

XPLC3264E2 Hardware Manual

Version 1.1

Copyright statement



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ZMC controller software involved in details as well as the introduction and routines of each instruction, please refer to ZBASIC software manual.

Information contained in this manual is only for reference. Due to improvements in design and functions and other aspects, Zmotion Technology reserves the final interpretation! Subject to change without notice!



Pay attention to safety when debug the machine! Be sure to design effective safety devices in the machine, and add the error handling procedures in software. Zmotion has no obligation or responsibility for the loss.

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Chapter I Controllers Introduction

ZMC is the abbreviation of motion controller published by ZMOTION Technology.

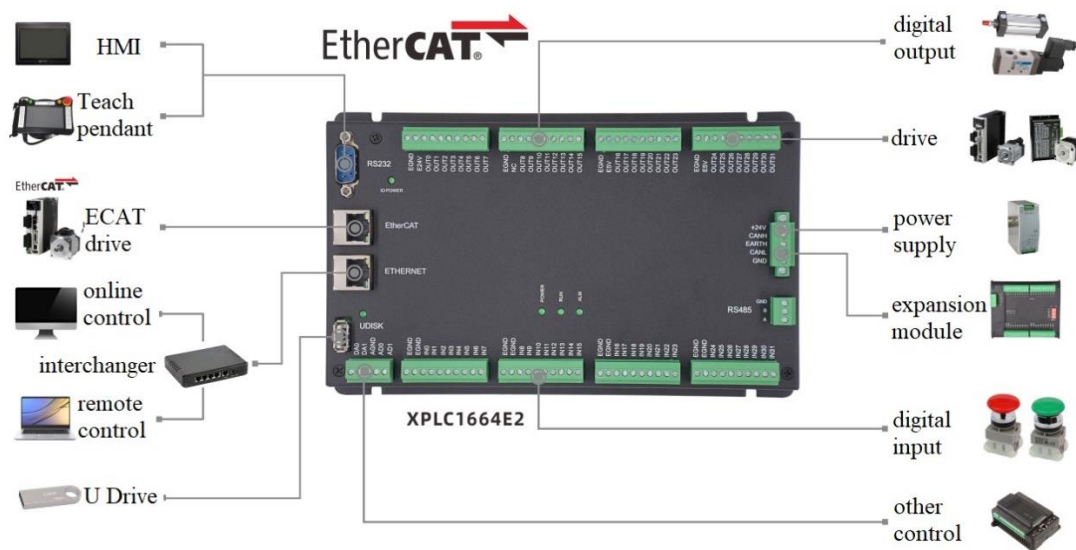
Zmotion motion controller can be applied all kinds of PC or offline places.

ZMC controller supports linear interpolation of up to 12 axes, interpolation of random, spherical or helical, electronic cam, electronic gear, synchronous follow, virtual axis etc.

ZMC supports multi-task run at the same time, and it can do simulation on PC directly.

XPLC is a kind of ZMC motion controller, which integrates ladder diagram and configuration software.

1.1 Connection Configuration

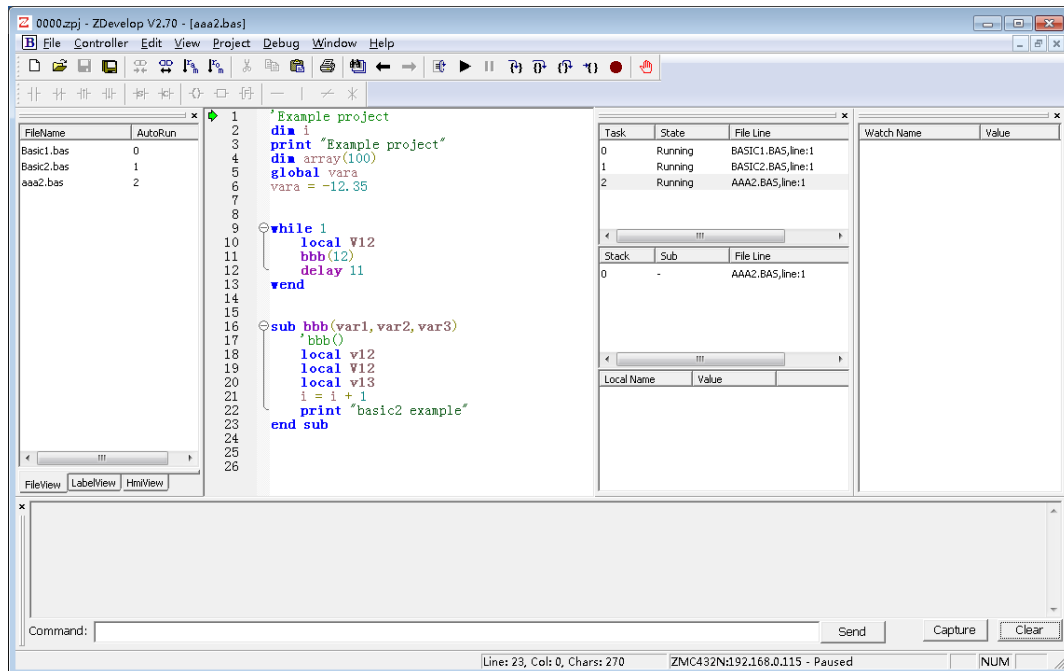


Typical Connection Configuration

XPLC motion controller supports Ethernet, CAN, 485, 232 and other communication interfaces, each expansion module can be connected through CAN bus to extend the inputs and outputs or axes of motion (Resistance of 120Ω is required between CANH and CANL)

XPLC motion controller supports data saving and reading through U drive.

1.2 Installation and Programming



ZDevelop Development Environment

XPLC motion controller is programmed and debugged by ZDevelop software. ZDevelop, the software is easy to program, compile and debug. Link ZDevelop and controller through serial, 485, USB or Ethernet.

Application procedures can be programmed by VC, VB, VS, C ++ Builder, C # and other software development. When debugs, Zevelop software can be connected with controller simultaneously, but needs a dynamic library when the procedure is running: zmotion.dll.

XPLC program can use ZBasic language, ladder diagram, multi-procedure can run at the same time.



XPLC ladder diagram and configuration software need to use above ZDevelop version 2.64.

1.3 Features

- Motion control of up to 32 axes (include virtual axis).
- The fastest refresh cycle of EtherCAT is 2ms.
- Pulse output mode: direction/pulse or double pulse.
- Encoder position measurement is supported and can be configured as hand wheel input mode.
- Maximum frequency output of each axis: 500kHz.
- Maximum inputs or outputs can reach 512 through CAN.
- Positive or negative position limit or origin of axis can be configured to any input.
- The output current of OUT28-31 can reach 300mA, which can directly drive some kinds of solenoid valves.
- Support up to 16 axes interpolation of linear, random spherical, helical.
- Electronic cam, electronic gear, position latch, synchronous follow, virtual axis etc.
- Multi-file and multi-task programming in ZBasic.
- Various encryption methods to protect customers' intellectual properties.

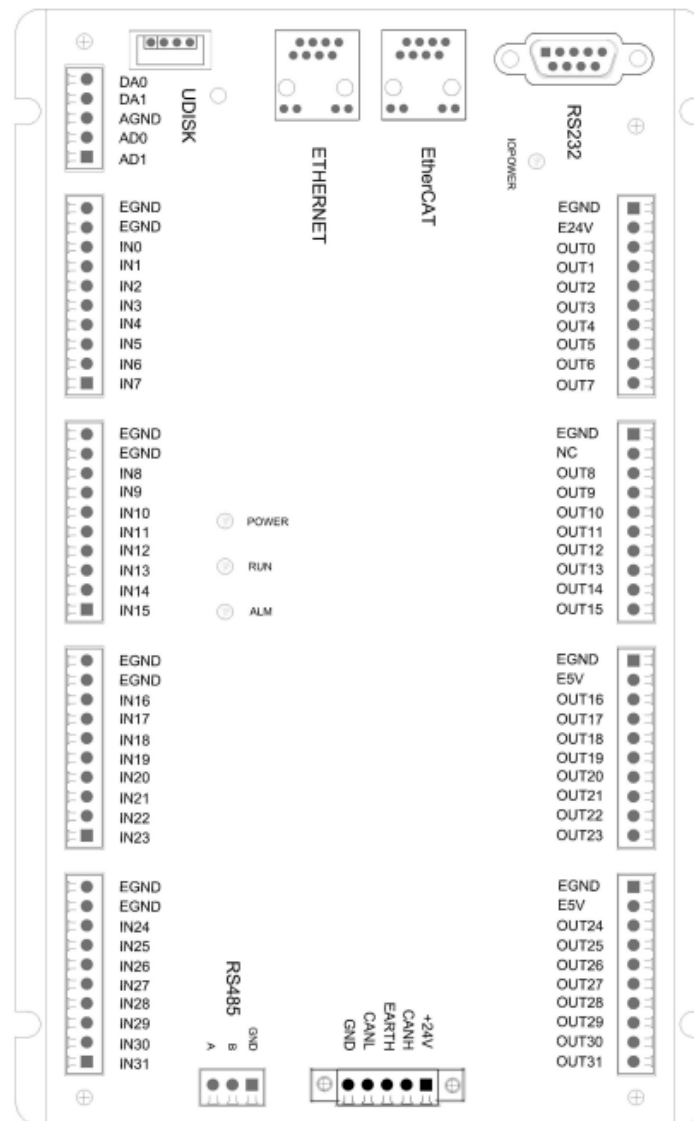
Chapter II Hardware Description

XPLC3264E2 also means XPLC1664E2/XPLC2464E2, the wiring and size are the same.

2.1 XPLC3264E2 Series Controller

	XPLC1664E2	XPLC2464E2	XPLC3264E2
Basic Axes	12	24	32
Max extended axes	32		
Type of basic axes	EtherCAT + Pulse (all 16), 2 encoder axes	EtherCAT + Pulse (all 24), 2 encoder axes	EtherCAT + Pulse (all 32), 2 encoder axes
Internal IO	32 inputs and 32 outputs (share with axis signal).		
Max extended IO	Up to 512 inputs and 512 outputs		
Internal ADDA	2 ADs/2DAs		
Max AD/DA	256 ADs, 128 DAs		
Pulse bits	32		
Encoder bits	32		
Speed/Acceleration bits	32		
Max pulse speed	500Khz		
Axis motion buffer	128		
Array space	160000		
VR	1024		
Procedure space	2Mbyte		
Flash space	8Mbyte (128 blocks)		
Power input	24V DC input, IO 24V input		
Communication	RS232, RS485, CAN, Net		
Size	219*135mm		

2.2 XPLC3264E2



- XPLC3264E2 has one EtherCAT interface, which can connect 32 fieldbus axes.
- XPLC3264E2 has 8 single-ended pulse axes, and with another 2 single-ended encoders.
- XPLC3264E2 board has 32 general inputs and 32 general outputs (pulse shares with output, encoder shares with input).
- XPLC3264E2 has 1 RS232 serial, 1 RS485, 1 Ethernet and 1 U drive interface.
- XPLC3264E2 has one CAN fieldbus interface, which supports connect with expansion module through ZCAN protocol.
- XPLC3264E2 supports 2 ADs and 2 DAs (0-10V).

2.2.1 Power/CAN Interface Signal

PIN NO	Name	Description
1	GND	Internal power ground
2	CANL	CAN differential data-
3	EARTH/SHIELD	Shield
4	CANH	CAN differential data+
5	+24V	Internal power 24V input



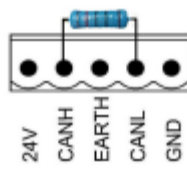
Please supply internal 24V power and external IO power separately, especially when there is serious electromagnetic interference on site, two 24V powers must be applied, or one power that can provides two isolation 24V output. When links to touch screen through serial port, use internal 24V to supply power for touch screen.



For communication quality, please use twisted shielded pair, and the shield connects with ground, the internal power of controller and expansion module use the same one. When ZMC106S controller and expansion module use different powers, controller power EGND should be linked with expansion module power GND, or CAN will be burned.



When multi-controller or IO link with CAN bus, there needs to connect with a 120ohm resistance between two sides, CANL and CANH (please see chapter 3, wiring reference).

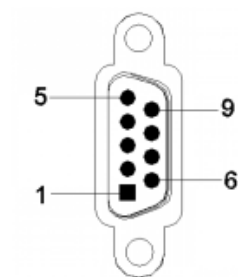


Power / CAN bus

2.2.2 RS485 Interface Signal

PIN NO	Name	Description
1	A	Differential data
2	B	Differential data
3	GND	Power ground

2.2.3 RS232 Interface Signal

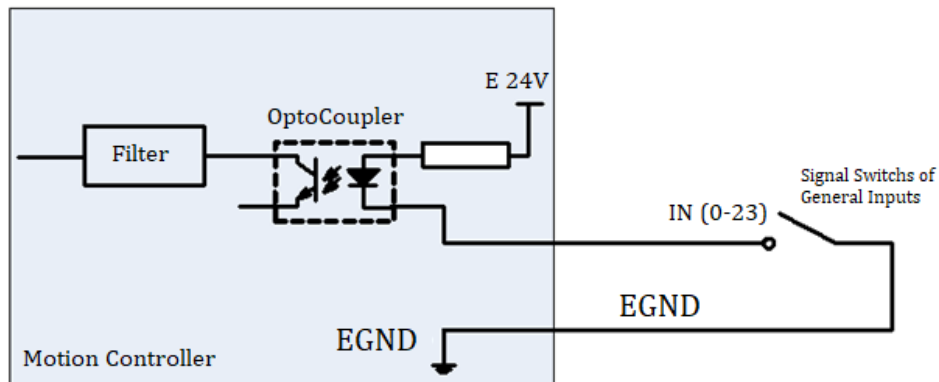


PIN NO	Name	Description
2	RXD	receive data PIN
3	TXD	send data PIN
5	GND	Power ground
9	DC5V	Power 5V output, which can supply power for text screen



Crossover cable with two female head is needed when try to link to computer (2/3 crossover cable).

2.2.4 General Input signal



2.2.4.1 Input 0-7

PIN NO	Name	Description
1	EGND	IO power ground
2	EGND	IO power ground
3	IN0	Input 0 (Latch A)
4	IN1	Input 1 (Latch B)
5	IN2	Input 2
6	IN3	Input 3
7	IN4	Input 4
8	IN5	Input 5
9	IN6	Input 6
10	IN7	Input 7

- Input0 and input1 support simultaneously latch A and latch B, other outputs are low speed optocoupler 10KHz.

2.2.4.2 Input 8-15

PIN NO	Name	Description
1	EGND	IO power ground

2	EGND	IO power ground
3	IN8	Input 8
4	IN9	Input 8
5	IN10	Input 10
6	IN11	Input 11
7	IN12	Input 12
8	IN13	Input 13
9	IN14	Input 14
10	IN15	Input 15

- Input0 and input1 support simultaneously latch A and latch B, other outputs are low speed optocoupler 10KHz.

2.2.4.3 Input 16-23

PIN NO	Name	Description
1	EGND	IO power ground
2	EGND	IO power ground
3	IN16	Input 16
4	IN17	Input 17
5	IN18	Input 18
6	IN19	Input 19
7	IN20	Input 20
8	IN21	Input 21
9	IN22	Input 22
10	IN23	Input 23

- Input0 and input1 support simultaneously latch A and latch B, other outputs are low speed optocoupler 10KHz.

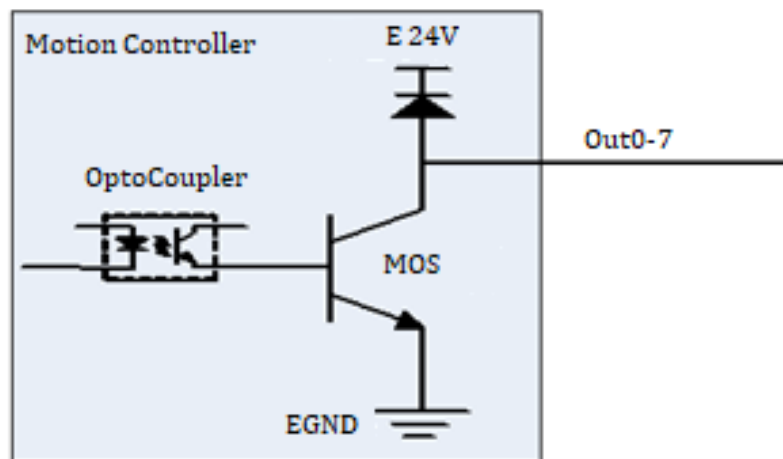
2.2.4.4 Input 24-31/Encoder signal

PIN NO	Name	Description	Other functions
1	EGND	IO power ground	
2	EGND	IO power ground	
3	IN24	Input 24	
4	IN25	Input 25	
5	IN26	Input 26	EZ1
6	IN27	Input 27	EB1
7	IN28	Input 28	EA1
8	IN29	Input 29	EZ0
9	IN30	Input 30	EB0
10	IN31	Input 31	EA0



24V encoder only can be used.

2.2.5 Output 1-2/IO power signal



PIN NO	Name	Description
1	EGND	IO power ground
2	E24V	IO power 24V

3	OUT0	Output 0
4	OUT1	Output 1
5	OUT2	Output 2
6	OUT3	Output 3
7	OUT4	Output 4
8	OUT5	Output 5
9	OUT6	Output 6
10	OUT7	Output 7

➤ **Output 2 terminal:**

PIN NO	Name	Description
1	EGND	IO power ground
2	NC	Hang in the air
3	OUT8	Output 8
4	OUT9	Output 9
5	OUT10	Output 10
6	OUT11	Output 11
7	OUT12	Output 12
8	OUT13	Output 13
9	OUT14	Output 14
10	OUT15	Output 15



Please supply internal 24V power and external IO power 24V separately, especially when there is serious electromagnetic interference on site.

2.2.6 Output 3-4/Axis pulse signal

PIN NO	Name	Description	Other functions
1	EGND	IO power ground	
2	E5V	5V power generated by IO	

		power, output, <300mA.	
3	OUT16	Output 16	DIR7
4	OUT17	Output 17	PUL7
5	OUT18	Output 18	DIR6
6	OUT19	Output 19	PUL6
7	OUT20	Output 20	DIR5
8	OUT21	Output 21	PUL5
9	OUT22	Output 22	DIR4
10	OUT23	Output 23	PUL4

➤ **Output 4 terminal:**

PIN NO	Name	Description	Other functions
1	EGND	IO power ground	
2	E5V	5V power generated by IO power, output, <300mA.	
3	OUT24	Output 24	DIR3
4	OUT25	Output 25	PUL3
5	OUT26	Output 26	DIR2
6	OUT27	Output 27	PUL2
7	OUT28	500MA max current output 28	DIR1
8	OUT29	500MA max current output 29	PUL1
9	OUT30	500MA max current output 30	DIR0
10	OUT31	500MA max current output 31	PUL0



Pulse axis port can use E5V common-anode output or E24V common-anode output.



When relative axis is configured as virtual axis (ATYPE=0), which is common general output, or will be axis signal.

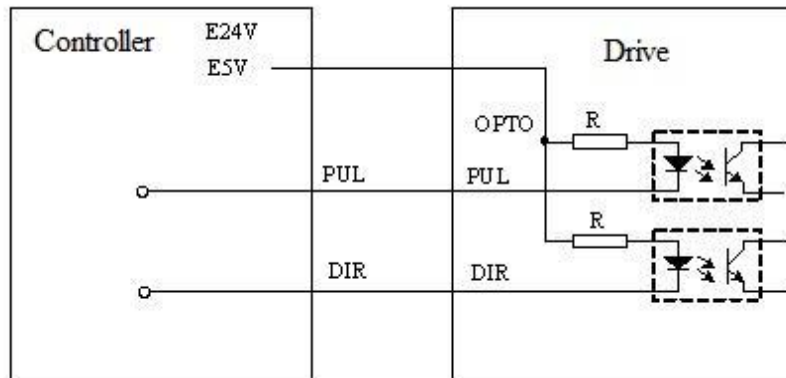


The max output current of OUT28-31 is 500MA, of OUT10-27 is 300MA.

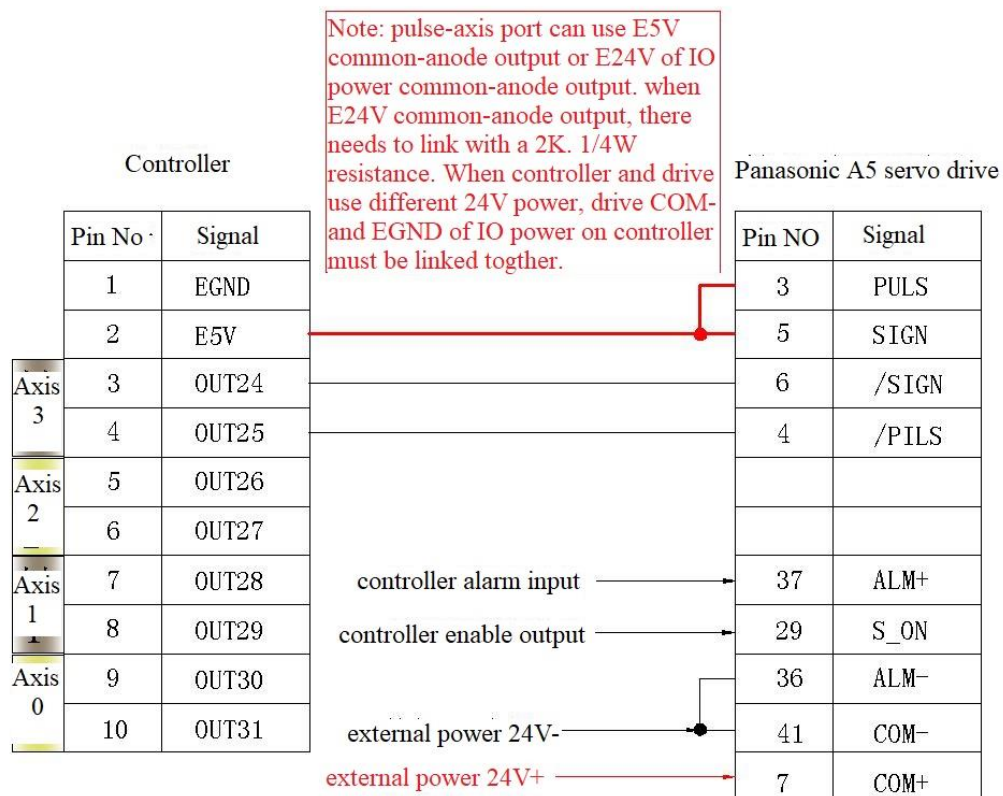
2.2.7 Wiring



General outputs are as pulse-axis ports, means external power, some drives are 24V interfaces, OPT0 can connect with 24V directly.



Single-ended Connection



Wiring reference of Panasonic A5 single-ended

2.2.8 ADDA signal

PIN NO	Name	Description
1	AOUT0	0-10V analog output 0
2	AOUT1	0-10V analog output 1
3	AGND	Analog GND
4	AIN0	0-10V analog input 0
5	AIN1	0-10V analog input 1

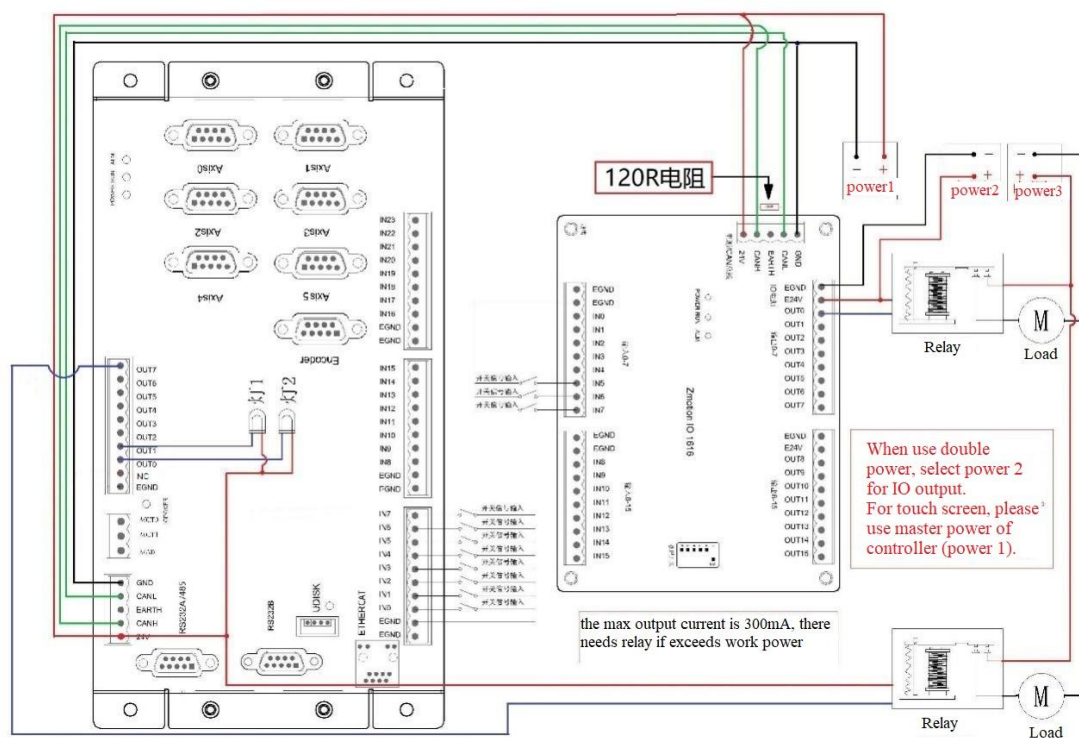


Internal ADDA of XPLC3264E2 uses internal power.

Chapter III Expansion Module

See *ZIO expansion card hardware manual* for reference.

3.1 Wiring Reference For CAN, Input, Output and Power



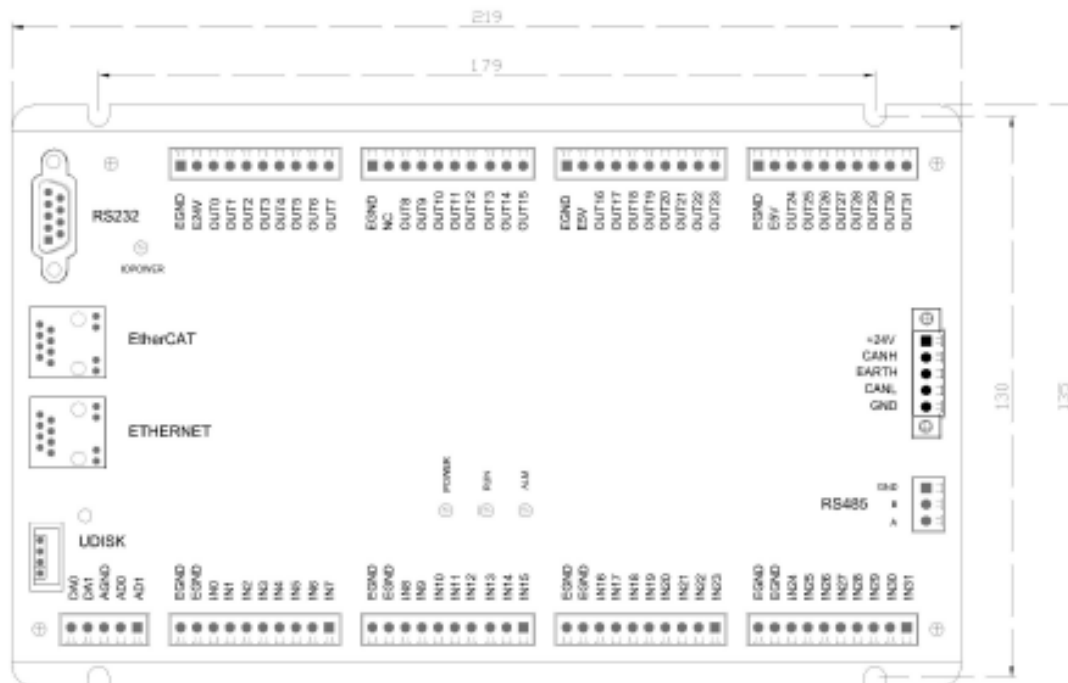
When multi expansion modules are linked on CAN bus, it is necessary to connect 120Ω resistor between CANL and the CANH on the last IO expansion module.

Chapter IV Common Problems

Problems	Suggestions
Motor does not rotate.	Check whether the ATYPE of the controller is correct; Check whether the pulse input mode matches the input pulse mode of the drive; Check whether the motor already reached hardware or software position limit, resulting in ALM signal comes. Check whether pulse count is normal in ZDEVELOP.
The controller is working normally, pulses is sent out normally, motor still does not rotate.	Check whether connection between drive and motor is correct and whether connection between the drive and the controller is correct. Check whether the drive works properly and there is no alarm.
Motor can rotate, but it is not working normally.	Check whether deceleration and speed exceed the device limit; Check whether pulse frequency output exceed the receiving limit of the drive; Check whether connection between controller and drive are correct and whether anti-interference measures are well done; Check whether current limiting resistance used in the photoelectric isolation circuit of pulse and direction signal output is too large and the working current is too small.
Motor is under control, but it may oscillate or overturn sometimes.	Check whether the drive parameters setting is correct. Check whether acceleration or deceleration period and motion speed were set properly in software.
Motor is under control, but homing position is inaccurate.	Check whether the origin signal switch is working normally; Check whether the origin signal is disturbed.
The position limit signal is invalid.	Check whether the position limit sensor is not working normally; Check whether the signal of the limit sensor is disturbed;
The expansion module can't be connected, and alarm light of the expansion module is on.	Check whether there is a 120Ω resistor at both ends; Check whether multi expansion modules use the same ID.
No signal comes to the input.	Check whether the IO is supplied normally; Check whether the input signal level matches the input channel.

	Check whether the input number matches the ID of the IO board.
The output does not work.	Check whether the IO is supplied normally; The IO also needs supply. Check whether the output number matches the ID of the IO board.
The motor will move around suddenly after a while	Check drive introduction if there needs to connect with GND.

Chapter V Hardware Installation



- ✧ Unit: mm
- ✧ Mounting hole diameter: 4.5mm
- ✧ Total height of controller: 45mm