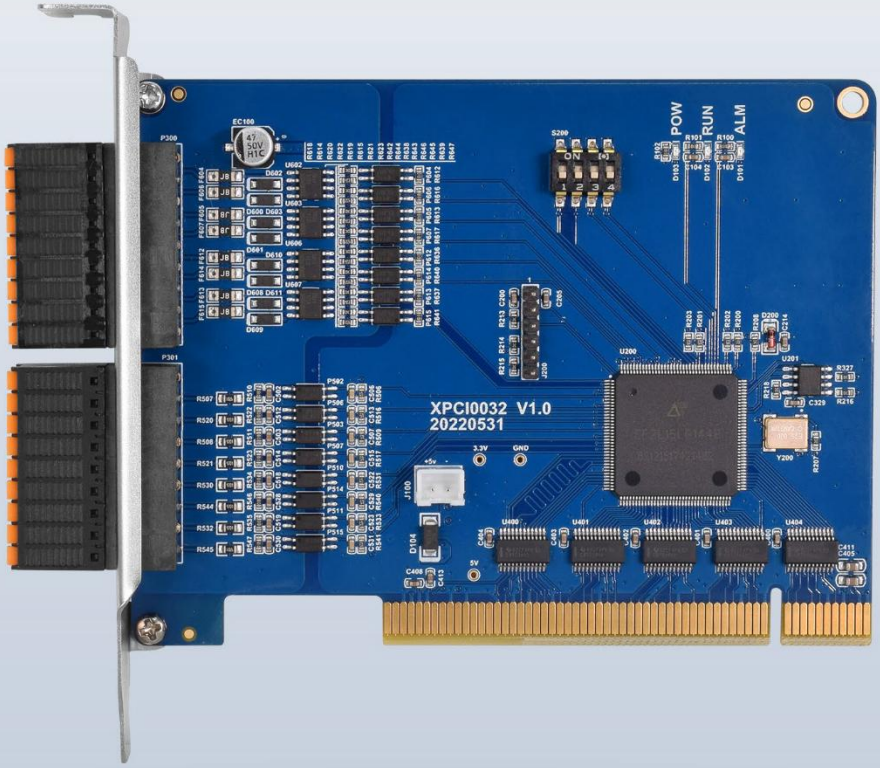
Zmotion®
正运动技术

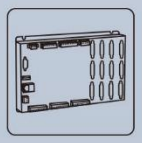
做更好用的运动控制，智造美好生活
Better Motion Control, Smarter Life

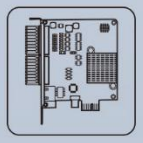
XPCI IO Control Card

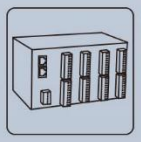
XPCI0032




Vision Motion Controller


Motion Controller


Motion Control Card


IO Expansion Modulee


HMI

Statement

Thank you for choosing our Zmotion products. Please be sure to read this manual carefully before use so that you can use this product correctly and safely. Zmotion is not responsible for any direct or indirect losses caused by the use of this product.

The information in this manual is for reference only. Due to design improvements and other reasons, Zmotion reserves the right of final interpretation of this information! Contents are subject to change without prior notice!

➢ Notes

In order to prevent possible harm and damage caused by incorrect use of this product, the following instructions are given on matters that must be observed.

■ Danger

Do not use it in places with water, corrosive or flammable gases, or near flammable substances.	May cause electric shock, fire, damage, etc.
When installing or disassembling, make sure the product is powered off.	
Cables should be connected securely, and exposed parts that are energized must be insulated by insulators.	
Wiring work must be performed by professionals.	

■ Notes

It should be installed within the specified environmental range.	May cause damage, mis-operation, etc.
Make sure there are no foreign objects on the product hardware circuit board.	
After installation, the product and the mounting bracket should be tight and firm.	
After installation, at least 2-3cm should be left between the product and surrounding components for ventilation and replacement.	
Never disassemble, modify, or repair it by yourself.	

Content

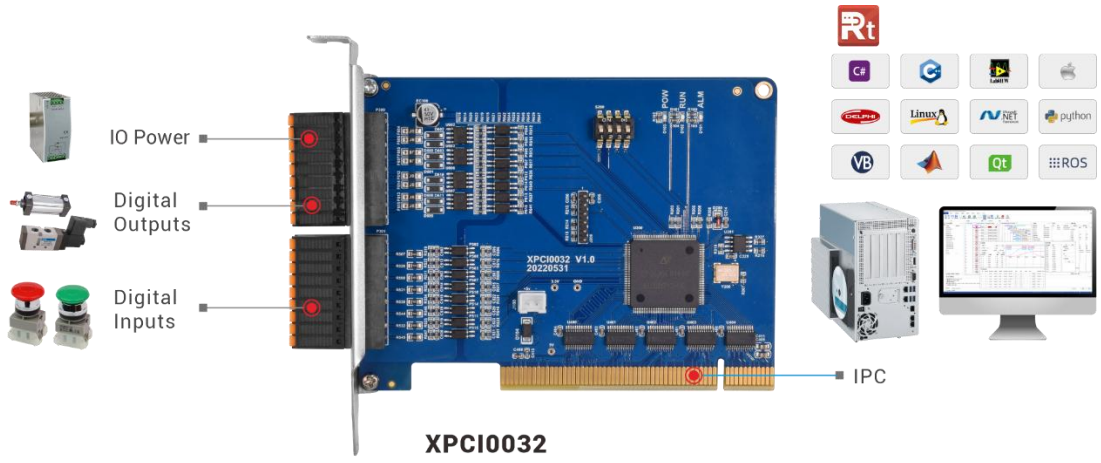
Chapter I Production Information

1.1. Product Information

XPCI0032-IO control card is a kind of new type PCI-IO expansion card for industrial automation control. It has 16 inputs and 16 outputs. And inputs can be connected to all kinds of switch signals, for example, sensor. Outputs also can drive some small switch devices, such as, solenoid valve, relay, cylinder, etc.

XPCI0032 IO control card can be used to expand IO numbers when IO resources are not enough.

1.2. System Structure

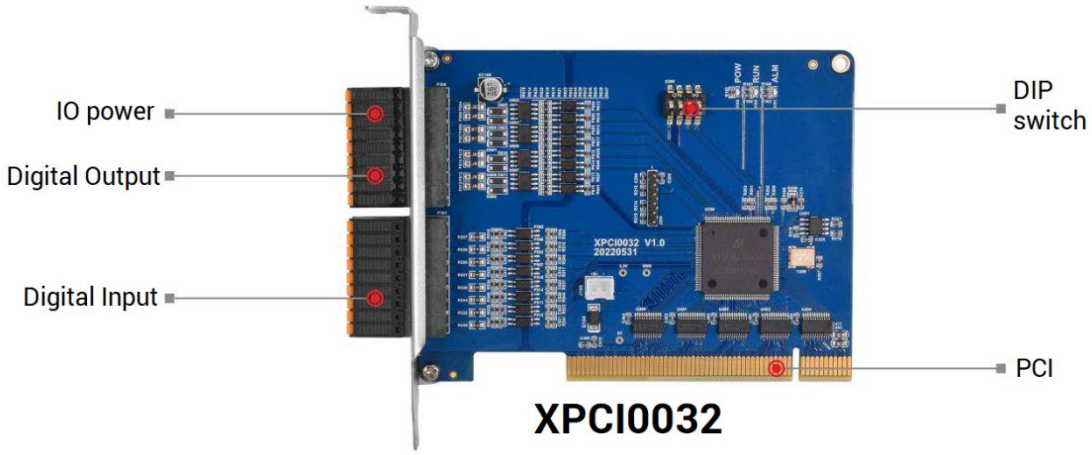


1.3. Functional Features

- Digital expansion: 16 inputs and 16 outputs
- The maximum output current of general digital outputs can reach 300mA, which can directly drive some kinds of solenoid valves.

- Support multi-file and multi-task programming in Basic.
- A variety of program encryption methods to protect the intellectual property rights of customers.

1.4. Interface Definitions



→ Interface Description

Mark	Interface	Number	Description
POW	The led that indicates the current state.	1	Power state: it lights when power is conducted.
RUN		1	Run state: it lights when runs normally
ALM		1	Error state: it lights when runs incorrectly
E+24V	IO power	1	24V DC power supplies power for IO
P300	General Digital Output	1	Include I/O control signals
P301	General Digital Input	1	Include I/O control signals

Chapter II Production Specification

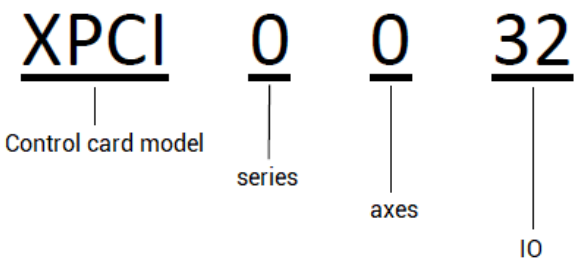
2.1. Basic Specification

Item	Description
Model	XPCI0032
Basic Axis Number	0
Basic Axis Type	-
Digital IO	16 inputs and 16 outputs (with overcurrent protection)
IO IN Frequency	<5kHz
IO OUT Frequency	<8kHz
Pulse Max Frequency	5MHz
Power IN	24V DC Input
Dimension	120*92mm

- **Notes**

- PCI does not support hot swapping, please turn off the computer before inserting and removing the card.
- Please handle it carefully, wear anti-static gloves or touch an effectively grounded metal object for body discharge before touching the control card circuit or inserting/unplugging the control card to prevent possible static electricity from damaging the motion control card.

2.2. Nameplate Information



2.3. Connection Configuration

External equipment / software configuration:

- Main computer / industrial control computer, wired-mouse & keyboard.
- Displayer
- Win10 operating system professional edition, RTSys (ZDevelop) development platform and operating system software of various machine tool industries, etc.

(note: you can download the latest RTSys (ZDevelop) version from the official website of Zmotion or contact us. If you use other upper computer development platforms, can also contact us to obtain function library files. And this product does not come with an operating system, and there is no built-in MotionRT software. Users need to go to the official website to download the MotionRT installation package)

Chapter III Wiring & Communication

3.1. IO Power Interface

IO power uses DC24V power supply, and connects to it through P300 interface. For more details, please refer to chapter 3.2.

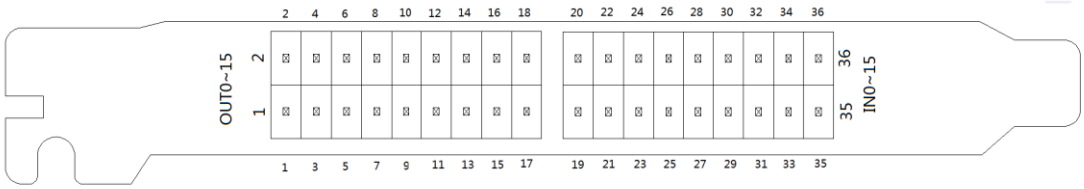
→ Specification:

Item	Description
Voltage	DC24V (-5%~+5%)
The current to open	≤0.15A
The current to work	≤0.1A
Anti-reverse connection	Yes
Overcurrent Protection	Yes

3.2. P300, P301 Interfaces

P300 and P301 are IO signal control interfaces.

→ Interface Appearance:



→ Terminal Definition

Pin	Name	Description	Pin	Name	Description
1	E24V	IO power input DC24V	19	NC	Reserved
2	EGND	IO power ground / IO public end	20	EGND	IO public end

3	OUT0	Digital output 0	21	IN0	Digital input 0
4	OUT1	Digital output 1	22	IN1	Digital input 1
5	OUT2	Digital output 2	23	IN2	Digital input 2
6	OUT3	Digital output 3	24	IN3	Digital input 3
7	OUT4	Digital output 4	25	IN4	Digital input 4
8	OUT5	Digital output 5	26	IN5	Digital input 5
9	OUT6	Digital output 6	27	IN6	Digital input 6
10	OUT7	Digital output 7	28	IN7	Digital input 7
11	OUT8	Digital output 8	29	IN8	Digital input 8
12	OUT9	Digital output 9	30	IN9	Digital input 9
13	OUT10	Digital output 10	31	IN10	Digital input 10
14	OUT11	Digital output 11	32	IN11	Digital input 11
15	OUT12	Digital output 12	33	IN12	Digital input 12
16	OUT13	Digital output 13	34	IN13	Digital input 13
17	OUT14	Digital output 14	34	IN14	Digital input 14
18	OUT15	Digital output 15	36	IN15	Digital input 15

3.3. IN Digital Inputs

Digital inputs are distributed in P301 signal interface.

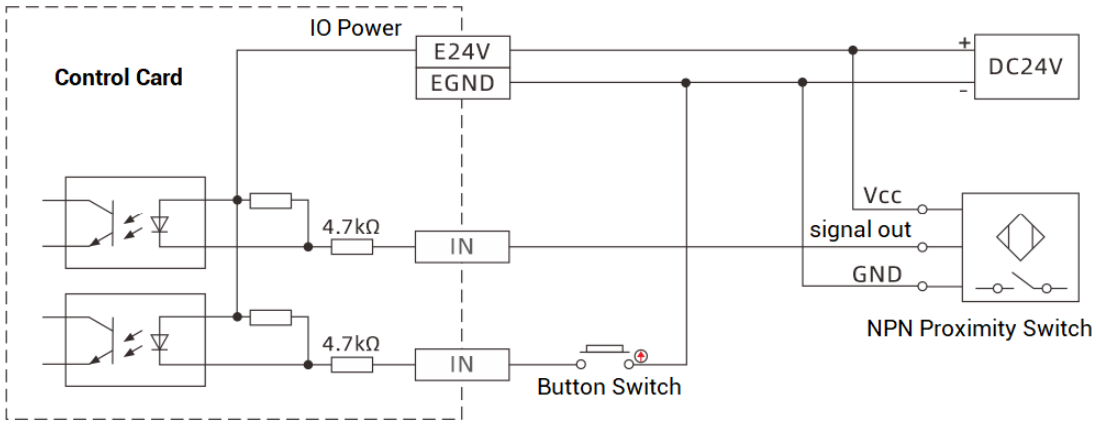
3.3.1. Digital Input Specification & Wiring

→ Specification

Item	Low-speed input (IN0-IN15)
Input method	NPN type
Input frequency	<5KHz
Impedance	4.7KΩ
Voltage level	DC24V

Voltage to open	<14.5V
Voltage to close	>14.7V
Min current	-1.8mA (negative direction)
Max current	-6mA (negative direction)
Isolation	optoelectronic isolation
Note: above parameters are typical values when control card IO power (E+24V) is 24V.	

→ Wiring Reference



→ Wiring Note

- The wiring principle of low-speed digital input IN (0-15) is shown in the figure above. The external signal source can be an optocoupler, a key switch or a sensor, etc., all can be connected as long as the requirements on output of electric level can be achieved.
- For the public end, please connect the "EGND" port on the IO terminal to the "COM" terminal of the external input device. If the signal area power supply of the external device and the power supply of the controller are in the same power supply system, this connection also can be omitted.

3.3.2. Basic Usage Method

(1) Please follow the above wiring instructions to wiring correctly.

(2) After powered on, please connect to RTSys.

(3) State values of corresponding input can be read directly through "IN" command or through "RTSys/Tool/IN".

3.4. OUT: Digital Output

Digital outputs are distributed in P300 signal interfaces.

3.4.1. Digital Output Specification & Wiring

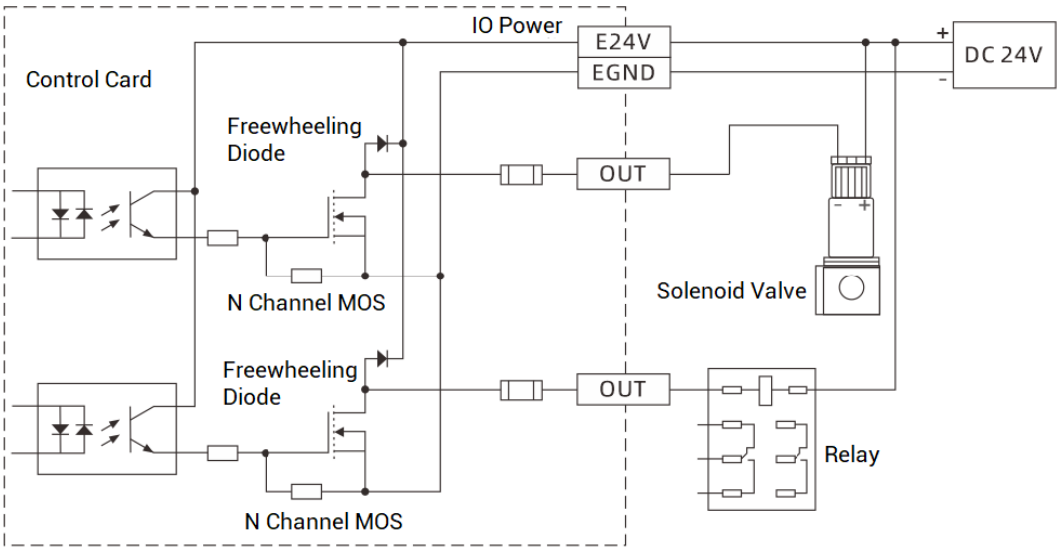
→ Specification

Item	Low-speed output (OUT0-15)
Output method	NPN Leakage type, it is 0V when outputs.
Frequency	<8kHz
Voltage level	DC24V
Max Output Current	+300mA
Max leakage current when off	25μA
Respond time to conduct	12μs
Respond time to close	80μs
Overcurrent protection	Support
Isolation	optoelectronic isolation

Note:

- The times in the form are typical based on the resistive load, and may change when the load circuit changes.
- Due to the leak-type output, the shutdown of the output will be obviously affected by the external load circuit, and the output frequency should not be set too high in the application. For low-speed output, it is recommended to be lower than 8HKz.

→ Wiring Reference



→ Wiring Note

- The wiring principle of low-speed digital output OUT(0-15) is shown in the figure above. The external signal source can be an optocoupler, a relay or a solenoid valve etc., all can be connected as long as the input current is not more than 300mA.
- For the public end, please connect the "EGND" port on the IO power supply to the negative pole of DC power supply of external input device. If the signal area power supply of the external device and the power supply of the controller are in the same power supply system, this connection also can be omitted.

3.4.2. Basic Usage Method

(1) Please follow the above wiring instructions to wiring correctly.

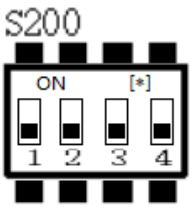
(2) After powered on, please connect to RTSys.

(3) State values of corresponding input can be read directly through “OP” command or through “RTSys/Tool/OP”.

3.5. DIP Switch

This product has one DIP switch.

→ DIP Switch Appearance



→ Usage Description

DIP switch S200 is used to set ID of XPCI0032.

When no dial, all are OFF: ID is 15.

When the first bit of S200 is dialed to ON: ID is 14.

When the second bit of S200 is dialed to ON: ID is 13.

When the third bit of S200 is dialed to ON: ID is 11.

When the fourth bit of S200 is dialed to ON: ID is 7.

When all are dialed, all are ON: ID is 0.

Chapter IV Installation Requirements

4.1. Installation Environment

Environment temperature: the ambient temperature has a great impact on the life of the device, and the operating environment temperature of the device is not allowed to exceed the allowable temperature range (-10°C to 55°C).

Please install it in a place that is not easy to vibrate. Vibration should not be greater than 4.9m/s^2. Take special care to stay away from equipment such as punch presses.

Avoid placing in direct sunlight, humidity, and water drops.

Avoid installing in places with corrosive, flammable and explosive gases in the air.

Avoid installing in places with oil and dust, the pollution level of the installation place is PD2.

This product is installed in the cabinet and needs to be installed in the final system. The final system should provide corresponding fireproof enclosures, electrical protection enclosures, and mechanical protection enclosures, etc., in compliance with relevant IEC standards.

CPU heat dissipation should be considered when the chassis is fully enclosed and there is no air circulation.

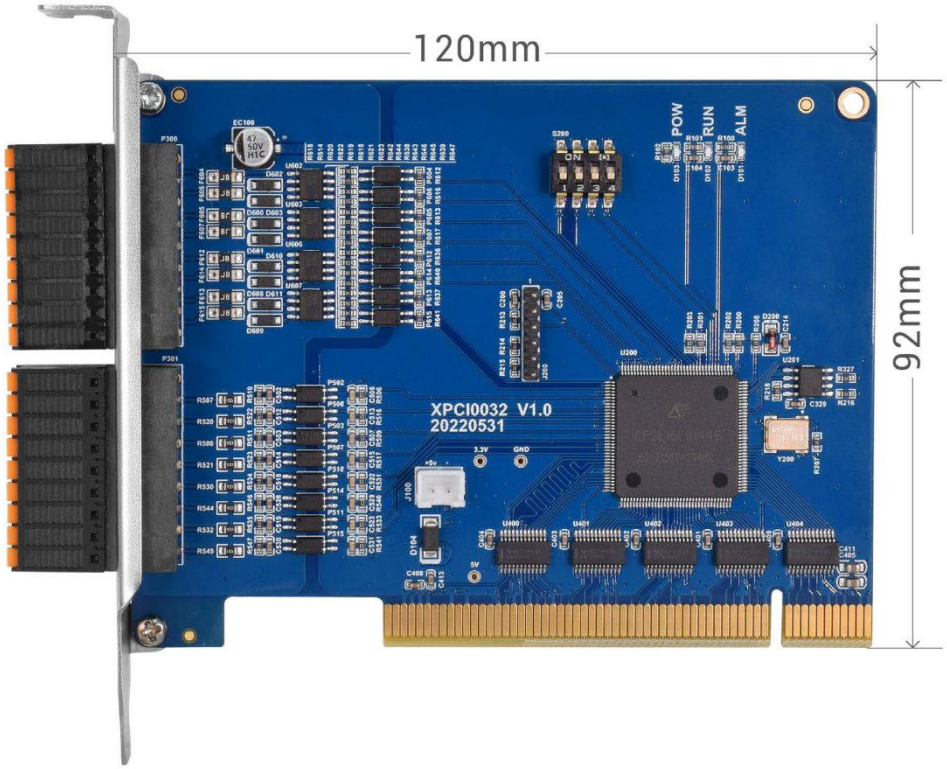
The CPU generates a lot of heat, and the board has limited space, so it is necessary to install an appropriate heatsink according to the case clearance to make use of the case cooling.

Item		Parameters
Work Temperature		-10℃-55℃
Work relative Humidity		10%-95% non-condensing
Storage Temperature		-40℃ ~ 70℃ (not frozen)
Storage Humidity		Below 90%RH (no frost)
vibration	Frequency	5-150Hz
	Displacement	3.5mm(directly install)(<9Hz)

	Acceleration	1g(directly install)(>9Hz)
	Direction	3 axial direction
Shock (collide)		15g, 11ms, half sinusoid, 3 axial direction
Degree of Protection		IP20

4.2. Installation Size

The card slot interface is designed according to the standard card of 32-bit card, and it is compatible with standard PCI V2.3 and below versions.



Size: 120mm*92mm

4.3. Installment Method

1. Turn off the power to the computer.
2. Open the computer case, select a free PCI card slot, and use a screwdriver to remove the corresponding baffle strip.

3. Insert the motion control card into the slot securely, and tighten the fixing screws on the baffle strip.

4. Remove a baffle strip adjacent to the slot and use screws to secure the adapter plate to the slot in the chassis.

- Notes

- PCI does not support hot swapping, please turn off the computer before inserting and removing the card.

- Please handle it carefully, wear anti-static gloves or touch an effectively grounded metal object for body discharge before touching the control card circuit or inserting/unplugging the control card to prevent possible static electricity from damaging the motion control card.

 **Installation attention**	• Non-professionals are strictly prohibited to operate. Specifically, professionals who had been trained related electrical equipment, or who master electrical knowledge. • Please be sure to read the product instruction manual and safety precautions carefully before installation. • Before installation, please ensure that the product is powered off. • Do not disassemble the module, otherwise the machine may be damaged. • In order to facilitate ventilation and controller replacement, 2-3cm should be left between the upper and lower parts of the controller and the installation environment and surrounding components. • Considering the convenient operation and maintenance of the controller, please do not install the controller in the following places: a) places where the surrounding ambient temperature exceeds the range of -10°C-55°C b) places where the ambient humidity exceeds the range of 10%-95% (non-condensing) c) places with corrosive gases and flammable gases d) places with many conductive powders such as dust and iron powder, oil mist, salt, and organic solvents e) there is direct sunlight

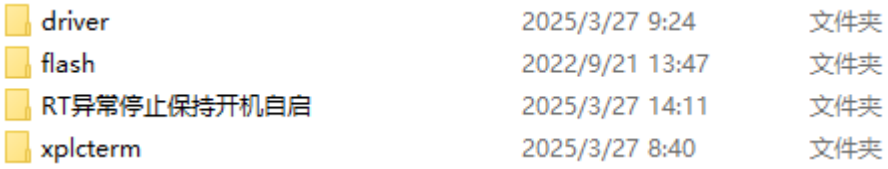
Chapter V How to Use MotionRT750

It is recommended to match MotionRT750 with XPCI / XPCIE card, then it can play better performance. The authorization information is saved into the control card, each control card has unique No.

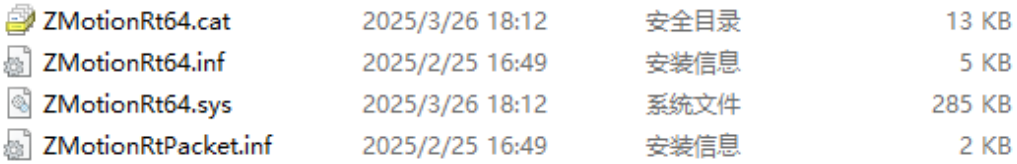
Note: this software requires enough strong PC / IPC performance and real-time. Currently, AMD CPU is not supported.

Before that, please obtain latest MotionRT7 file and unzip it.

Address: https://www.zmotionglobal.com/download_list_14.html



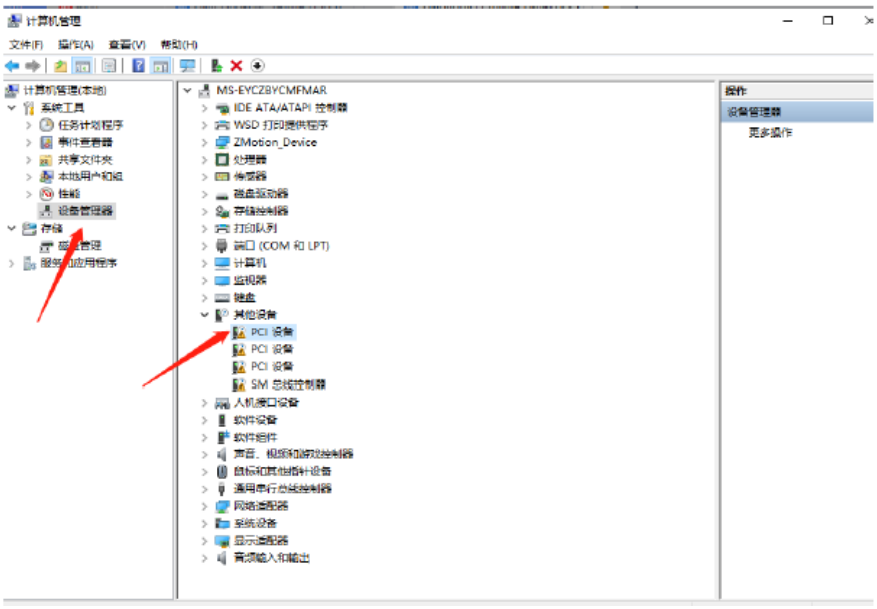
- Driver: the driver folder, it includes MotionRT7 drive installation information file, ECAT protocol installation information, installation software, safety content file, sys system file, signature file, etc.



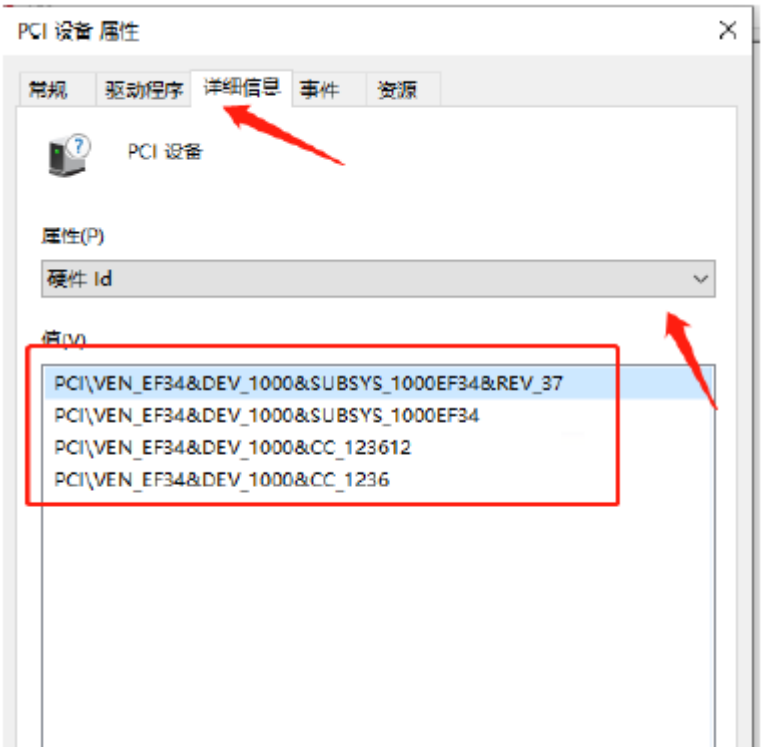
  - ✓ ZMotionRT64.cat: the digital signature file of drive program.
  - ✓ ZMotionRT64.inf: MotionRT7 software drive installation information, while installing the drive, select this file by browsing folder.
  - ✓ ZMotionRT64.sys: system file.
  - ✓ ZMotionRTPacket.inf: ethercat protocol installation information, while installing ECAT protocol, select this file by browsing folder.
- Flash: controller system folder
- Xplcterm: xplc screen folder, it includes xplcterm software, which is used as screen to show HMI interface

5.1. How to Install MotionRT750 Drive (with Card)

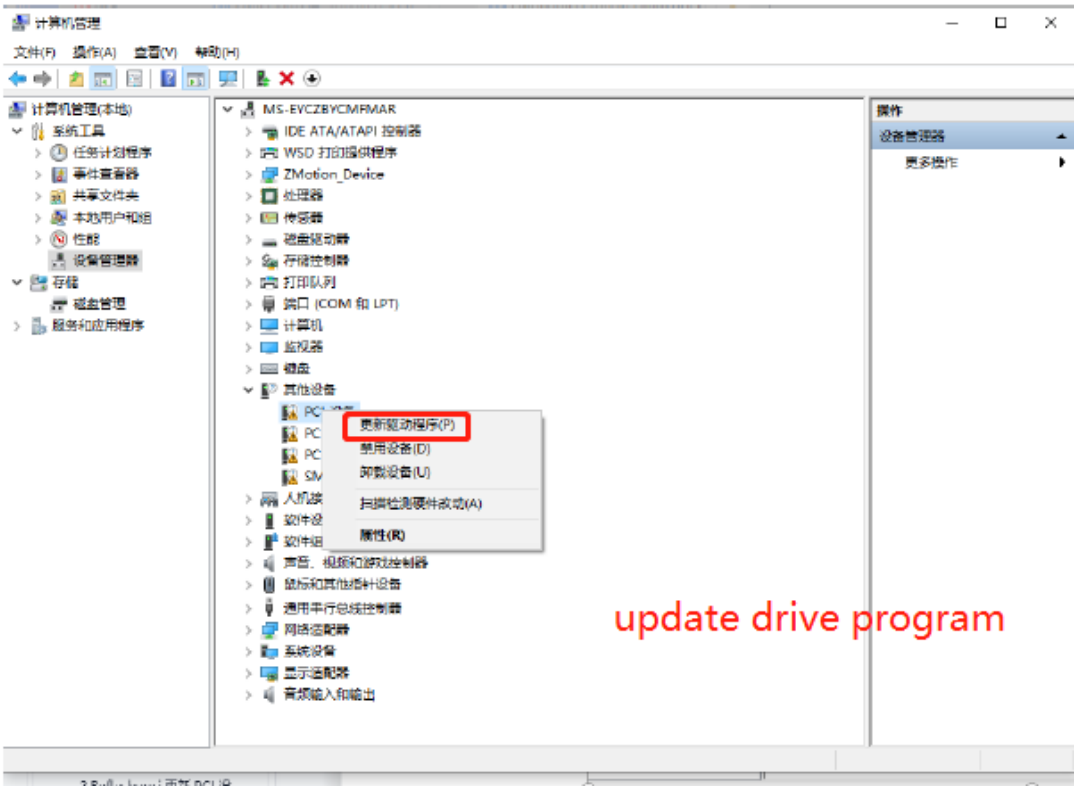
1. Open the Device Manager menu and select the PCI device in Other Devices.



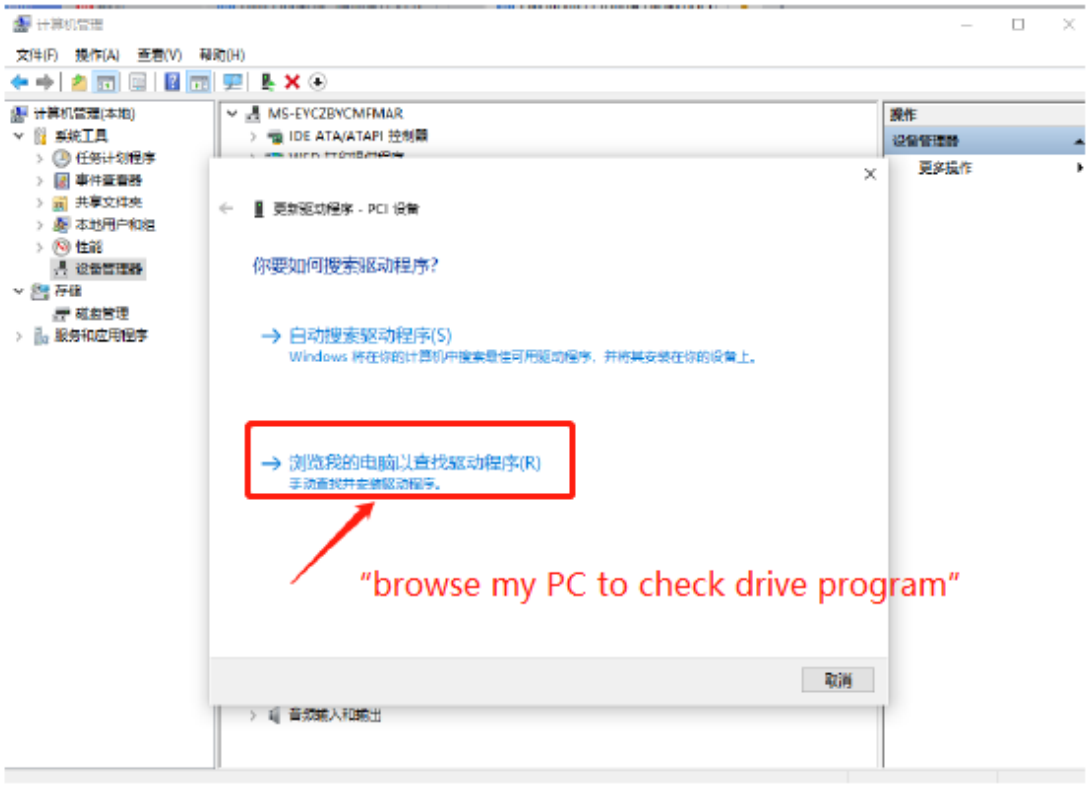
2. If there are multiple PCI devices, right-click "Properties" to view detailed information, select "Hardware ID" for properties, and confirm that it is a PCI device starting with PCI\VEN_EF34&DEV_1000&.



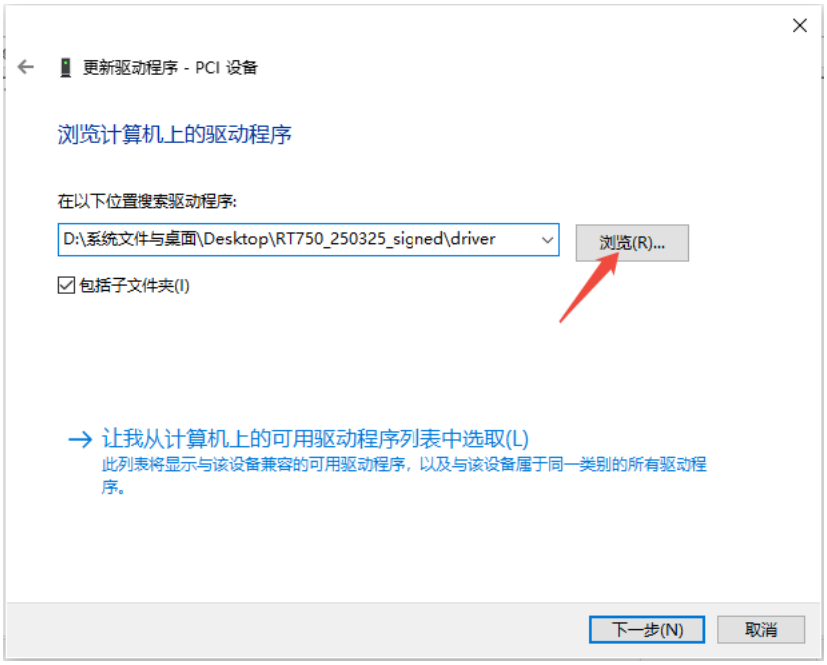
3. Find PCI Device, right-click to select “update drive program".



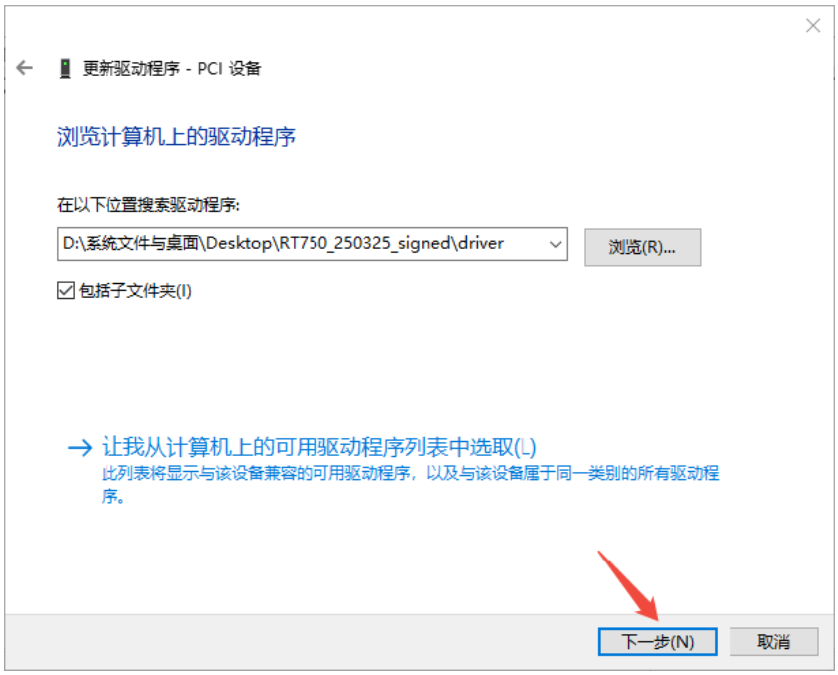
4. Select “browse my PC to check drive program".



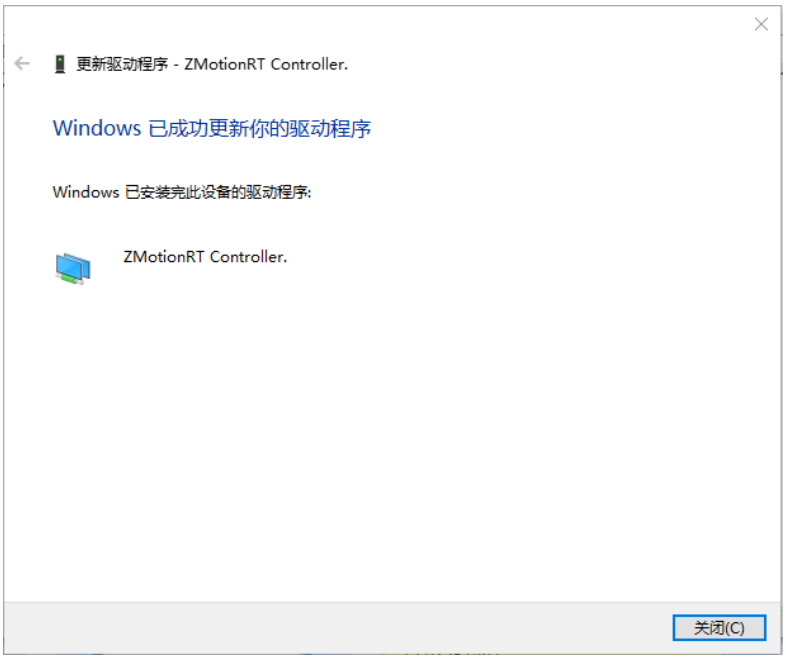
5. Click “browse", and select driver folder of RT750 drive.



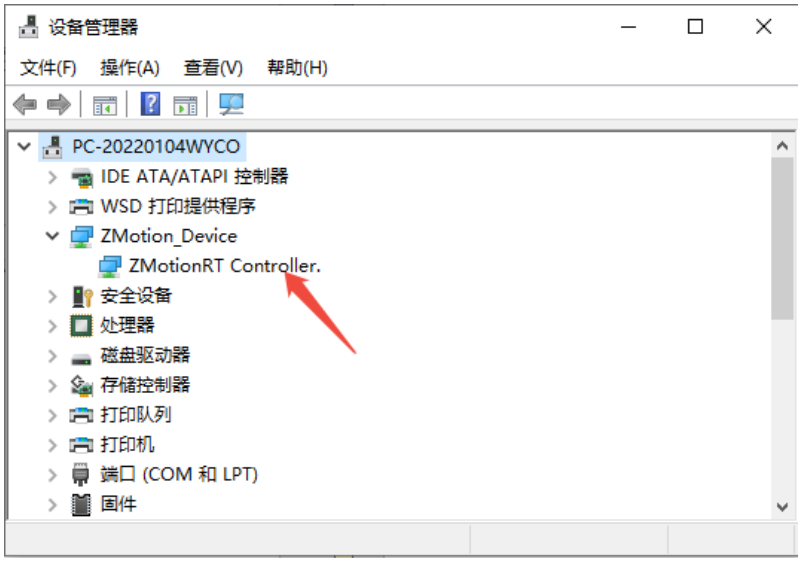
6. Click “next step".



7. Wait until installed, click close.



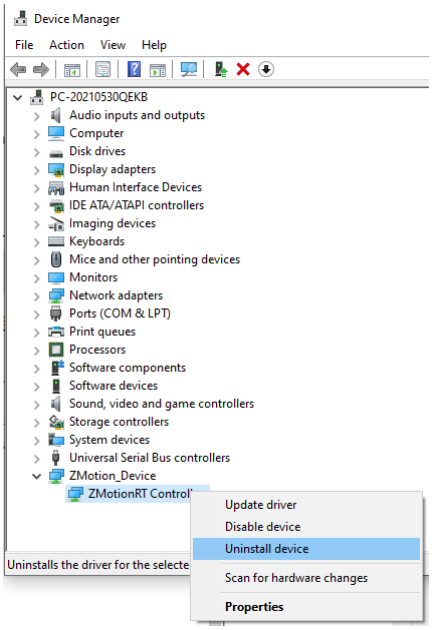
8. If there is ZMotionRTController in the device manager, the installation is successful.



5.2. How to Unload MotionRT750

1. Before that, stop MotionRT7, and close software program.

2. Find ZmotionRT Controller from device manager, right click “Uninstall Device"



3. Check “delete this device's drive program software”, then click “uninstall”.

4. Click “action” again, find “scan for hardware changes”, PCI device shown in other devices = uninstalled successfully.

5.3. How to Use One Single Card / Multi-Card

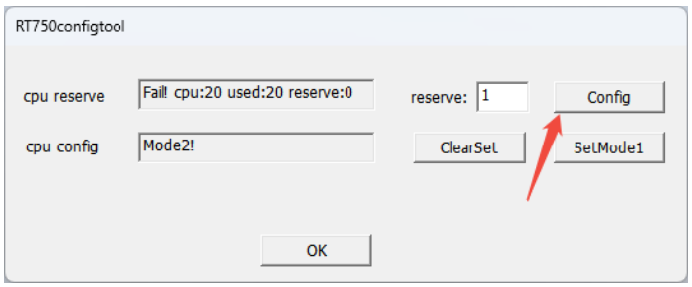
1. Insert motion control card into IPC (please operate it when power off).
2. When there are several cards, you can set card ID No. in advance. For single one, skip this step.
3. Install drive and MotionRT750 software.
4. Right-click and select "Run as Administrator" to open configtool.exe (included in the MotionRT750 installation package) to enter the CPU configuration. Generally, the reserve setting is set to 1 by default and does not need to be changed. Simply click

"Config" to confirm the setting. The CPU config setting is displayed as default and generally does not need to be changed. Simply click "OK".

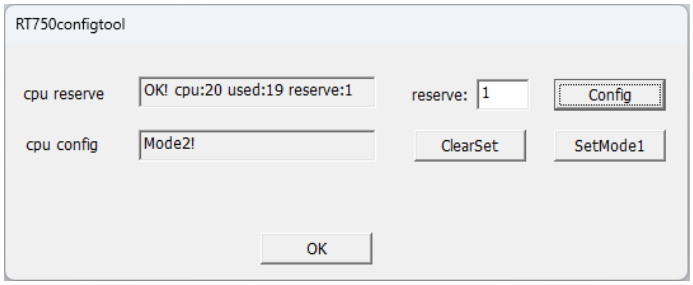
[How to disable Hyper-Threading Technology varies depending on the brand or system. Please search for the corresponding method on the web.]

➢ Notes:

- The corresponding version of the driver must be installed before execution.
- The console program must be closed before execution.
- It needs administer permission.
- MotionRT750 can't be used without CPU configuration. If don't use MotionRT750, please set reserve as 0, and click "ClearSet" to clear configurations, restart the PC.



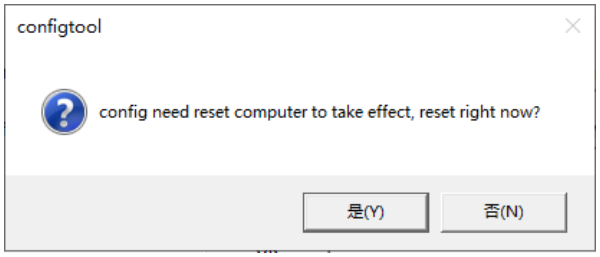
"configtool" -- not be configured



"configtool" -- be configured successfully

5. Click OK and the following window will pop up. Select "Yes" to restart the PC immediately. (This step may not be supported on some computers. If the computer becomes unresponsive or freezes when running software after restarting, or other applications become unusable, the computer may not support MotionRT750. You can use MotionRT710 instead.)

➢ Note: The CPU configuration will take effect only after restarting the computer!!!



6. After restarting, open and run MotionRT750.exe (if it prompts CPU configuration error, please check steps 4 and 5)
7. Configure parameters reasonably in RT console.
8. Start: after configuring the parameters -- save -- click the Start button to start the RT software. To change the configuration parameters, you need to stop and then start the RT again.
9. Connect to card by LOCAL / IP, then download into card.

Chapter VI Programming

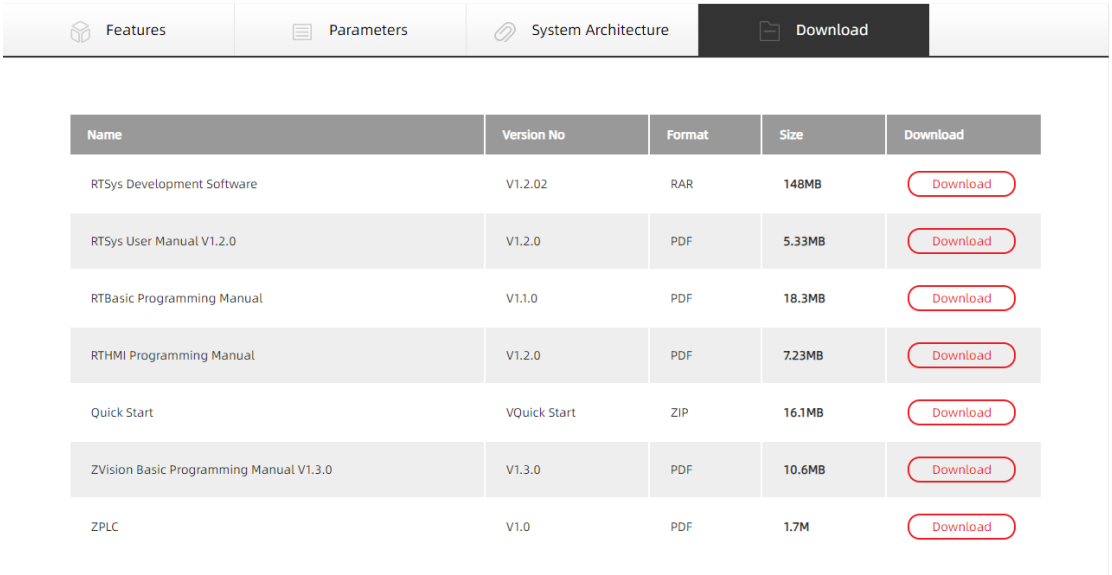
6.1. Program in RTSys Software

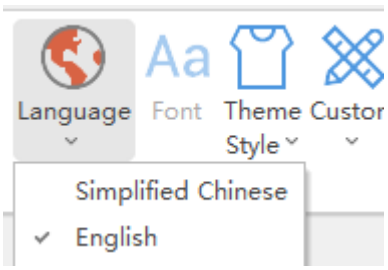
RTSys is a PC-side program development, debugging and diagnostic software for the Zmotion motion controllers. Through it, users can easily edit and configure the controller program, quickly develop applications, diagnose system operating parameters in real time, and debug the running program in real time. What's more, it supports Chinese and English bilingual environments.

In RTSys, there are 4 programming languages for motion control development, Basic, PLC, HMI and C language, they can run multi-tasks among them, especially for Basic, multi-task running can be achieved separately, hybrid programming is also OK with PLC, HMI and C language.

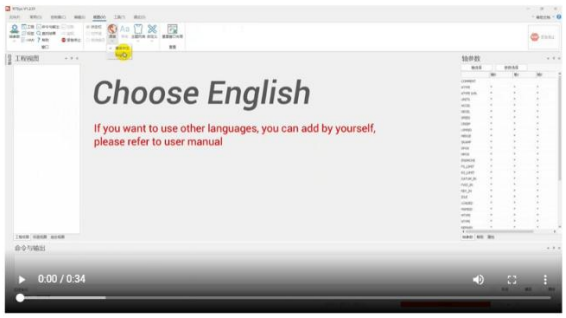
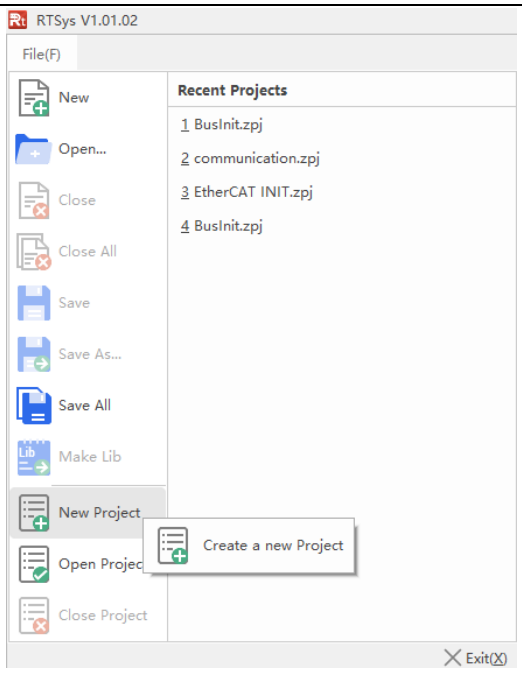
RTSys Downloading Address: https://www.zmotionglobal.com/pro_info_282.html

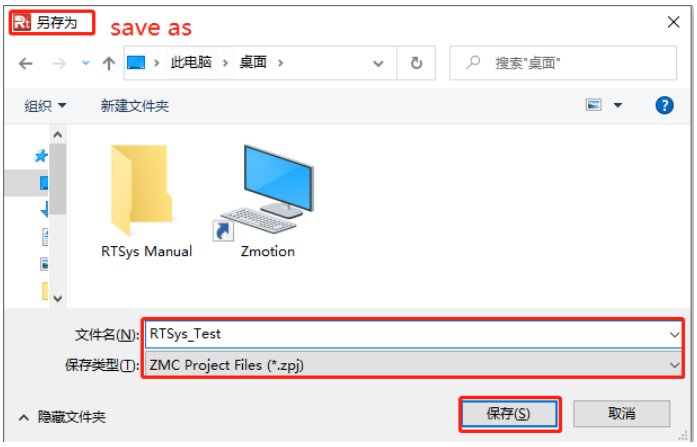
And related manuals can be found in "Download":



Step	Operations	Display Interface
1	Switch the Language: "Language" – "English", then there will pop	

<table>
<tr>
<td></td>
<td>up one window, click OK, and restart it.</td>
<td>Language Switch Video Showing:

E. How to Switch the Language
Find "视图" (the fourth one in the above menu), then find the "语言", choose English, restart RTSys. Enligsh RTSys will take effect when opened again.
 
</td>
</tr>
<tr>
<td>2</td>
<td>New Project: “File” – “New Project”, Save as window will pop up, then enter file name, save the project file with suffix “zpj.”.</td>
<td> 

 
</td>
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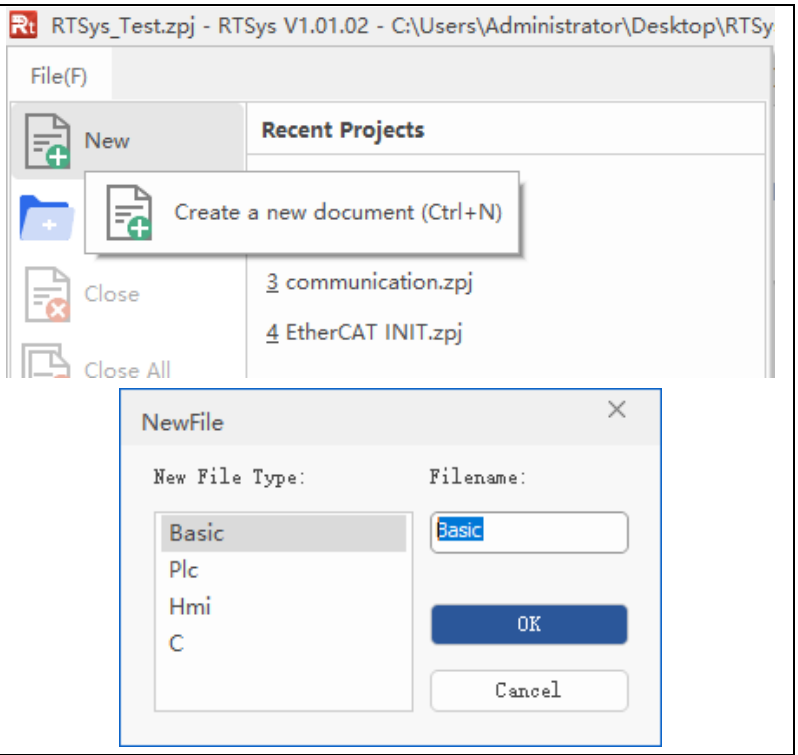
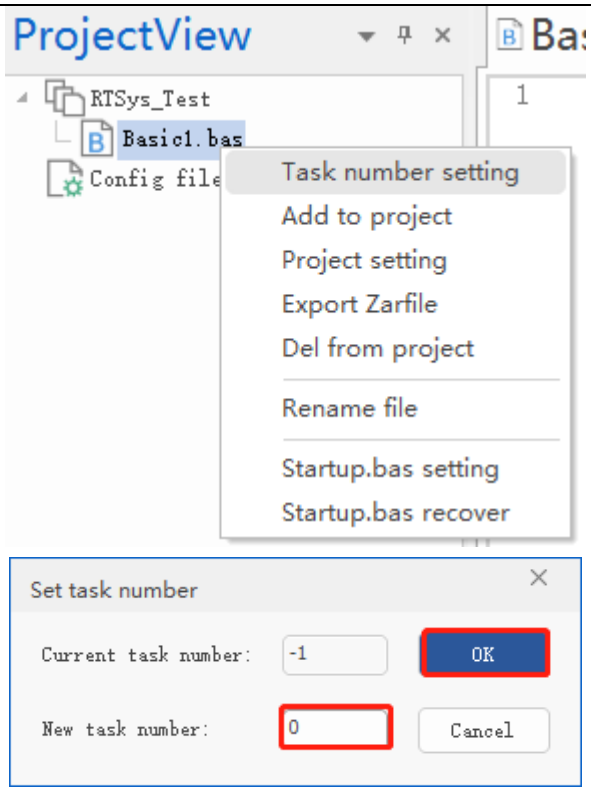
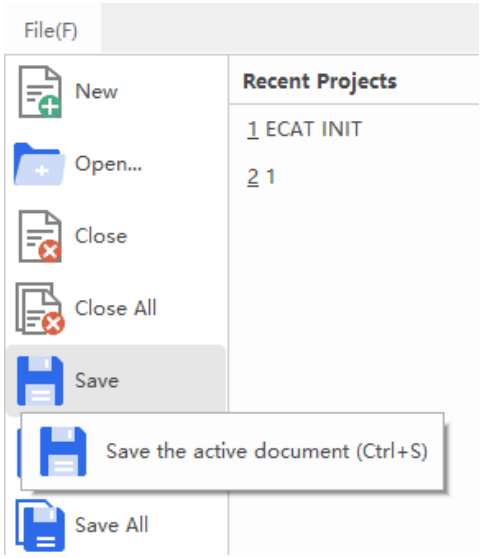
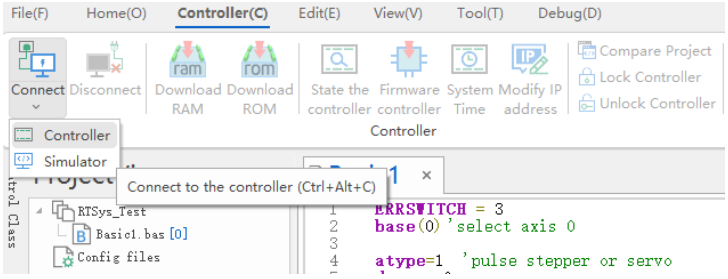
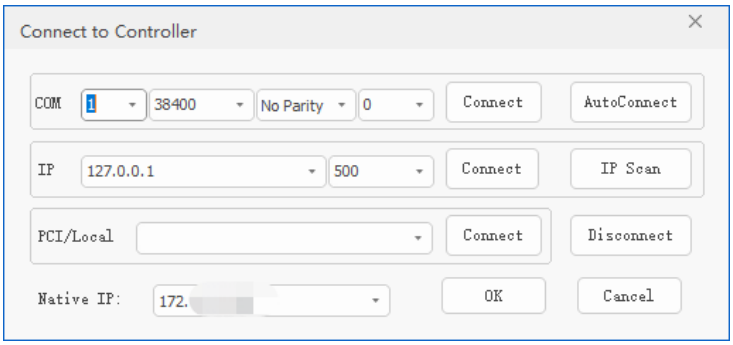
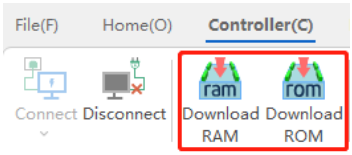
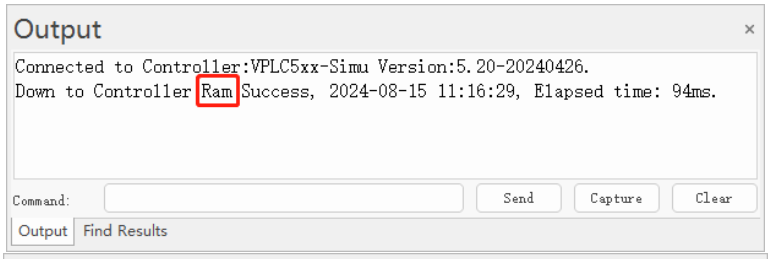
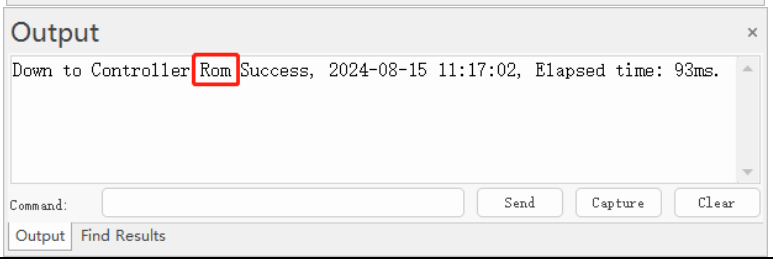
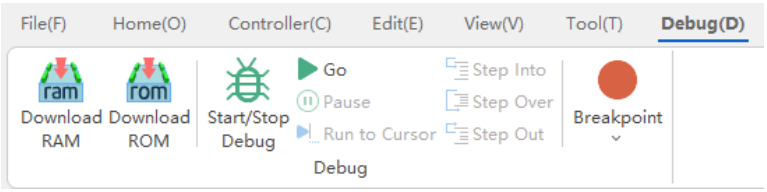
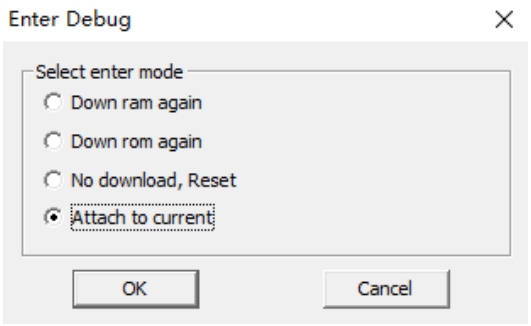
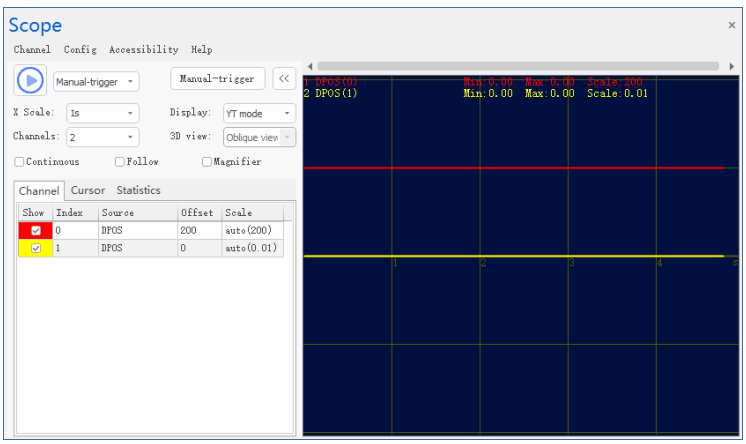
</table>

3	New File: “File” – “New File”, select file type to build, here select Basic, click “OK”.	
4	Set Auto Run No.: right click the file, open task number setting window, enter task No., which can be any + value, no priority, but not the same.	

5	Save File: edit the program in program editing window, click "save", new built file will be saved under "zpj." project automatically. "Save all" means all files under this project will be saved.	
6	Connection: Click "controller – connect", if no controller, select connect to simulator.	
	Then, "connect to controller" window will pop up, you can select serial port or net port to connect, select matched serial port parameters or net port IP address, then click "connect".	
7	Download Program into	● **RAM:** it will not save when power off. ● **ROM:** it will save data when power off, and when the program

	Controller: "Ram/Rom" – "download RAM / download ROM", if it is successful, there is print indication, at the same time, program is downloaded into controller and runs automatically.	is connected to controller again, running according to task No.   
8	Debug: "Debug" – "Start/Stop Debug" to call "Task" and "Watch" window, because it was downloaded before, here select "Attach the current".	 
9	Scope function: Click "View" – "Scope" to open oscilloscope. It can capture needed data, for debugging.	

Notes:

- When opening an project, choose to open the zpj file of the project. If only the Bas file is opened, the program cannot be downloaded to the controller.
- When the project is not created, only the Bas file cannot be downloaded to the controller.
- The number 0 in automatic operation represents the task number, and the program runs with task 0, and the task number has no priority.
- If no task number is set for the files in the entire project, when downloading to the controller, the system prompts the following message WARN: no program set autorun

6.2. Upgrade Controller Firmware

Firmware upgrade can be achieved by downloading zfm firmware package in RTSys. zfm file is the firmware upgrade package of controller, please select corresponding firmware because different models are with different packages, please contact manufacturer).

How to update:

a. Open ZDevelop / RTSys software, then click "controller – connect", find PCI/LOCAL method, click "connect". If connected, there will be "Connected to Controller: PCIE464 Version: 4.93 – 20231220." In "output" window.

b. Click "controller – state the controller", find basic info, then current software version can be checked.

c. Click "controller – update firmware", current controller model and software version can be viewed.

d. Click "browse", and select saved firmware file, click "update", then one window will pop up, please click "ok".

e. After that, "connect to controller" window appears again, and please select "PCI/Local" again, and click "connect".

f. When connection is successful, "firmware update" interface is shown. Now

system enters ZBIOS state, please click “update” again.

g. When it is loaded, “firmware update” window disappears, now in output window, it shows “Update firmware to Controller Success”.

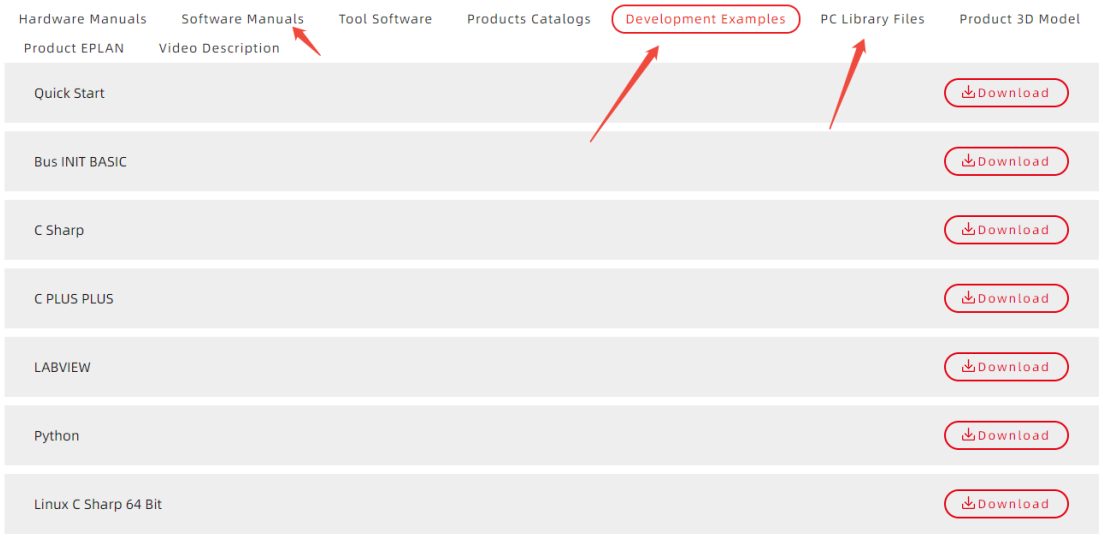
h. Do step a and step b again, check whether the firmware is updated or not.

6.3. Program in Host-Computer by PC Languages

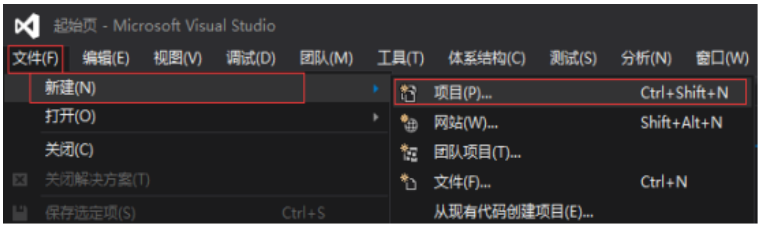
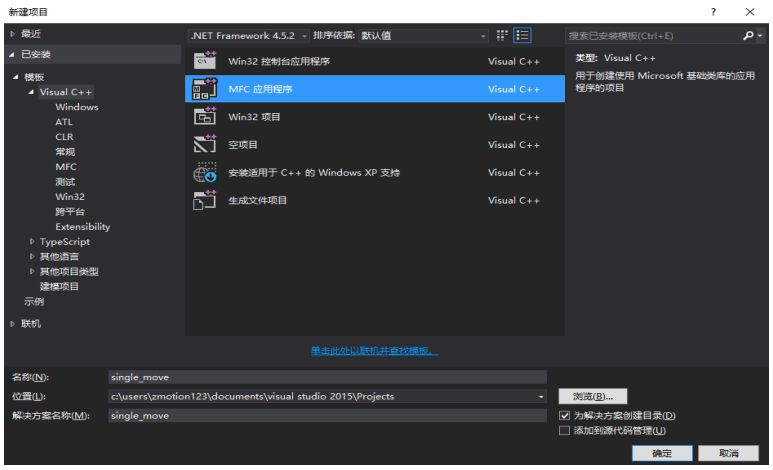
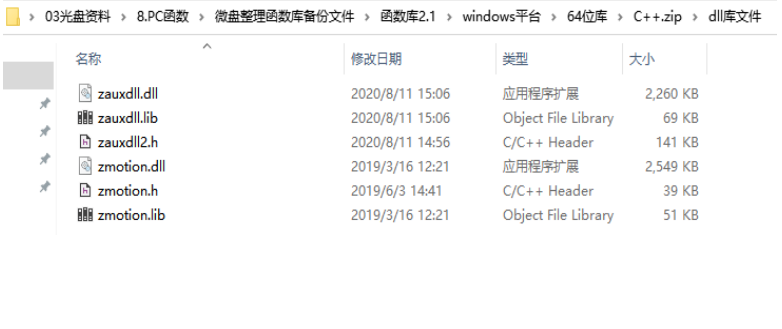
The controller supports development under various operating systems such as windows, linux, Mac, Android, and wince, and provides dll libraries in various environments such as vc, c#, vb.net, and labview, as shown in the figure below. PC software programming refers to "Zmotion PC Function Library Programming Manual".

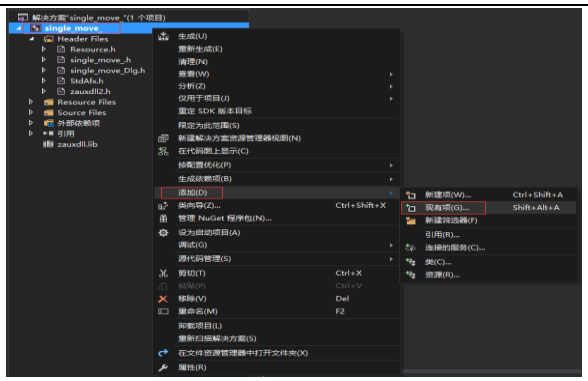
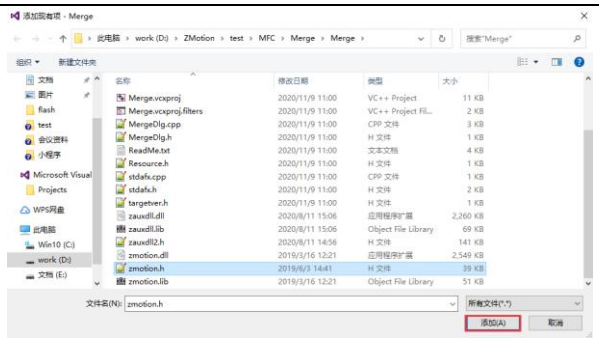
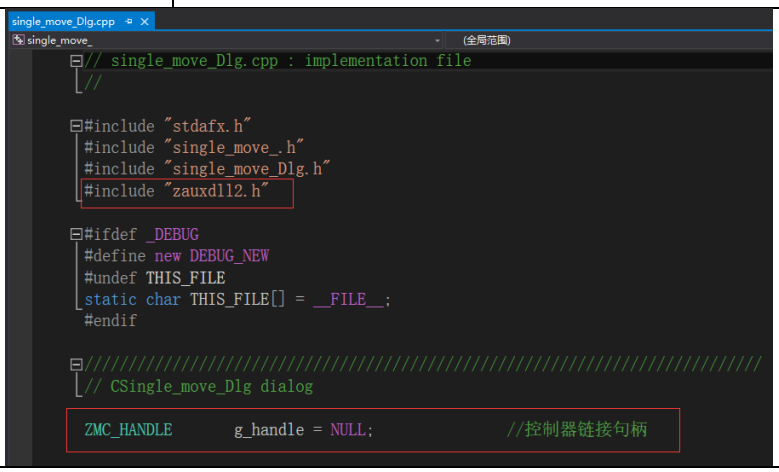
The program developed using the PC software cannot be downloaded to the controller, and it is connected to the controller through the dll dynamic library. The dll library needs to be added to the header file and declared during development.

- Get PC library file, example: https://www.zmotionglobal.com/download_list_17.html



The c++ project development process in VS is as follows:

Step	Operations	Display Interface
1	Open VS, click “File” – “New” – “Project”.	
2	Select development language as “Visual C++” and the select program type as “MFC application type”.	
3	Select “Based on basic box”, click “next” or “finish”	
4	Find C++ function library provided by manufacturer. Routine is below (64-bit library)	
5	Copy all DLL related library files under the above path to the newly created project.	

<table>
<tr><td rowspan="2">6</td><td rowspan="2">Add a static library and related header files to the project. Static library: zauxdll.lib, zmotion.lib
Related header files: zauxdll2.h, zmotion.h</td><td>1) Right-click the header file first, and then select: "Add" → "Existing Item".</td><td>  </td></tr>
<tr><td>2) Add static libraries and related header files in sequence in the pop-up window.</td><td>  </td></tr>
<tr><td>7</td><td>Declare the relevant header files and define the controller connection handle, so far the project is newly created.</td><td colspan="2"> 
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Chapter VII Operation and Maintain

The correct operation and maintenance of the device can not only guarantee and extend the life cycle of the equipment itself, but also take technical management measures according to the pre-specified plan or the corresponding technical conditions to prevent equipment performance degradation or reduce the probability of equipment failure.

7.1. Regular Inspection and Maintenance

The working environment has an impact on the device. Therefore, it is usually inspected regularly based on the inspection cycle of 6 months to 1 year. The inspection cycle of the device can be appropriately adjusted according to the surrounding environment to make it work within the specified standard environment.

Check item	Check content	Inspection standards
power supply	Check whether the voltage is rated	DC 24V (-5%~5%)
surroundings	Whether the ambient temperature is within the specified range (when installed in the cabinet, the temperature inside the cabinet is the ambient temperature)	-10°C - 55°C
	Whether the ambient humidity is within the specified range (when installed in the cabinet, the humidity in the cabinet is the ambient humidity)	10%-95% non-condensing
	Is there direct sunlight	No
	With or without droplets of water, oil, chemicals, etc.	No
	Whether there is dust, salt, iron filings, dirt	No
	Whether there is corrosive gas	No
	Whether there are flammable and	No

	explosive gases or articles	
	Whether the device is subjected to vibration or shock	Should be within the range of vibration resistance and impact resistance
	Is the heat dissipation good	Keep good ventilation and heat dissipation
Installation and Wiring Status	Whether the basic unit and the expansion unit are installed firmly	The mounting screws should be tightened without loosening
	Whether the connecting cables of the basic unit and the expansion unit are fully inserted	The connection cable cannot be loosened
	Are the screws of the external wiring loose	Screws should be tightened without loosening
	Whether the cable is damaged, aged, cracked	The cable must not have any abnormal appearance

7.2. Common Problems & Solutions

Problems	Suggestions
Motor does not rotate.	5. Check whether the ATYPE of the controller is correct. 6. Check whether hardware position limit, software position limit, alarm signal work, and whether axis states are normal. 7. Check whether motor is enabled successfully. 8. Confirm whether pulse amount UNITS and speed values are suitable. If there is the encoder feedback, check whether MPOS changes. 9. Check whether pulse mode and pulse mode of drive are matched. 10. Check whether alarm is produced on motion controller station or drive station. 11. Check whether the wiring is correct. 12. Confirm whether controller sends pulses normally.

The position limit signal is invalid.	1. Check whether the limit sensor is working normally, and whether the "input" view can watch the signal change of the limit sensor. 2. Check whether the mapping of the limit switch is correct. 3. Check whether the limit sensor is connected to the common terminal of the controller.
No signal comes to the input.	1. Check whether the limit sensor is working normally, and whether the "input" view can watch the signal change of the limit sensor. 2. Check whether the mapping of the limit switch is correct. 3. Check whether the limit sensor is connected to the common terminal of the controller.
The output does not work.	1. Check whether IO power is needed. 2. Check whether the output number matches the ID of the IO board.
POWER led is ON, RUN led is OFF.	1. Check whether the power of the power supply is sufficient. At this time, it is best to supply power to the controller alone, and restart the controller after adjustment. 2. Check whether the ALM light flickers regularly (hardware problem).
RUN led is ON, ALM led is ON.	1. Program running error, please check RTSys error code, and check application program.
Fail to connect controller to PC through serial port.	1. Check whether the serial port parameters are modified by the running program, you can check all the current serial port configurations through ?*SETCOM. 2. Check whether the serial port parameters of the PC match the controller. 3. Open the device manager and check whether the serial driver of the PC is normal.
CAN expansion module cannot be connected.	1. Check the CAN wiring and power supply circuit, whether the 120 ohm resistor is installed at both

	ends. 2. Check the master-slave configuration, communication speed configuration, etc. 3. Check the DIP switch to see if there are multiple expansion modules with the same ID. 4. Use twisted-pair cables, ground the shielding layer, and use dual power supplies for severe interference (the main power supply of the expansion module and the IO power supply are separately powered)
Fail to connect controller to PC through net port.	1. Check IP address of PC, it needs to be at the same segment with controller IP address. 2. Check controller IP address, it can be checked and captured after connection through serial port. 3. When net port led is off, please check wiring. 4. Check whether controller power led POWER and running indicator led RUN are ON normally. 5. Check whether the cable is good quality, change one better cable to try again. 6. Check whether controller IP conflicts with other devices. 7. Check whether controller net port channel ETH are all occupied by other devices, disconnect to other devices, then try again. 8. When there are multiple net cards, don't use other net cards, or change one computer to connect again. 9. Check PC firewall setting. 10. Use “Packet Internet Groper” tool (Ping), check whether controller can be Ping, if it can't, please check physical interface or net cable. 11. Check IP address and MAC address through arp-a.