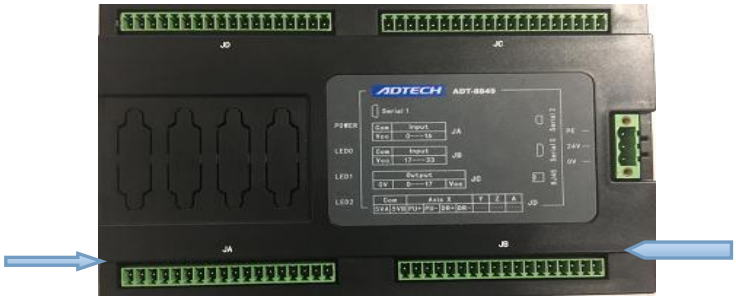


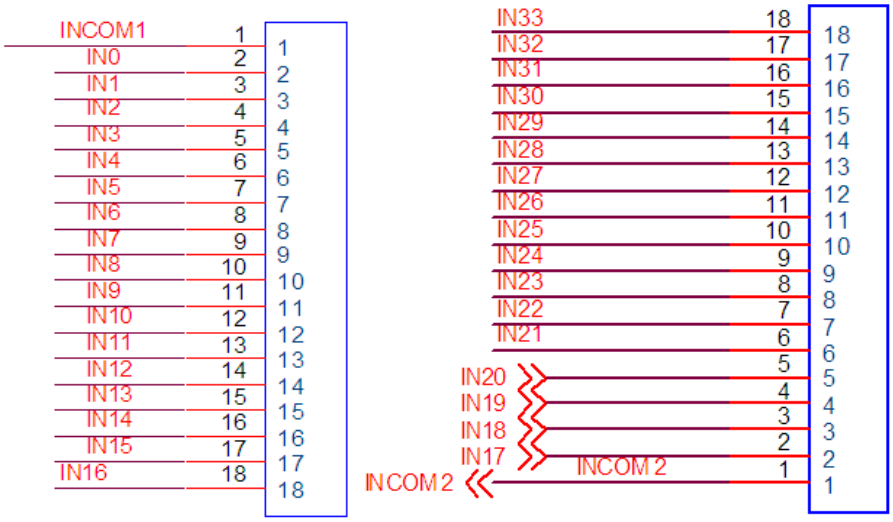
USB-UART for software debugging

Wire No.	Definition	Function
1	USB_VCC	External power supply 5V
2	DM	Mini USBdifferential signal D-
3	DP	Mini USBdifferential signal D+
4	NC	NC
5	GND	External power ground
6	M1	Fixed support foot 1
7	M2	Fixed support foot 2
8	M3	Fixed support foot 3
9	M4	Fixed support foot 4

Appendix VII: ADT8849 Wiring Instructions

1.ADT-8849 input ports





JA Wire No.	Name	Function	JB Wire No.	Name	Function
1	INCOM 1	Input common 1 (+24V power supply)	1	INCOM 2	Input common 2 (+24V power supply)
2	IN0	X home (or X servo Z phase)	2	IN17	B home (or X servo Z phase)
B	IN1	Y home (or Y servo Z phase)	3	IN18	C home (or Y servo Z phase)
4	IN2	Z home (or Z servo Z phase)	4	IN19	Bpositive limit
5	IN3	R home (or R servo Z phase)	5	IN20	Bnegative limit
6	IN4	Xpositive limit	6	IN21	Cpositive limit
7	IN5	Xnegative limit	7	IN22	Cnegative limit
8	IN6	Ypositive limit	8	IN23	Universal input
9	IN7	Ynegative limit	9	IN24	
10	IN8	Zpositive limit	10	IN25	
11	IN9	Znegative limit	11	IN26	
12	IN10	Rpositive limit	12	IN27	
13	IN11	Rnegative limit	13	IN28	
14	IN12	External start, system configuration required	14	IN29	
15	IN13	External emergency stop, allow configuration	15	IN30	

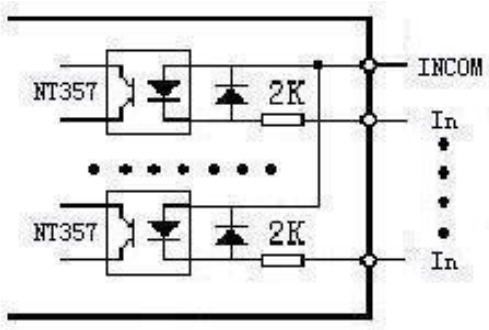
		andmodification			
16	IN14	External reset, allow configuration and modification	16	IN31	
17	IN15	External pause, system configuration required	17	IN32	
18	IN16	Universal input	18	IN33	

※Note: The home port of each axis is configured in “Factory parameters” ->“Motor features” ->“Homeport”. The above home port wiring uses the default port.

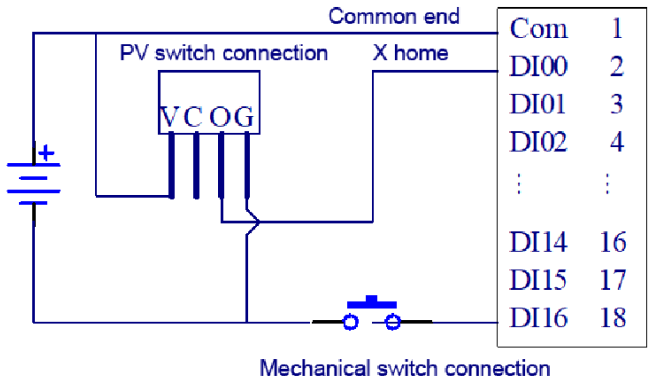
※Note: All the above input ports are universal input ports. To occupy the home and limit ports, simply turn the home and limit configuration function of the corresponding axis.

2. Input port wiring method

Controller internal input port diagram:

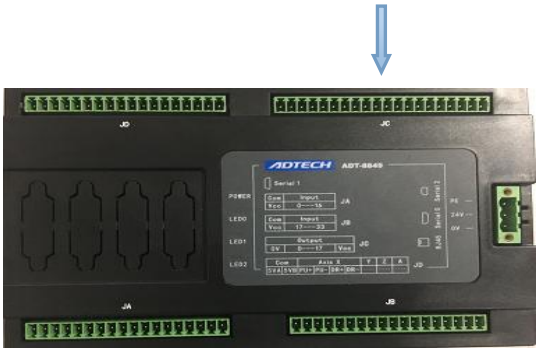


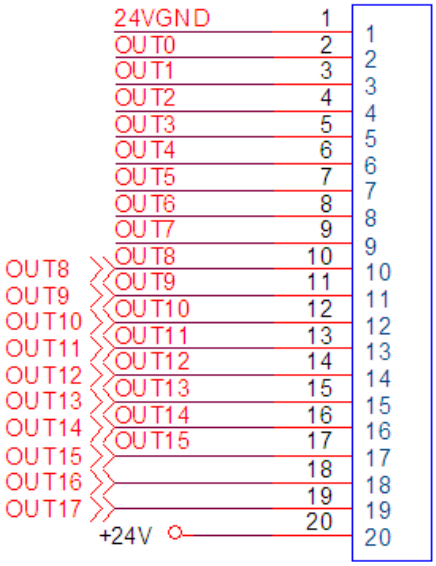
Controller general input connection: (PV switch V means VCC, G means GND, O means output)



The INCOM terminal is connected to the positive terminal of the external power supply, and the input signal is connected to the corresponding terminal pin. The common end of IN0-IN16 is INCOM1; the common end of IN17-IN33 is INCOM2; when used, the common end needs to be connected to +24V power supply, the input point is low level effective, and the current of single input does not exceed 15mA and isn’tless than 5 mA.

3.ADT-8849 output ports





8849 output ports

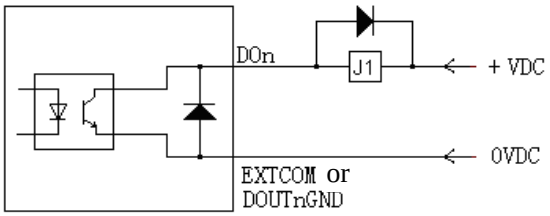
JCWire No.	Name	Function
1	24VGND	Output common, 24V ground
2	OUT0	Output0--17
3	OUT1	
4	OUT2	
5	OUT3	
6	OUT4	
7	OUT5	
8	OUT6	
9	OUT7	
10	OUT8	
11	OUT9	
12	OUT10	
13	OUT11	
14	OUT12	
15	OUT13	
16	OUT14	
17	OUT15	

18	OUT16	
19	OUT17	
20	+24V	External +24V power supply

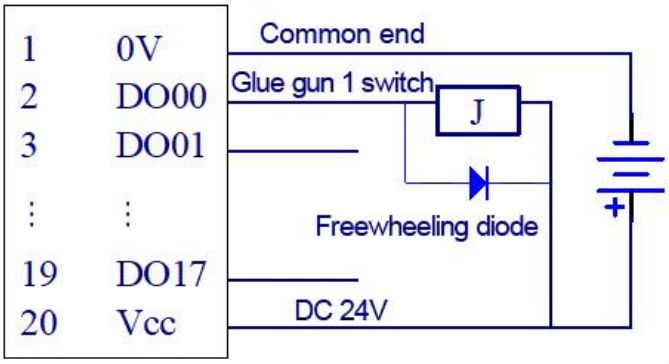
4. Output port wiring method

The switching output of this control system is the open collector output. The common terminal is the first pin of JC1, which is also the GND of the load power supply. When using, please connect the pin 20 of JC1 to the +24V power supply, and the output point is low level effective.

Connect the load between +24V and the output point. The internal output circuit has relatively complete protection measures: overcurrent protection, overvoltage protection, short circuit protection, overheat protection, and freewheeling protection measures, but if inductive loads such as relays are connected, connect the both ends of the relay coil to freewheeling diodes, as shown below:



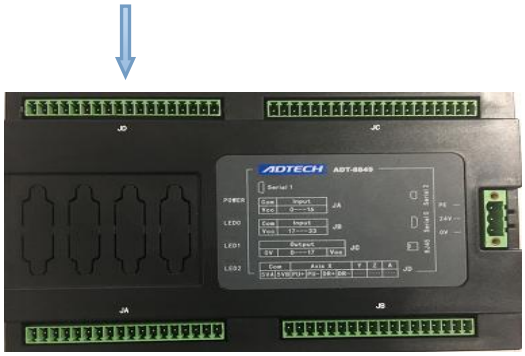
Controller internal output structure diagram



Controller output port general wiring

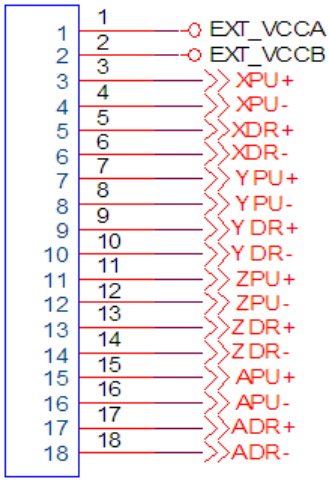
※Note: The recommended power supply voltage is 24V, preferably not more than 30V. The positive and negative poles must not be reversed, and the load should not be short-circuited, or else it will cause accidents!

5. ADT-8849 motor driver interface definition



ADT-8849 motor driver interface

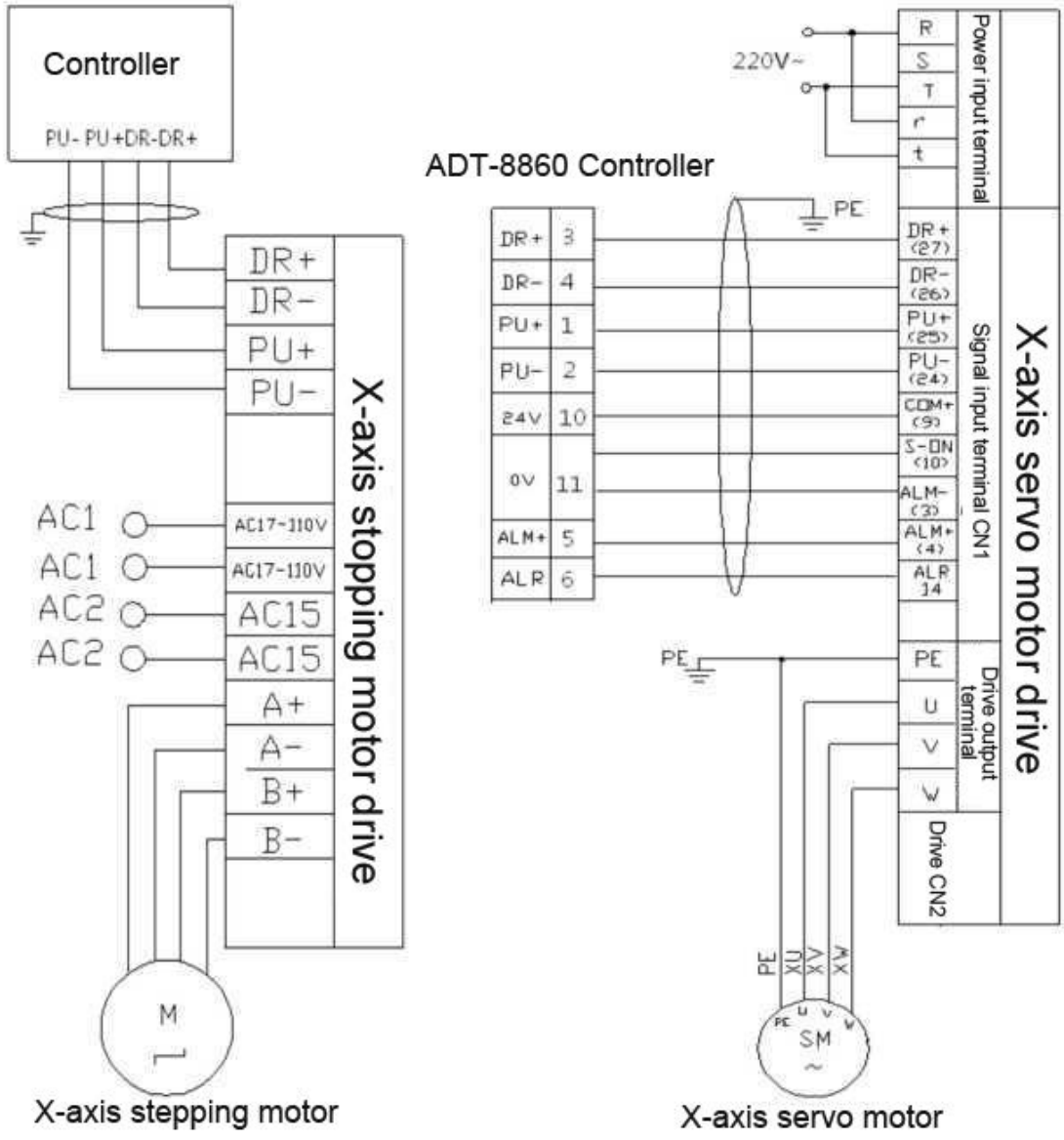
ADT-8849 has four motor drive interfaces, which are on the terminal block JD.



Wire No.	Name	Function
1	EXT_VCCA	Supply 5V power externally for X, Y-axis power supply of common anode connection
2	EXT_VCCB	Supply 5V power externally forZ, A-axis power supply of common anode connection
3	XPU+	X pulse signal+
4	XPU-	X pulse signal-
5	XDR+	Xdirection signal +
6	XDR-	Xdirection signal -
7	YPU+	Y pulse signal+
8	YPU-	Y pulse signal-
9	YDR+	Ydirection signal +
10	YDR-	Ydirection signal -
11	ZPU+	Z pulse signal+
12	ZPU-	Z pulse signal-
13	ZDR+	Zdirection signal +
14	ZDR-	Zdirection signal -

15	APU+	A pulse signal+
16	APU-	A pulse signal-
17	ADR+	Adirection signal +
18	ADR-	Adirection signal-

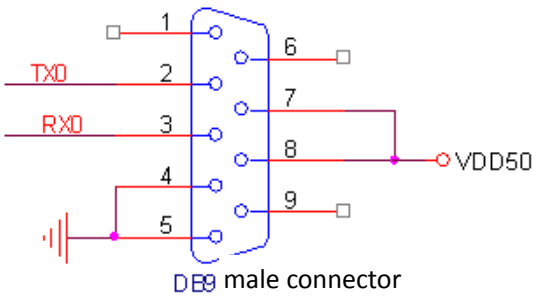
6. Stepper and servo general wiring diagram



7.Serial port pin wiring instructions

7.01 Serial port 0 wiring definition

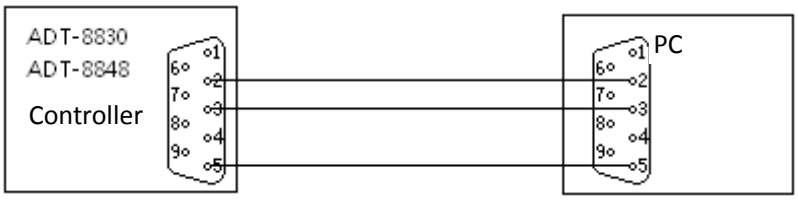
ADT-8849 \8830 COM0 port



ADT-8849COM0 port

ADT-8849 COM0		
Wire No.	**Name**	**Function**
1	NC	NC
2	TX0	Data transmission
3	RX0	Data reception
4	GND	Power ground
5	GND	Power ground
6	NC	NC
7	VDD5.0	Supply 5V power externally
8	VDD5.0	Supply 5V power externally
9	NC	NC

7.02 Serial port 0 and computer wiring

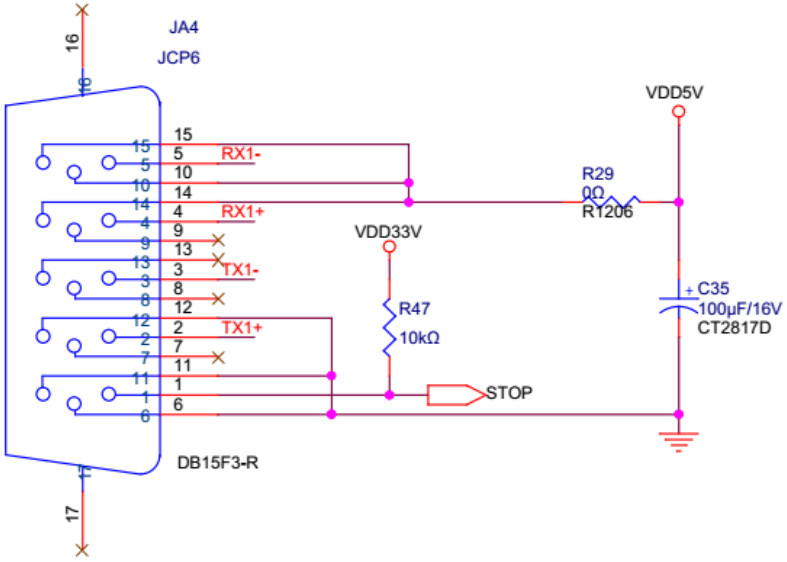


ADT-8849 COM0 RS-232communication

7.03 Serial port 1 wiring definition

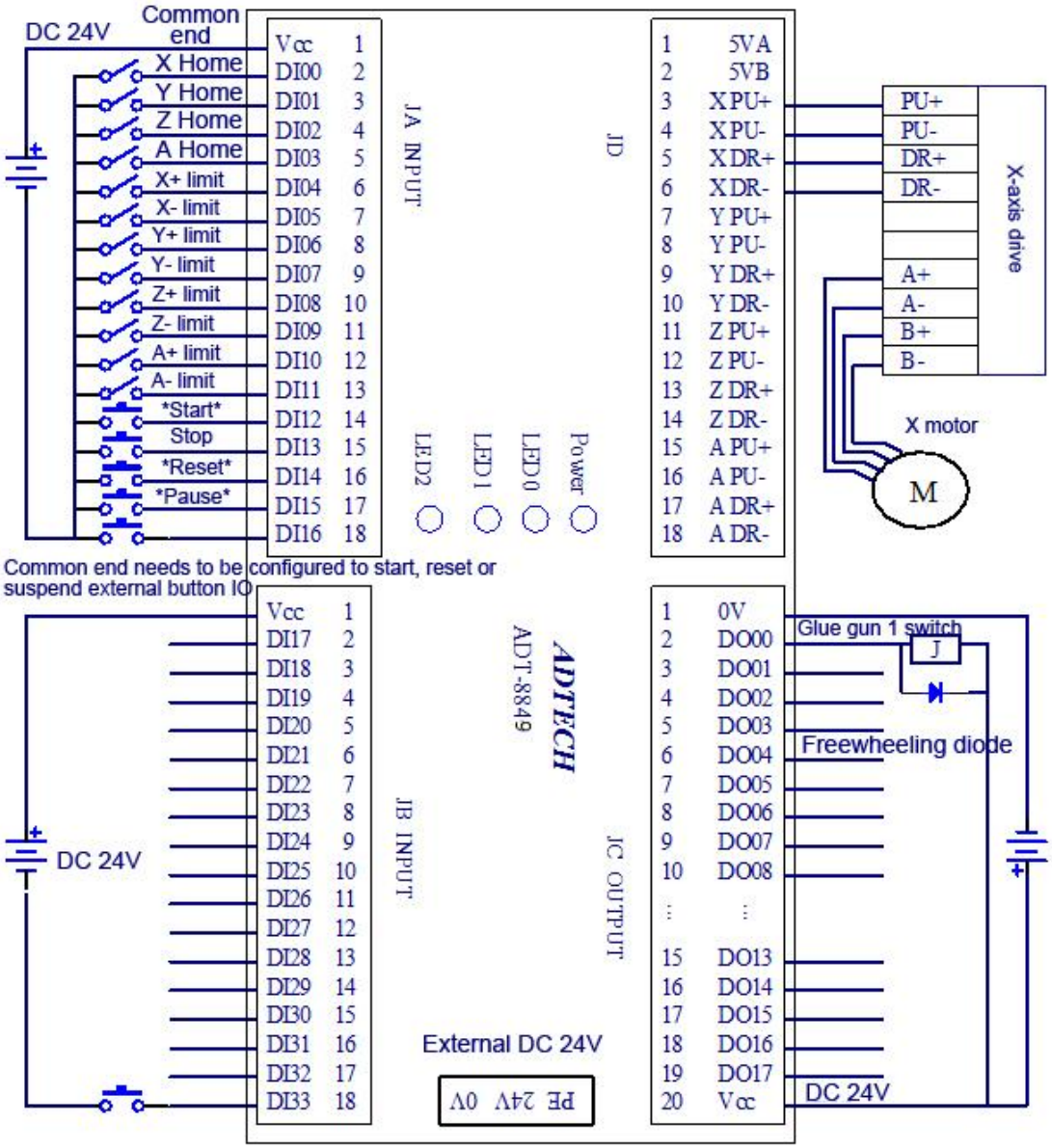
The controller COM1 port is used to connect the handheld box TV5600-B01.

ADT-8849 COM1 port



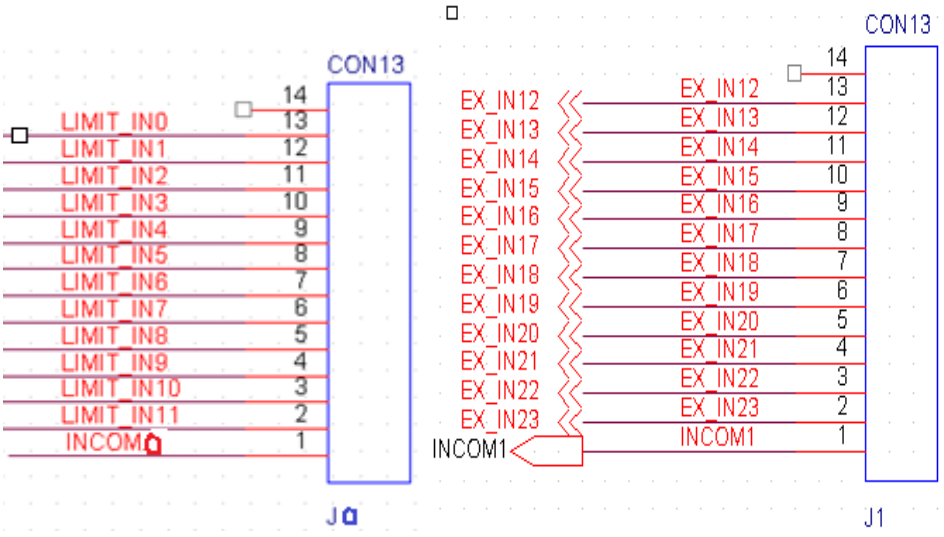
Wire No.	Name	Function
1	STOP	Hard emergency stop signal
2	TX1+	Data transmission +
3	TX1-	Data transmission -
4	RX1+	Data reception +
5	RX1-	Data reception -
9,13,8,7	NC	NC
11,12,6	GND	Power ground
14,15,10	VDD5V	Supply 5V power externally

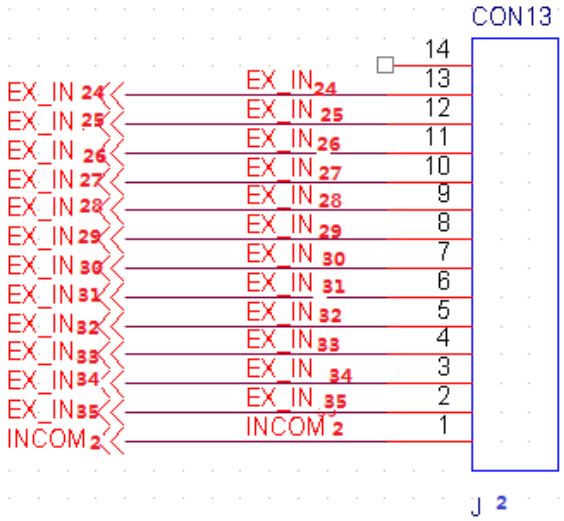
8. ADT-8849wiring diagram example


DC 24V
Common end
X Home
Y Home
Z Home
A Home
X+ limit
X- limit
Y+ limit
Y- limit
Z+ limit
Z- limit
A+ limit
A- limit
Start
Stop
Reset
Pause
Vcc 1
DI00 2
DI01 3
DI02 4
DI03 5
DI04 6
DI05 7
DI06 8
DI07 9
DI08 10
DI09 11
DI10 12
DI11 13
DI12 14
DI13 15
DI14 16
DI15 17
DI16 18
JA INPUT
JD
LED2
LED1
LED0
Power
1 5VA
2 5VB
3 X PU+
4 X PU-
5 X DR+
6 X DR-
7 Y PU+
8 Y PU-
9 Y DR+
10 Y DR-
11 Z PU+
12 Z PU-
13 Z DR+
14 Z DR-
15 A PU+
16 A PU-
17 A DR+
18 A DR-
PU+
PU-
DR+
DR-
A+
A-
B+
B-
X-axis drive
X motor
M
Common end needs to be configured to start, reset or suspend external button IO
Vcc 1
DI17 2
DI18 3
DI19 4
DI20 5
DI21 6
DI22 7
DI23 8
DI24 9
DI25 10
DI26 11
DI27 12
DI28 13
DI29 14
DI30 15
DI31 16
DI32 17
DI33 18
JB INPUT
ADTECH
ADT-8849
JC OUTPUT
1 0V
2 DO00
3 DO01
4 DO02
5 DO03
6 DO04
7 DO05
8 DO06
9 DO07
10 DO08
15 DO13
16 DO14
17 DO15
18 DO16
19 DO17
20 Vcc
Glue gun 1 switch
J
Freewheeling diode
DC 24V
External DC 24V
DC 24V
0V 24V PE

Appendix VIII: AMC1600P Wiring Instructions

1. AMC-1600 input ports





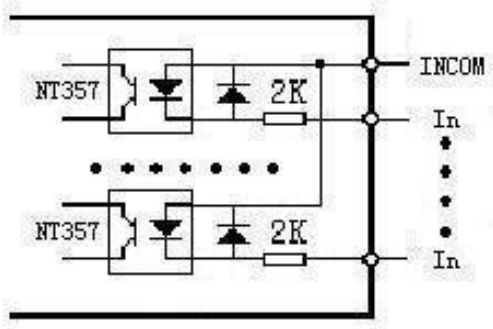
J0 Wire No.	Name	Function	J1 Wire No.	Name	Function	J2 Wire No.	Name	Function
1	IN0	X home (or X servo Z phase)	1	IN12	Start, system configuration required	1	IN24	Universal input
2	IN1	Y home (or Y servo Z phase)	2	IN13	Stop, allow configuration and modification	2	IN25	Universal input
3	IN2	Z home (or Z servo Z phase)	3	IN14	Reset, allow configuration and modification	3	IN26	Universal input
4	IN3	R home (or R servo Z phase)	4	IN15	Pause, system configuration required	4	IN27	Universal input
5	IN4	Xpositive limit	5	IN16	Universal input	5	IN28	Universal input
6	IN5	Xnegative limit	6	IN17	B home	6	IN29	Universal input
7	IN6	Ypositive limit	7	IN18	C home	7	IN30	Universal input
8	IN7	Ynegative limit	8	IN19	Bpositive limit	8	IN31	Universal input
9	IN8	Zpositive limit	9	IN20	Bnegative limit	9	IN32	Universal input
10	IN9	Znegative limit	10	IN21	Cpositive limit	10	IN33	Universal input
11	IN10	Rpositive limit	11	IN22	Cnegative limit	11	IN34	Universal input
12	IN11	Rnegative limit	12	IN23	Universal input	12	IN35	Universal input
13	INCOM 0	Input common 1 (+24V power supply)	13	INCOM 1	Input common 2 (+24V power supply)	13	INCOM 2	Input common 3 (+24V power supply)

※Note: The home port of each axis is configured in “Factory parameters” ->“Motor features” ->“Homeport”. The above home port wiring uses the default port.

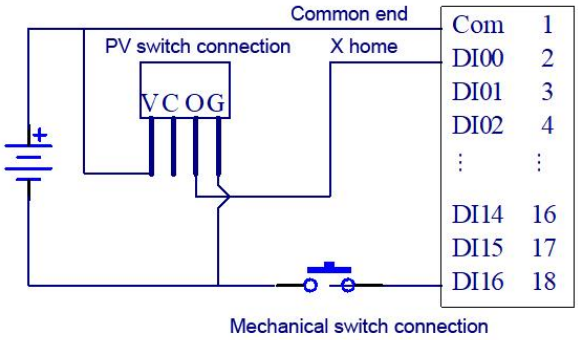
※Note: All the above input ports are universal input ports. To occupy the home and limit ports, simply turn the home and limit configuration function of the corresponding axis.

2. Input port wiring method

Controller internal input port diagram:

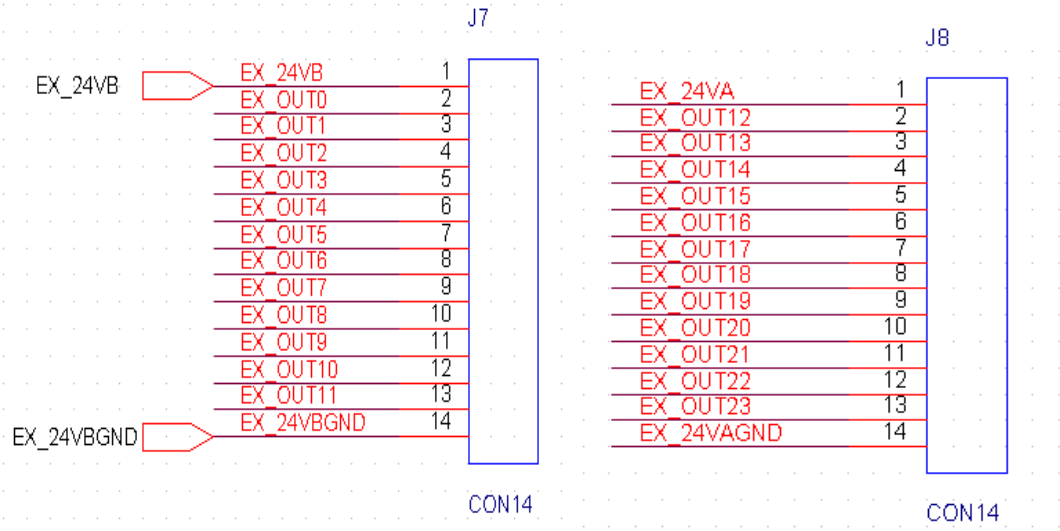


Controller general input connection: (PV switch V means VCC, G means GND, O means output)



The INCOM terminal is connected to the positive terminal of the external power supply, and the input signal is connected to the corresponding terminal pin. The common end of IN0-IN16 is INCOM1; the common end of IN17-IN33 is INCOM2; when used, the common end needs to be connected to +24V power supply, the input point is low level effective, and the current of single input does not exceed 15mA and isn'tless than 5 mA.

3.AMC1600P output ports

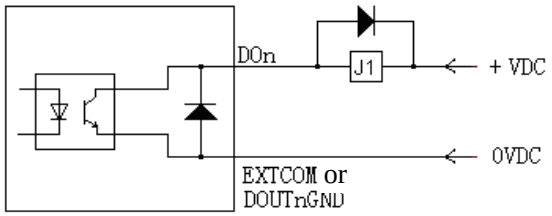


Wire No.	Name	Function	Wire No.	Name	Function
1	EX_24VB	External 24V power input	1	EX_24VA	External 24V power supply
2	EX_OUT0	Universal output	2	EX_OUT12	Universal output
3	EX_OUT1		3	EX_OUT13	
4	EX_OUT2		4	EX_OUT14	
5	EX_OUT3		5	EX_OUT15	
6	EX_OUT4		6	EX_OUT16	
7	EX_OUT5		7	EX_OUT17	
8	EX_OUT6		8	EX_OUT18	
9	EX_OUT7		9	EX_OUT19	
10	EX_OUT8		10	EX_OUT20	
11	EX_OUT9		11	EX_OUT21	
12	EX_OUT10		12	EX_OUT22	
13	EX_OUT11		13	EX_OUT23	
14	EX_24VBGND	External 24V power ground	14	EX_24VAGND	External 24V power ground

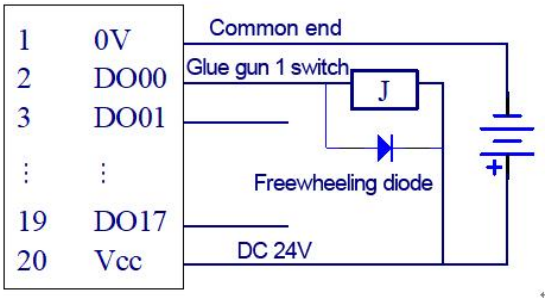
4. Output port wiring method

The switching output of this control system is the open collector output. The common terminal is the first pin of JC1, which is also the GND of the load power supply. When using, please connect the pin 20 of JC1 to the +24V power supply, and the output point is low level effective.

Connect the load between +24V and the output point. The internal output circuit has relatively complete protection measures: overcurrent protection, overvoltage protection, short circuit protection, overheat protection, and freewheeling protection measures, but if inductive loads such as relays are connected, connect the both ends of the relay coil to freewheeling diodes, as shown below:



Controller internal output structure diagram

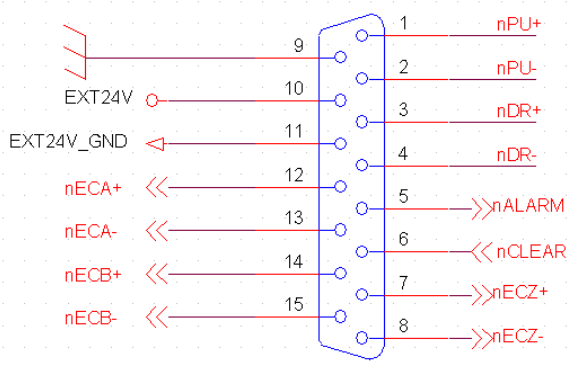


Controller output port general wiring

※Note: The recommended power supply voltage is 24V, preferably not more than 30V. The positive and negative poles must not be reversed, and the load should not be short-circuited, or else it will cause accidents!

5. AMC1600P motor driver interface definition

AMC-1600 motor driver interface



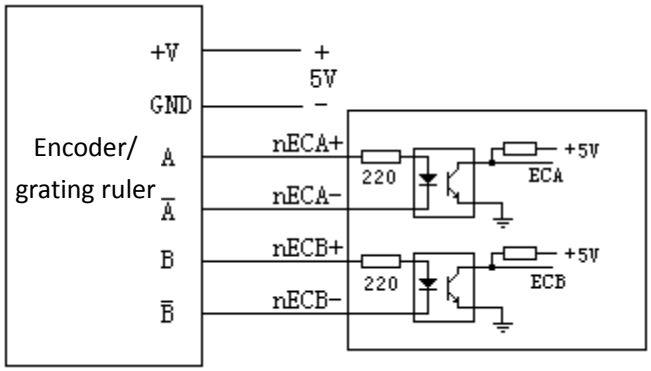
Wire No.	Definition	Function
1	nPU+	Pulse signal+
2	nPU-	Pulse signal-
3	nDR+	Direction signal+
4	nDR-	Direction signal-
5	nALARM	For servo alarm input
6	nCLEAR	For servo clearing
7	nECZ+	Encoder Z-phase input +
8	nECZ-	Encoder Z-phase input -
9		Ground signal
10	EXT24V	External input 24V power supply
11	EXT24V_GND	
12	nECA+	Encoder A-phase input +
13	nECA-	Encoder A-phase input -
14	nECB+	Encoder B-phase input +
15	nECB-	Encoder B-phase input -

6. Encoder wiring

AB phase decoding input is divided into differential connection method and common anode connection method, which are determined by the type of the encoder. The encoder output usually has open collector output, complementary output, voltage output, and long line driver output. The open collector output, complementary output and voltage output can adopt the common anode connection method, and the long line driver output adopts the differential connection method.

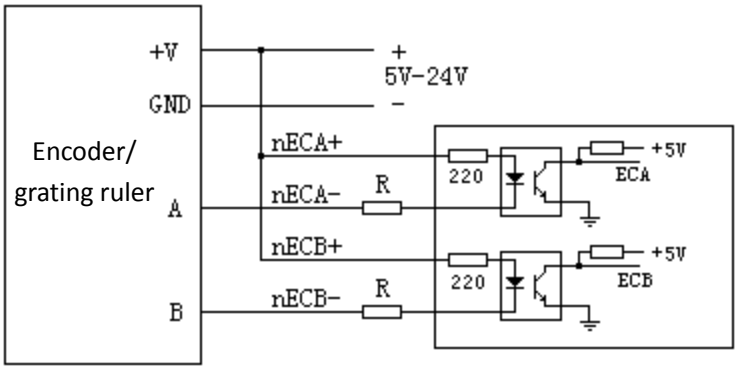
As shown below, the AB phase decoding input signal uses the differential input wiring mode; for common anode connection method, the positive terminal of phase A and the positive terminal of phase B must be connected together; for common cathode connection, the negative terminal of phase A and the negative terminal of phase B must be connected.

The differential connection is as follows:



The 5V power supply is provided externally.

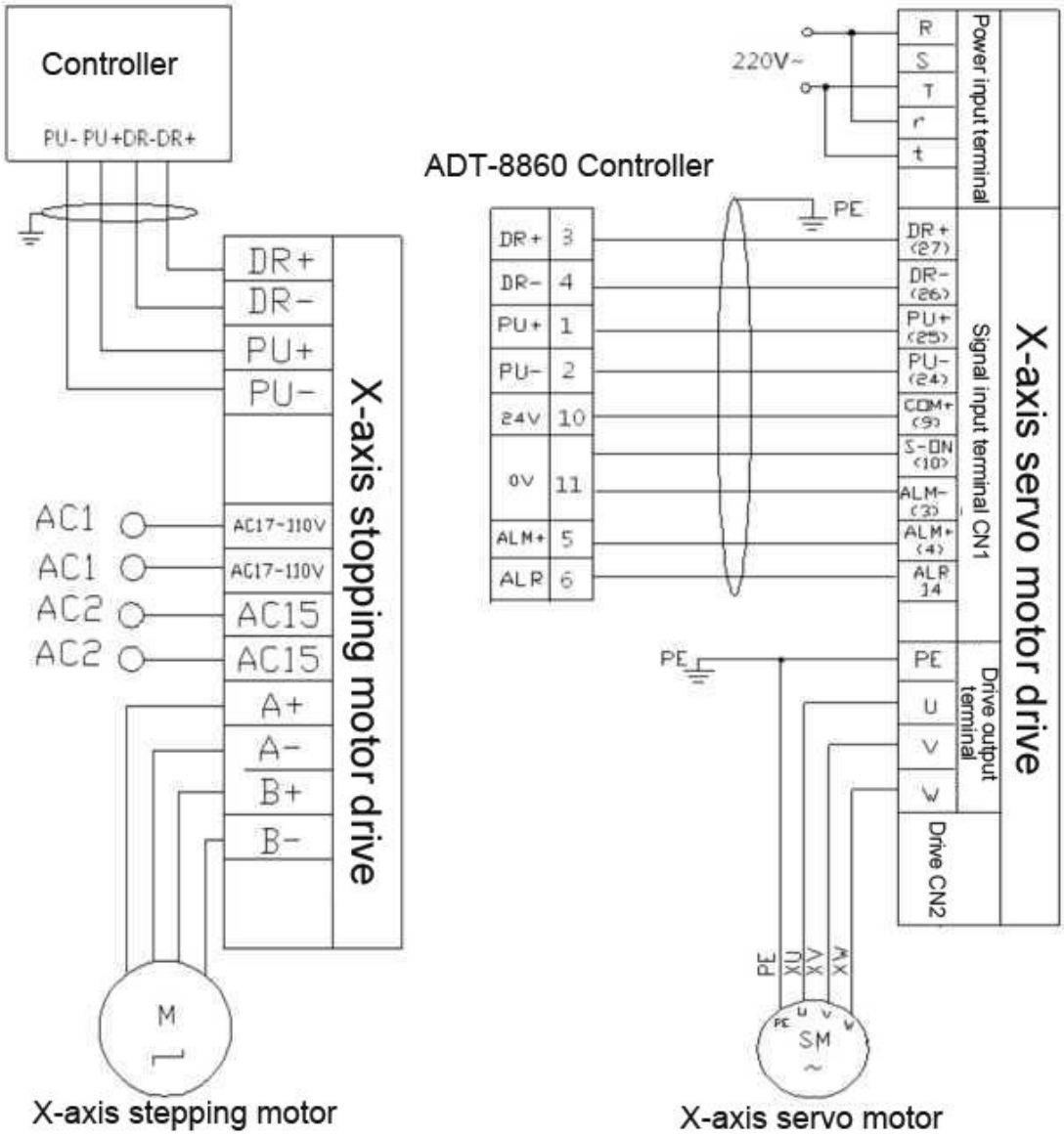
The common anode connection method is as follows:



The power supply voltage is determined by the encoder. When using a 5V power supply, the resistor R isn't required. When using a 12V power supply, R can be 1K-2K resistor. When using a 24V power supply, R can be 2K-5K resistor.

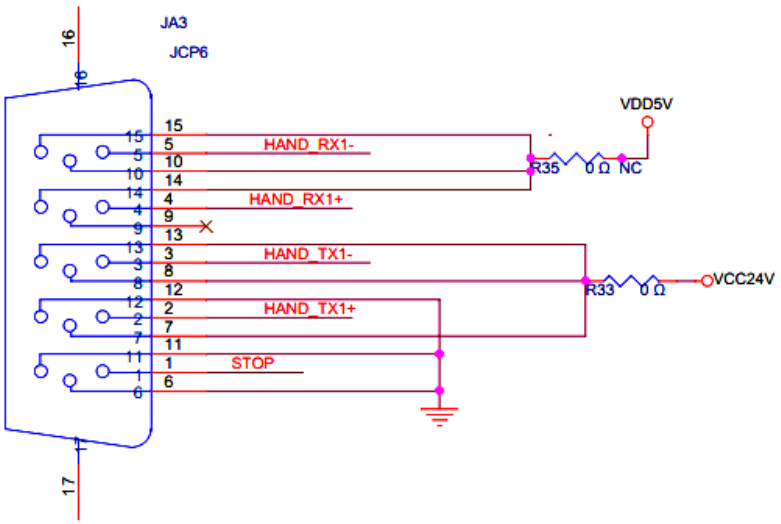
※Note: Try to use the differential output encoder because the differential method is better in anti-interference when the line is long.

7. Stepping and servo general wiring diagram



8. AMC1600serial port

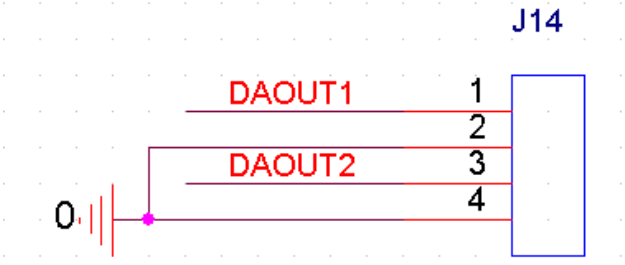
AMC1600 COM1 port



Wire No.	Name	Function
1	STOP	STOP
2	TX1+	Data transmission +
3	TX1-	Data transmission -
4	RX1+	Data reception +
5	RX1-	Data reception -
9	NC	NC
11,12,6	GND	Power ground
14,15,10	VDD5V	Supply 5V power externally
13,8,7	VDD24V	Supply 24V power externally

9. Analog definition

AMC-1600analog output



1	DAOUT1	Analog voltage line 1
2	GND	Analog voltage reference ground
3	DAOUT2	Analog voltage line 2
4	GND	Analog voltage reference ground

10. AMC-1600 wiring diagram example