



XD/XL series PLC

User manual [Hardware]

WUXI XINJE ELECTRIC CO., LTD.

No. PD 01 20260410 1.6

	Safety Precautions	
	Catalog	
	Preface	
	Product Overview	1
	Main Unit Specifications	2
XD/XL series PLC	System Configuration	3
User manual [Hardware]	Power Supply Specifications & Wiring Methods	4
	Input Specifications & Wiring Methods	5
	Output Specifications & Wiring Methods	6
	Operation, Commissioning & Maintenance	7
	Soft Element Switching	8
	Appendix	

General descriptions

- Thank you for purchasing Xinje XD/XL series PLC.
- This manual mainly introduces XD/XL series PLC hardware features etc.
- Please read this manual carefully before using and wire after understanding the content.
- About software and programming instructions, please refer to related manuals.
- Please hand this manual over to operation users.

Notices for users

- Only experienced operator can wire the plc. If any problem, please contact our technical department.
- The listed examples are used to help users to understand, so it may not act.
- Please conform that PLC specifications and principles are suitable when connect PLC to other products.
- Please conform safety of PLC and machines by yourself when use the PLC. Machines may be damaged by PLC errors.

Responsibility statement

- The manual content has been checked carefully, however, mistakes may happen.
- We often check the manual and will correct the problems in subsequent version. Welcome to offer advices to us.
- Excuse us that we will not inform you if manual is changed.

Contact information

If you have any problem about products, please contact the agent or Xinje company.

- Whatsup: +86 180 6833 9655
- Fax: 0086 510-85111290
- Address: No.816, Jianzhu West Road, Binhu District, Wuxi City, Jiangsu Province, China
- Code: 214072

WUXI XINJE ELECTRIC CO., LTD. copyrights

Do not copy or use manual without written permission. Offenders should be responsible for losses. Please keep all copyrights of our company including practical modules, designed patents and copyrights mentioned in register.

Safety Precautions

All potential hazards that may occur during product operation are covered in the Safety Precautions, which are categorized into two levels: CAUTION and DANGER. For any matters not specified herein, comply with fundamental electrical operation procedures.



Caution

Incorrect use may lead to danger, such as moderate and slight injury, property loss.



Warning

Critical miss may lead to serious danger, such as death or serious injury, serious loss of property.

● Conform about products



Caution

1. Do not install the controller which is damaged, lack parts or type unfit.
Otherwise, injury may occur.

● Product design



Warning

1. Please make safety circuit outside controller to make sure the system can run in safety when controller errors.
Otherwise, incorrect action or fault may occur.



Caution

1. Do not put control wiring or power wiring together, separate them at least 10cm in principle.
Otherwise, incorrect action or damage may occur.

● Product installation



Warning

1. Cut off all external power before installing controller.
Otherwise, an electric shock may occur.



Caution

1. Please install and use the PLC in the environment condition that specified in general specifications in this manual. Do not use in wet, high temperature, smog, conductive dust, corrosive gas, combustible gas, vibration, shock occasion. Otherwise, electric shock, fire disaster, incorrect action, damage etc.
2. Do not touch conductive parts of PLC.
Otherwise, incorrect action or fault may occur.
3. Please install the product by DIN46277 or M3screw and install them on flat surface. Otherwise, incorrect action or damage may occur.
4. Avoid ablation powder or elastic wires into product shell when processing screw holes. Otherwise, incorrect action or fault may occur.
5. Make sure connection compact and good when using expansion cables to connect expansion modules. Otherwise, bad communication or incorrect action may occur.
6. Cut off power when connecting external devices, expansion devices and battery etc.
Otherwise, incorrect action or default may occur.

● Product wiring



Warning

1. Cut off external power before wiring. Otherwise, an electric shock may occur.
2. Connect AC or DC power to special power terminal correctly. Otherwise, may burn the controller.
3. Close the panel cover plate before controller powering on and running. Otherwise, an electric shock may occur.



Caution

1. Do not use an external 24V power supply to connect to the 24V or 0V terminals of the controller or expansion module.
May cause damage to the product.
2. Use 2mm² cable to ground the ground terminals of expansion modules and controllers, never common ground to high voltage system. Otherwise, products fault or damage may occur.
3. Do not wiring between idle terminals. Otherwise, incorrect action or damage may occur.
4. Avoid ablation powder or elastic wires into product shell when processing screw holes. Otherwise, incorrect action or fault may occur.
5. Tighten up wiring terminals and separate conductive parts. Otherwise, incorrect action or product damage may occur.

● **Run and maintenance**



Warning

1. Do not touch terminals after power on.
Otherwise, an electric shock may occur.
2. Do not connect or move the wires when power on.
Otherwise, an electric shock may occur.
3. Make sure to stop the PLC before changing the controller program.
Otherwise, malfunction may occur.



Caution

1. Do not disassemble and assemble product arbitrarily.
Damage to product may occur.
2. Plug and connect cables on the condition of power off.
Otherwise, cable damage or malfunction may occur.
3. Do not wire the idle terminals.
Otherwise, malfunction or damage may occur.
4. Cut off the power when disassemble expansion modules, external devices and batteries.
Otherwise, malfunction and fault may occur.
5. Dispose them as industrial waste when out of use.

Catalog

CATALOG	6
PREFACE	9
<i>MANUAL CONTENT STRUCTURE</i>	<i>9</i>
<i>MANUAL SCOPE OF APPLICATION</i>	<i>11</i>
<i>MANUAL CONVENTIONS</i>	<i>11</i>
<i>RELEVANT MANUAL</i>	<i>12</i>
<i>MANUAL ACQUISITION</i>	<i>15</i>
1 PRODUCT OVERVIEW	16
1-1. <i>PRODUCT SPECIFICATIONS</i>	<i>16</i>
1-1-1. <i>XD series CPU units</i>	<i>16</i>
1-1-2. <i>XL series CPU units</i>	<i>23</i>
1-2. <i>MODEL LIST</i>	<i>29</i>
1-2-1. <i>XD series basic unit model and list</i>	<i>29</i>
1-2-2. <i>XL series basic unit model and list</i>	<i>39</i>
1-3. <i>EACH PART'S DESCRIPTION</i>	<i>46</i>
1-3-1. <i>XD series structure</i>	<i>46</i>
1-3-2. <i>XL series structure</i>	<i>49</i>
2 SPECIFICATIONS AND PARAMETERS OF CPU	57
2-1. <i>SPECIFICATIONS AND PARAMETERS</i>	<i>57</i>
2-1-1. <i>General Specifications</i>	<i>57</i>
2-1-2. <i>Performance and Specifications</i>	<i>58</i>
2-2. <i>DIMENSIONS</i>	<i>65</i>
2-2-1. <i>XD series dimensions</i>	<i>65</i>
2-2-2. <i>XL series dimensions</i>	<i>68</i>
2-3. <i>TERMINAL ARRANGEMENT</i>	<i>71</i>
2-3-1. <i>XD series terminal arrangement</i>	<i>71</i>
2-3-2. <i>XL series terminal arrangement</i>	<i>75</i>
2-4. <i>COMMUNICATION PORTS</i>	<i>79</i>
3 SYSTEM STRUCTURE	82
.....	82
3-1. <i>SYSTEM STRUCTURE</i>	<i>82</i>
3-2. <i>PERIPHERAL DEVICES</i>	<i>83</i>
3-2-1. <i>Program Software</i>	<i>83</i>
3-2-2. <i>Human Machine Interface (HMI)</i>	<i>83</i>
3-2-3. <i>XL adapter power supply</i>	<i>84</i>

3-2-4 Downloader.....	86
3-2-5 External terminal.....	91
3-3. CONFIGURATION PRINCIPLE.....	93
3-4. ID ASSIGNMENT OF EXPANSIONS.....	94
3-5. INSTALL THE PRODUCTS.....	95
4 POWER SUPPLY SPECIFICATION AND WIRING METHOD.....	96
4-1. POWER SUPPLY SPECIFICATIONS.....	96
4-2. AC POWER SUPPLY AND DC INPUT.....	97
5 INPUT SPECIFICATIONS AND WIRING METHODS.....	98
5-1. INPUT SPECIFICATION.....	98
5-1-1. XD series input specification.....	98
5-1-2. XL series input specification.....	102
5-2. DC INPUT SIGNAL (AC POWER SUPPLY).....	108
5-3. HIGH SPEED COUNTER INPUT.....	112
5-3-1. Counting mode.....	112
5-3-2. High Speed Counting Range.....	114
5-3-3. The Input Wiring Of HSC.....	114
5-3-4. Input Terminals Assignment.....	114
5-3-5. AB Phase Counter's Frequency Multiplication Setting.....	124
6 OUTPUT SPECIFICATION AND WIRING METHODS.....	125
.....	125
6-1. OUTPUT SPECIFICATION.....	125
6-2. RELAY OUTPUT TYPE.....	128
6-3. TRANSISTOR OUTPUT TYPE.....	130
7 RUN, DEBUG, MAINTENANCE.....	132
.....	132
7-1. RUN AND DEBUG.....	132
7-2. DAILY MAINTENANCE.....	133
8 SWITCH BETWEEN SOFT COMPONENTS.....	134
8-1. FUNCTION SUMMARY.....	134
8-2. OPERATION METHOD.....	135
APPENDIX.....	138
APPENDIX 1 SPECIAL SOFT ELEMENT SCHEDULES.....	138
Appendix 1-1. Special Auxiliary Relay Schedule.....	138
Appendix 1-2. Special Data Register Schedule.....	145
Appendix 1-3. Special Flash Register schedule.....	154
APPENDIX 2 INSTRUCTION SCHEDULE.....	158
Appendix 2-1. Basic Instruction List.....	158
Appendix 2-2. Application Instruction List.....	159
Appendix 2-3. Special Instructions List.....	162

<i>APPENDIX 3 PLC CONFIGURATION LIST.....</i>	<i>166</i>
APPENDIX 4 COMMON QUESTIONS Q&A.....	170

Preface

Manual Content Structure

This manual includes XD/XL series PLC types and system constitutions. It mainly introduces XD/XL series PLC basic units' specification, I/O wiring, run and maintenance, and XD/XL series PLC expansion modules' parameters, appearance and features etc.

This manual has 9 chapters, an overview of each chapter are as follows:

Chapter No.	Chapter Name	Chapter Content
1	Product Overview	This chapter mainly introduces the performance features, model composition of XD/XL series programmable logic controllers (PLCs), the overall product lineup of the full series, and descriptions of each component of the products.
2	Main Unit Specifications	This chapter mainly describes the general specifications, performance specifications, terminal layout, product outline dimensions and interface descriptions of the basic units of XD/XL series programmable logic controllers (PLCs).
3	System Configuration	This chapter mainly introduces the system architecture centered on XD/XL series programmable logic controllers (PLCs), peripheral devices, expansion modules, connection rules between the main unit and expansion modules, product installation, calculation of I/O points, and allocation of input/output address numbers.
4	Power Supply Specifications & Wiring Methods	This chapter mainly covers the power supply specifications and wiring methods of XD/XL series programmable logic controllers (PLCs).
5	Input Specifications & Wiring Methods	This chapter mainly introduces the input specifications, input wiring and high-speed counter processing of XD/XL series programmable logic controllers (PLCs).
6	Output Specifications & Wiring Methods	This chapter mainly introduces the output specifications, relay output processing and transistor output processing of XD/XL series programmable logic controllers (PLCs).
7	Operation, Commissioning and	This chapter mainly describes the operation, commissioning procedures and routine maintenance of

	Maintenance	XD/XL series programmable logic controllers (PLCs).
8	Soft Element Switching	This chapter introduces a distinctive feature of XD/XL series programmable logic controllers (PLCs): the free switching function of input and output points.
-	Appendix	This chapter mainly presents the addresses and functions of special soft elements, instruction list, PLC function configuration table, and Frequently Asked Questions (FAQ) for XD/XL series programmable logic controllers (PLCs).

Manual scope of application

This manual is hardware manual of XD/XL series PLC, contents are as follows:

1. XD series PLC basic units

Including XD series basic units, XD series extension modules, XD series extension BD boards, and XD series extension ED modules. Please refer to the model table in Chapters 1-2 for specific product models.

[Note]: There is a special model XD3-22T4TC-E that is not covered by this manual. Please refer to the XD3-22T4TC-E Programmable Controller User Manual.

2. XL series PLC basic units

It includes XL series basic units, XL series expansion modules, XL series extended ED modules and XL series power supply modules.

Refer to the model table in Chapter 1-2 for specific product models.

3. Version requirements

- ◆ The XD series PLC requires the software version to be v3.2 and above.
- ◆ The XL series PLC requires the software version to be v3.5 and above.
- ◆ There are version requirements for some instructions. Please refer to each instruction for details.

[Note]: XD2 series PLC requires the software version to be v3.5.1 and above.

Manual conventions

Due to space limitations, certain abbreviations may be used in this manual in place of full names. The relevant names are listed in the table below for reference.

Short name	Explanation
XC series PLC	General name of XC series programmable logic controllers
XL series PLC	General name of XL series programmable logic controllers
XD series PLC	General name of XD series programmable logic controllers
Basic units or noumenon	Short name of XD series PLC basic units
Expansion devices or expansion units	General name of XD series PLC expansion modules and BD cards
Expansion modules	General name of XD series PLC all expansion modules.
Input and output expansion or I/O expansion	Short name of XD series PLC all input and output expansion modules
Analog expansions	Short name of XD series PLC all analog expansion modules

Peripheral units	General name of programming software, HMI and network modules
Programming software	XINJE PLC Programming Editing Software
HMI	General name of TG, TS, OP series products
TG series	General name of TG series touch screen
TS series	General name of TS series touch screen
OP series	General name of OP series text panel

Relevant manual

This manual includes XD/XL series PLC hardware, about more application such as programming and instructions, please refer to relevant manuals.

Manual Name	Manual Description	Remarks
Installation & Operation Manual		
XD Series Programmable Controller User Manual	Describes the specifications, dimensions, installation, wiring and other contents of XD series basic units (excluding Ethernet models and special models).	Scan QR Code on Label for Access
XD5 Series Differential PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XD5 series differential PLCs.	Scan QR Code on Label for Access
XD3E (NP) Series Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XD3E series bipolar input models.	Scan QR Code on Label for Access
XD5E Series Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XD5E series basic units.	Scan QR Code on Label for Access
XDME Series Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XDME series basic units.	Scan QR Code on Label for Access
XDH-60 Series Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XDH-60T4.	Scan QR Code on Label for Access
XDH-60A32-E Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XDH-60A32-E.	Scan QR Code on Label for Access

Manual Name	Manual Description	Remarks
Installation & Operation Manual		
XDH-60A64-E Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XDH-60A64-E.	Scan QR Code on Label for Access
XDH-30A16 Series Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XDH-30A16, XDH-30A16L and other products.	Scan QR Code on Label for Access
XL Series Programmable Logic Controller User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XL series basic units (Ethernet models excluded).	Scan QR Code on Label for Access
XL Series Bipolar Input PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XL series bipolar input basic units (Ethernet models excluded).	Scan QR Code on Label for Access
XL5N-32T CAN Communication PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XL5N-32T.	Scan QR Code on Label for Access
XL5E Ethernet PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XL5E series basic units.	Scan QR Code on Label for Access
XLME-16T4 Ethernet PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XLME-16T4.	Scan QR Code on Label for Access
XLME-32T4 Ethernet PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XLME-32T4.	Scan QR Code on Label for Access
XLME-64T10 Ethernet PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XLME-64T10.	Scan QR Code on Label for Access
XLH-24A16 Bus-type PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of	Scan QR Code on Label for Access

Manual Name	Manual Description	Remarks
Installation & Operation Manual		
	XLH-24A16.	
XLH-24A16L Bus-type PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XLH-24A16L.	Scan QR Code on Label for Access
XLH-30A32 Bus-type PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XLH-30A32.	Scan QR Code on Label for Access
XLH-30A32L Bus-type PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XLH-30A32L.	Scan QR Code on Label for Access
XL5H-24A8(L) Bus-type PLC User Manual	It introduces the specifications, dimensions, installation, wiring and other relevant information of XL5H-24A8 and XL5H-24A8L.	Scan QR Code on Label for Access
XL-P50-E Power Module User Manual	It covers specifications, dimensions, installation and other relevant information of XL-P50-E.	Scan QR Code on Label for Access
Programming Software Manual		
XD/XL/XG Series PLC User Manual (Software Volume) V3.8.0	Introduces operation methods and skills of Xinje PLC programming software Electronic version	Available upon separate request
Instruction Programming Manual		
XD/XL Series Programmable Logic Controller User Manual [Basic Instructions Volume]	It introduces the application of basic instructions for XD and XL series PLCs.	Printed version & Electronic version available upon separate request
XD/XL Series Programmable Logic Controller User Manual [Position Control Volume]	It introduces the application of pulse output, motion control and other instructions for XD and XL series PLCs.	Printed version & Electronic version available upon separate request
XDH/XLH Series Programmable Logic Controller User Manual [Advanced Motion Control Volume]	It introduces the usage of advanced motion control instructions for XDH, XLH series PLCs.	Available upon separate request
X-NET Communication Manual		
X-NET Bus User Manual	It introduces the usage of Xinje X-NET field bus and motion bus.	Available upon separate request

Manual Name	Manual Description	Remarks
Installation & Operation Manual		
Ethernet Communication Manual		
Ethernet Communication User Manual	It introduces the Ethernet communication functions of Ethernet-type PLCs.	Available upon separate request
Expansion Equipment Manual		
XD Series PLC Expansion Module User Manual	It introduces features, parameters, overall dimensions, terminals and wiring of XD series expansion modules.	Available upon separate request
XD Series PLC ED Expansion Module User Manual	It introduces features, parameters, overall dimensions, terminals and wiring of XD series ED expansion modules.	Available upon separate request
XL Series PLC Expansion Module User Manual	It introduces features, parameters, overall dimensions, terminals and wiring of XL series expansion modules.	Available upon separate request
XL Series PLC ED Expansion Module User Manual	It introduces features, parameters, overall dimensions, terminals and wiring of XL series ED expansion modules.	Available upon separate request
Special Model Manual		
XD3-22T4TC-E Programmable Controller User Manual	Introduce the product specifications, input and output wiring, and specific usage of XD3-22T4TC-E	Available upon separate request

Manual Acquisition

Ways to Obtain the Above Manuals:

1. Paper manual

Contact your product supplier, distributor or local office to apply for copies.

2. Electronic version

Log on to Xinje official website www.xinje.com, enter the Download Center to search and download.

1 Product Overview

1-1. Product Specifications

1-1-1. XD series CPU units

1-1-1-1 XD series basic unit

1) Rich variety of models

The XD series basic units cover 10 sub-series product lines with abundant models and freely combinable configurations.

- I/O Points 10, 16, 24, 30, 32, 48, 60, 80 points
- Output Type Transistor, Relay, Transistor And Relay Mixed, Differential
- Input Type PNP, NPN, Differential
- Power Type AC220V, DC24V

Series	Description
XD1 (Economic Type)	Include 10, 16, 24, 32 points. It features relatively simple functions, does not support right expansion modules, left ED expansion modules or BD expansion modules, and can meet users' general application requirements.
XD2 (Basic Type)	Include 16, 24, 32, 48, 60 points. Equipped with complete basic functions. It does not support right expansion modules, but supports left ED expansion modules and BD expansion modules (16-point model excluded). It can satisfy users' basic application requirements.
XD3 (Standard Type)	Include 16, 24, 32, 48, 60 points. Fully featured to meet the application requirements of most users. It supports 2 to 4 axes of pulse output and is compatible with expansion modules, ED expansion modules and BD expansion modules (16-point model excluded).
XD5 (Enhanced & Differential Type)	Include 16, 24, 32, 42, 48, 60, 80 points. It inherits all functions of XD3, with an operating speed 15 times faster than XC series. It supports high-speed pulse output for 2 to 10 axes and provides larger internal resource storage. Compatible with expansion modules, ED expansion modules and BD expansion modules (16-point model excluded). SD card expansion is supported except for the 16-point model. Models XD5-24D2T2-E and XD5-48D4T4-E support differential input and output.

XDM (Motion Control Type)	Include 24, 32, 60 points. It supports all functions of XD3, and provides high-speed pulse output for 4 to 10 axes. It realizes motion control functions including 2-axis linkage, interpolation and follow-up control. It is compatible with expansion modules, ED expansion modules and BD expansion modules, and supports SD card expansion.
XDC (Motion Bus Type)	Include 24, 32, 48, 60 points. It retains all functions of XD3, supports 2 channels of high-speed pulse output and 20-axis X-NET motion bus control. It can be equipped with expansion modules, ED expansion modules and BD expansion modules.
XD3E (Ethernet Type)	Include 24, 30, 48, 60 points. It supports most functions of XD3, comes with Ethernet communication function, and supports high-speed pulse output of 2 to 4 axes. It can be fitted with expansion modules, ED expansion modules and BD expansion modules.
XD5E (Ethernet Type)	Include 24, 30, 48, 60 points model. It supports most functions of XD5 and is equipped with Ethernet communication, as well as high-speed pulse output for 2 to 10 axes. It can be connected with expansion modules, ED expansion modules and BD expansion modules. Models XD5E-60T4 and XD5E-60T10-E support online download function.
XDME (Motion Control & Ethernet Type)	Contains 30, 60 points functions. It supports most functions of XDM and integrates Ethernet communication. It is equipped with motion control instructions such as interpolation and follow-up control, and supports high-speed pulse output for 4 to 10 axes. It can be connected with expansion modules, ED expansion modules and BD expansion modules. Models XDME-60T4-E and XDME-60T10-E support the online download function.
XDH (EtherCAT Bus Type)	Contains 24, 30, 60 points functions. It supports most functions of XD series, equipped with Ethernet communication and EtherCAT bus. It supports motion control instructions including interpolation and follow-up control, 4-axis high-speed pulse output and electronic cam function. It can be connected with expansion modules, ED expansion modules and BD expansion modules (24-point and 30-point models are not supported).

Note: ※1: About special function of products, please refer to Appendix 3.

2) Powerful functions

XD series PLC have rich basic functions and many special functions. Different type is fit for different application.

Abundant basic function

- **High speed operation**
Basic processing instruction: 0.02~0.05us (Ethernet-type models achieve a scan time ranging from 0.01 us to 0.03 us). Scanning time: 10,000 per 1ms. Program capacity is up to 1.5MB (XDH can up to 4MB).
- **Abundant expansions**
XD Series PLC※¹ generally supports 10 to 16 expansion modules, 1 to 2 BD expansion boards and 1 left ED expansion module.
- **Multiple communication ports**
The basic unit is equipped with 1 to 4 communication ports, including USB, RS232, RS485 and RJ45, which can connect various external devices such as inverters, meters and printers.
- **Abundant software capacity**
The maximum resource capacity is as follows: 8,000 non-retentive step relays S, 1,000 retentive step relays HS, 70,000 non-retentive auxiliary relays M, 12,000 retentive auxiliary relays HM, 1,280 input relays X, 1,280 output relays Y, 5,000 non-retentive timers T, 2,000 retentive timers HT, 5,000 non-retentive counters C, 2,000 retentive counters HC, 70,000 non-retentive data registers D, 25,000 retentive data registers HD, 8,192 FD registers. The XDH series features larger internal memory capacity.
- **Two programming types**
XD series PLC support two programming types, instruction list and ladder chart which can switch to each other.
- **Rich instructions**
Include order control, data move and compare, arithmetic, data circulate and shift, pulse output, HSC, interruption, PID etc.
- **Real time clock**
XD series PLC has built-in clock to control time, for time control..
- **Compact size, convenient to install**
XD series PLC feature compact dimensions and easy installation, supporting DIN and screw two installation modes.

Enhanced special function

- **EtherCAT bus**
XDH series PLCs support EtherCAT motion bus and can synchronously control up to 64 axes with a control cycle ≤ 1 ms. For detailed operation,

please refer to User Manual for [XDH/XLH Series Programmable Controllers (Advanced Motion Control)].

- **X-NET fieldbus**

XD series PLC support X-NET fieldbus, which can fast communicate with XD series PLC and TG series HMI. XDC series PLC supports X-NET fieldbus function, can control 20 motors at the same time. Refer to X-NET fieldbus manual for details. For specific applications, please refer to [X-NET Bus User Manual].

- **Ethernet Communication**

Ethernet PLC has RJ45 port and supports TCP/IP protocol. It can realize MODBUS-TCP communication and free format communication based on Ethernet. Supports program download, online monitoring, remote monitoring, and communication with other TCP/IP devices. For specific applications, please refer to [Ethernet Communication User Manual].

- **High-speed pulse counter, frequency up to 80KHz**

XD series PLC CPU units have 2~10 channels two-phase high-speed counter and high-speed counting comparer, supporting two counting modes: single-phase and AB-phase, with a maximum frequency of 80 kHz..

- **High-speed pulse output, frequency up to 100 KHz.**

XD series PLC^{*1} usually have 2~10 pulse output terminals, pulse frequency up to 100KHz.

- **Interruption function**

XD series PLC interruption functions include external interruption, timing interruption and high-speed counting interruption to meet different interruption demands.

- **I/O points switch freely**

D series PLCs adopt exclusive special functions, a technology developed to handle terminal damage. Normal operation can be realized without program modification.

- **C language function block**

Function blocks can be programmed in C language for superior program confidentiality. In addition, abundant built-in arithmetic functions of C language enable implementation of various functions, saving internal memory space and improving programming efficiency.

- **POU Function**

XDPPro V3.7.16 supports POU functions, including Functions (FC), Function Blocks (FB) and programs. Users can write FC and FB via Ladder Diagram, C language or Structured Text (ST)^{*4}, and call them in programs.

- **PID function on CPU units**

XD series PLC^{*1} CPU units have PID control function and auto-tuning control function.

- **Sequence BLOCK**

Sequence block makes instructions carry out in sequence, especially suitable for pulse output, motion control, module read and write etc, and largely simplifies the program writing.

- **100 segments high speed counting interruption**

XD series PLC^{※1} high speed counter have 100 segments 32 bits preset value. Each segment can generate interruption with good real-time, high reliability, low cost.

- **PWM (pulse width modulation)**

XD series PLC^{※1} PWM function can be used to control DC motor.

- **Frequency measure**

XD series PLC^{※1} can measure frequency.

- **Precise time**

XD series PLC^{※1} can realize 1ms and 32bit precise timing.

- **Online download^{※3}**

Partial models of XD5E, XDME and all XDH series PLCs support online download, enabling uninterrupted PLC operation.

- **Differential input and output**

XD5 series differential PLCs support differential signal input and output. The maximum differential input frequency reaches 1 MHz, and the differential output frequency reaches 920 kHz.

- **SD card**

XD5 (except 16 points) and XDM series support SD card expansion for data storage and backup, and the card capacity does not exceed 32GB.

3) Easy to program

XD/E series also use XDPPro program software. Improved aspects:

- Ladder and instruction can be switched at any time.
- Add Software annotation, ladder annotation, instruction hints etc.
- Offer many editing panel of special instructions.
- Perfect monitor modes: ladder monitor, free monitor, data monitor.
- Mutely-windows display, convenient to manage.
- For detailed software application instructions, please refer to User Manual for [XD/XL Series Programmable Controllers (Software Volume)].

Note:

※1: Here, XD series PLC refers to the PLC that can realize the described functions, that is to say, not all XD series PLC can realize the described functions. Refer to Appendix 3 for specific functions of PLC.

※2: PLC can output high-speed pulse of 100kHz ~ 200kHz, but it can not guarantee the normal operation of all servo systems. Please connect a resistance of about 500 Ω between the output terminal and 24V power supply.

※3: For online download function, please refer to [User Manual for XD/XL/XG Series Programmable Controllers (Software Volume)].

※4: POU supports programming with Structured Text (ST) in software version 3.8.0 and above.

1-1-1-2. XD Expansions

1) Expansion Modules

To meet control requirement better, XD series PLC can work with expansions, XD1, XD2 cannot connect expansion modules, and XD3, XD3E can link 10 expansion modules, XD5, XDM, XDC, XD5E, XDME, XDH can connect 16 modules.

- Rich variety

It includes I/O expansion module, analog processing module and temperature control module.

- I/O expansion module

Input 8~32 points; Output points: 8~32; Output type: transistor, relay; Power supply: DC24V, AC220V.

- Analog quantity processing module

Type: AD, DA, AD/DA; Number of channels: AD 4~12, DA 2~4; Power supply: DC24V.

- Temperature control module

Type: PT100, thermocouple; Number of channels: 2~6; PID control: built-in, relay; Power supply: DC24V.

2) Expansion BD

Two types of BD expansion boards are available: communication boards and precision clock boards. 24~32 points can connect 1 BD, 48~60 points type can connect 2 BD boards. (16 points cannot connect BD)

- Communication BD

- XD-NE-BD: Equipped with RS485 communication and standard X-NET interface for bus communication.

XD-NS-BD: Supports RS232 communication.

XD-NO-BD: Equipped with X-NET optical fiber interface for bus communication.

- Precise clock BD

XD-RTC-BD provides more accurate clock function than PLC itself, and the error is less than 13 seconds per month.

Note: XD1 series, XD full series 16 point PLC, and XDH series 30 point do not support expanding BD boards.

3) Expansion ED

XD series left expansion ED board is for wireless communication. It can connect 1 ED board. XD1 series PLCs do not support ED expansion modules. EtherCAT models are incompatible with all ED modules except XD-NES-ED.

- Wifi communication ED:

XD-WBOX-ED, support PLC program upload and download, remote monitoring.

- Wireless transparent transmission ED:

XD-SBOXT-ED, support communication between PLC, HMI, PC.

- 4GBOX communication module

XD-4GBOX-ED, support remote wireless monitoring, PLC program upload and download, mobile phone message exchange, support 4G network.

- Communication expansion module

XD-NES-ED, support RS232 or RS485 (high-speed, support X-NET fieldbus), the two ports cannot use at the same time.

- CANopen communication module

XD-COBOX-ED, support CANopen communication, can be master or slave station.

- Temperature Control Modules

XD-1TC-ED and XD-4PT-ED provide analog input for temperature sensors: XD-1TC-ED supports thermocouples, while XD-4PT-ED supports thermal resistors.

- Analog IO Modules

XD-2AD2DA-A-ED: Supports current-type input and output.

XD-2AD2DA-V-ED: Supports voltage-type input and output.

XD-4AD-A-ED: Supports current-type input.

XD-4AD-V-ED: Supports voltage-type input.

XD-4DA-A-ED: Supports current-type output.

XD-4DA-V-ED: Supports voltage-type output.

- Analog & Temperature Mixed Modules

XD-2AD2PT-A-ED: 2-channel current input + 2-channel PT100 temperature input.

XD-2AD2PT-V-ED: 2-channel voltage input + 2-channel PT100 temperature input.

XD-2PT2DA-A-ED: 2-channel PT100 temperature input + 2-channel current output.

XD-2PT2DA-V-ED: 2-channel PT100 temperature input + 2-channel voltage output.

1-1-2. XL series CPU units

1-1-2-1. XL series basic unit

1) Model Introduction

The XL series PLCs are slim programmable controllers, and their basic units currently cover 10 sub-series product lines.

- I/O Points 16, 24, 30, 32, 64 points
- Output Type Transistor, Relay
- Input Type NPN, PNP
- Power Type DC24V

Series	Description
XL1 (Economic Type)	Contains 16 points. Compatible with all functions of XD1 series PLC, the speed is 12 times faster than XC series. It does not support special functions such as pulse output, high-speed counting, nor right expansion module and left expansion ED module, and can meet the simple use needs of users.
XL3 (Basic Type)	Include 16 points, 32 points. With all the functions of XD3 series PLC, the processing speed is 12 times of XC series PLC. Supports 2 to 4 channels of pulse output, support right expansion module and left expansion ED module, capable of meeting the application requirements of most users.
XL5 (Enhanced Type)	Contains 16 points, 32 points, 64 points. Compatible with all functions of XD5 series PLC, the speed is 12 times that of XC series, supporting 2~4 channels pulse output, supporting right expansion module and left expansion ED module, which can meet the needs of most users.
XL3E (Ethernet Type)	Contains 16 points, 32 points. It is fully compatible with all functions of XD3 series PLCs, supports Ethernet communication and 2-axis high-speed pulse output, and can be equipped with expansion modules, ED expansion modules and BD expansion boards to satisfy most users' application demands.
XL5E (Ethernet Type)	Contains 16 points, 32 points, 64 points. Compatible with all functions of XD5 series PLC, the speed is 12 times faster than XC series. It supports

	Ethernet communication, 2~10 channels pulse output, right expansion module and left expansion ED module. It can meet the needs of most users. XL5E models support online download function.
XL5N (CAN Communication Type)	Only available in 32-point specification. It is compatible with most functions of XL5E, built-in two independent CAN communication channels, supports 2-channel pulse output, and is compatible with right expansion modules and left ED expansion modules to meet most users' application requirements.
XLME (Motion Control, Ethernet Type)	Contains 16 points, 32 points, 64 points.. Compatible with all functions of XDM series PLC, the speed is 12 times faster than XC series. It supports Ethernet communication, motion control instructions such as interpolation and servo, 4~10 channels pulse output, right expansion module and left expansion ED module. It can meet the needs of most users. XLME models support online download function.
XLH (EtherCAT bus Type)	Includes 24 points, 30 points specifications. It is compatible with most functions of XLME, supports Ethernet communication, EtherCAT bus, supports motion control instructions such as interpolation and electronic cam follow-up, supports 4-axis high-speed pulse output, electronic cam functions, and can be connected to expansion modules and expanded ED.
XL5H (EtherCAT Bus Type)	Includes 24 points, 30 points specifications. It is compatible with most functions of XL5E, supports EtherCAT bus, motion control instructions including follow-up function and 2-axis high-speed pulse output. It can be equipped with right expansion modules and left ED expansion modules to meet most users' application requirements.
LC5E (EtherCAT Bus Type)	Only available in 32-point specification. It is compatible with most functions of XL5E, and can act as an EtherCAT slave to exchange data with the master station. It supports Ethernet communication, EtherCAT bus and 4-channel pulse output, and is compatible with right expansion modules and left ED expansion modules to meet most users' application requirements.

2) Powerful functions

XL series PLC have rich basic functions and many special functions.

Abundant basic function

- **High speed operation**
Adopts 32-bit CPU, basic processing instruction: 0.02~0.05us (Ethernet type 0.01~0.03us), scanning time: 10,000 per 1ms. Program capacity is up to 1MB (XLH can up to 4MB) .
- **Abundant expansions**
XL series PLC※¹ generally supports 10-16 different types and models of right expansion modules and 1ED expansion modules.
- **Multiple communication ports**
CPU units have 1~4 communication ports, support RS232, RS485, RJ45, and can work with many external devices, such as frequency inverters, instruments, printers.
- **Abundant software capacity**
Up to 8000 processes S, 1000 retention processes HS, 7000 intermediate relays M, 12000 retention relays HM, 1280 input relays X, 1280 output relays Y, 5000 normal timers T, 2000 latched timers HT, 5000 counters C, 2000 retention counters HC, 70000 data registers D, 25000 retention data registers HD, 8192 registers FD.
- **Two programming types**
XL series PLC support two programming types, instruction list and ladder chart which can switch to each other.
- **Rich instructions**
Include order control, data move and compare, arithmetic, data circulate and shift, pulse output, HSC, interruption, PID etc.
- **Real time clock**
XL series PLC has built-in clock to control time , used for time control.
- **Compact size, convenient to install**
XL series PLC has mini size and is easy to install on the DIN rail.

Enhanced special function

- **EtherCAT bus**
The XLH series PLC supports EtherCAT motion bus and can synchronously control up to 32 axes with a control cycle of less than or equal to 1ms. For specific usage, please refer to the XDH/XLH series programmable controller user manual [Advanced Motion Control].
- **X-NET fieldbus**
XL series PLC support X-NET fieldbus, which can fast communicate with XD/XL series PLC and TG/TN series HMI. Refer to [X-NET fieldbus manual] for details.
- **Ethernet Communication**
Ethernet PLC has RJ45 port and supports TCP/IP protocol. It can realize MODBUS-TCP communication and free format communication based on Ethernet. Support program download, on-line monitoring, remote monitoring, and communication with other TCP/IP devices. Specific applications can be

referred to "TCP/IP Communication User Manual Based on Ethernet Communication".

- **High-speed pulse counter, frequency up to 80KHz**
XL series PLC CPU units have 3~10 channels two-phase high-speed counter and high-speed counting comparer, can realize single-phase and AB-phase counting, frequency up to 80 KHz.
- **High-speed pulse output, frequency up to 100 KHz^{※2}.**
XL series PLC usually have 2~10 pulse output terminals, pulse frequency up to 100KHz.
- **Interruption function**
XL series PLC interruption functions include external interruption, timing interruption and high-speed counting interruption to meet different interruption demands.
- **I/O points switch freely**
XL series PLC unique function. Do not need to change program when terminals are damaged.
- **C language function block**
C language block makes the program more secured. C language rich operation function can realize many functions, which saves internal space and improves programming efficiency.
- **POU function**
XDPPro V3.7.16 supports POU functions, including functions (FC), function blocks (FB) and programs. Users can write FC and FB through ladder diagram, C language, structured text ST^{※4}, and then call them in the program.
- **Body PID function**
XL series PLC^{※1} CPU units have PID control function and auto-tuning control function.
- **Sequence BLOCK**
Sequence block makes instructions carry out in sequence, especially suitable for pulse output, motion control, module read and write etc, and largely simplifys the program writing.
- **100 segments high speed counting interruption**
XL series PLC high speed counter have 100 segments 32 bits preset value. Each segment can generate interruption with good real-time, high reliability, low cost.
- **PWM(pulse width modulation)**
XL series PLC PWM function can be used to control DC motor.
- **Frequency measure**
XL series PLC can measure frequency.
- **Precise time**
XL series PLC can realize 1ms and 32 bits precise timing.
- **Online Download^{※3}**

Partial XL5E models and XLH series PLCs support online download function, realizing uninterrupted PLC operation.

3) Easy to program

Programming of XL series PLCs is also carried out in Xinje PLC programming software, which will not be elaborated here. For details, please refer to [XD/XL/XG Series Programmable Controller User Manual (Software Volume)].

Note:

※1: The XL series PLC mentioned herein generally refers to PLCs capable of the described functions, meaning not all XL series PLCs support the above functions. See Appendix 3 for specific functions corresponding to each PLC model.

※2: The PLC can output high-speed pulses ranging from 100 KHz to 200 KHz, but normal operation of all servo drives cannot be guaranteed. A resistor of approximately 500 Ω shall be connected between the pulse output terminal and the 24 V power supply.

※3: Refer to *XD/XL/XG Series Programmable Controller User Manual (Software Volume)* for details on the online download function.

※4: Structured Text (ST) programming is supported in POU's with software version V3.8.0 and above.

1-1-2-2. XL Expansions

1) Expansion Modules

To meet control requirement better, XL series PLC can work with expansions, XL3/XL3E can link 10 expansion modules, XL5/XL5E/XL5N/XLME/XLH/XL5H can link 16 expansion modules, XL1 cannot support expansion modules.

- Rich variety
It includes I/O expansion module and analog quantity processing module.
- I/O expansion module
Input 8~32 points; Output points: 8~32; Output type: transistor, relay; Power supply: DC24V.
- Analog quantity processing module
Analog quantity type: voltage, current; Number of channels: AD 4-8, DA 2-4; Power supply: DC24V.
- Temperature control module
Type: PT100, thermocouple; Number of channels: 4; PID control: built-in, relay; Power supply: DC24V.

2) Expansion ED

XL series PLCs can be equipped with ED expansion modules on the left side, with a maximum of one ED module in general. (The XL1 series PLCs do not support ED expansion modules; EtherCAT models do not support all ED module types and only work with XL-NES-ED).

- Communication expansion module

XL-NES-ED, support RS232 or RS485 (high-speed, support X-NET fieldbus), the two ports cannot use at the same time.

XL-COBX-ED supports CANopen communication and can be used as master station or slave station.

- Analog I/O

XL-2AD2DA-A-ED, support current I/O

XL-2AD2DA-V-ED, support voltage I/O

XL-4AD-A-ED, support current input

XL-4AD-V-ED, support voltage input

XL-4DA-A-ED, support current output

XL-4DA-V-ED, support voltage output

- Analog and temperature mixed type:

XL-2AD2PT-A-ED, support 2 channels current input, 2 channels PT100 temperature input.

XL-2AD2PT-V-ED, support 2 channels voltage input, 2 channels PT100 temperature input.

XL-2PT2DA-A-ED, support 2 channels PT100 temperature input, 2 channels current output.

XL-2PT2DA-V-ED, support 2 channels PT100 temperature input, 2 channels voltage output.

1-2. Model list

1-2-1. XD series basic unit model and list

1-2-1-1. Model Composition and Model List of XD Series Basic Units

1) Basic unit model

The model composition of XD series PLC basic units is generally as follows:

$$\begin{array}{ccccccc} \text{XDME} & \text{—} & 60 & \text{P} & \text{A16} & \text{D4} & \text{T4} & \text{—} & \text{E} \\ \hline & & \text{①} & & \text{②} & \text{③} & \text{④} & & \text{⑤} & & \text{⑥} & & \text{⑦} \end{array}$$

① Series type	1:	XD1 Series: Economic Type
	2:	XD2 Series: Basic Type
	3:	XD3 Series: Standard Type
	5:	XD5 Series: Enhanced Type
	3E:	XD3E Series: Ethernet Communication Type
	5E:	XD5E Series: Ethernet Communication Type
	M:	XDM Series: Motion Control Type
	ME:	XDME Series: Ethernet Motion Control Type
② I/O points	C:	XDC Series: Motion Bus Control Type
	H:	XDH Series: EtherCAT Bus Type
	10:	5 I / 5 O
	16:	8I / 8O
	24:	14I /10O (Or 12I /12 O)
	30:	16I /14O
	32:	18I /14 O (Or 16I /16 O)
	42:	24I /18 O
③ Input point type	48:	28I /20 O
	60:	36I /24 O
	80:	40I /40 O
④ EtherCAT motion control function	—:	NPN type
	P:	PNP type
	NP:	Bipolar Input
	A8:	Control 8-axis EtherCAT slaves
	A8L:	Control 8-axis EtherCAT slaves, Electronic cam function not supported
	A16:	Control 16-axis EtherCAT slaves
	A16L:	Control 16-axis EtherCAT slaves, Electronic cam function not supported
	A32:	Control 32-axis EtherCAT slaves
	A64:	Control 64-axis EtherCAT slaves

⑤	Differential output	D2:	2 differential high-speed pulse output
		D4:	4-channel differential high-speed pulse output
⑥	Output Point Type, Number of Transistor Pulse Output Channels	R:	Relay Output
		T:	Transistor Output, 2-channel pulse output (Not supported by XD1 series)
		T4:	Transistor Output, 4-channel pulse output
		T4L:	Transistor Output, 4-channel pulse output, expanded program capacity type
		T6:	Transistor Output, 6-channel pulse output
		T10:	Transistor Output, 10-channel pulse output
		RT:	Mixed Relay & Transistor Output, 2-channel pulse output (Not supported by XD1 series)
⑦	Power supply	E:	AC power supply (220V)
		C:	DC power supply (24V)

2) Basic unit model list

Note: Unreleased PNP models listed in the following table can be customized upon request.

XD1 series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	XD1-10R-E	XD1-10T-E	-	XD1-10R-C	XD1-10T-C	-	5	5
	XD1-16R-E	XD1-16T-E		XD1-16R-C	-		8	8
	XD1-24R-E	XD1-24T-E		XD1-24R-C			12	12
	XD1-32R-E	XD1-32T-E	-	XD1-32R-C	XD1-32T-C	-	16	16
PNP	XD1-16PR-E	-	-	-	-	-	8	8

XD2 series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	XD2-16R-E	XD2-16T-E	-	XD2-16R-C	XD2-16T-C	-	8	8
	XD2-24R-E	XD2-24T-E	XD2-24RT-E	XD2-24R-C	XD2-24T-C	XD2-24RT-C	14	10
	XD2-32R-E	XD2-32T-E	XD2-32RT-E	XD2-32R-C	XD2-32T-C	XD2-32RT-C	18	14
	XD2-42R-E	XD2-42T-E	-	-	-	-	24	18
	XD2-48R-E	XD2-48T-E	XD2-48RT-E	XD2-48R-C	XD2-48T-C	XD2-48RT-C	28	20
	XD2-60R-E	XD2-60T-E	XD2-60RT-E	XD2-60R-C	XD2-60T-C	XD2-60RT-C	36	24
PNP	-	-	-	XD2-32PR-C	-	-	18	14

XD3 series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
N P N	XD3-16R-E	XD3-16T-E	XD3-16RT-E	XD3-16R-C	XD3-16T-C	XD3-16RT-C	8	8
	-	XD3-22T4TC-E	-	-	-	-	8	14
	XD3-24R-E	XD3-24T-E	XD3-24RT-E	XD3-24R-C	XD3-24T-C	XD3-24RT-C	14	10
	-	XD3-24T4-E	-	-	XD3-24T4-C	-	14	10
	XD3-32R-E	XD3-32T-E	XD3-32RT-E	XD3-32R-C	XD3-32T-C	XD3-32RT-C	18	14
	-	XD3-32T4-E	-	-	-	-	18	14
	XD3-48R-E	XD3-48T-E	XD3-48RT-E	XD3-48R-C	XD3-48T-C	XD3-48RT-C	28	20
	XD3-60R-E	XD3-60T-E	XD3-60RT-E	XD3-60R-C	XD3-60T-C	XD3-60RT-C	36	24
P N P	XD3-16PR-E	XD3-16PT-E	-	XD3-16PR-C	XD3-16PT-C	XD3-16PRT-C	8	8
	XD3-24PR-E	XD3-24PT-E	XD3-24PRT-E	XD3-24PR-C	XD3-24PT-C	XD3-24PRT-C	14	10
	XD3-32PR-E	XD3-32PT-E	XD3-32PRT-E	XD3-32PR-C	XD3-32PT-C	XD3-32PRT-C	18	14
	XD3-48PR-E	XD3-48PT-E	XD3-48PRT-E	XD3-32PR-C	XD3-32PT-C	XD3-32PRT-C	28	20
	XD3-60PR-E	XD3-60PT-E	XD3-60PRT-E	XD3-48PR-C	XD3-48PT-C	XD3-48PRT-C	36	24

XD5 series list

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	XD5-16R-E	XD5-16T-E	XD5-16RT-E	XD5-16R-C	XD5-16T-C	-	8	8
	XD5-24R-E	XD5-24T-E	XD5-24RT-E	XD5-24R-C	XD5-24T-C	XD5-24RT-C	14	10
	-	XD5-24T4-E	-	-	XD5-24T4-C	-	14	10
	-	XD5-24D2T2-E	-	-	-	-	14	10
	XD5-32R-E	XD5-32T-E	XD5-32RT-E	XD5-32R-C	XD5-32T-C	XD5-32RT-C	18	14
	-	XD5-32T4-E	-	-	XD5-32T4-C	-	18	14
	XD5-42R-E	XD5-42T-E	-	-	-	-	24	18

	XD5-48R-E	XD5-48T-E	XD5-48RT-E	XD5-48R-C	XD5-48T-C	XD5-48RT-C	28	20
	-	XD5-48T4-E	-	-	XD5-48T4-C	-	28	20
	-	XD5-48D4T4-E	-	-	-	-	28	20
	-	XD5-48T6-E	-	-	XD5-48T6-C	-	28	20
	XD5-60R-E	XD5-60T-E	XD5-60RT-E	XD5-60R-C	XD5-60T-C	XD5-60RT-C	36	24
	-	XD5-60T4-E	-	-	XD5-60T4-C	-	36	24
	-	XD5-60T6-E	-	-	XD5-60T6-C	-	36	24
	-	XD5-60T10-E	-	-	XD5-60T10-C	-	36	24
PNP	XD5-24PR-E	XD5-24PT-E	XD5-24PRT-E	XD5-24PR-C	XD5-24PT-C	XD5-24PRT-C	14	10
	-	XD5-24PT4-E	-	-	-	-	14	10
	XD5-32PR-E	XD5-32PT-E	XD5-32PRT-E	XD5-32PR-C	XD5-32PT-C	XD5-32PRT-C	18	14
	-	-	-	-	XD5-32PT4-C	-	18	14
	XD5-48PR-E	XD5-48PT-E	XD5-48PRT-E	XD5-48PR-C	XD5-48PT-C	XD5-48PRT-C	28	20
	-	XD5-48PT6-E	-	-	XD5-48PT6-C	-	28	20
	XD5-60PR-E	-	-	-	XD5-60PT-C	-	36	24
	-	-	-	-	XD5-60PT6-C	-	36	24

XDM series list

Type							Input points (DC24V)	Output points (R, T)
AC power supply				DC power supply				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	XDM-24T4-E	-	-	XDM-24T4-C	-	14	10
	-	XDM-32T4-E	-	-	XDM-32T4-C	-	18	14
	-	XDM-60T4-E	-	-	XDM-60T4-C	-	36	24
	-	XDM-60T10-E	-	-	XDM-60T10-C	-	36	24
	-	XDM-60T4L-E	-	-	XDM-60T4L-C	-	36	24
PNP	-	XDM-24PT4-E	-	-	XDM-24PT4-C	-	14	10
	-	XDM-32PT4-E	-	-	XDM-32PT4-C	-	18	14
	-	XDM-60PT10-E	-	-	XDM-60PT10-C	-	36	24

XDC series list

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	XDC-24T-E	-	-	XDC-24T-C	-	14	10
	-	XDC-32T-E	-	-	XDC-32T-C	-	18	14
	-	XDC-48T-E	-	-	XDC-48T-C	-	28	20
	-	XDC-60T-E	-	-	XDC-60T-C	-	36	24
PNP	-	-	-	-	XDC-60PT-C	-	36	24

XD3E series list

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/ transistor mixed	Relay output	Transistor output	Relay/ transistor mixed		
NPN	XD3E-24R-E	XD3E-24T-E	-	-	-	-	14	10
	XD3E-30R-E	XD3E-30T-E	-	-	-	-	16	14
	XD3E-48R-E	XD3E-48T-E	-	-	-	-	28	20
	XD3E-60R-E	XD3E-60T-E	-	-	-	-	36	24
PNP	-	-	-	XD3E-30PR -C	XD3E-30PT-C	-	16	14
	-	-	-	XD3E-48PR -C	-	-	28	20
	-	-	-	-	XD3E-60PT-C	-	36	24
NPN & PNP	XD3E-24NPR -E	XD3E-24NPT-E	-	-	-	-	14	10
	XD3E-30NPR -E	XD3E-30NPT-E	-	-	-	-	16	14
	-	XD3E-30NPT4-E	-	-	-	-	16	14
	XD3E-48NPR -E	XD3E-48NPT-E	-	-	-	-	28	20
	-	XD3E-48NPT4-E	-	-	-	-	28	20
	XD3E-60NPR -E	XD3E-60NPT-E	-	-	-	-	36	24
	-	XD3E-60NPT4-E					36	2

XD5E series list

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	XD5E-24R-E	XD5E-24T-E	-	XD5E-24R-C	-	-	14	10
	XD5E-30R-E	XD5E-30T-E	-	-	XD5E-30T-C	-	16	14
	-	XD5E-30T4-E	-	-	XD5E-30T4-C	-	16	14
	XD5E-48R-E	XD5E-48T-E	-	-	-	-	28	20
	XD5E-60R-E	XD5E-60T-E	-	-	-	-	36	24
	-	XD5E-60T4-E	-	-	-	-	36	24
	-	XD5E-60T6-E	-	-	XD5E-60T6-C	-	36	24
	-	XD5E-60T10-E	-	-	XD5E-60T10-C	-	36	24
PNP	-	-	-	XD5E-30PR-C	XD5E-30PT-C	-	16	14
	-	XD5E-30PT4-E	-	-	-	-	16	14
	-	-	-	XD5E-48PR-C	-	-	28	20

	-	XD5E-60PT6-E	-	-	-	-	36	24
	-	-	-	-	XD5E-60PT10-C	-	36	24

XDME series list

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	XDME-30T4-E	-	-	XDME-30T4-C	-	16	14
	-	XDME-60T4-E	-	-	-	-	36	24
	-	XDME-60T10-E	-	-	-	-	36	24

XDH series list

Type							Input points (DC24V)	Output points (R, T)
	AC power			DC power				
	Relay output	Transistor output	Relay/transis tor mixed	Relay output	Transistor output	Relay/transis tor mixed		
NPN	-	XDH-24A8-E	-	-	-	-	14	10
	-	XDH-24A8L-E	-	-	-	-	14	10
		XDH-30A16-E	-	-	-	-	16	14
	-	XDH-30A16L-E	-	-	XDH-30A16L-C	-	16	14
	-	XDH-60T4-E	-	-	XDH-60T4-C	-	36	24
	-	XDH-60A32-E	-	-	XDH-60A32-C	-	36	24
	-	XDH-60A64-E	-	-	-	-	36	24
PNP	-	XDH-30PA16-E	-	-	-	-	16	14
	-	XDH-30PA16L-E	-	-	XDH-30PA16L-C	-	16	14
	-	XDH-60PT4-E	-	-	-	-	36	24
	-	XDH-60PA32-E	-	-	-	-	36	24
	-	XDH-60PA64-E	-	-	-	-	36	24

1-2-1-2. XD expansion module list

1) I/O expansion

I/O expansion modules name constitute:

$\text{XD} - \text{E} \bigcirc \square \bigcirc \square - \square$
 ① ② ③ ④ ⑤ ⑥ ⑦

①	Series name	XD: XD series expansion modules
②	Expansion module	E: Expansion module
③	Input points	8 / 16 / 32
④	Special for input	X: NPN input type PX: PNP input type

⑤	Output points	8 / 16 / 32
⑥	Output mode	YT: Transistor output YR: Relay output
⑦	Power supply type	E: AC220V C: DC24V

• I/O expansion module type list

Model				I/O points	Input points (DC24V)	Output points (R, T)
Type	Input	Output				
		Relay output	Transistor output			
NPN	XD-E8X	-	-	8	8	-
	-	XD-E8YR	XD-E8YT	8	-	8
	-	XD-E8X8YR	XD-E8X8YT	16	8	8
	XD-E16X	-	-	16	16	-
		XD-E16YR	XD-E16YT	16	-	16
	-	XD-E16X16YR-E	XD-E16X16YT-E	32	16	16
	-	XD-E16X16YR-C	XD-E16X16YT-C	32	16	16
	XD-E32X-E	-	-	32	32	-
	XD-E32X-C	-	-	32	32	-
	-	XD-E32YR-E	XD-E32YT-E	32	-	32
	-	XD-E32YR-C	XD-E32YT-C	32	-	32
PNP	XD-E8PX	-	-	8	8 points	-
	-	XD-E8PX8YR	XD-E8PX8YT	16	8 points	8
	XD-E16PX	-	-	16	16 points	-
	-	XD-E16PX16YR-E	XD-E16PX16YT-E	32	16 points	16
	-	XD-E16PX16YR-C	XD-E16PX16YT-C	32	16 points	16
	XD-E32PX-E	-	-	32	32 points	-
	XD-E32PX-C	-	-	32	32 points	-

2) Analog temperature modules

Analog, temperature model constitute:

XD — E 4AD 2DA 6PT 6TC 1WT 4SSI **— P — H**
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Expansion module	E:	Refers to expansion modules
②	Analog input	4AD:	4-channel analog input
		8AD:	8-channel analog input
		12AD:	12-channel analog input
③	Analog output	2DA:	2-channel analog output
		4DA:	4-channel analog output
④	Temperature input	6PT:	6-channel platinum thermal resistance input
		4PT3:	4-channel platinum thermal resistance input (3-wire system)
⑤	Temperature input	2TC:	2-channel thermocouple input
		6TC:	6-channel thermocouple input

⑥	Pressure measurement	1WT:	1-channel pressure measurement
		2WT:	2-channel pressure measurement
		4WT:	4-channel pressure measurement
⑦	Encoder test	4SSI:	4-channel encoder detection
⑧	Model Distinction	P:	With PID control
		A:	New hardware version (only for WT modules) Current input type (only for 8AD modules)
		B:	Analog voltage output: -5V~5V or -10V~10V (only for 4AD2DA modules) Hardware version distinction (only for WT modules)
		C:	Hardware version distinction (only for WT modules)
		D:	Hardware version distinction (only for WT modules)
		V:	Voltage input type (for 8AD, 12AD modules)
⑨	Isolation Status	-:	Standard type
		H:	Isolated between each channel (only for 6TC-P-H, 4DA-H modules)

Analog, temperature expansion module type schedule

Type		Function
Analog input	XD-E4AD	4 channels analog input
	XD-E8AD	8 channels analog input
	XD-E8AD-A	8 channels analog input, current input type
	XD-E8AD-V	8 channels analog input, voltage input type
	XD-E12AD-V	12 channels analog input, voltage input type
Analog input and output	XD-E4AD2DA	4 channels analog input, 2 channels analog output
	XD-E4AD2DA-B	4 channels analog input, 2 channels analog output
Analog output	XD-E2DA	2 channels analog output
	XD-E4DA	4 channels analog output
	XD-E4DA-H	4-channel analog output, isolated between each channel
Temperature measurement	XD-E6PT-P	6 channels PT100 temperature measurement, with PID control
	XD-E6TC-P	6 channels K-type thermocouple temperature measurement, with PID control
	XD-E6TC-P-H	6 channels K-type thermocouple temperature measurement, with PID control, each channel is isolated
	XD-E4PT3-P	4 channels PT100 temperature measurement, with PID control
	XD-2TC-P	2 channels K-type thermocouple temperature measurement, with PID control
Pressure measurement	XD-E1WT-A	1 channel pressure measurement, -39.06mV~39.06mV
	XD-E2WT-A	2 channels pressure measurement, -39.06mV ~ 39.06mV

	XD-E4WT-A	4 channels pressure measurement, -39.06mV ~ 39.06mV
	XD-E2WT-B	2 channels pressure measurement, 0~10mV
	XD-E1WT-C	1 channels pressure measurement, 0~10mV, precision 20-bit
	XD-E2WT-C	2 channels pressure measurement, 0~10mV, precision 20-bit
	XD-E4WT-C	4 channels pressure measurement, 0~10mV, precision 20-bit
	XD-E1WT-D	1 channels pressure measurement, 0~10mV, precision 22-bit
	XD-E2WT-D	2 channels pressure measurement, 0~10mV, precision 22-bit
	XD-E4WT-D	4 channels pressure measurement, 0~10mV, precision 22-bit
Mixed Analog & Temperature	XD-E2AD2PT2DA	2-channel analog input, 2-channel analog output, 2-channel temperature control
	XD-E3AD4PT2DA	3-channel analog input, 2-channel analog output, 4-channel temperature control
Special Module	XD-E4SSI	4-channel encoder position detection, supports 10bit~31bit

3) Extension BD board

The naming rule of extension BD board:

XD — NE — BD
 ① ②

- ①: BD type NE: RS485 port
 NS: RS232 port
 NO: X-NET optical fiber port
 RTC: precise timing
- ②: Type BD: extension BD board

• Extension BD board model list

Model		Description
Communication	XD-NE-BD	RS485 communication, X-NET standard interface, bus communication function
	XD-NS-BD	RS232 communication function
	XD-NO-BD	X-NET optical fiber interface, bus communication function
Precise Clock	XD-RTC-BD	It provides more accurate clock function than PLC body, and the error is less than 13 seconds per month

4) Left extension ED module

The naming rule of left extension ED module:

XD — 2AD 2DA 2PT NES — A — ED

① ② ③ ④ ⑤ ⑥

- ①: Analog input 2AD: 2 channels analog input
- ②: Analog output 2DA: 2 channels analog output
- ③: Temperature measure 2PT: 2 channels PT100 input
- ④: communication NES: RS232 or RS485
WBOX: WIFI
4GBOX: 4G
SBOXT: Wireless transparent transmission
COBOX: CANopen
- ⑤: Analog type A: I/O is current mode
V: I/O is voltage mode
- ⑥: Extension ED: left extension ED

- Left extension ED module model list:

Model		Description
Communication	XD-WBOX-ED	WIFI communication module, support PLC download program, online monitoring and so on
	XD-SBOXT-ED	Wireless transmission module, support PLC and PLC, HMI, computer communication
	XD-4GBOX-ED	Support remote wireless monitoring, PLC program download and SMS information interaction, support 4G
	XD-COBOX-ED	Support CANopen communication, can be used as master station or slave station
	XD-NES-ED	Expand 1 RS232 and 1 RS485 communication port, but can not be used at the same time
Analog input	XD-4AD-A-ED	4 channels analog current input
	XD-4AD-V-ED	4 channels analog voltage input
Analog output	XD-4DA-A-ED	4 channels analog current output
	XD-4DA-V-ED	4 channels analog voltage output
Analog input and output	XD-2AD2DA-A-ED	2 channels analog current input, 2 channels analog current output
	XD-2AD2DA-V-ED	2 channels analog voltage input, 2 channels analog voltage output
Analog and temperature mixed	XD-2AD2PT-A-ED	2 channels analog current input, 2 channels PT100 temperature input
	XD-2AD2PT-V-ED	2 channels analog voltage input, 2 channels PT100 temperature input
	XD-2PT2DA-A-ED	2 channels PT100 temperature input, 2 channels analog current output
	XD-2PT2DA-V-ED	2 channels PT100 temperature input, 2 channels analog voltage output

1-2-2. XL series basic unit model and list

1-2-2-1. XL Series Basic Unit Model Composition and Model Table

1) Basic Unit Mode

2) 1 Composition

The basic unit model composition of XL series PLC is generally as follows:

$$\begin{array}{ccccc} \text{XL} & \text{ME} & - & 64 & \text{P} & \text{T10} & \text{A16} \\ \hline & \textcircled{1} & & \textcircled{2} & \textcircled{3} & \textcircled{4} & \textcircled{5} \end{array}$$

①	Type	1:	XL1 series economic type
		3:	XL3 series standard type
		5:	XL5 series enhanced type
		3E:	XL3E series Ethernet type
		5E:	XL5E series Ethernet type
		5N:	XL5N series CAN type
		ME:	XLME series Ethernet type
		H:	XLH series EtherCAT type
②	I/O points	16:	8I /8O
		24:	12I /12O
		30:	14I /16O
		32:	16I /16O
		64:	32I /32O
③	Input type	-:	NPN
		P:	PNP
④	Output point type, number of transistor pulse paths	R:	R: Relay output
		T:	T: Transistor output, 2-channel pulse output (not supported by XL1 series)
		T4:	T4: transistor output, 4-channel pulse output
		T6:	T6: transistor output, 6-channel pulse output
		T10:	T10: transistor output, 10 channel pulse output
⑤	EtherCAT motion contro	A8:	Control 8-axis EtherCAT slave station
		A8L:	Control 8-axis EtherCAT slave, does not support electronic cam
		A16:	Control 16 axis EtherCAT slave station
		A16L:	Control 16 axis EtherCAT slave, does not support electronic cam
		A32:	Control 32 axis EtherCAT slave station

3) List of Basic Unit Models

XL1 series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	-	-	-	XL1-16T	-	8	8
	-	-	-	-	XL1-16T-U	-	8	8

XL3 series List

Type							Input points (DC24V)	Output points (R, T)
AC power			DC power					
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	-	-	XL3-16R	XL3-16T	-	8	8
	-	-	-	XL3-32R	XL3-32T	-	16	16
PNP	-	-	-	XL3-16PR	-	-	8	8
	-	-	-	XL3-32PR	-	-	16	16
NPN& PNP	-	-	-	XL3-16R	XL3-16T4	-	8	8

Note: XL3-16R, bipolar input, hardware version Hx.5.x and above. (Hardware versions start with the prefix H and are marked on the side label of the product.)

XL5 series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	-	-	-	XL5-16T	-	8	8
	-	-	-	-	XL5-32T	-	16	16
	-	-	-	-	XL5-32T4	-	16	16
	-	-	-	-	XL5-64T10	-	32	32
PNP	-	-	-	-	XL5-32PT4	-	16	16
NPN& PNP	-	-	-	-	XL5-16T4	-	8	8

XL3E series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN&	-	-	-	-	XL3E-16T	-	8	8
PNP	-	-	-	-	XL3E-32T	-	16	16

XL5E series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN& PNP	-	-	-	-	XL5E-16T	-	8	8
	-	-	-	-	XL5E-32T	-	16	16
	-	-	-	-	XL5E-32T4	-	16	16
	-	-	-	-	XL5E-64T6	-	32	32
	-	-	-	-	XL5E-64T10	-	32	32
PNP	-	-	-	-	XL5E-32PT4	-	16	16

XL5N series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	-	-	-	XL5E-32T	-	16	16
PNP					XL5E-32PT	-	16	16

XLME series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN& PNP	-	-	-	-	XLME-16T4		8	8
	-	-	-	-	XLME-32T4	-	16	16
	-	-	-	-	XLME-64T10	-	32	32

XLH series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	-	-	-	XLH-24A16	-	12	12
	-	-	-	-	XLH-24A16L	-	12	12
	-	-	-	-	XLH-30A32	-	14	16
	-	-	-	-	XLH-30A32L	-	14	16
PNP	-	-	-	-	XLH-24PA16	-	12	12
	-	-	-	-	XLH-24PA16L	-	12	12
	-	-	-	-	XLH-30PA32	-	14	16

XL5H series List

Type							Input points (DC24V)	Output points (R, T)
AC power				DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN&	-	-	-	-	XL5H-24A8	-	12	12
PNP	-	-	-	-	XL5H-24A8L	-	12	12

1-2-2-2. XL series expansion unit model composition and model table

1) I/O expansion modules

The model composition of the digital expansion module is as follows:

$$\begin{array}{ccccccc} \text{XL} & - & \text{E} & \bigcirc & \square & \bigcirc & \square - \square \\ \textcircled{1} & & \textcircled{2} & \textcircled{3} & \textcircled{4} & \textcircled{5} & \textcircled{6} & \textcircled{7} \end{array}$$

①	Series	XL series expansion module
②	Expansion module	E: expansion module
③	Input points	8 or 16 or 32
④	Input type	X: NPN type input PX: PNP type input NPX: Bipolar Input
⑤	Output points	8 or 16 or 32
⑥	Output mode	YT: transistor output YR: relay output
⑦	Interface type	None: European terminal interface A: Horn terminal interface, external terminal block is required

• I/O expansion module type list

Model				I/O points	Input points (DC24V)	Output points (R, T)
Type	Input	Output				
		Relay output	Transistor output			
NPN	-	XL-E8X8YR	XL-E8X8YT	16	8	8
	XL-E16X	-	-	16	16	-
	-	XL-E16YR	XL-E16YT	16	-	16
	-	-	XL-E16YT-A	16	-	16
	-	-	XL-E16X16YT	32	16	16
	-	-	XL-E16X16YT-A	32	16	16
	XL-E32X	-	-	32	32	-
	XL-E32X-A	-	-	32	32	-
	-	-	XL-E32YT	32	-	32
	-	-	XL-E32YT-A	32	-	32
PNP	-	XL-E8PX8YR	XL-E8PX8YT	16	8	8
	XL-E16PX	-	-	16	16	-
	-	-	XL-E16PX16YT	32	16	16
	-	-	XL-E16PX16YT-A	32	16	16
	-	-	XL-E16PX16PYT	32	16	16
	XL-E32PX	-	-	32	32	-
	XL-E32PX-A	-	-	32	32	-
NPN& PNP	-	XL-E8NPX8YR	XL-E8NPX8YT	16	8	8

2) Analog quantity and temperature expansion module

The model composition of analog and temperature expansion modules is as follows:

$$\frac{\text{XL}}{1} - \frac{\text{E}}{2} \frac{\bigcirc}{3} \frac{\square}{4} \frac{\bigcirc}{5} \frac{\square}{6} - \frac{\square}{7}$$

①	Series	XL series expansion module
②	Expansion module	E: expansion module
③	Input channel	1 or 2 or 4 or 8
④	Analog input	AD: analog voltage and current input PT3: indicates the input of 3-wire PT100 temperature sensor TC: thermocouple temperature sensor input WT: pressure measurement
⑤	Output channel	2 or 4
⑥	Analog output	DA: analog voltage, current output
⑦	Analog type	A: current mode V: voltage mode P: PID function D: Hardware version differentiation (only for WT modules) S: Representing a resolution of 1/65536 (16 bits)

List of Analog and Temperature Expansion Module Models

Type		Description
Analog I/O	XL-E4AD	4-channel analog input, supporting two modes of current and voltage
	XL-E4AD2DA	4-channel analog input, 2-channel analog output
	XL-E4DA	4-channel analog output, supporting both current and voltage modes
	XL-E8AD-A	8-channel analog input, supporting current mode
	XL-E8AD-V	8-channel analog input, supporting voltage mode
	XL-E8AD-A-S	8-channel analog input, supports current mode, 16 bit resolution
	XL-E8AD-A-S	8-channel analog input, supports current mode, 16 bit resolution
Temperature control	XL-E4PT3-P	4 channels PT100 temperature measuring, built-in PID function
	XL-E4TC-P	4 channels themocouple temperature measuring, built-in PID function
Weighing	XL-E1WT-D	1 channel pressure measurement, - 20 ~ 20mV, 23 bits conversion accuracy

Type		Description
	XL-E2WT-D	2 channel pressure measurement, - 20 ~ 20mV, 23 bits conversion accuracy
	XL-E4WT-D	4 channel pressure measurement, - 20 ~ 20mV, 23 bits conversion accuracy

3) Left expansion ED module

The model composition of analog and temperature modules is as follows:

$$\text{XL} - \underbrace{2\text{AD}}_{\textcircled{1}} \underbrace{2\text{DA}}_{\textcircled{2}} \underbrace{2\text{PT}}_{\textcircled{3}} \underbrace{\text{NES}}_{\textcircled{4}} - \underbrace{\text{A}}_{\textcircled{5}} - \underbrace{\text{ED}}_{\textcircled{6}}$$

①	Analog input	2AD: 2 channels analog input
②	Analog output	2DA: 2 channels analog output
③	Temperature measurement	2PT: 2 channels PT100 input
④	Communication	NES: RS232 or RS458 communication
⑤	Analog type	A: A: I/O is current mode V: V: I/O is voltage mode
⑥	Left expansion	ED: ED: left expansion ED module

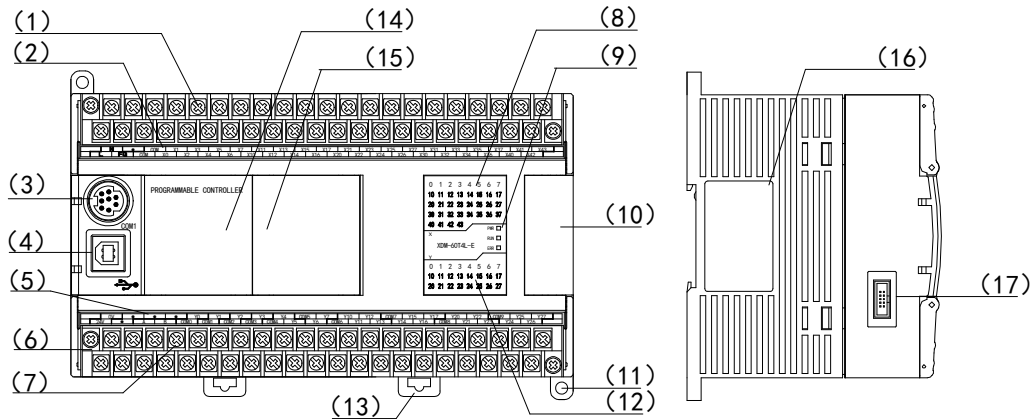
Left expansion ED module list:

Model		Description
Analog input	XL-E4AD-A-ED	4 channels analog current input
	XL-E4AD-V-ED	4 channels analog voltage input
Analog output	XL-E4DA-A-ED	4 channels analog current output
	XL-E4DA-V-ED	4 channels analog voltage output
Analog I/O	XL-E2AD2DA-A-ED	2 channels analog current input, 2 channels analog current output
	XL-E2AD2DA-V-ED	2 channels analog voltage input, 2 channels analog voltage output
Analog temperature mixed type	XL-E2AD2PT-A-ED	2 channels analog current input, 2 channels PT100 temperature input
	XL-E2AD2PT-V-ED	2 channels analog voltage input, 2 channels PT100 temperature input
	XL-E2PT2DA-A-ED	2 channels PT100 temperature input, 2 channels analog current output
	XL-E2PT2DA-V-ED	2 channels PT100 temperature input, 2 channels analog voltage output
Communication	XL-NES-ED	One RS232 port, one RS485 port, cannot use at the same time
	XL-COBOX-ED	Support CANopen communication, which can be used as master station or slave station

1-3. Each Part's Description

1-3-1. XD series structure

1-3-1-1.XD series basic structural composition



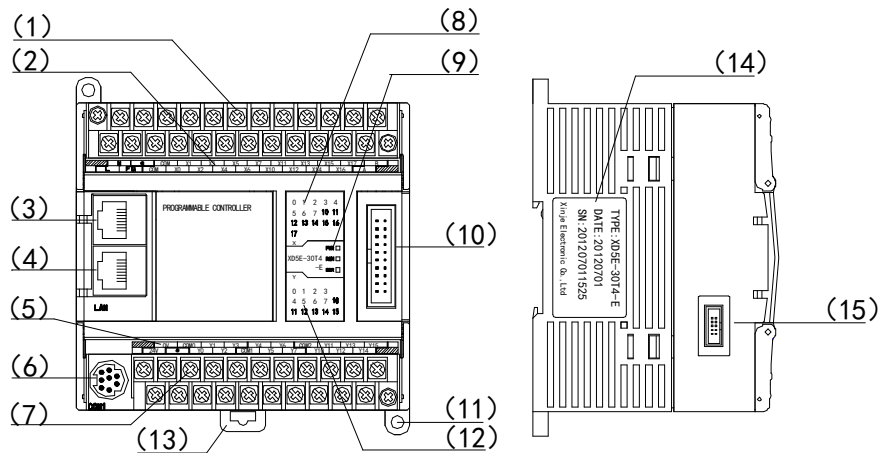
Each part's name is listed below:

- | | |
|---|--|
| (1): Input & power supply terminals | (10): expansion module connection port |
| (2): Input terminal label | (11): installation hole (2 holes) |
| (3): COM1 | (12): output action display |
| (4): USB port | (13): rail mounting hook (2 hooks) |
| (5): Output terminal label | (14): expansion BD (COM4) |
| (6): Output & 24V power terminals | (15): expansion BD (COM5) |
| (7): output terminal, RS485 port (COM2) | (16): product label |
| (8): Input action display | (17): expansion ED (COM3) |
| (9): system LED | |
| PWR: power supply | |
| RUN: working | |
| ERR: error | |

Note:

- (1) for the PLC hardware version below 3.2, position 4 is RS232 port.
- (2) for XD1, XD2, XDC series PLC, position 4 is RS232 port.
- (3) for XDC series PLC, position 4 RS232 port and terminal A and B (RS485 port) is the same port, they cannot be used at the same time.

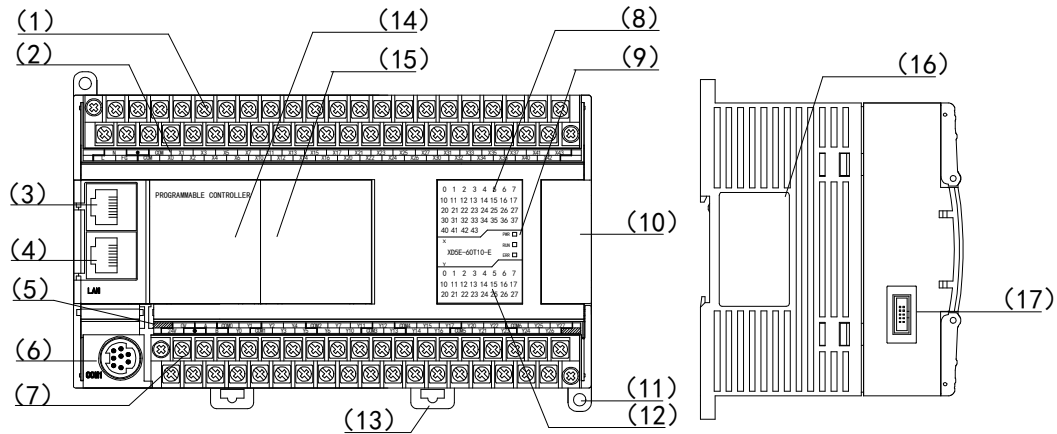
1-3-1-2. XD3E-24/30, XD5E-24/30, XDME-30, XDH-30 structure



Each part's name is listed below:

- | | |
|--|--|
| (1) : input terminal, power supply input, RS485 (COM2) | (9) : system indicator light
PWR: power
RUN: run
ERR: error |
| (2) : input label | (10) : expansion module access |
| (3) : RJ45 port1 | (11) : installation hole (2 holes) |
| (4) : RJ45 port2 | (12) : output indicator light |
| (5) : output label | (13) : rail installation hook |
| (6) : RS232 (COM1) | (14) : product label |
| (7) : output terminal, 24V output terminal | (15) : left extension ED module interface (COM3) |
| (8) : input indicator light | |

1-3-1-3. XD3E-48/60, XD5E-48/60, XDME-60, XDH-60 structure



Each part's name is listed below:

1: Input & power supply terminals

2: Input terminal label

3: RJ45 port 1

4: RJ45 port 2

5: Output terminal label

6: RS232 port (COM1)

7: output terminal, RS485 port (COM2)

8: Input action display

9: system LED

PWR: power supply

RUN: working

ERR: error

10: expansion module connection port

11: installation hole (2 holes)

12: output action display

13: rail mounting hook (2 hooks)

14: expansion BD (COM4)

15: expansion BD (COM5)

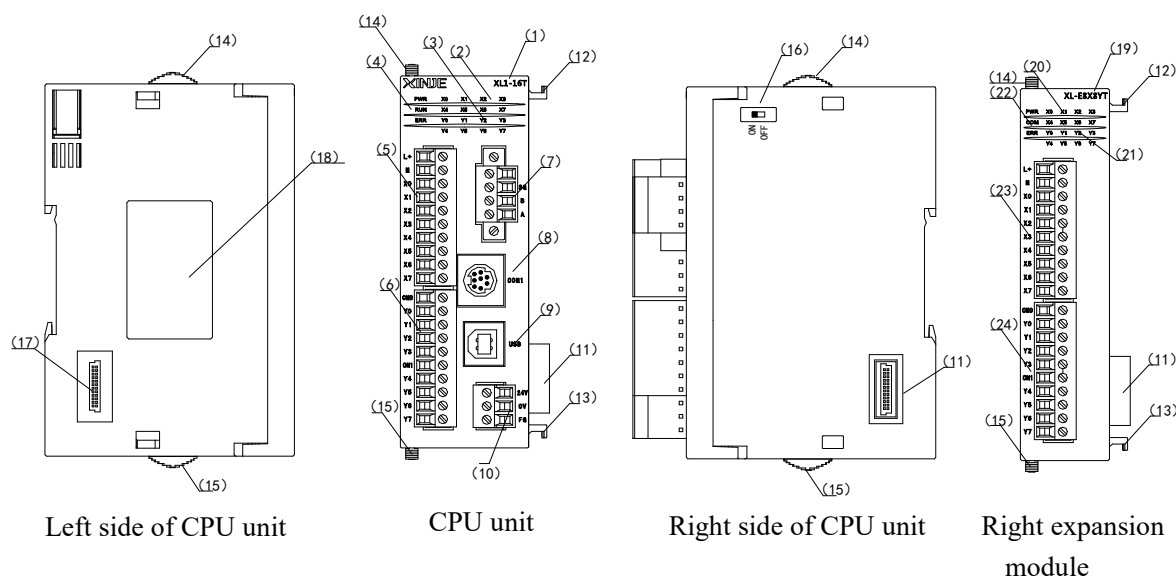
16: product label

17: left expansion ED module access (COM3)

Note: XDH-60T4 (version lower than v3.7.1) series cannot support extension BD and ED module.

1-3-2. XL series structure

1-3-2-1. Basic structural composition of XL series



Each part's name is listed below:

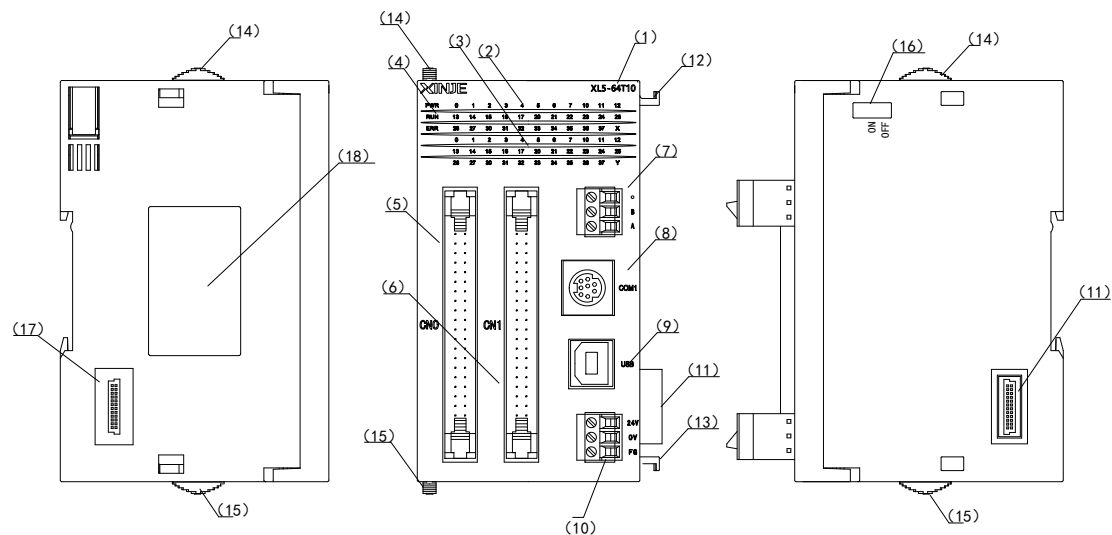
- | | |
|--|--|
| (1) : PLC model | (15) : slide lock (down) |
| (2) : input label and indicator light | (16) : DIP switch |
| (3) : output label and indicator light | (17) : left expansion ED module interface (COM3) |
| (4) : system indicator light | (18) : product label |
| PWR: power | (19) expansion module model |
| RUN: run | (20) : expansion module input label and indicator light |
| ERR: error | (21) : expansion module output label and indicator light |
| (5) : input terminal | (22) : expansion module system indicator light |
| (6) : output terminal | PWR: power |
| (7) : RS485 port(COM2) | COM: communication |
| (8) : RS232 port(COM1) | ERR: error |
| (9) : USB port | (23) : expansion module input terminal |
| (10) : power input terminal | (24) : expansion module output terminal |
| (11) : right expansion module access | |
| (12) : module fixed hook (up) | |
| (13) : module fixed hook (down) | |
| (14) : slide lock (up) | |

Note:

- (1) XL3/XL5 series USB communication ports are only for download and monitoring of programs. (except XL1-16T-U series, XL1 other models can not support USB ports.)
- (2) Position (9) of XL1 hardware version H4 and higher is RS232 (COM0), position (9) of XL1 hardware version H4 and lower is empty.

(3) When the dial switch on the side of XL3-16, XL5-16/32 body is used for RS485 port communication, when the PLC is in the first or the end of the bus, please turn the dial switch to on.

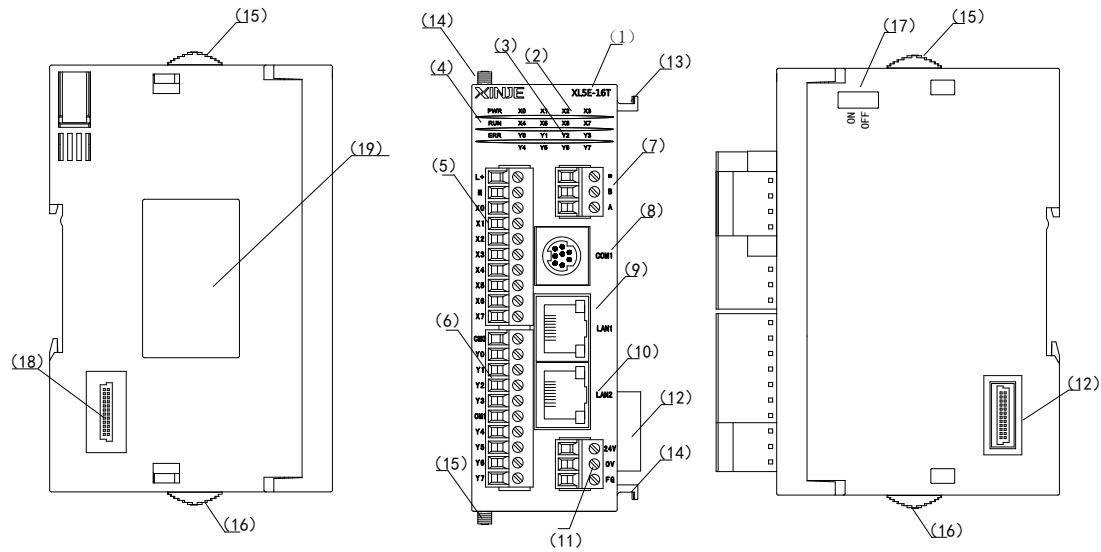
1-3-2-2. XL5-64 series structure



Each part's name is listed below:

- | | |
|----------------------------------|---|
| (1) : PLC model | (9) : USB port |
| (2) : input label and indicator | (10) : Power supply input terminal |
| (3) : output label and indicator | (11) : right expansion module access port |
| (4) : system LED | (12) : module fixing hook(up) |
| PWR: power supply | (13) : module fixing hook(down) |
| RUN: working | (14) : sliding lock (up) |
| ERR: error | (15) : sliding lock (down) |
| (5) : input terminals (CN0) | (16) : empty |
| (6) : output terminals (CN1) | (17) : left expansion module access port (COM3) |
| (7) : RS485 port (COM2) | (18) : product label |
| (8) : RS232 port (COM1) | |

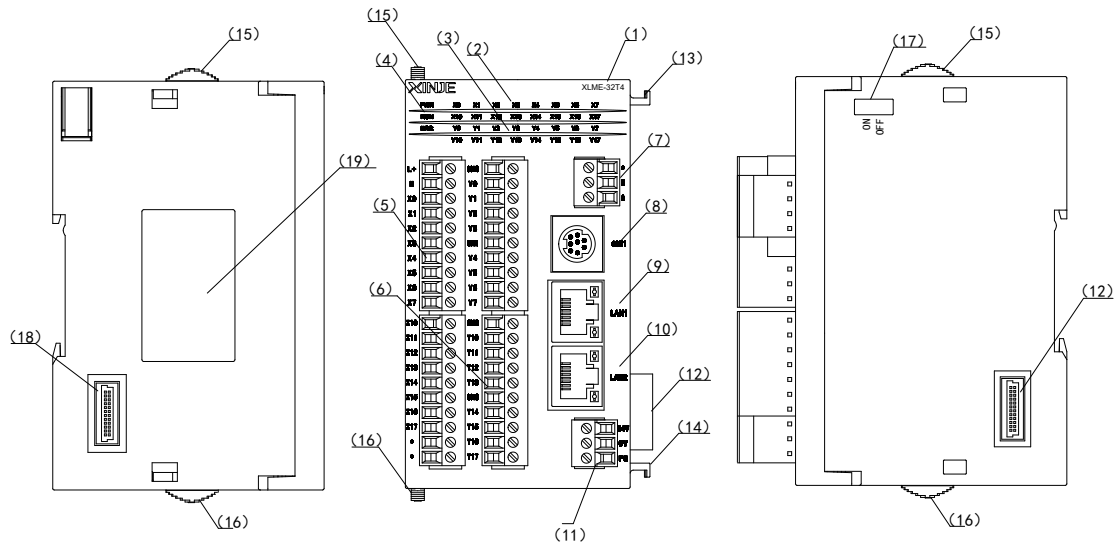
1-3-2-3. XL3E-16, XL5E-16 series structure



Each part's name is listed below:

- | | |
|----------------------------------|---|
| (1) : PLC model | (9) : RJ45 port1 (LAN1) |
| (2) : input label and indicator | (10) : RJ45 port2 (LAN2) |
| (3) : output label and indicator | (11) : Power supply input terminal |
| (4) : system LED | (12) : right expansion module access port |
| PWR: power supply | (13) : module fixing hook(up) |
| RUN: working | (14) : module fixing hook(down) |
| ERR: error | (15) : sliding lock (up) |
| (5) : input terminals | (16) : sliding lock (down) |
| (6) : output terminals | (17) : empty |
| (7) : RS485 port (COM2) | (18) : left expansion module access port |
| (8) : RS232 port(COM1) | (COM3) |
| | (19) : product label |

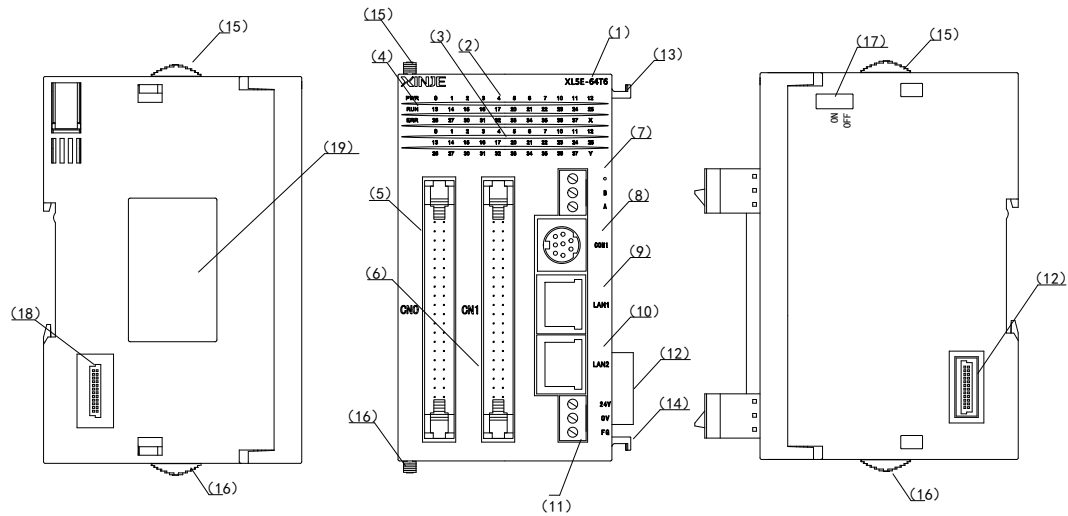
1-3-2-4. XL3E-35, XL5E-32, XLME-32 structure



Each part's name is listed below:

- | | |
|----------------------------------|---|
| (1) : PLC model | (9) : RJ45 port1 (LAN1) |
| (2) : input label and indicator | (10) : RJ45 port2 (LAN2) |
| (3) : output label and indicator | (11) : Power supply input terminal |
| (4) : system LED | (12) : right expansion module access port |
| PWR: power supply | (13) : module fixing hook(up) |
| RUN: working | (14) : module fixing hook(down) |
| ERR: error | (15) : sliding lock (up) |
| (5) : input terminals | (16) : sliding lock (down) |
| (6) : output terminals | (17) : empty |
| (7) : RS485 port (COM2) | (18) : left expansion module access port |
| (8) : RS232 port(COM1) | (COM3) |
| | (19) : product label |

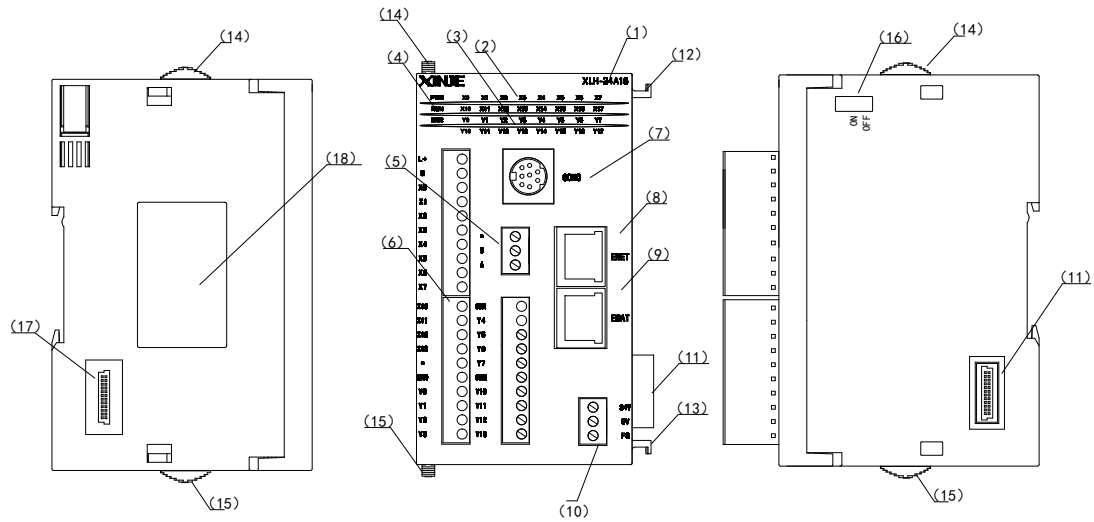
1-3-2-5. XL5E-64, XLME-64 structure



Each part's name is listed below:

- | | |
|---------------------------------------|---|
| (1) : PLC model | (9) : RJ45 port1 (LAN1) |
| (2) : input label and indicator | (10) : RJ45 port2 (LAN2) |
| (3) : output label and indicator | (11) : Power supply input terminal |
| (4) : system LED | (12) : right expansion module access port |
| PWR: power supply | (13) : module fixing hook(up) |
| RUN: working | (14) : module fixing hook(down) |
| ERR: error | (15) : sliding lock (up) |
| (5) : input terminal interface (CN0) | (16) : sliding lock (down) |
| (6) : output terminal interface (CN1) | (17) : empty |
| (7) : RS485 port (COM2) | (18) : left expansion module access port (COM3) |
| (8) : RS232 port (COM1) | (19) : product label |

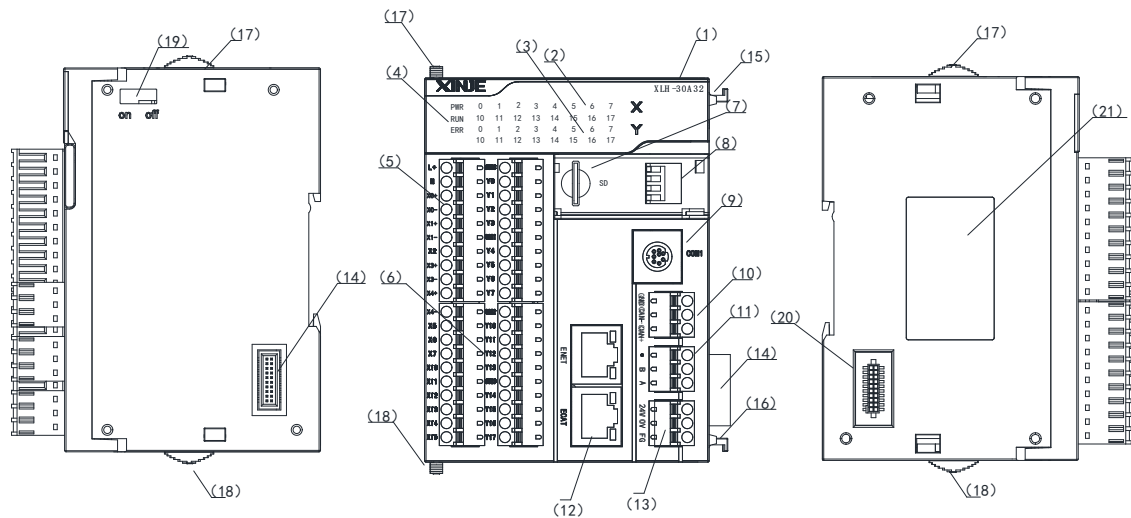
1-3-2-6. XLH-24, XL5H-24 series structure



Each part's name is listed below:

- | | |
|----------------------------------|---|
| (1) : PLC model | (8) : RJ45 port1 (LAN1) |
| (2) : input label and indicator | (9) : RJ45 port2 (LAN2) |
| (3) : output label and indicator | (10) : Power supply input terminal |
| (4) : system LED | (11) : right expansion module access port |
| PWR: power supply | (12) : module fixing hook(up) |
| RUN: working | (13) : module fixing hook(down) |
| ERR: error | (14) : sliding lock (up) |
| (5) : RS485 port (COM2) | (15) : sliding lock (down) |
| (6) : input output terminals | (16) : empty |
| (7) : RS232 port (COM1) | (17) : left expansion module access port (COM3) |
| | (18) : product label |

1-3-2-7. XLH-30 structural composition



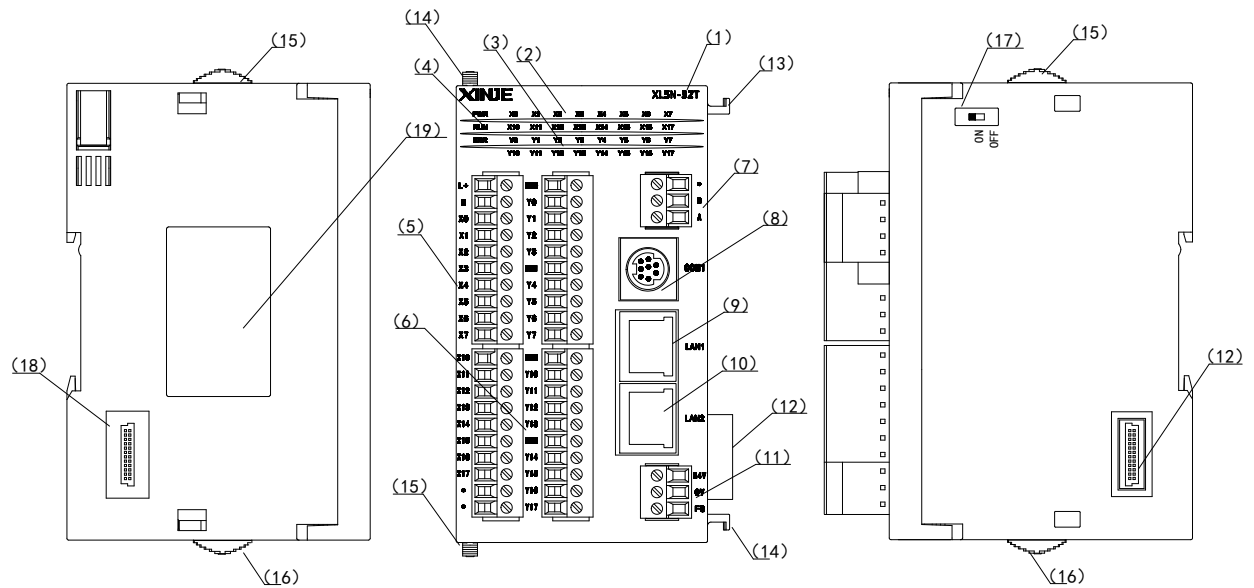
The names of each part are as follows:

- | | |
|---|---|
| (1) PLC body model | (10) CANopen port (COM6) |
| (2) : Input labels and indicator lights | (11) : RS485□(COM2) |
| (3) Output labels and indicator lights | (12) Communication ports 4 and 5 (RJ45) |
| (4) System indicator light | (13) : Power supply connection terminal |
| PWR: Power indicator light | (14) Right expansion module access port |
| RUN: Running indicator light | (15) Fixed module hook (top) |
| ERR: Error indicator light | (16) Fixed module hook (bottom) |
| (5) : Input terminal | (17) Sliding lock buckle (top) |
| (6) : Output terminal | (18) Sliding lock buckle (bottom) |
| (7) SD card slot | (19) : Empty |
| (8) : dip switch | (20) Left extended ED module access port (COM3) |
| (9) RS232 communication port (COM1) | (21): Product label |

Note: The XLH-30A32 (L) model has four dip switches, of which dip switches 1 and 2 are used to control the PLC startup status, and dip switches 3 and 4 are CAN communication terminal resistors:

Dialing position function		Function
Dial 1	Dial 2	
OFF	OFF	Normal startup
ON	OFF	Start flashing the device
OFF	ON	Power on stop and restore default communication parameters
Dial 3	Dial 4	Function
OFF	OFF	Close the CAN communication terminal resistor
ON	ON	Open the CAN communication terminal resistor

1-3-2-8. XL5N-32 structural composition



The names of each part are as follows:

- | | |
|---|---|
| (1) PLC body model | (9) Communication port 1 (RJ45) |
| (2) : Input labels and indicator lights | (10) Communication port 2 (CANopen) |
| (3) Output labels and indicator lights | (11) : Power supply connection terminal |
| (4) System indicator light | (12) Right expansion module access port |
| PWR: Power indicator light | (13) Fixed module hook (top) |
| RUN: Running indicator light | (14) Fixed module hook (bottom) |
| ERR: Error indicator light | (15) Sliding lock buckle (top) |
| (5) : Input terminal | (16) Sliding lock buckle (bottom) |
| (6) : Output terminal | (17) : Empty |
| (7) RS485 port (COM2) | (18) Left extended ED module access port (COM3) |
| (8) RS232 port (COM1) | (19) : Product label |

2 Specifications and parameters of CPU

2-1. Specifications and Parameters

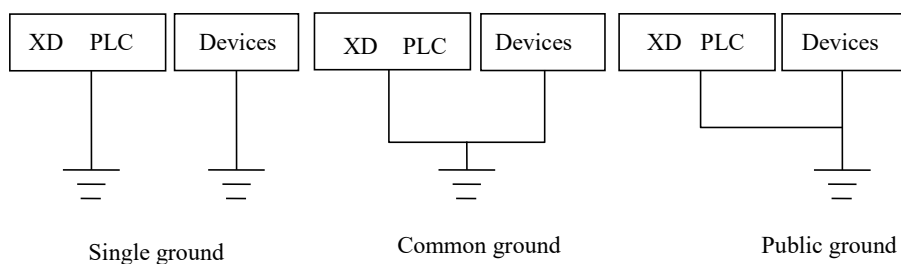
2-1-1. General Specifications

This specification is fit for XD and XL series PLC.

Items	Specifications
Isolation voltage	Above DC 500V 2MΩ
Anti-noise	Noise voltage 1000Vp-p 1us pulse per 1minute
Atmosphere	No corrosive, flammable gas
Ambient temperature	0°C~60°C 0°C~50°C (XDH series) 0°C~55°C (XL series)
Ambient humidity	5%~95% (NO condensation)
Altitude	Within 2000 meter
USB port	USB download port, connect PC to upload/download/online monitoring
COM0	RS-232, to connect upper computer, HMI for program or debug.
COM1	RS-232, to connect upper computer, HMI for program or debug.
COM2	RS-485, to connect intelligent instruments or inverters.
COM3	To connect left extension ED module
Ethernet port	RJ45, connect to upper device, monitoring, connect to other devices in the LAN
Installation	Use M3 screws or DIN to fix
Grounding (FG)	The third type grounding (do not grounding with strong power system)

Note:

- ※ 1: XD1, XD2, XDC, XD3E, XD5E, XDME, XDH, XL1 (except XL1-16T-U), XL3E, XL5N, XL5E, XLME, XL5H, XLH series models do not have USB ports.
- ※ 2: COM0 port is only available for XD1, XD2 and XL1 series PLCs, but not for other models.
- ※ 3: XD1-10/16 has no COM2, i.e. RS485 port.
- ※ 4: For XDC series PLC, COM2 port is divided into RS232 and RS485 communication interfaces, and the two communication interfaces cannot be used at the same time.
- ※ 5: XD1 and XL1 series PLCs do not support extended ED modules.
- ※ 6: Ethernet port is only available for XD3E, XD5E, XDME, XDH, XL3E, XL5E, XL5N, XLME, XLH and XL5H series PLCs.
- ※ 7: The specification of the guide rail is DIN46277, and the width is 35mm. XL series PLC only supports the installation of the guide rail.
- ※ 8: Separate grounding or common grounding should be used instead of public grounding.



2-1-2. Performance and Specifications

1) XD series PLC specifications:

Item		Specification									
Program execution mode		Cyclic scanning mode									
Programming mode		Command, ladder chart									
Processing speed		XD1/XD2/XD3/XD5/XDM/XDC/XDH-24/30: 0.02~0.05us XD3E/XD5E/XDME/XDH-60: 0.01~0.03us									
Power-off holding		General PLC uses FlashROM and lithium battery (3V button battery)									
User program capacity※1		XD1/XD2/XD3/XD3E: 256KB									
		XD5/XDM: 512KB(XDM-60T4L: 1.5MB)									
		XDC: 384KB									
		XD5E/XDME: 1MB									
		XDH: 2MB(24/30 points)/ XDH: 4MB(60 points)									
I/O※2	Total	10	16	24	30	32	42	48	60	80	
	Input points	5	8	14 or 12	16	18 or 16	24	28	36	40	
		X0~X4	X0~X7	X0~X15 or X0~X13	X0~X17	X0~X21 or X0~X17	X0~X27	X0~X33	X0~X43	X0~X47	
	Output points	5	8	10 or 12	14	14 or 16	18	20	24	40	
		Y0~Y4	Y0~Y7	Y0~Y11 or Y0~Y13	Y0~Y15	Y0~Y15 or Y0~Y17	Y0~Y21	Y0~Y23	Y0~Y27	Y0~Y47	
Internal coil(X) ※3		1280 points: X0~X77, X10000~X11777, X20000~X20177, X30000~X30077									
Internal coil(Y) ※4		1280 points: Y0~Y77, Y10000~Y11777, Y20000~Y20177, Y30000~Y30077									
Internal coil	General use M	8000 points	XD1/XD2/XD3: M0~M7999								
		70000 points	XD5/XDM/XDC/XD5E/XDME: M0~M69999								
		200000 points	XDH: M0~M199999								
	Power-off	960 points	XD1/XD2/XD3: HM0~HM959								

Item		Specification	
	holding HM※5	12000 points	XD5/XDM/XDC/XD5E/XDME: HM0~HM11999
		20000 points	XDH: HM0~HM19999
	Special use SM※6	2048 points	XD1/XD2/XD3: SM0~SM2047
		5000 points	XD5/XDM/XDC/XD5E/XDME: SM0~SM4999
		50000 points	XDH: SM0~SM49999
Flow	General use S	1024 points	XD1/XD2/XD3: S0~S1023
		8000 points	XD5/XDM/XDC/XD5E/XDME: S0~S7999
		20000 points	XDH: S0~S19999
	Power-off holding HS※5	128 points	XD1/XD2/XD3: HS0~HS127
		1000 points	XD5/XDM/XDC/XD5E/XDME: HS0~HS999
		2000 points	XDH: HS0~HS1999
Timer	General use T	576 points	XD1/XD2/XD3: T0~T575
		5000 points	XD5/XDM/XDC/XD5E/XDME: T0~T4999
		20000 points	XDH: T0~T19999
	Power-off holding HT※5	96 points	XD1/XD2/XD3: HT0~HT95
		2000 points	XD5/XDM/XDC/XD5E/XDME/XDH: HT0~HT1999
	Precise timing ET	26 points	ET0~ET25
	Specification	100ms timer: set time 0.1~3276.7sec. 10ms timer: set time 0.01~327.67sec. 1ms timer: set time 0.001~32.767sec.	
Counter	general use C	576 points	XD1/XD2/XD3/XD3E: C0~C575
		5000 points	XD5/XDM/XDC/XD5E/XMDE: C0~C4999
		20000 points	XDH: C0~C19999
	Power-off holding HC※5	96 points	XD1/XD2/XD3/XD3E: HC0~HC95
		2000 points	XD5/XDM/XDC/XD5E/XMDE/XDH: HC0~HC1999
		32 points	XD1/XD2/XD3/XD3E: High speed counters HSC0~HSC31
	High speed counter	40 points	XD5/XDM/XDC/XD5E/XDME/XDH: High speed counters HSC0~HSC39
	Specification	16-bit counter: K0~32,767 32-bit counter: -2147483648~+2147483647	
Data register	General use D	8000 points	XD1/XD2/XD3/XD3E: D0~D7999
		70000 points	XDM/XDC/XD5E/XDME: D0~D69999※7

Item		Specification	
		500000 points	XDH-24A8(L)/XDH-30A16(L)/XDH-60T4: D0~D499999
		1000000 points	XDH-60A32: D0~D999999
		2000000 points	XDH-60A64: D0~D1999999
	Power-off holding HD※5	1000 points	XD1/XD2/XD3/XD3E: HD0~HD999
		25000 points	XDM/XDC/XD5E/XDME: HD0~HD24999
		50000 points	XDH-24A8(L)/XDH-30A16(L)/XDH-60T4: HD0~HD49999
		100000 points	XDH-60A32: HD0~HD99999
		200000 points	XDH-60A64: HD0~HD199999
	Special use SD※6	2048 points	XD1/XD2/XD3/XD3E: SD0~SD2047
		5000 points	XD5/XDM/XDC/XD5E/XDME: SD0~SD4999
		50000 points	XDH: SD0~SD49999
	Special power-off holding HSD	500 points	XD1/XD2/XD3/XD3E: HSD0~HSD499
		2000 points	XD5/XDM/XDC/XD5E/XDME: HSD0~HSD1999
		50000 points	XDH: HSD0~HSD49999
Flash ROM register	Power-off holding FD※5	5120 points	XD1/XD2/XD3/XD3E: FD0~FD5119
		8192 points	XD5/XDM/XDC/XD5E/XDME: FD0~FD8191
		65536 points	XDH: FD0~FD65535
	special use SFD※6	2000 points	XD1/XD2/XD3: SFD0~SFD1999
		6000 points	XD5/XDM/XDC/XD5E/XDME: SFD0~SFD5999
		65488 points	XDH: SFD0~SFD65487
	Special secret register FS	48 points	FS0~FS47
WAIT command special coil		32 points	SEM0~SEM31
High speed processing ability		High speed counting, pulse output, external interrupt	
Password protection		6-bit ASCII	
Self diagnosis function		Power on self-test, monitoring timer, syntax check	

2) XL series PLC specifications:

Item		Specification			
Program execution mode		Cyclic scanning mode			
Programming mode		Command, ladder chart			
Processing speed		XL1/XL3/XL5/XLH-24: 0.02~0.05us; XL5N/XLH-30/XL5H/XL5E/XLME: 0.01~0.03us			
Power-off holding		General PLC uses FlashROM and lithium battery (3V button battery)			
User program capacity※1		XL1/XL3: 256KB			
		XL5: 512KB			
		XL5E/XL5N/XLMEXL5H: 1MB			
		XLH: 2MB (24 points)、4MB (30 points)			
I/O※2	Total	16	24	32	64
	Input points	8 X0~X7	12 X0~X13	16 X0~X17	32 X0~X37
	Output points	8 Y0~Y7	12 Y0~Y13	16 Y0~Y17	32 Y0~Y37
Internal coil(X) ※3		896 points	XL1/XL3: X0~X77, X10000~X11177, X20000~X20177, X30000~X30077		
		1280 points	XL5/XL5E/XL5N/XLME/XLH/XL5H : X0~X77, X10000~X11777, X20000~X20177, X30000~X30077		
Internal coils(Y) ※4		896 points	XL1/XL3: Y0~Y77, Y10000~Y11177, Y20000~Y20177, Y30000~Y30077		
		1280 points	XL5/XL5E/XL5N/XLME/XLH/XL5H : Y0~Y77, Y10000~Y11777, Y20000~Y20177, Y30000~Y30077		
Internal coil	General use M	8000 points	XL1/XL3: M0~M7999		
		70000 points	XL5/XL5E/XL5N/XL5H/XLME: M0~M69999		
		200000 points	XLH: M0~M199999		
	Power-off holding HM※5	960 points	XL1/XL3: HM0~HM959		
		12000 points	XL5/XL5E/XL5N/XL5H/XLME: HM0~HM11999		
		20000 points	XLH: HM0~HM19999		
	Special use SM※6	2048 points	XL1/XL3: SM0~SM2047		
		5000 points	XL5/XL5E/XL5N/XL5H/XLME: SM0~SM4999		
		50000 points	XLH: SM0~SM49999		
Flow	General use S	1024 points	XL1/XL3: S0~S1023		

Item		Specification	
		8000 points	XL5/XL5E/XL5N/XL5H/XLME: S0~S7999
		20000 points	XLH: S0~S19999
	Power-off holding HS※5	128 points	XL1/XL3: HS0~HS127
		1000 points	XL5/XL5E/XL5N/XL5H/XLME: HS0~HS999
		2000 points	XLH: HS0~HS1999
Timer	General use T	576 points	XL1/XL3: T0~T575
		5000 points	XL5/XL5E/XL5N/XL5H/XLME: T0~T4999
		20000 points	XLH: T0~T19999
	Power-off holding HT※5	96 points	XL1/XL3: HT0~HT95
		2000 points	XL5/XL5E/XL5N/XL5H/XLME/XLH: HT0~HT1999
	Precise timing ET※10	26 points	XL1/XL3/XL5/XL5E/XL5N/XLME: precise timing ET0~ET25
		24 points	XL5H: Accurate timing ET0~ET23 (not supported by XLH)
	Sepecification	100ms timer: set time 0.1~3276.7sec. 10ms timer: set time 0.01~327.67sec. 1ms timer: set time 0.001~32.767sec.	
Counter	General use C	576 points	XL1/XL3: C0~C575
		5000 points	XL5/XL5E/XL5N/XL5H/XLME: C0~C4999
		20000 points	XLH: C0~C19999
	Power-off holding HC※5	96 points	XL1/XL3: HC0~HC95
		2000 points	XL5/XL5E/XL5N/XL5H/XLME/XLH: HC0~HC1999
	High speed counter	32 points	XL1/XL3: High speed counters HSC0~HSC31
		40 points	XL5/XL5E/XL5N/XL5H/XLME/XLH: High speed counters HSC0~HSC39
	Specification	16-bit counter: K0~32,767 32-bit counter: -2147483648~+2147483647	
Data register	General use D	8000 points	XL1/XL3: D0~D7999
		70000 points	XL5/XL5E/XL5N/XL5H/XLME: D0~D69999

Item		Specification	
		500000 points	XLH-24A16: D0~D499999
		1000000 points	XLH-30A32: D0~D999999
	Power-off holding HD※5	1000 points	XL1/XL3: HD0~HD999
		25000 points	XL5/XL5E/XL5N/XL5H/XLME: HD0~HD24999
		50000 points	XLH-24A16: HD0~HD49999
		1000000 points	XLH-30A32: HD0~HD99999
	Special use SD※6	2048 points	XL1/XL3: SD0~SD2047
		5000 points	XL5/XL5E/XL5N/XL5H/XLME: SD0~SD4999
		50000 points	XLH: SD0~SD49999
	Special power-off holding HSD	500 points	XL1/XL3: HSD0~HSD499
		2000 points	XL5/XL5E/XL5N/XL5H/XLME: HSD0~HSD1999
		50000 points	XLH: HSD0~HSD49999
Flash ROM register	Power-off holding FD※5	5120 points	XL1/XL3: FD0~FD5119
		8192 points	XL5/XL5E/XL5N/XL5H/XLME: FD0~FD8191
		65536 points	XLH: FD0~FD65535
	Special use SFD※6	2000 points	XL1/XL3: SFD0~SFD1999
		6000 points	XL5/XL5E/XL5N/XL5H/XLME: SFD0~SFD5999
		65488 points	XLH: SFD0~SFD65487
	Secret register FS	48 points	FS0~FS47
WAIT command special coil		32 points	SEM0~SEM31
High speed processing ability		High speed counting, pulse output, external interrupt	

Item	Specification
Password protection	6-bit ASCII
Self diagnosis function	Power on self-test, monitoring timer, syntax check

Note:

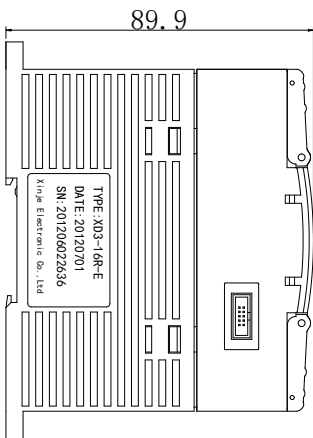
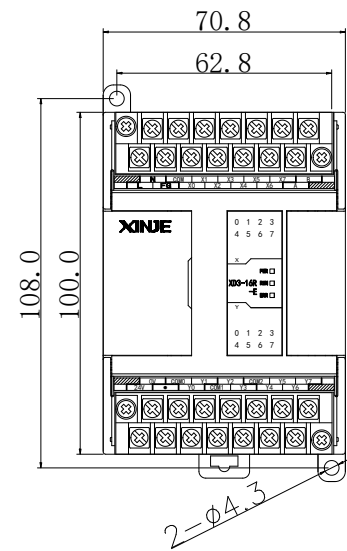
- ※ 1: User program capacity refers to the maximum program capacity during confidential downloading.
- ※ 2: I/O points refer to the number of terminals that users can input and output signals from outside.
- ※ 3: X refers to the internal input relay. X beyond I points can be used as an intermediate relay.
- ※ 4: Y refers to the internal output relay. Y exceeding the number of O points can be used as an intermediate relay.
- ※ 5: [] mark is the default power-off holding area and cannot be changed.
- ※ 6: Special purpose refers to the special purpose register occupied by the system, which cannot be used for other purposes. See Appendix 1 for details.
- ※ 7: The range of XD5 series data registers for firmware versions V3.4.6 and above is D0~D69999, and the range of XD5 series data registers for firmware versions V3.4.5 and below is D0~D59999.
- ※ 8: The numbers of input coils, output relays/transistors are octal numbers, and the numbers of other memories are decimal numbers.
- ※ 9: The I/O not connected to the peripheral equipment can be used as a fast internal relay.
- ※ 10: XDH and XLH do not support accurate timing temporarily.

2-2. Dimensions

2-2-1. XD series dimensions

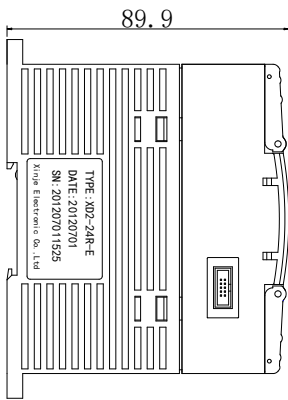
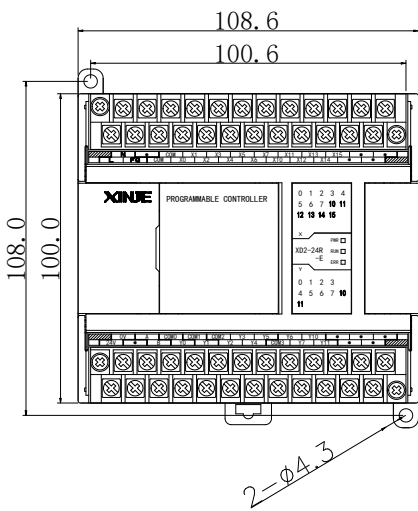
Note: the height is 79.9mm for PLC firmware version v3.4 and below.

(Unit: mm)



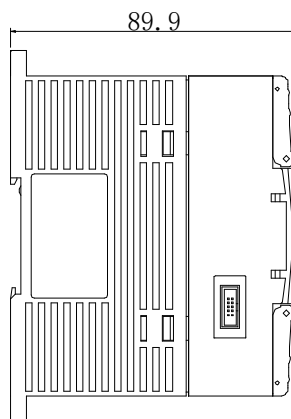
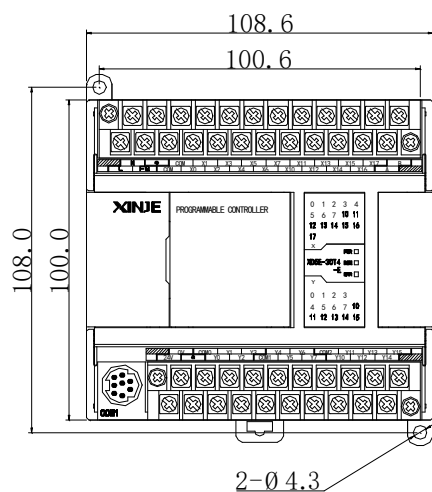
Suitable Model:

Series	Points
XD1	10/16
XD2	
XD3	
XD5	



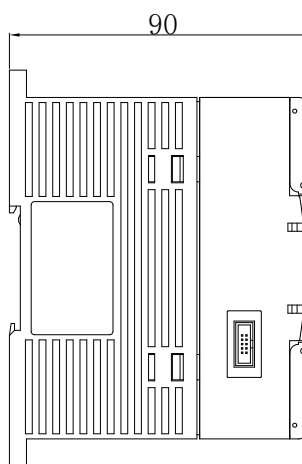
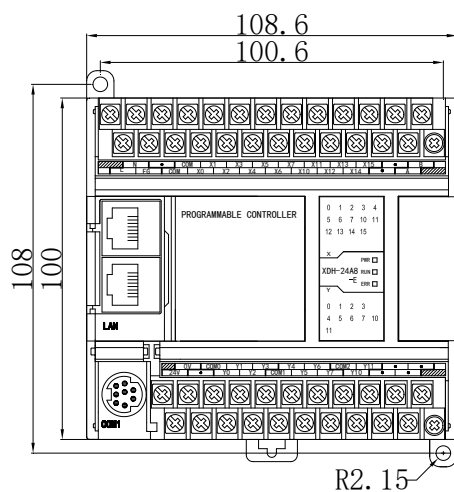
Suitable Model:

Series	Points
XD1	24/32
XD2	
XD3	
XD5	
XDM	
XDC	



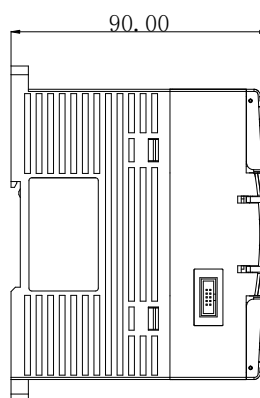
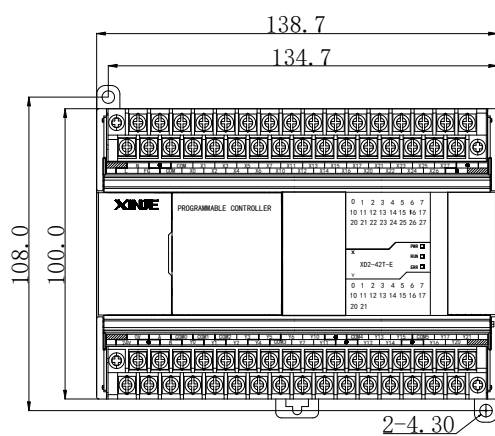
Suitable Model:

Series	Points
XD3E	24/30
XD5E	
XDME	
XDH	30



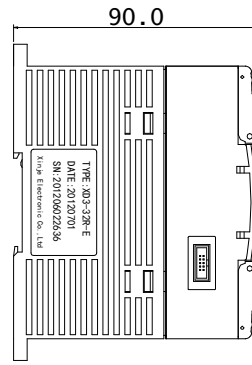
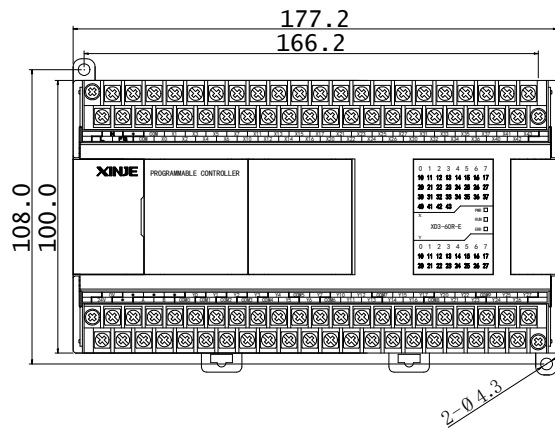
Suitable Model:

Series	Points
XDH	24



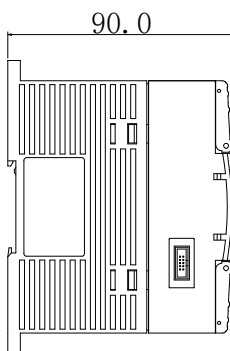
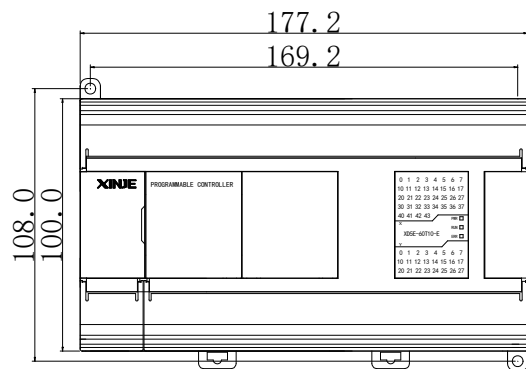
Suitable Model:

Series	Points
XD2	42
XD3	
XD5	



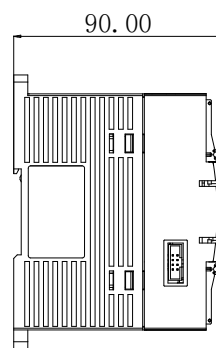
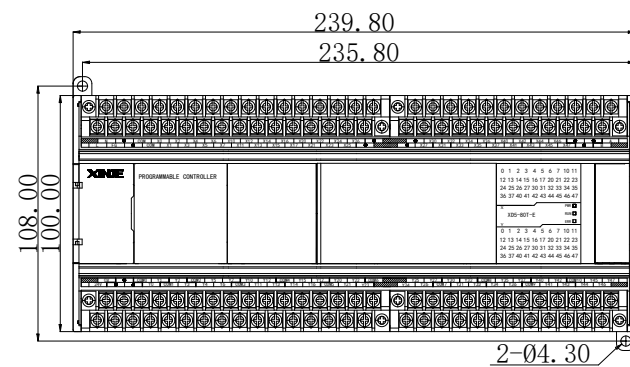
Suitable Model:

Series	Points
XD2	48/60
XD3	
XD5	
XDM	
XDC	



Suitable model:

Series	Points
XD5E	48/60
XDME	48/60
XDH	60

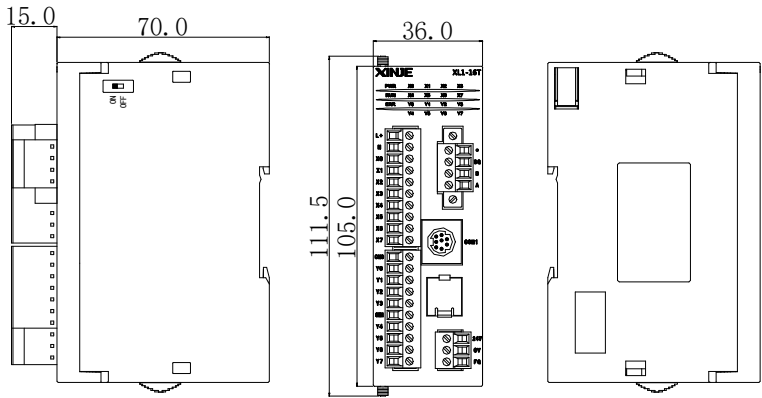


Suitable model:

Series	Points
XD5	80

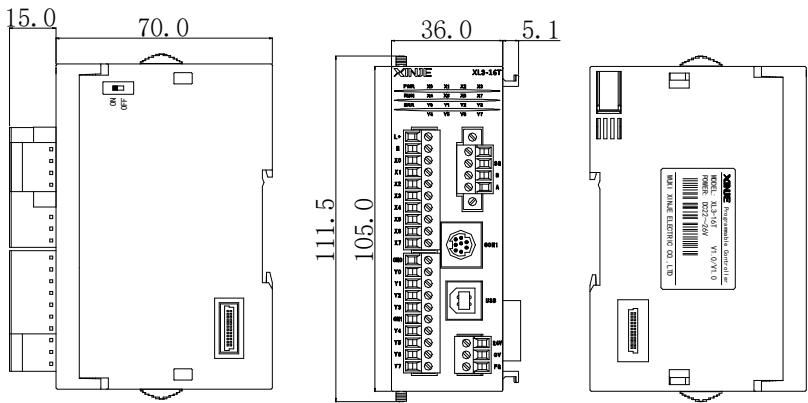
2-2-2. XL series dimensions

(Unit: mm)



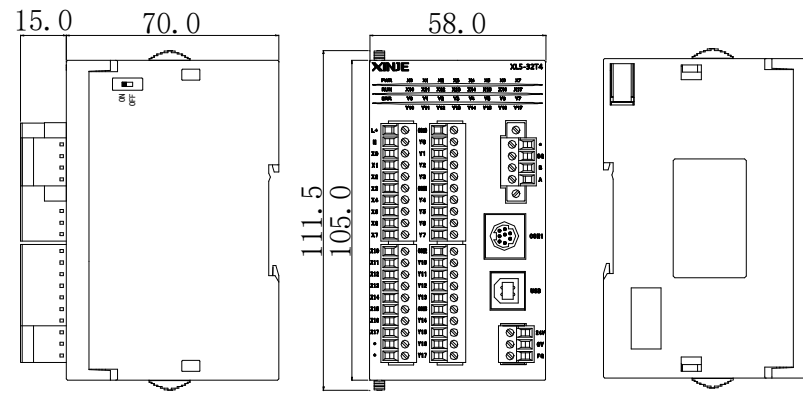
Suitable model:

Series	Points
XL1	16



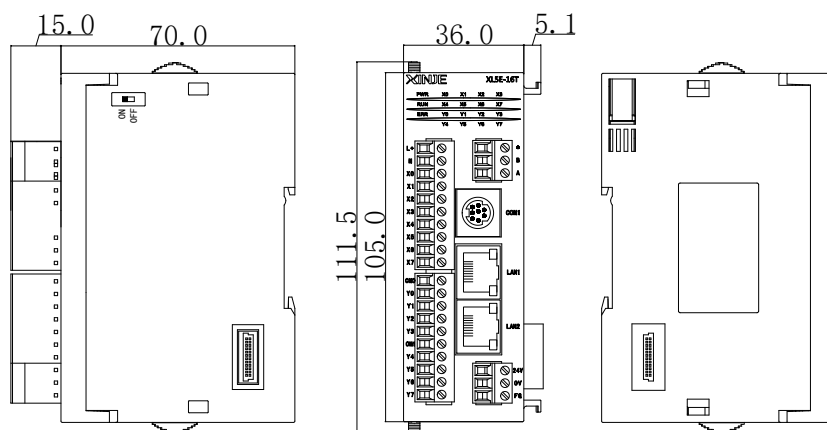
Suitable model:

Series	Points
XL3	16
XL5	



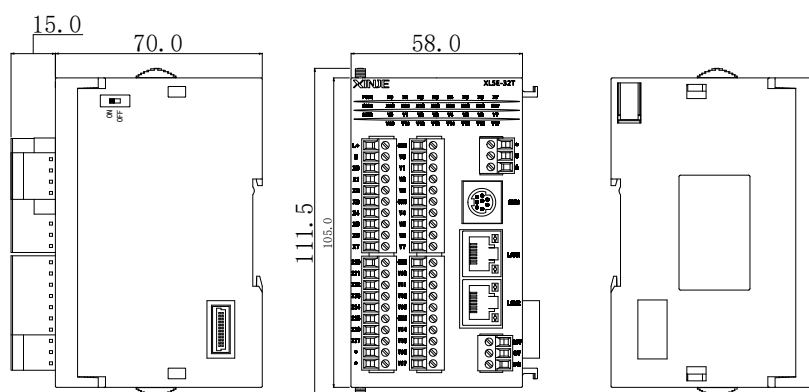
Suitable model:

Series	Points
XL3	32
XL5	



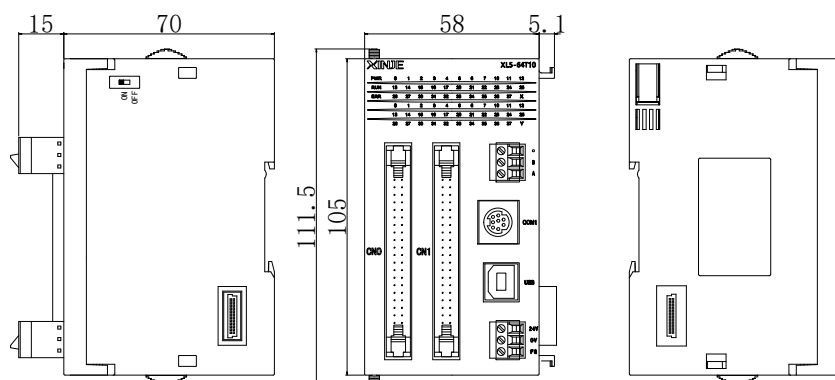
Suitable model:

Series	Points
XL5E	16
XL3E	



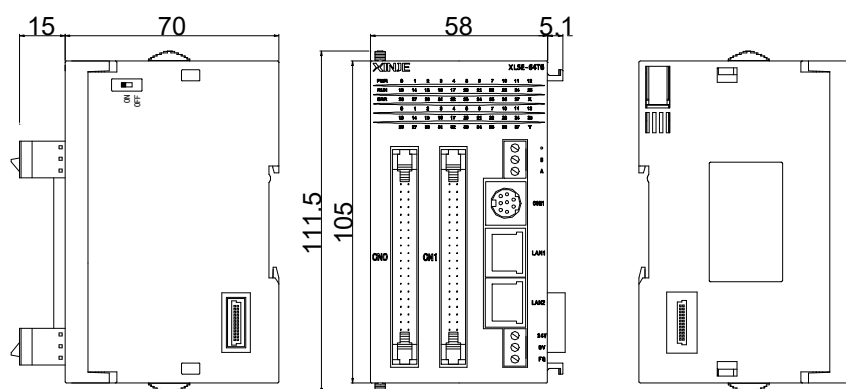
Suitable model:

Series	Points
XL3E	32
XL5E	32
XL5N	
XLME	



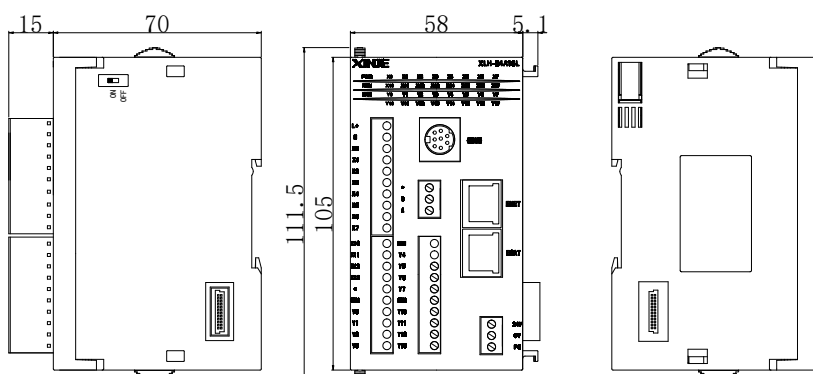
Suitable model:

Series	Points
XL5	64



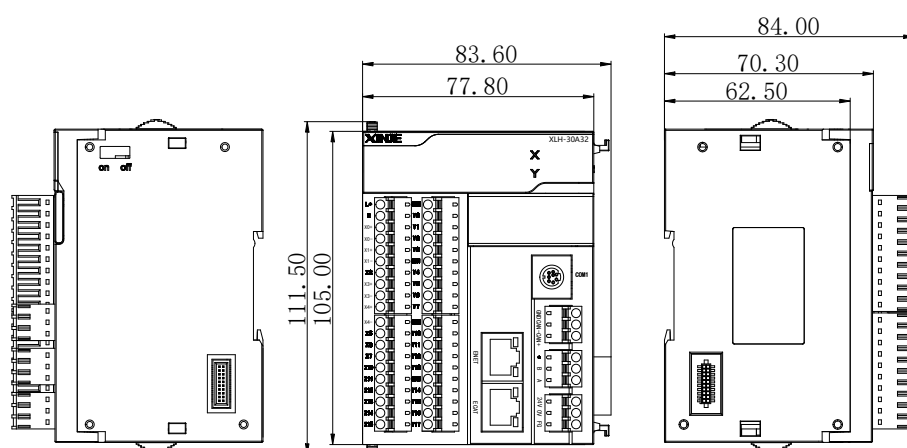
Suitable model:

Series	Points
XL5E	64
XLME	64



Suitable model:

Series	Points
XLH	24
XL5H	



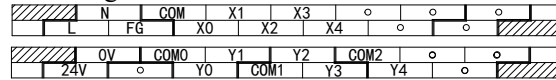
Suitable model:

Series	Points
XLH	30

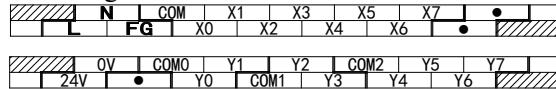
2-3. Terminal arrangement

2-3-1. XD series terminal arrangement

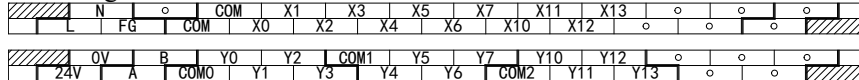
● Diagram 1



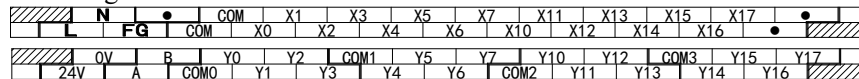
● Diagram 2



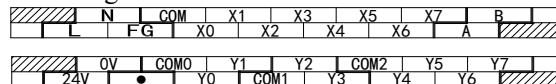
● Diagram 3



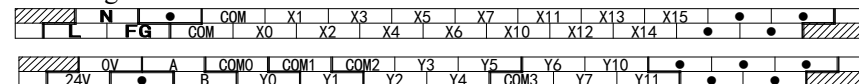
● Diagram 4



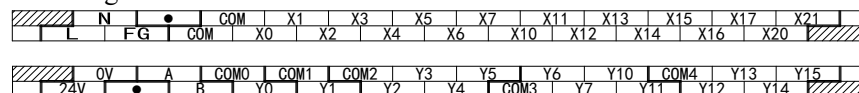
● Diagram 5



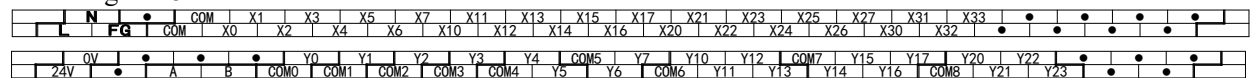
● Diagram 6



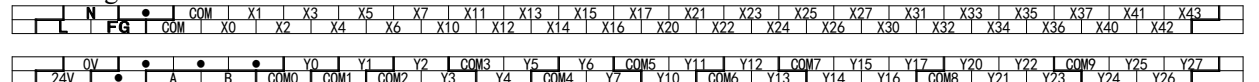
● Diagram 7



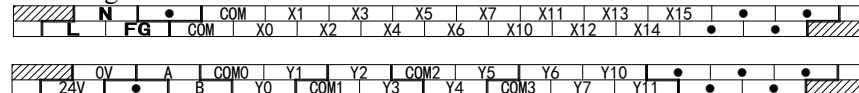
● Diagram 8



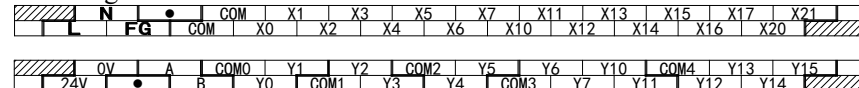
● Diagram 9



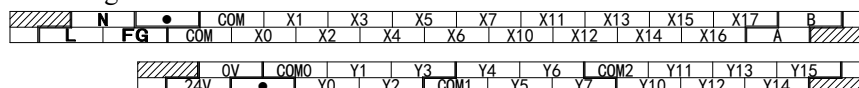
● Diagram 10



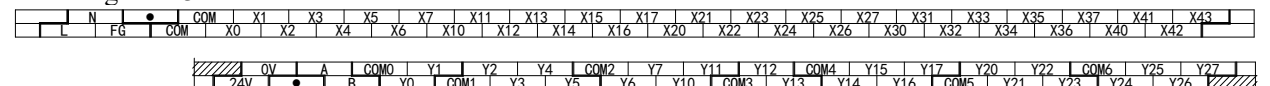
● Diagram 11



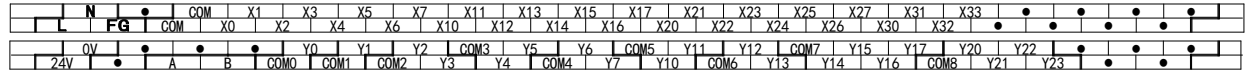
● Diagram 12



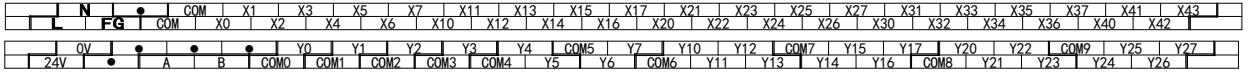
● Diagram 13



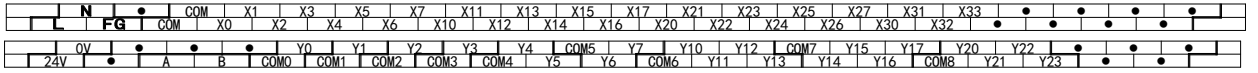
● Diagram 14



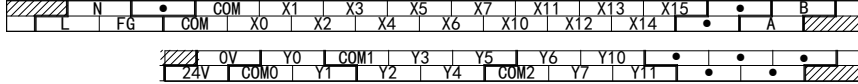
● Diagram 15



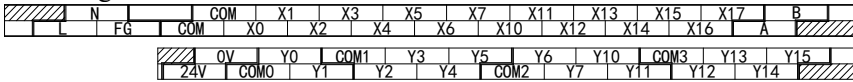
● Diagram 16



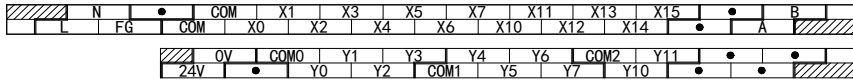
● Diagram 17



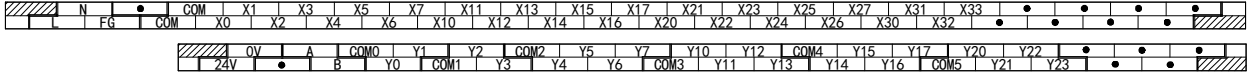
● Diagram 18



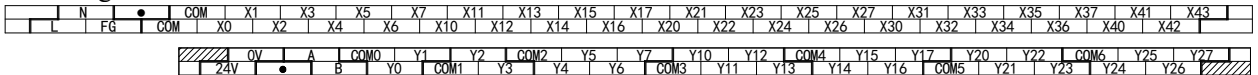
● Diagram 19



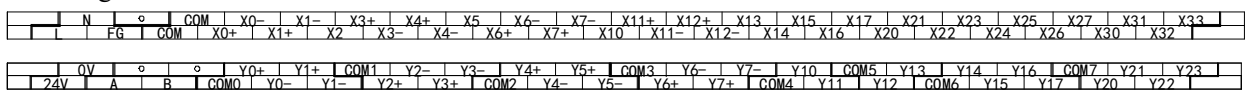
● Diagram 20



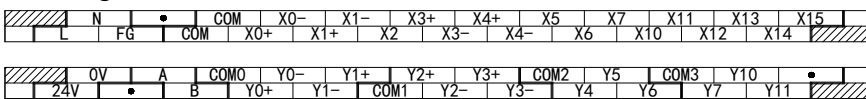
● Diagram 21



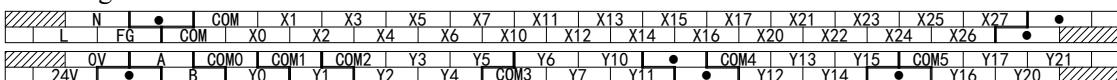
● Diagram 22



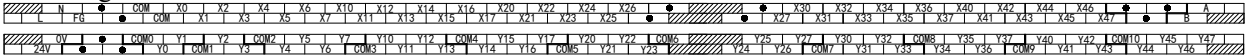
● Diagram 23



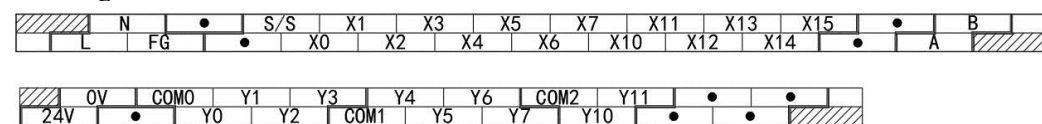
● Diagram 24



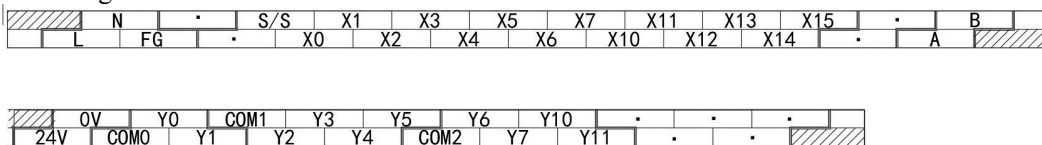
● Diagram 25



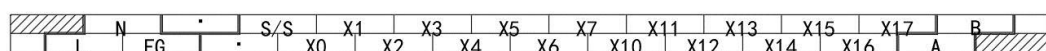
● Diagram 26



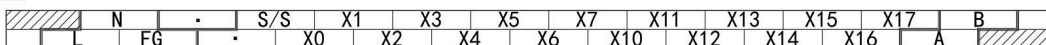
● Diagram 27



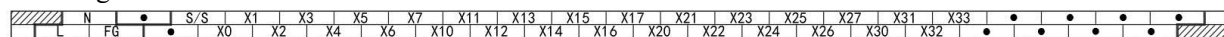
● Diagram 28



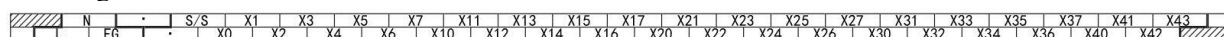
● Diagram 29



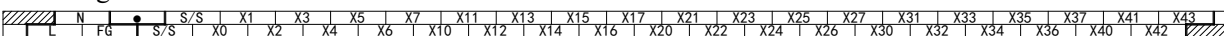
● Diagram 30



● Diagram 31



● Diagram 32



The graph for the model:

Diagram	Suitable model	Note
Diagram 1	XD1-10	5 I / 5 O
Diagram 2	XD1-16	8 I / 8 O
Diagram 3	XD1-24	12 I / 12 O
Diagram 4	XD1-32	16 I / 16 O
Diagram 5	XD2-16, XD3-16, XD5-16	8 I / 8 O
Diagram 6	XD2-24, XD3-24, XD5-24	14 I / 10 O
Diagram 7	XD2-32, XD3-32, XD5-32	18 I / 14 O
Diagram 8	XD2-48, XD3-48, XD5-48, XDC-48	28 I / 20 O
Diagram 9	XD5-60T6, XD5-60T10, XDM-60T10	36 I / 24 O
Diagram 10	XD3-24T4, XD5-24T4, XDM-24T4, XDC-24T	14 I / 10 O
Diagram 11	XD3-32T4, XD5-32T4, XDM-32T4, XDC-32T	18 I / 14 O
Diagram 12	XD3E-30T, XD5E-30T, XD5E-30T4, XDME-30T4, XDH-30A16, XDH-30A16L	16 I / 14 O
Diagram 13	XD5E-60T6, XD5E-60T10, XDME-60T10	36 I / 24 O
Diagram 14	XD5-48T6	28 I / 20 O
Diagram 15	XD2-60, XD3-60, XD5-60, XD5-60T4, XDC-60, XDM-60T4, XDM-60T4L	36 I / 24 O
Diagram 16	XD5-48T4	28 I / 20 O
Diagram 17	XD3E-24R, XD5E-24R	14 I / 10 O
Diagram 18	XD3E-30R, XD5E-30R	16 I / 14 O
Diagram 19	XD3E-24T, XD5E-24T, XDH-24A8, XDH-24A8L	14 I / 10 O
Diagram 20	XD3E-48, XD5E-48	28 I / 20 O

Diagram 21	XD3E-60、XD5E-60、XD5E-60T4、XDME-60T4、 XDH-60T4、XDH-60A32	36 I /24 O
Diagram 22	XD5-48D4T4	28 I /20 O
Diagram 23	XD5-24D2T2	14 I /10 O
Diagram 24	XD2-42、XD3-42、XD5-42	24 I /18 O
Diagram 25	XD5-80	40 I /40 O
Diagram 26	XD3E-24NPT-E、	14 I /10 O
Diagram 27	XD3E-24NPR-E	14 I /10 O
Diagram 28	XD3E-30NPT-E、XD3E-30NPT4-E	16 I /14 O
Diagram 29	XD3E-30NPR-E	16 I /14 O
Diagram 30	XD3E-48NPT-E、XD3E-48NPR-E、XD3E-48NPT4-E	28 I /20 O
Diagram 31	XD3E-60NPT-E、XD3E-60NPR-E、XD3E-60NPT4-E	36 I /24 O
Diagram 32	XD5E-60NPR	36 I /24 O

Note:

- ※ 1: The above terminal arrangement diagram is -E type PLC (power input terminals are L, N). L and N of -C type PLC are power input terminals 24V+ and 24 - respectively.
- ※ 2: RT type PLC, only the first two circuits are transistor output, and the rest are relay output.
- ※ 3: 24V and 0V on the output terminal block are external output terminals, which can supply power to the module or sensor, but must not exceed its maximum output current. See Section 4-1 for details.
- ※ 4: FG is a grounding terminal, which is used to shield interference and can be grounded separately as required.
- ※ 5: Common terminal COM of input terminal corresponds to all input points; COM on the output terminal block corresponds to different Y output points. When using, please wire according to the actual division on the PLC output label.
- ※ 6: Terminals A and B on the terminal block are RS485 communication interfaces, A is RS485+, B is RS485 -.
- ※ 7: The above terminal arrangement diagram is applicable to both NPN type and PNP type.
- ※ 8: Among the input terminals of XD5-48D4T4, X0, X1, X3, X4, X6, X7, X11, X12 are differential inputs, and the rest are NPN inputs; Among the output terminals, Y0, Y1, Y2, Y3, Y4, Y5, Y6, Y7 are differential outputs, and the rest are transistor outputs.
- ※ 9: Among the input terminals of XD5-24D2T2, X0, X1, X3 and X4 are differential inputs, and the rest are NPN inputs; Among the output terminals, Y0, Y1, Y2 and Y3 are differential outputs, and the rest are transistor outputs.

2-3-2. XL series terminal arrangement

1) Input/output terminal block

- Terminal arrangement for NPN or PNP input models

XL1-16T, XL3-16R/T, XL5-16T, XL5E-16T, XLME-16T4※1	XL3-32R/T, XL5-32T, XL5-32T4, XL5E-32T※1, XL5E-32T4※1, XL5N-32T	XL5-64T10, XL5E-64T6※1, XL5E-64T10※1, XLME-64T10※1
XLH-24A16(L) ※1	XL5H-24A8(L) ※1	XLH-30A32(L) ※1

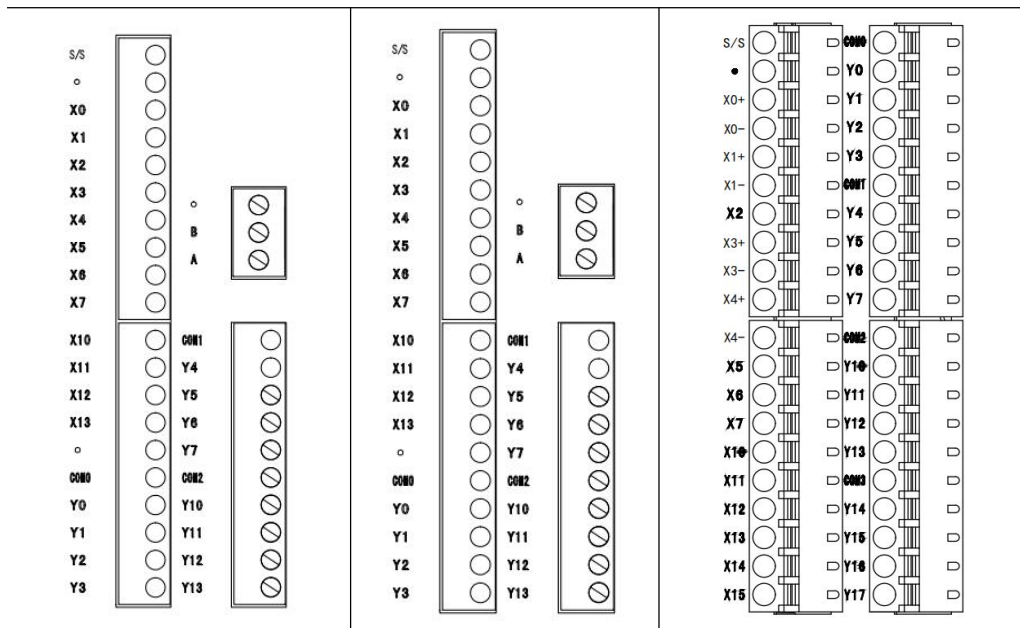
[Note]: ※1: XL3-16R、XL5E-16T/32T/32T4、XL5E-64T6/64T10、XLME-16T4/32T4、XLME-64T10、XL5H-24A8L、XL5H-24A8、XLH-30A32(L)、XLH-24A16(L) the model

distinguishes whether the input type is bipolar based on the hardware version (the hardware version starts with H on the product side label), as shown in the table below:

PLC model	Hardware version requirements
XL3-16R	Hx.5.x and above
XL3-16T4	-
XL5-16T4	-
XL3E-16T/32T	-
XL5E-16T/32T/32T4、XLME-16T4/32T4	Hx.5.x and above
XL5E-64T6/64T10、XLME-64T10、XLH-30A32(L)	Hx.4.x.x.x.x and above
XL5H-24A8L	Hx.4.x.x and above
XL5H-24A8、XLH-24A16(L)	Hx.6.x.x and above
XLH-30A32(L)	Hx.4.x.x.x.x and above
XLH-24A16(L)	Hx.6.x.x and above

● Terminal arrangement of bipolar input models

Terminal arrangement of bipolar input models		
XL3-16R、XL3-16T4、 XL5-16T4、XL3E-16T、 XL5E-16T、XLME-16T4	XL3E-32T、XL5E-32T、 XL5E-32T4、 XLME-32T4	XL5E-64T6、XL5E-64T10、 XLME-64T10
XLH-24A16(L)	XL5H-24A8(L)	XLH-30A32(L)



The XL series PLC does not have a built-in 24V power supply, so an external 24V switch power supply is required for input wiring, with L+ connected to 24V+ and M connected to 24V -.

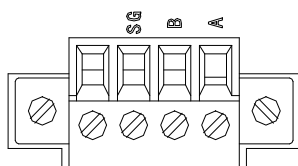
The common terminal of the input terminal is M; the common terminal of the output terminals Y0~Y3 is CM0/COM0; The common terminals of Y4~Y7 are CM1/COM1; The common terminal of Y10~Y13 is COM2; The common terminal of Y14~Y17 is COM3.

The XL5/XL5E/XL5N/XL5H/XLME series 64 point models can choose to use external terminal blocks when wiring. The terminal block models and cables are shown in the following table:

Input/output	Terminal block model	Cable
Input part (CN0)	JT-E32X	JC-TE32-NN05 (0.5m)
Output part (CN1)	JT-E32YT	JC-TE32-NN10 (1.0m)
		JC-TE32-NN15 (1.5m)

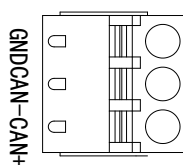
Specific instructions about the terminal block, please refer to section [3-2-5](#)..

2) RS485 communication terminal block



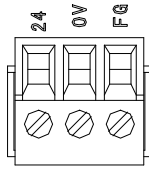
- A is RS485+, B is RS485-. Please connect A to A, B to B when communicating.
- SG is communication ground terminal, it can connect to SG terminal of servo drive in general.

3) CAN communication terminal block



- During communication, connect CAN+ to CAN+ and CAN- to CAN-.
- GND is the grounding terminal used to shield interference and can be separately grounded as needed.

4) Power terminal block



- PLC power supply input terminals are 24V, 0V.
- FG is ground terminal for shield interference, please connect to ground separately.

5) Connection head specifications of terminal

When wiring XL series PLC, its wiring head should meet the following requirements:

- (1) The stripping length is 9 mm;
- (2) Flexible conductors with bare tubular ends are 0.25-1.5 mm².
- (3) Flexible conductors with tubular pre-insulated end is 0.25-0.5 mm².

2-4. Communication Ports

XD series generally has USB port (not available for individual models), COM0 (RS232, only supported by XD1/XD2), COM1 (RS232), COM2 (RS485, XDC RS485/RS232), and Ethernet port (supported by XD3E/XD5E/XDME/XDH).

The XL series generally has USB ports (XL1/XL3E/XL5E/XLME/XL5N/XL5H/XLH do not have this port), COM0 (RS232, only XL1 supports) COM1 (RS232) 、 COM2(RS485) 、 Ethernet port (supported by XL3E/XL5E/XL5N/XLME/XLH/XL5H), CAN communication port (supported by firmware 3.7.3 and above XLH-30A32 (L)).

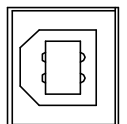
[Note]: Only XL1 series with hardware version H4 and above can have COM0 (RS232 port).

The main functions of each communication port are as follows:

- The USB port can be used to download programs and data at high speed;
- The COM0 port supports X-NET and Modbus communication modes (X-NET is the default), which is mainly used for downloading programs and monitoring;
- The COM1 and COM2 ports are mainly used for communication and can also be used to download programs;
- The Ethernet port can be used to download programs, monitor, and communicate with other devices in the LAN. The LAN2 port of XDH is used for EtherCAT bus control, which can control up to 64 axes at the same time.
- The CAN port can communicate with other devices that support CAN bus communication.

1)USB port

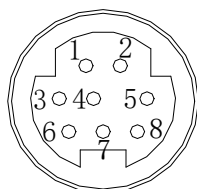
USB port only can download program but cannot communicate with other device. Please use printer USB cable or XINJE USB cable JC-UA-15 to download.



Note: XD1, XD2, XDC, XD3E, XD5E, XDME, XDH, XL1,XL3E, XL5E, XLME, XLH, XL5N, XL5H series models have no USB port (XL1-16T-U has one USB port).

2) RS232 port

RS232 port can upload, download program and communication. COM0 and COM1 support X-NET and Modbus mode. The pin diagram of COM0, COM1, COM2 (only for XDC series) are shown as below:



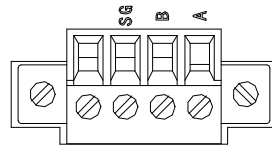
4: RxD
5: TxD
8: GND

Mini Din 8-core plug-in (holes)

3) RS485 port

The COM2 of XD series PLC are the terminal A and B. A is RS485+, B is RS485-.

The COM2 of XL series PLC is separately, they are terminal A, B and SG(signal ground). A is RS485+, B is RS485-, SG is signal ground.



Note:

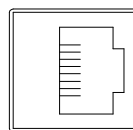
※ 1: XD1-10/16 has no RS485 port.

※ 2: XL3-16, XL5-16/32 models, 485 port terminals are A, B, SG, and SG is the signal ground terminal.

4) Ethernet port

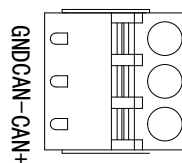
The Ethernet port is an RJ45 interface, with stable and convenient communication methods. It can be used for downloading programs, online monitoring, remote monitoring, etc., and can communicate with other TCP IP devices within the local area network. Please refer to the Ethernet Communication User Manual for instructions on how to use Ethernet communication.

In addition, the LAN2 port of XDH/XLH/XL5H can be used for EtherCAT bus control. XDH can control 16~64 axes simultaneously, and XLH can control 16~32 axes simultaneously, with a control cycle of $\leq 1\text{ms}$. For the usage of EtherCAT bus, please refer to the "XDH/XLH/XG2 Series Programmable Controller User Manual [Advanced Motion Control Chapter]".



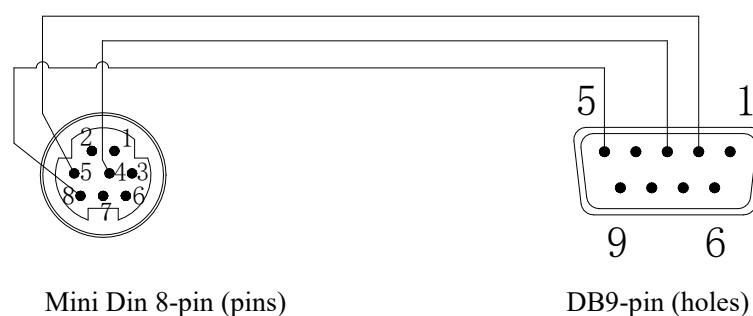
5) CAN communication port

XLH-30A32 models with versions 3.7.3 and above support CANopen bus. Please refer to the "CAN Communication User Manual" for the usage of CAN bus.



6) Program Cable

Download program via RS232 port must use XINJE DVP cable. If not available, you can also make your own cable, and the connection method is shown in the following figure:



Note:

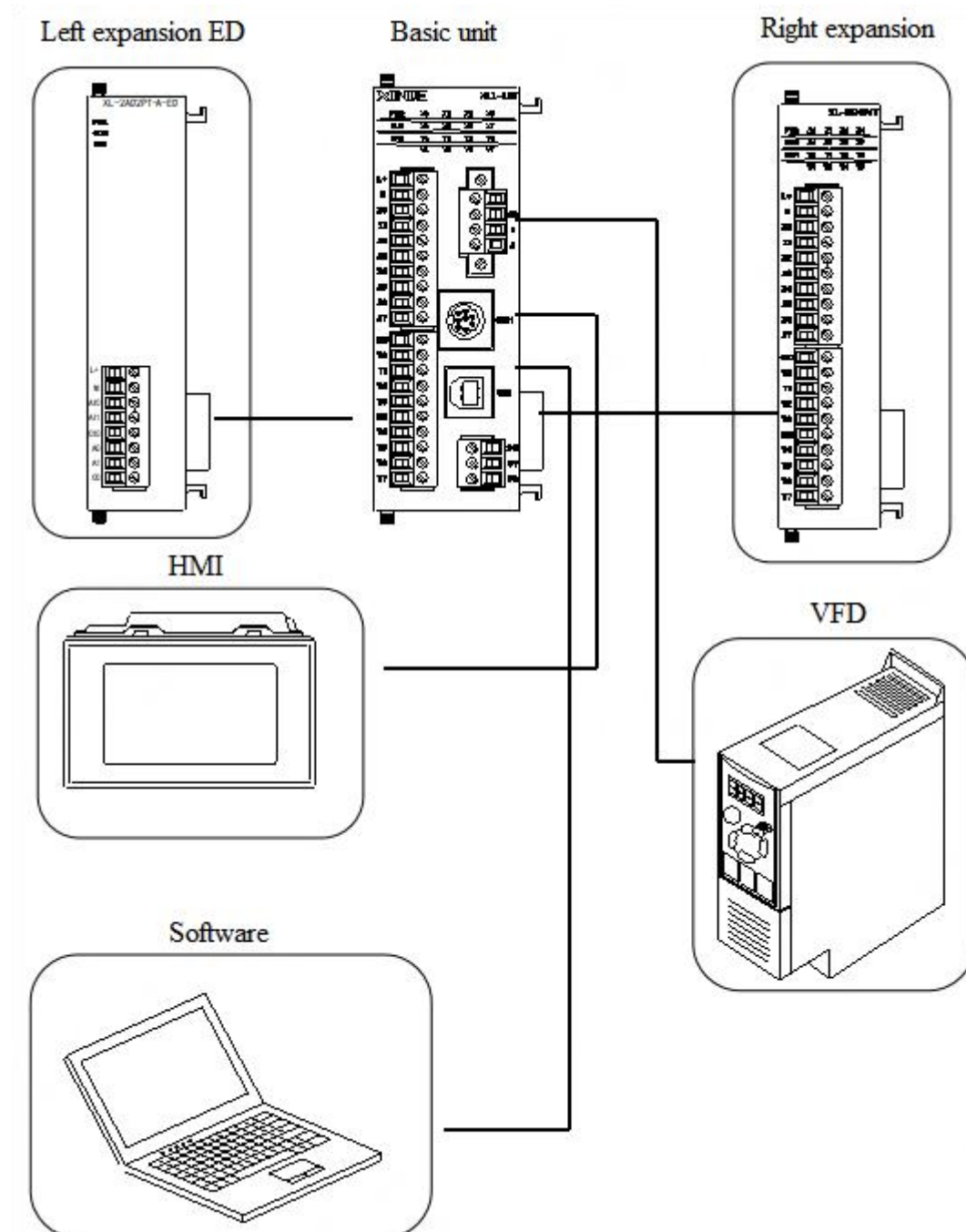
※ 1: The above diagram is a DVP wiring diagram. The colors of the wires on pins 2, 3, and 5 on the DB9 plug (hole) side are brown, red, and black, respectively.

※ 2: The XVP cable needs to be connected to another cable on the basis of the DVP cable shown in the above figure, which is the first terminal on the front (Mini Din8) and the seventh terminal on the back (DB9).

3 System Structure

3-1. System Structure

The following figure is a system architecture diagram constructed based on the basic configuration of XD/XL series PLC (using XL series PLC as an example). We can know the general connection among PLC, peripheral equipments and expansions from the chart; also classic applications of PLC's each COM port, connection and expansions etc.



Note: In the above chart, the communication devices connected to the COM port are only samples for your reference. Each COM port can connect with many devices in real applications.

3-2. Peripheral Devices

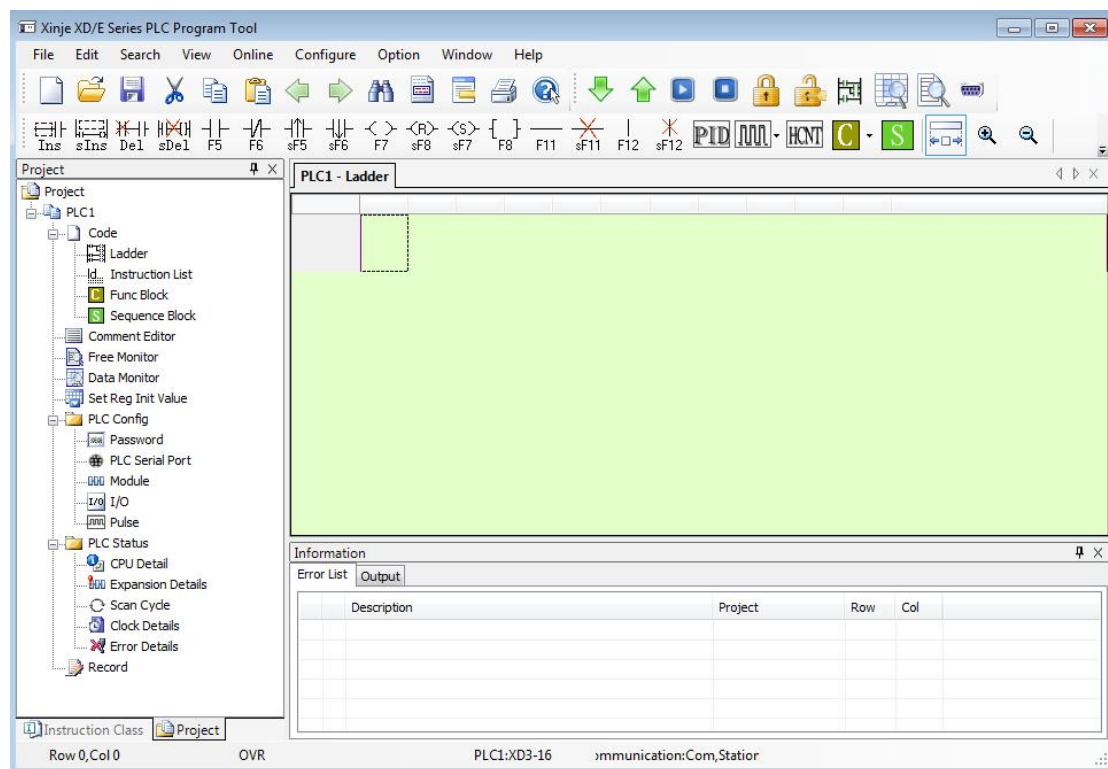
XD/XL series PLC basic units can work with many kinds of peripheral devices.

3-2-1. Program Software

In the programming software, it can write or upload programs to PLC, monitor the operation of PLC in real time, configure PLC and other functions. After the programming software "Xinje PLC programming tool software" is installed on the personal PC, the connection between PLC and programming software can be realized by using USB download cable or programming cable through the USB port, COM0, COM1 port or RJ45 port of the basic unit.

Please use the special download cable for PLC provided by Xinje Company, or you can make your own cable. Please refer to Section 2-4 for the connection method.

- Program Interface



[※1] : Please use the PLC specific download cable provided by Xinje Company, or you can make your own cable. Please refer to sections 2-4 for the connection method.

3-2-2 Human Machine Interface (HMI)

The HMI link PLC to the operators. The HMI can send the commands from operators to PLC, and then PLC executes the commands.

XD/XL series PLC support diverse brands of HMI; the connection is based on the communication protocol. Generally communicate via Modbus protocol, the detailed parameters setting depends on the HMI.

The Xinje HMI can work with PLC directly (The communication parameters are set in accordance already). Presently Xinje HMI has TG, TS, OP series.

1) TG, TS series

- Size 4.3", 7", 8", 10.1", 15.6"
- Display 16 million color, 65536 color
- Operation touch screen
- Interface RS232, RS422, RS485, USB, Internet port
- Communication Work with many PLC brands, inverters, instruments etc.
Drive panel printer directly, support multiple printer.
Dual COM ports make it possible that work with 2 different devices at the same time.
Support free format protocol, users can write the driver program freely
- Recipe Input different group of data in the table
- Picture Rich stereoscopic 3D gallery, font effects, data collect, data backup etc.
- Password nine-level setting
- Advanced function animation design and so on

2) OP series

- Size 3.7"
- Display Blue LCD, 256 true color
- Buttons Nr. 7, 20 not touch screen
- Interface RS232, RS422, RS485
- Communication Work with many PLC brands.
Communicate with Xinje Inverters
- RTC Built-in

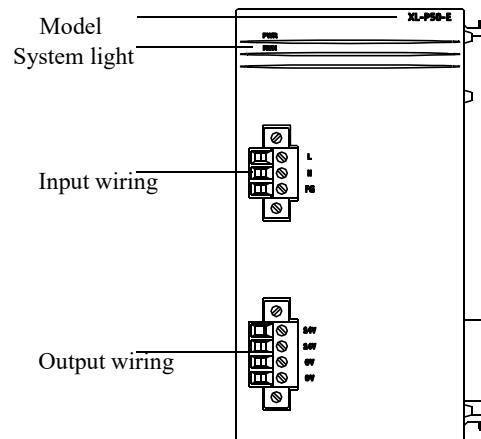
3-2-3 XL adapter power supply

XL series PLC can use external power supply or XL special power supply module XL-P50-E.

1) Basic specification

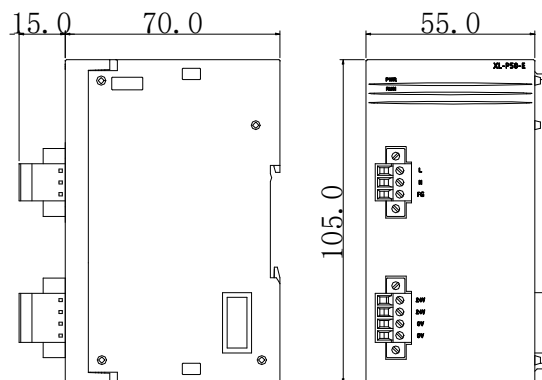
Item	Specification
Power supply	AC100-240V
Output voltage	DC24V
Output current	2A
Air	No corrosive and flammable gas
Ambient temperature	0°C~60°C
Ambient humidity	5%RH~95%RH (no condensation)
Installation	Install on the rail directly
Ground	The third ground (cannot connect to ground with strong power system)

2) Structure



Structure name	Function
Model	The model of the product
System light	PWR: power light, always ON when the module is energized RUN: run light, always ON when the module is running well
Input wiring	L, N: power supply input terminal FG: ground terminal
Output wiring	Can output 1 set of 24V, 0V to the outside, mainly supplying power to the XL body

3) Dimensions (Unit:mm)



3-2-4 Downloader

The JD-P03 downloader is used for copying programs and data between multiple Xinje PLCs in PC free situations.

(1) Suitable PLC

XD/XL series PLC (XDH/XLH cannot support) or ZG/ZP series integrated controller.

(2) Version

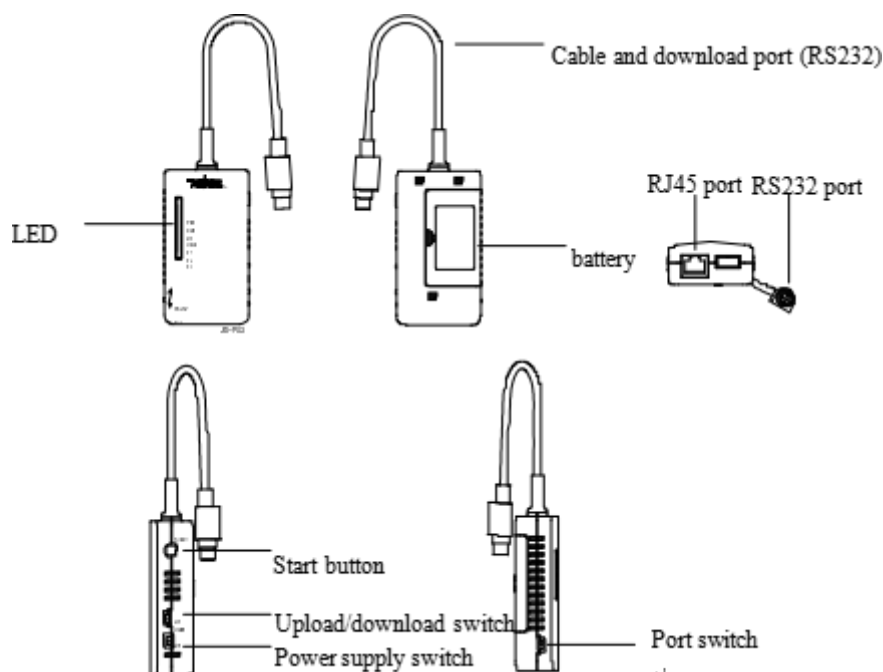
Model	Upload (PLC→downloader)	Download (downloader→PLC)
PLC without Ethernet port	PLC firmware V3.4.6 and up	PLC firmware V3.4 and up
PLC with Ethernet port (Non online download)	PLC firmware V3.5.3 and up	PLC firmware V3.5 and up
PLC with Ethernet port (Online download)	PLC firmware V3.7.4. and up	PLC firmware V3.7.4 and up

[Note]: If the above PLC does not support downloaders, please contact technical support.

(3) Basic specification

Item	Specification
Dimension	94.8mm×52.0mm×26.5mm
Using environment	No corrosive gas
Environment temperature	0°C~60°C
Environment humidity	5~95%

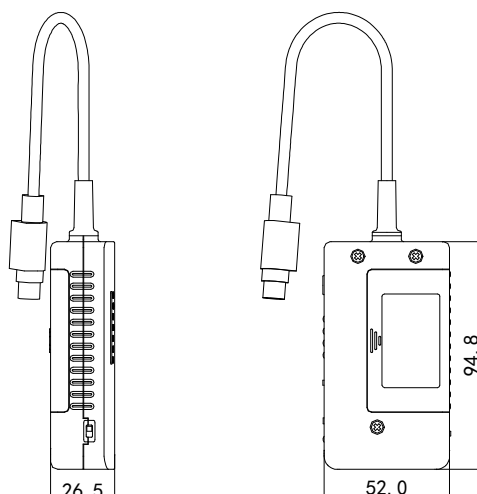
(4) Structure



Name	Function
LED	POWER
	COM

	OK	After the downloader completes the power on stop action to PLC, the OK light is always on, waiting for the user to press start button; then the downloader starts the upload / download action, and the OK light is off; when the upload / download is completed, the OK light will slowly flash
	DATA	DATA light flashes in upload mode, DATA light is always ON in download mode
	E1	Error light 1
	E2	Error light 2
	E3	Error light 3
Start button	START	Press this button to perform the upload or download operation; after the download is completed, this button can be used to run / stop the PLC, press this button to run PLC once, press again to stop PLC (state alternation). During the process, the connection cannot be disconnected, otherwise the operation will be invalid
Upload/ download switch	UP	Program upload mode, PLC program upload to the downloader
	DOWN	Program download mode, download program to PLC
Power supply switch	ON	The downloader is powered by self generated battery (PLC is not necessary to connect power supply)
	OFF	The downloader is supplied by RS232 port (PLC must be connected to power supply)
Port switch	RS232	Download / upload the program through RS232 port
	ETH	Download / upload the program through Ethernet port
Battery		It can put two No.5 batteries to supply power to the downloader; it can supply power to the PLC through 232 port, so that the PLC can also use the downloader to download the program when the power is not connected
RS232 port		① Used for uploading/downloading programs; ② Power the downloader through 232 ports (PLC needs to be powered on), or power the PLC (downloader battery powered)
Ethernet port		It is suitable for PLC download and upload with Ethernet port, but the firmware version cannot be updated
Cable and download port (RS232)		RS232 serial port, used to connect downloader and PLC

(5)Dimension (unit: mm)



(6) Preparation before uploading / downloading

- Communication port selection

Determine the communication interface to be used (RS232 / Ethernet port), and turn the "communication switch" to the corresponding interface.

- Mode selection

Determine the program upload and download mode, and turn the "upload / download switch" to the corresponding mode.

- Hardware connection

If RS232 port is used, only RS232 port needs to be connected with RS232 port of PLC; if Ethernet port is used, Ethernet port and RS232 port need to be connected with Ethernet port and RS232 port of PLC at the same time.

- Power on

After connection, power on the PLC and downloader; after power on, the OK light of the Downloader is always on, and the COM light flashes for 2s and then goes out. At this time, it enters the **pre-download / upload state**.

Note:

※1: There are two power supply modes for the downloader: one is to install two batteries (No. 5 batteries are installed); the other is to supply power from PLC through download cable.

※2: Connect the downloader to the PLC correctly and then power on to enter the pre-download / upload state; the modification mode is invalid after power on.

(7) Upload

- RS232 mode

When the downloader is in the upload mode, it is connected with the source PLC through the download cable and RS232 port, and then it is powered on. The downloader enters the pre-upload state, and press the START button to start uploading the program of the source PLC to the downloader. At this time, the DATA light and COM light flash rapidly; after the upload is completed, the COM light is off, the DATA and OK lights flash slowly at the frequency of 1Hz.

- Ethernet mode

When the downloader is in the upload mode, after connecting with the source PLC through the Ethernet port, download cable and RS232 port, the downloader enters the pre-upload state. Press

the START button to start uploading the program of the source PLC to the downloader. At this time, the DATA light and ACT light (the yellow light above the Ethernet port) flash rapidly; after the upload is completed, the DATA light and OK light slowly flash at the frequency of 1Hz.

Note: The parameters of COM1 will be modified in the process of uploading, and the original parameters will be restored after power on again after uploading. Do not disconnect the power supply or disconnect the connection during the upload process, otherwise the parameters of COM1 will not be restored.

(8) Download

After uploading the program, turn the "upload / download switch" to DOWN and power on again. After the downloader enters the pre-download state, you can choose whether to download PLC data (HM, HD, FD and other power-off holding registers, serial port parameters, pulse configuration, etc.), and the specific operation is shown in the following table:

Port	Need download data	Operation method	Indicator status
RS232	No	Press STRAT button once	The com light flashes quickly to start the download; after the download is completed, the com light is off, the OK light is flashing slowly at 1Hz, and the data light is always on
	Yes	Keep press START until DATA is always ON	
Ethernet	No	Press STRAT button once	After the com light flashes twice, it goes out, and the act light (the yellow light above the Ethernet port) flashes quickly, that is, the download starts; after the download is completed, the OK light flashes slowly at 1Hz, and the data is always on
	Yes	Keep press START until DATA is always ON	

In the download process, after the com light is off, sometimes the data light is not on (the probability of this situation is very small), which is also a normal situation. After the com lamp is off, the com lamp will flicker intermittently in the download process, which is also normal.

Note:

※1: The status of the data light is not used as the sign of whether the download is completed or not. The OK light 1Hz slow flashing is taken as the completion mark of the download.

※2: If you choose not to download data, if it is an Ethernet PLC, you must ensure that the firmware version of the uploaded PLC is the same as that of the downloaded PLC, otherwise the data may be lost.

(9) Password protection function

If the source PLC contains a password, the downloader will compare and verify the password read in the internal with that of the PLC. If the verification is successful, the upload action can be carried out. The operation method for the downloader to read the password is as follows:

① Find a PLC that supports the downloader (the model does not need to be consistent with the source PLC), and write the password to HD0 ~ HD2 registers in ASCII code monitoring mode.

② Connect the PLC with the downloader through RS232 port. Select the downloader mode as "UP". Press and hold START to power on, and the OK light and DATA light flash alternately, which indicates that the password is read successfully.

③ Then according to the normal upload mode, the program and data in the source PLC can be uploaded to the downloader.

Note:

※1: If the uploaded program contains a password, the program downloaded by the downloader also contains the same password; if the downloader reads the new password again, the program downloaded by the downloader will change to the new password.

※2: If the uploaded program does not contain a password, the program downloaded by the downloader does not contain a password, and the function of reading the password is invalid.

※3: When encrypting uploads, the source PLC and the PLC that uploads the password cannot be the same PLC, otherwise the source PLC will not be able to enter pre download mode when uploading the program.

(10) PLC firmware update

When downloading, E1 and E3 lights flash alternately, indicating that the target PLC version is not supported. At this time, the PLC firmware version can be updated by forced download.

Operation method: **Press and hold the START button to power on**, the ERR indicator light of PLC will flash rapidly, that is to say, the firmware will be updated. After the update, the DATA light will flash. Please do not power on again at this time. Press START or long press START to download normally.

Note:

The forced download function must be used when E1 and E3 indicator lights flash alternately and error is reported; if forced download is used, the parameters of COM1 port will be restored to the factory value, and the data of Ethernet PLC may be lost. It is recommended to download the data while downloading the program.

(11) Battery

When the battery is used as the power supply for PLC, due to the different power consumption of PLC of different models, the working time of battery is also different (The power consumption of Ethernet model is larger, and the more the number of points, the greater the power consumption).

The following table lists the duration of continuous operation of some models powered by battery.

The data is for reference only.

PLC model	Normal battery	Panasonic rechargeable battery (2450mAh)
XD3-32T-E	About 1h50min	About 5h40min
XD5-60T6-E	About 1h	About 4h30min

(12) Error indicator description

Error dicator status	Description	Measures
E1 flash	PLC locked	Check that the password read is correct
E3 flash	The value in SD200~SD230 are changed	Check whether the SD register has been modified

E1 and E2 flash at the same time	The source PLC version is older and does not support uploading	Update the source PLC firmware to the latest version
E1 and E3 flash at the same time	Failed to read password or PLC firmware error, upload failed	Check whether the source PLC can be used normally
E1 and E2 flash alternately	Upload incomplete	Please upload the program again
E1 and E3 flash alternately	The target PLC version is older and does not support downloading	Update firmware version by force download
E2 and E3 flash alternately	The upload program is inconsistent with the download model	The upload program must be consistent with the download model
E1, E2 and E3 light up at 500ms frequency in turn	PLC firmware error during download, unable to connect	Check whether the PLC can use the target normally
E1, E2 and E3 extinguished at 500ms frequency in turn	Wrong selection of communication port	Check whether the communication port selection switch is consistent with the communication port

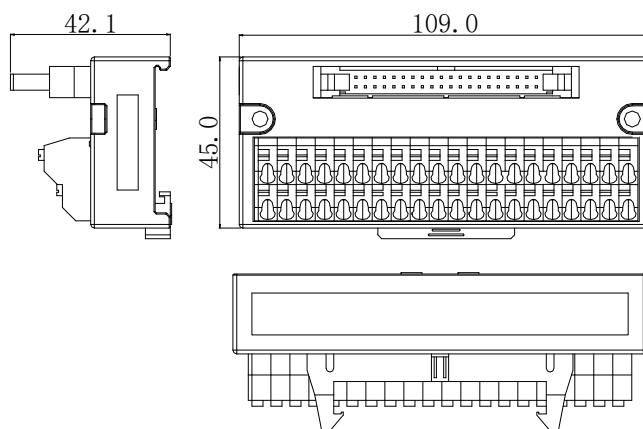
3-2-5 External terminal

XL5/XL5E/XLME series 64-point models can be used in combination with external terminal block. The model and cable of terminal block are as follows:

Input/output	Terminal block model	Cable
Input CN0	JT-E32X	JC-TE32-NN05(0.5m) JC-TE32-NN10(1.0m)
Output CN1	JT-E32YT	JC-TE32-NN15(1.5m)

(1) Terminal block

- Dimension Unit: mm



- Terminal arrangement

The CN0 (input part) terminals are arranged as follows:

L+	X0	X1	X2	X3	•	X10	X11	X12	X13	•	X20	X21	X22	X23	•	X30	X31	X32	X33
M	X4	X5	X6	X7	•	X14	X15	X16	X17	•	X24	X25	X26	X27	•	X34	X35	X36	X37

The CN0 (input part) terminal arrangement (NPC&PNP type) is as follows:

S/S	X0	X1	X2	X3	•	X10	X11	X12	X13	•	X20	X21	X22	X23	•	X30	X31	X32	X33
•	X4	X5	X6	X7	•	X14	X15	X16	X17	•	X24	X25	X26	X27	•	X34	X35	X36	X37

The CN1 (output part) terminals are arranged as follows:

COM0	Y0	Y1	Y2	Y3	COM2	Y10	Y11	Y12	Y13	COM4	Y20	Y21	Y22	Y23	COM6	Y30	Y31	Y32	Y33
COM1	Y4	Y5	Y6	Y7	COM3	Y14	Y15	Y16	Y17	COM5	Y24	Y25	Y26	Y27	COM7	Y34	Y35	Y36	Y37

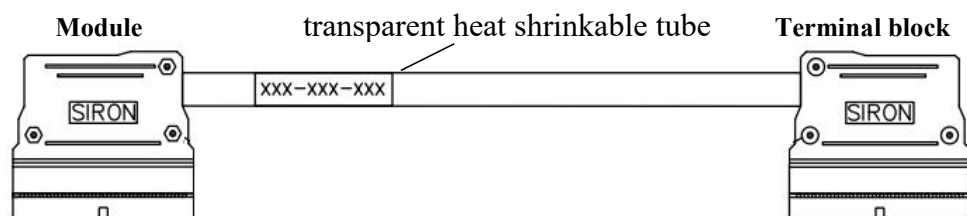
- Wiring method

When wiring, press the spring switch with a small screwdriver, insert the wire into the corresponding socket, and release the spring switch. It is required that the length of the conductor peeled off is 1.5cm.

(2) Cable

When connecting the external terminal block, it is necessary to use the connecting cable. Xinje provides JC-TE32-NN05, JC-TE32-NN10 and JC-TE32-NN15 cables of different length and specifications for users to choose. When connecting, please note that one end of the connection module is wrapped by the transparent heat shrinkable tube, and the other end is connected to the terminal sub station, which can not be connected reversely!!!

The connection diagram is as follows:



3-3. Configuration Principle

1) COM port

- XD/XL series PLC (CPU units) are usually equipped with COM1, COM2 and USB port.
- COM1 is equipped with RS232. COM2 is RS485. The two ports are independent.
- The USB port is generally used for programming download and online monitoring, and the download speed is faster than COM1 and COM2.

2) About Expansion Devices

- Generally, one CPU unit can work with different types of expansions, can expand digital I/O, analog I/O, temperature control etc.
- XD1/XD2 cannot support expansion module, XD3 can work with 10 expansions and XD5/XDM/XDC/XD5E /XDME/XDH can connect 16 modules.
- XL1 does not support extension modules, XL3/XL3E series can expand up to 10 modules, XL5/XL5E/XL5N/XLME/XL5H/XLH series can expand up to 16 modules.
- After connecting the CPU unit with the expansion, if the "PWR" LED of expansion ON, then the expansion can work properly;.

3) How to calculate the I/O

- I/O points include actual input and output points.
- After connect with the expansions, the total I/O points=I/O on basic unit + I/O on expansions.
- Digital I/O is octal.
- Analog I/O is decimal.
- After expansion, the total I/O can up to 572 points.

How to calculate the I/O

Basic Unit XD3-32R-E (18I/14O) connect with 5 XD-E8X8Y expansions, then the total I/O points should be:

Input Points: $18 + 8 * 5 = 58$

Output points: $14 + 8 * 5 = 54$

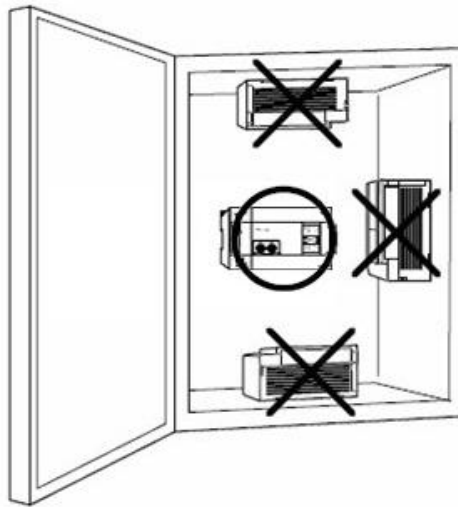
Total points: Input+ Output = $58+54=112$

3-4. ID Assignment of Expansions

Sign	Name	Range		Points
X	Input points	XD XL	X10000~X10077(#1 extension module) X11100~X11177(#10 extension module) X11700~X11777(#16 extension module)	1024
		XD	X20000~X20077(#1 extension BD) X20100~X20177(#2 extension BD)	128
		XD XL	X30000~X30077(#1 extension ED)	64
Y	Output points	XD XL	Y10000~Y10077(#1 extension module) Y11100~Y11177(#10 extension module) Y11700~Y11777(#16 extension module)	1024
		XD	Y20000~Y20077(#1 extension BD) Y20100~Y20177(#2 extension BD)	128
		XD XL	Y30000~Y30077(#1 extension ED)	64
ID	Extension module	XD XL	ID10000~ID10099(#1 extension module) ID10900~ID10999(#10 extension module) ID11500~ID11599(#16 extension module)	1600
	Extension bd	XD	ID20000~ID20099(#1 extension BD) ID20100~ID20199(#2 extension BD)	200
	Extension ed	XD XL	ID30000~ID30099(#1 extension ED)	100
QD	Extension module	XD XL	QD10000~QD10099(#1 extension module) QD10900~QD10999(#10 extension module) QD11500~QD11599(#16 extension module)	1600
	Extension bd	XD	QD20000~QD20099(#1 extension BD) QD20100~QD20199(#2 extension BD)	200
	Extension ed	XD XL	QD30000~QD30099(#1 extension ED)	100

3-5. Install The Products

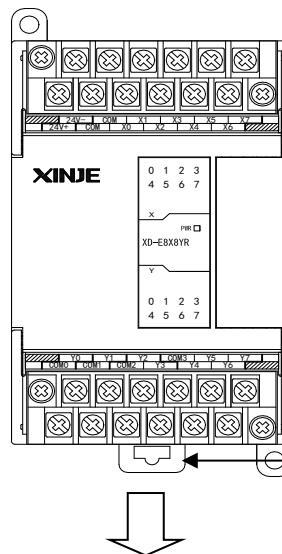
1) Installation Position



2) Installation Method

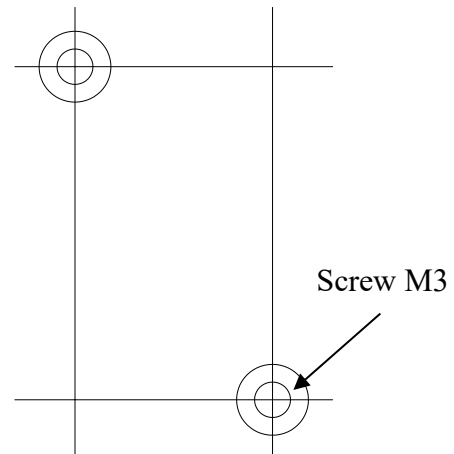
Use DIN or screws to install the CPU units and expansions.

- DIN46277



DIN installation

- Directly install by screws



Basic units or expansion modules install on DIN46277 rail (width 35mm). Pull down the hook on DIN rail and take down the product.

Note: XL series PLC only supports rail installation.

3) Installation Environment

Please install the products according to chapter 2-1-1.

4 Power Supply Specification and Wiring Method

4-1. Power Supply Specifications

The power specifications of XD series PLC support AC power type and DC power type (Type with ‘-E’ is AC power, type with ‘-C’ is DC power).

XL series PLC power supply only supports DC type.

1) AC power

Items	Content
Rated Voltage	AC100V~240V
Allowed Voltage Range	AC90V~265V
Rated Frequency	50/60Hz
Allow momentary power off time	Interruption Time ≤ 0.5 AC cycle, interval ≥ 1 second
Impulse Current	Max 40A below 5ms/AC100V max 60A below 5ms/AC200V
Maximum Power Consumption	15W (16 points and below)/30W (24 points and above)
Power Supply for Sensor	24VDC $\pm 10\%$ 16 points max is 200mA, 32 points max is 400mA

Note:

※1: Please use the wire cable more than 2mm² to avoid the decrease of voltage.

※2: Even power off in 10ms, the PLC can still keep working. But when power is off for long time or voltage abnormally decrease, the PLC will stop working, output will be OFF. When power is on again, the PLC will run automatically.

※3: The grounding terminals on basic units and expansions connect together, and use the third type grounding.

2) DC Power

Items	Content
Rated Voltage	DC24V
Allowed Voltage Range	DC21.6V~26.4V
Input Current (Only for basic unit)	120mA DC24V
Allow momentary power off time	10ms DC24V
Impulse Current	10A DC26.4V
Maximum Power Consumption	15W (16 points and below) /30W (24 points and above)
Power Supply for Sensor	24VDC $\pm 10\%$ 16 points max is 200 mA, 32 points max is 400mA

Note:

※1: XD series PLC provides DC24V power supply (terminal 24V, 0V), it can be power supply for sensor, 10~16 points PLC DC24V is 200mA, 24/32/48/60 points PLC DC24V is 400mA. This terminal cannot connect to external power supply.

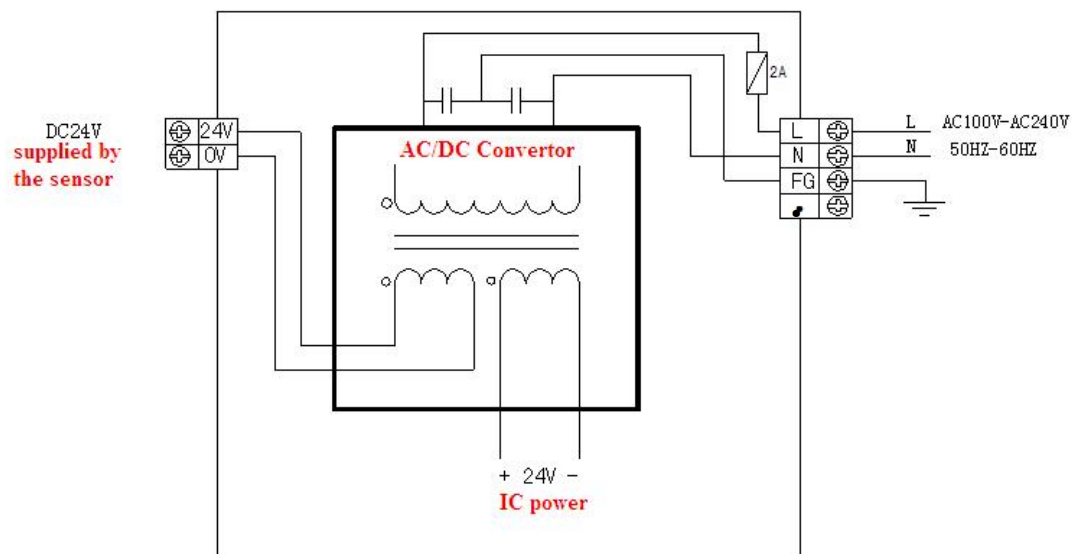
※2:  is empty terminal, do not use it.

※3: Please connect the  terminals on basic units and expansions together.

4-2. AC Power Supply and DC Input

The following content is only applicable to XD series PLCs.

Composition wiring



※1: Connect the power supply to L, N terminals.

※2: The 24 V and 0 V terminals can be used as the power supply for the sensor. The 10 / 16 points is 200 mA / DC24 V, and 24 points and above is 400 mA / DC 24V. In addition, this terminal cannot be powered by an external power supply.

※3:  terminal is idle, do not wire outside or work as middle relay terminals.

※4: Please connect the  terminals on basic units and expansions together.

5 Input Specifications and Wiring Methods

5-1. Input Specification

5-1-1. XD series input specification

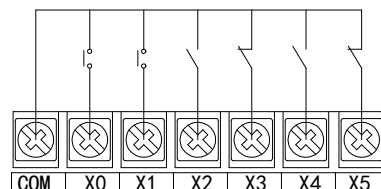
The input of XD series PLC is divided into four modes: NPN, PNP, bipolar, and differential. The internal structure and wiring methods of these four modes are introduced below.:

5-1-1-1. NPN input specifications

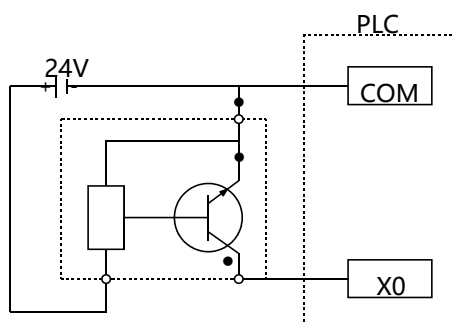
1) Input specification

Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal's form	Contact input or NPN open collector transistor
Circuit insulation	Photo-electricity coupling insulation
Input action's display	LED light when input ON

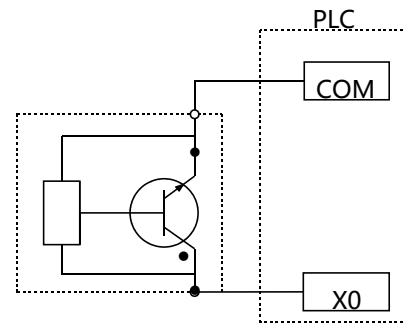
2) Wiring example



Switch button wiring diagram



3-wire (NPN) proximity switch wiring diagram



2-wire (NPN) proximity switch wiring diagram

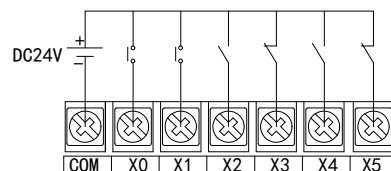
[Note]: If using DC24V provided by the PLC body, there is no need to connect DC0V to the COM input point; If an external switch power supply is used, it must be connected.

5-1-1-2. PNP input specifications

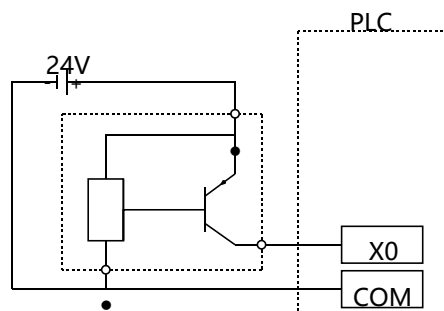
1) Input specification

Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal's form	Contact input or PNP open collector transistor
Circuit insulation	Photo-electricity coupling insulation
Input action's display	LED light when input ON

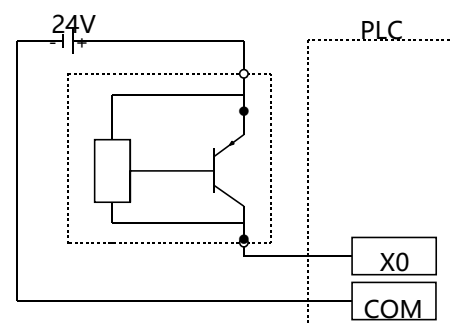
2) Wiring example



Switch button wiring diagram



3-wire (PNP) proximity switch wiring diagram



2-wire (PNP) proximity switch wiring diagram

Note: Whether using DC24V provided by the PLC itself or an external 24V power supply, DC0V must be connected to the COM input point.

5-1-1-3. Bipolar input specifications

XD3E-24/30/48/60NPT/R-E, XD3E-30/48/60NPT4-E, and XD5E-60NPR-E support bipolar input, namely NPN and PNP input modes. The input specifications and wiring are as follows:

1) Input specification

XD5E-60NPR-E model:

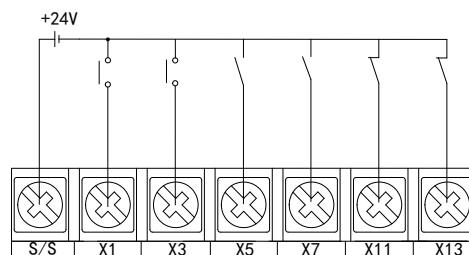
Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	7mA/DC24V
Input ON current	Above 4.5mA

Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal's form	NPN or PNP compatible input open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action's display	LED light when input ON

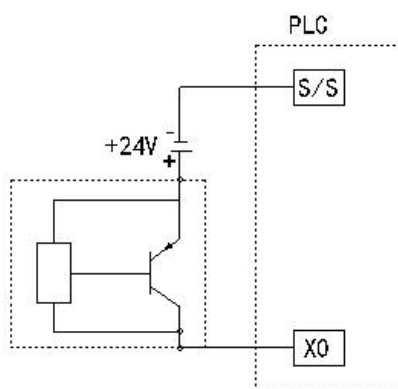
XD3E-□NPR/T□-E model:

Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	4mA/DC24V
Input ON current	Above 2.5mA
Input OFF current	Under 1mA
Input response time	About 10ms
Input signal's form	NPN or PNP compatible input open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action's display	LED light when input ON

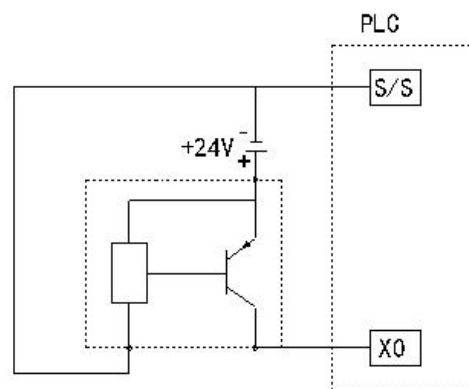
2) Wiring example



Example of switch button wiring diagram



Example of wiring diagram for two-wire (normally open or normally closed) proximity switch



Example of wiring diagram for three wire (PNP type) proximity switch

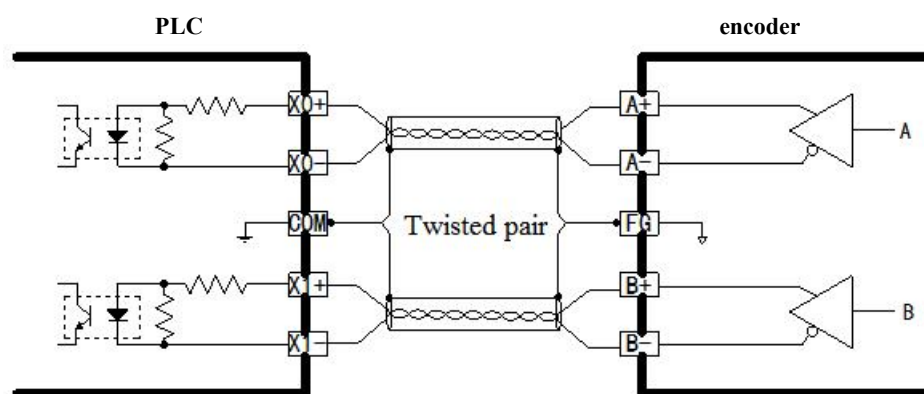
5-1-1-4 Differential mode

1) Input specification

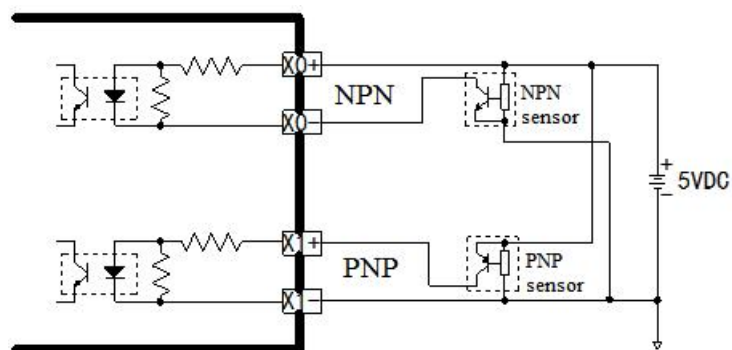
XD5 series PLC supports differential mode input, the specification is shown as below:

Item	XD5-48D4T4-E	XD5-24D2T2-E
Differential input	8 points (X0, X1, X3, X4, X6, X7, X11, X12)	4 points (X0, X1, X3, X4)
Input signal	5V differential signal	
Input max frequency	1MHz	
Circuit insulation	Optoelectronic coupling insulation	
Input action display	The LED is ON when the input is ON	

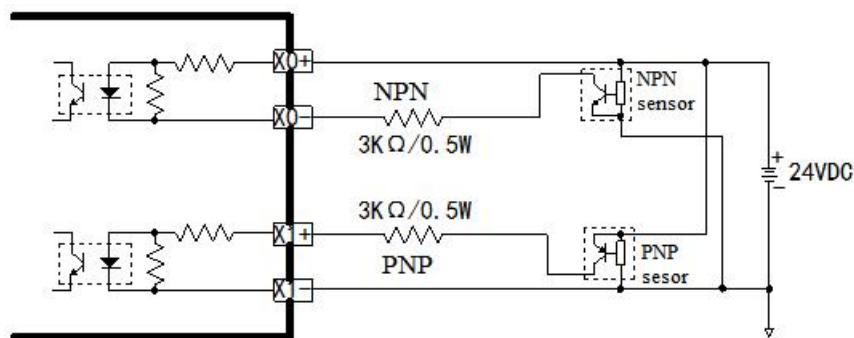
2) Wiring example of differential input:



Wiring diagram with encoder



Wiring diagram with 5V single ended NPN and PNP signals



Wiring diagram with 24V single ended NPN and PNP signals

Note: When the differential input terminal receives 5V/24V single ended NPN and PNP signals, the maximum frequency of high-speed counting is 1M..

5-1-2. XL series input specification

The input of XL series PLC is divided into four modes: NPN, PNP, bipolar, and differential. The internal structure and wiring methods of these four modes are introduced below.

5-1-2-1. NPN input specifications

1) Input specification

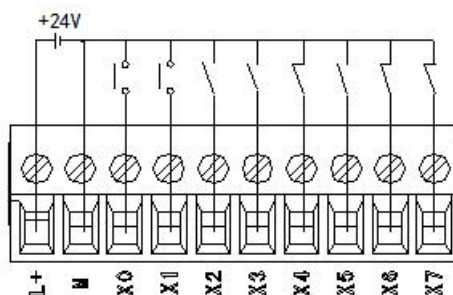
- General models:

Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal's form	Contact input or NPN open collector transistor
Circuit insulation	Photo-electricity coupling insulation
Input action's display	LED light when input ON

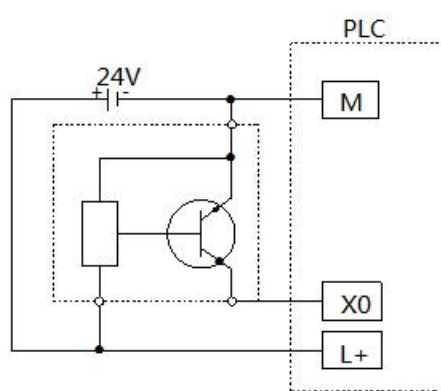
- XL5-64T10, XL5E-64T6, XL5E-64T10, XLME-64T10:

Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	7mA/DC24V
Input ON voltage	Below 9V
Input OFF voltage	Above 19V
Input response time	About 10ms
Input signal's form	Contact input or NPN open collector transistor
Circuit insulation	Photo-electricity coupling insulation
Input action's display	LED light when input ON

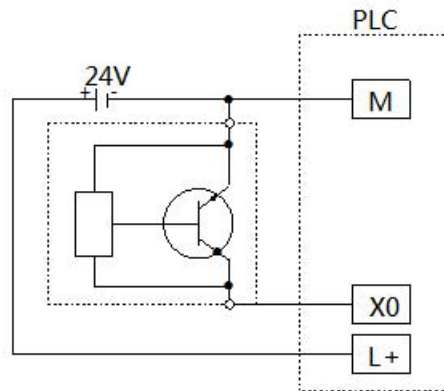
2) NPN input wiring example



Switch button wiring diagram



3-wire (NPN) proximity switch wiring diagram



2-wire(NO or NC) proximity switch wiring diagram

- Input terminal

It need to connect external DC24V power supply for PLC. Please connect 24V to L+, 0V to M. The input is ON when the input terminal and **M** pass through by connecting no voltage contactor or NPN open collector transistor, the related input light is ON.

- Input circuit

The first circuit and secondary circuit is isolated by optical coupler, the C-R filter is installed in secondary circuit. It can prevent from error operation caused by input vibration or noise. For input ON to OFF or OFF to ON, the response time is about 6ms inside PLC. The input terminal has internal digital filter.

- Input sensitivity

The input current is 7mA, but for reliable action, the input ON current must be above 4.5mA, the input OFF current is below 1.5mA.

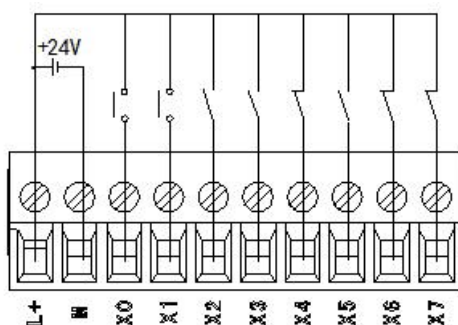
5-1-2-2. PNP input specifications

PNP series models need to be distinguished from product models, please refer to [1-2-2 XL series basic unit model and list](#).

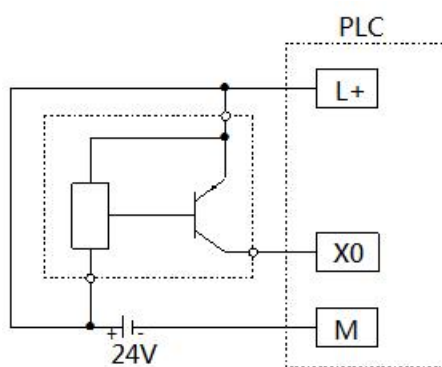
1) Input specification

Items	Content
Input signal's voltage	DC24V±10%
Input signal's current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal's form	Contact input or PNP open collector transistor
Circuit insulation	Photo-electricity coupling insulation
Input action's display	LED light when input ON

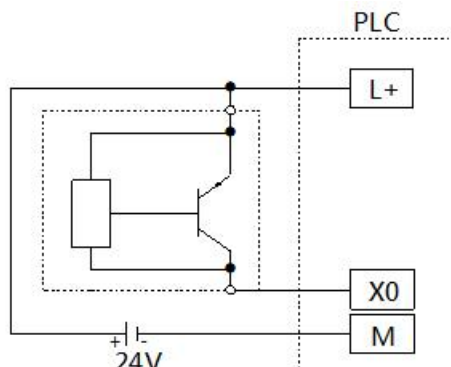
2) Wiring example



Switch button wiring diagram



3-wire (PNP) proximity switch wiring diagram



2-wire (NO or NC) proximity switch wiring diagram

5-1-2-3. Bipolar input specifications

The bipolar input model is compatible with NPN and PNP input methods, and the PLC and corresponding firmware versions that support bipolar input are as follows:

PLC model	Hardware version requirements
XL3-16R	Hx.5.x and above
XL3-16T4	-
XL5-16T4	-
XL3E-16T/32T	-
XL5E-16T/32T/32T4	Hx.5.x and above
XL5E-64T6/64T10	Hx.4.x.x.x.x and above
XLME-16T4/32T4	Hx.5.x and above
XLME-64T10	Hx.4.x.x.x.x and above
XL5H-24A8L	Hx.4.x.x and above
XL5H-24A8	Hx.6.x.x and above
XLH-30A32 (L)	Hx.4.x.x.x.x and above
XLH-24A16 (L)	Hx.6.x.x and above

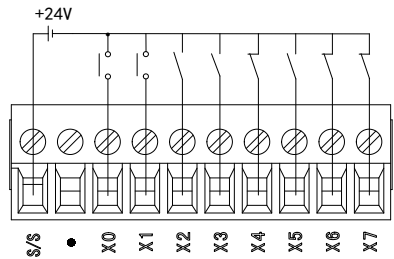
1) Input specification

Items	Content
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Below 1.5mA

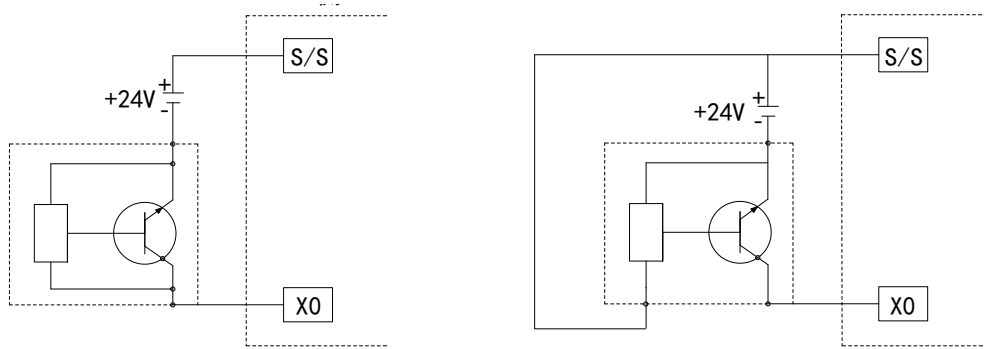
Input response time	About 10ms
Input signal form	NPN or PNP compatible input open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action display	When the input is ON, the LED light is on

2) Wiring example

- NPN mode



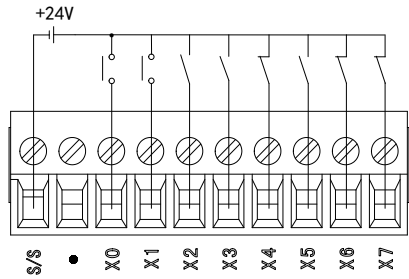
Example of switch button wiring diagram



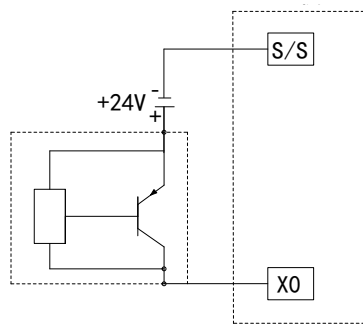
Example of wiring diagram for two-wire (normally open or normally closed) proximity switch

Example of wiring diagram for three wire (NPN type) proximity switch

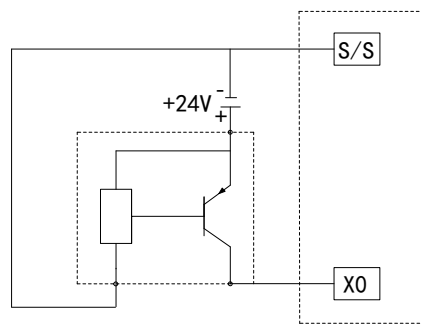
- PNP mode



Example of switch button wiring diagram



2-wire(NO or NC) proximity switch wiring diagram



3-wire (PNP) proximity switch wiring diagram

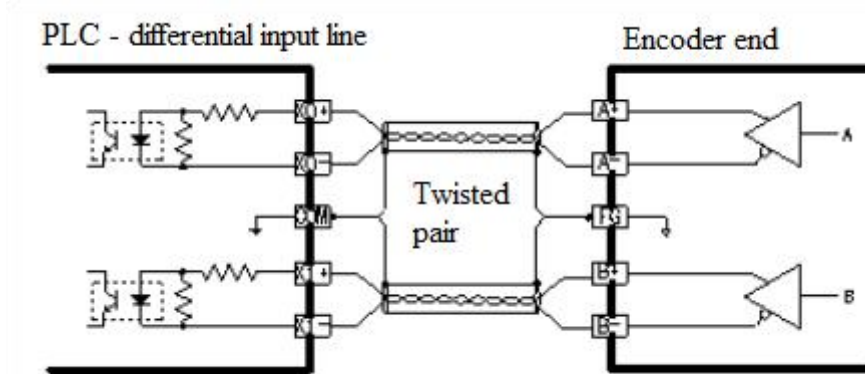
5-1-2-4. Differential Input Specification

1) Input specification

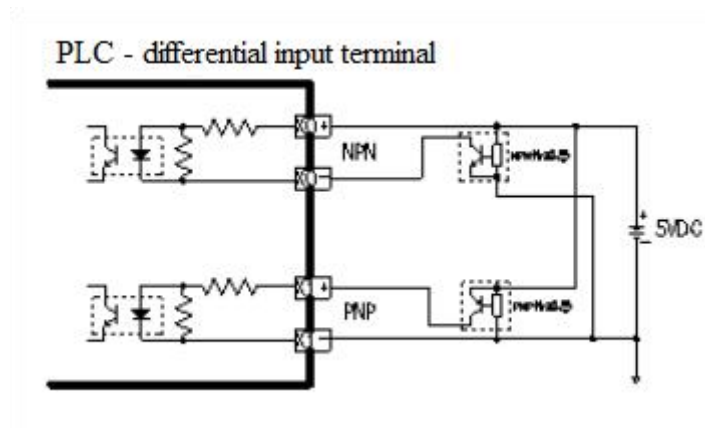
The XLH-30A32 series differential PLC supports differential input mode, and its specifications and wiring methods are as follows:

Items	XLH-30A32
Differential input point	4 points (X0, X1, X3, X4)
Input signal	5V differential signal
Enter the highest frequency	1MHz
Circuit insulation	Optoelectronic coupling insulation
Input action display	When the input is ON, the LED light is on

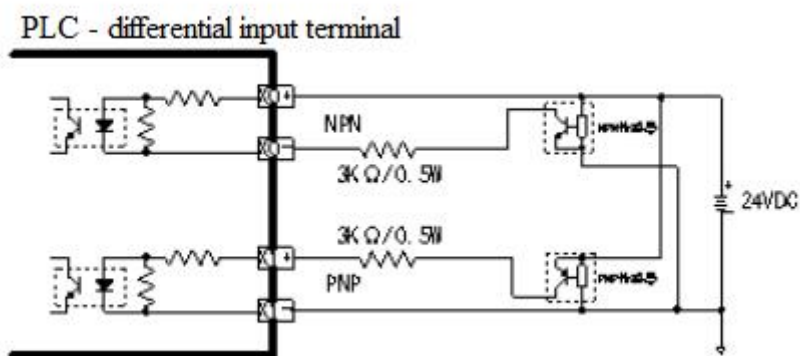
2) Wiring example



Example of wiring diagram with encoder



Example of wiring diagram for 5V single ended NPN and PNP signals



Example of wiring diagram for 24V single ended NPN and PNP signals

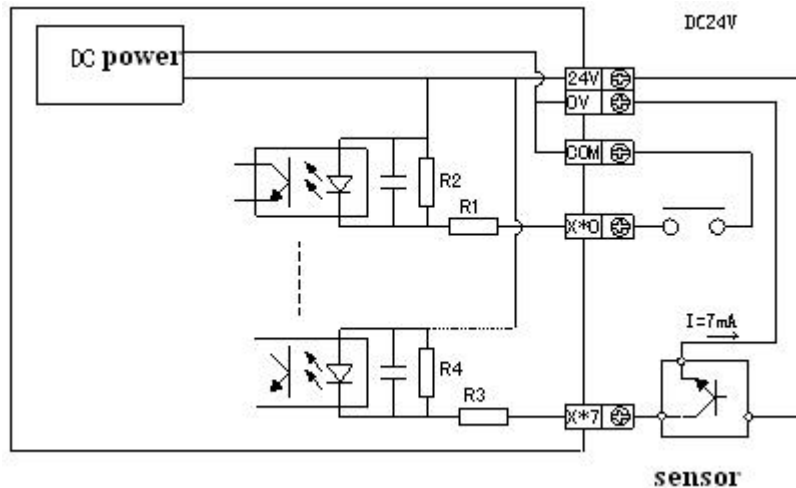
Note: When the differential input terminal receives 5V/24V single ended NPN and PNP signals, the maximum frequency of high-speed counting is 1M.

5-2. DC Input Signal (AC power supply)

Below contents are only fit for XD series PLC.

1) DC Input Signal

- NPN mode



- Input terminals

When connect input terminals and terminal **COM** with contact without voltage or NPN open collector transistor, if input is ON, LED lamp will light which indicates input is ON. There are many input terminals **COM** to connect in PLC.

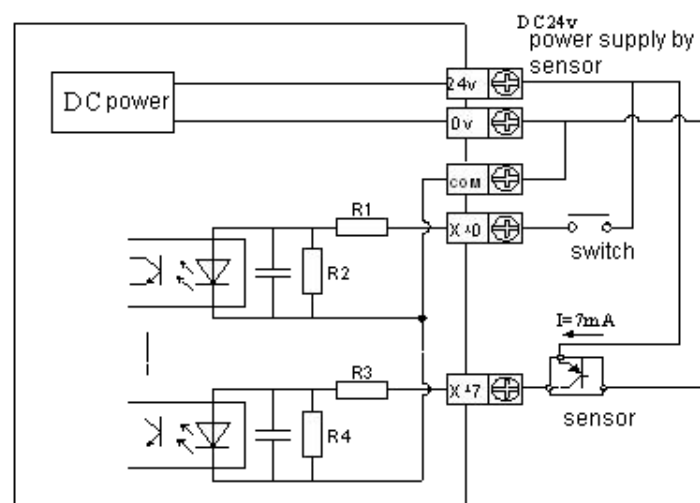
- Input circuits

Photo-electricity coupling is used to insulate between primary load circuit and secondary circuit. The secondary circuit with C-R filter is to avoid wrong operation caused by vibration of input contacts or noise along with input signal. For above-mentioned reasons, if input ON→OFF, OFF→ON, the response time delays about 6ms in PLC. There is a digital filter inside the input terminal.

- Input sensitivity

The PLC input current is DC24V 7mA, but to act correctly, the current should be above 4.5mA when input is ON and under 1.5mA when input is OFF.

- PNP mode



- Input terminals

When connect input terminals and terminal COM with DC24V contact or NPN open collector transistor, if input is ON, LED lamp will light which indicates input is ON. There are many input terminals COM to connect in PLC.

- Input circuits

Photo-electricity coupling is used to insulate between primary load circuit and secondary circuit. The secondary circuit with C-R filter is to avoid wrong operation caused by vibration of input contacts or noise along with input signal. For above-mentioned reasons, if input ON→OFF, OFF→ON, the response time delays about 10ms in PLC. There is a digital filter inside the input terminal.

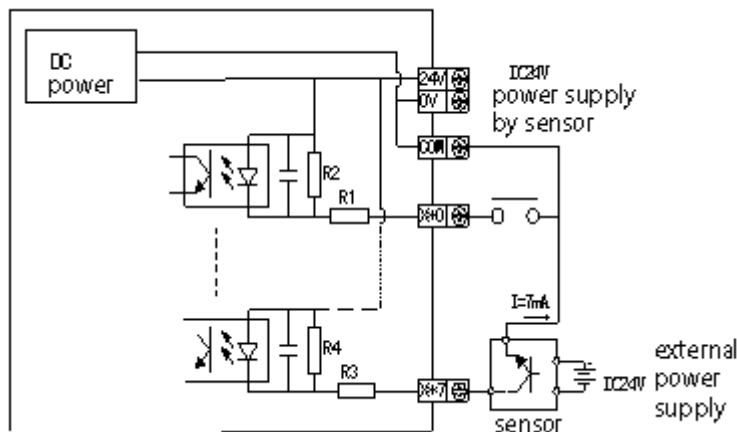
- Input sensitivity

The PLC input current is DC24V 7mA, but to act correctly, the current should be above 4.5mA when input is ON and under 1.5mA when input is OFF.

2) External circuit used for sensors

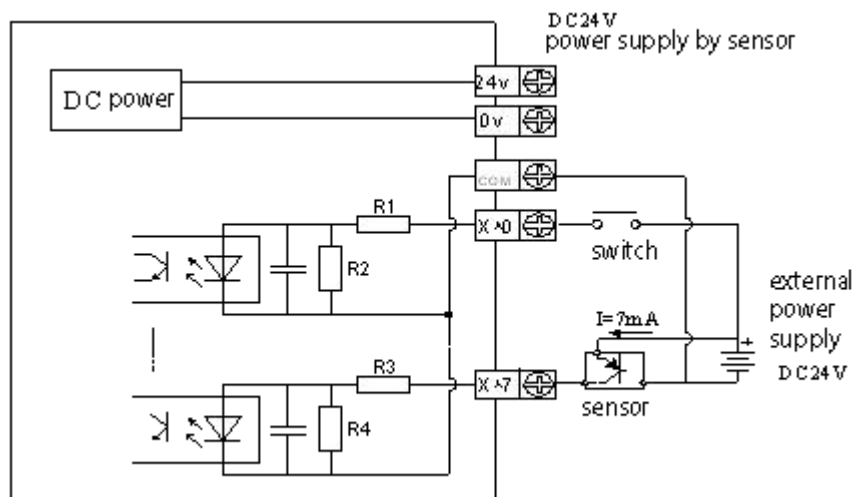
- NPN mode

XD series PLC input current is supplied by its interior 24V power, so if use exterior power to drive sensor like photo electricity switch, the exterior power should be DC24V±4V, please use NPN open collector type for sensor's output transistor.



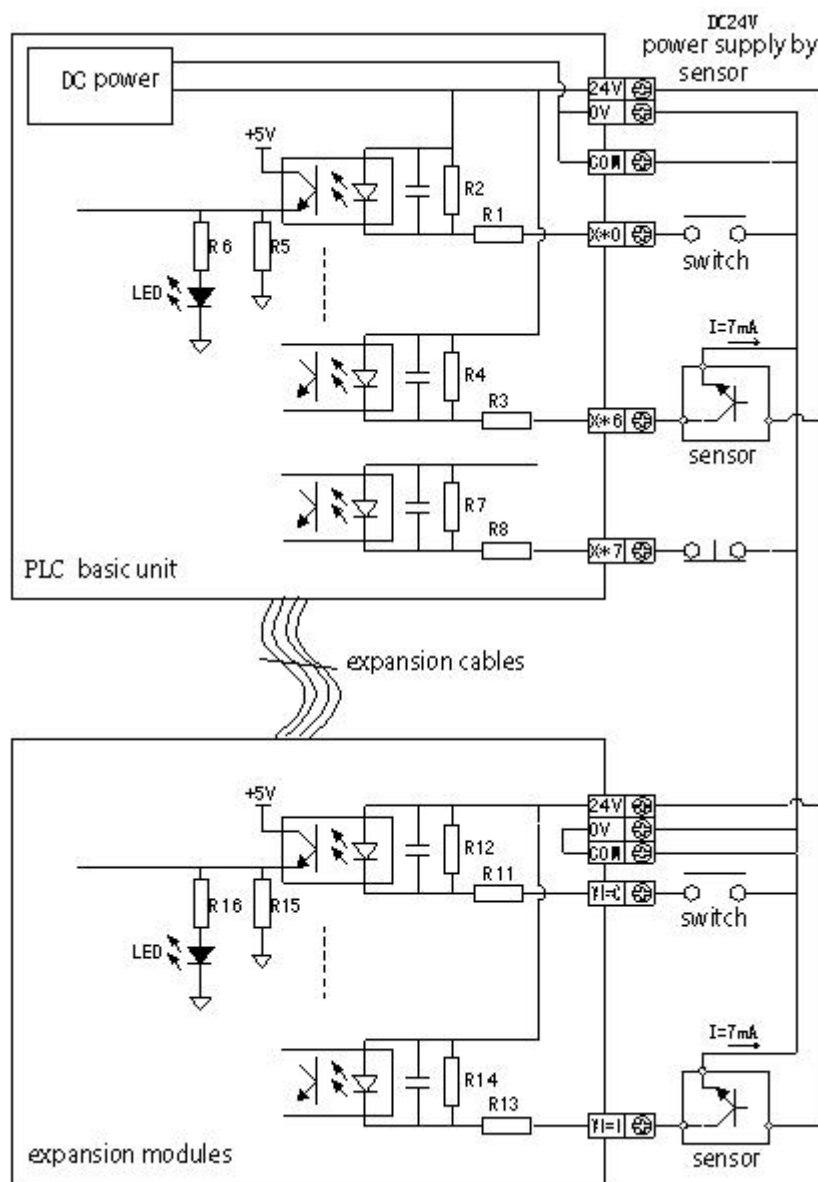
- PNP mode

XD series PLC input current is supplied by its interior 24V power, so if use exterior power to drive sensor like photo electricity switch, the exterior power should be DC24V±4V, please use PNP open collector type for sensor's output transistor.

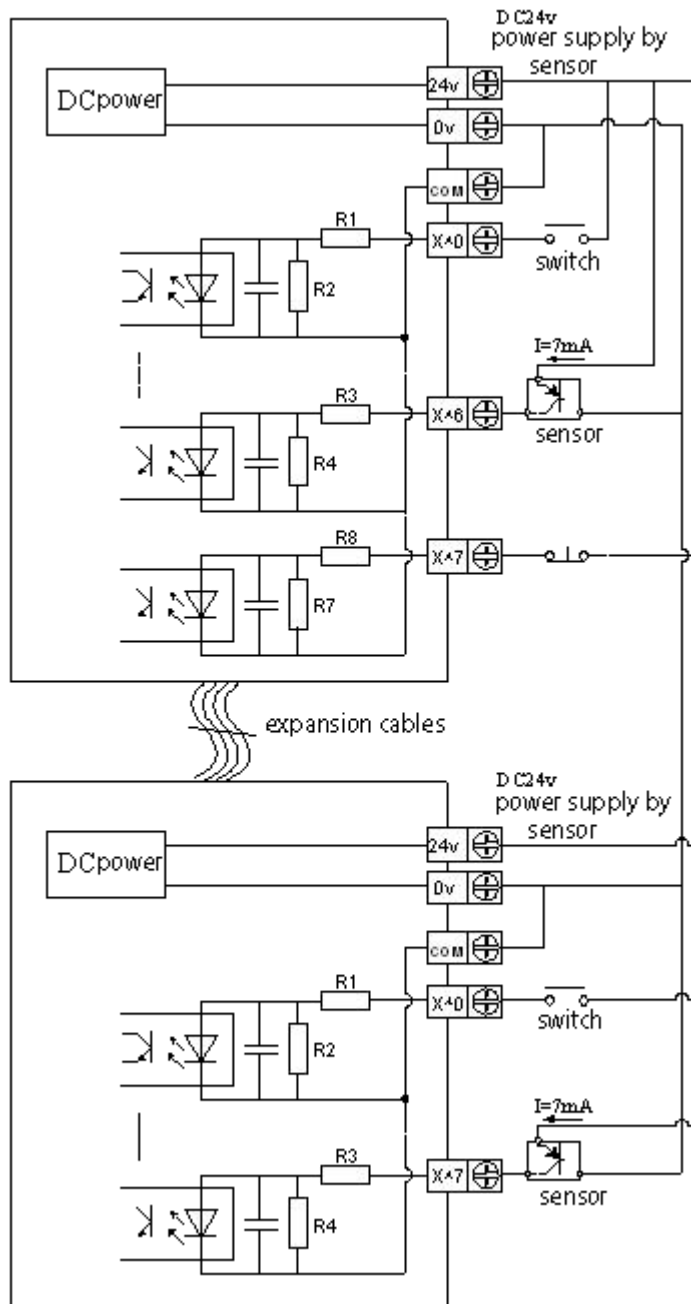


3) Input Wiring

- NPN mode



- PNP mode

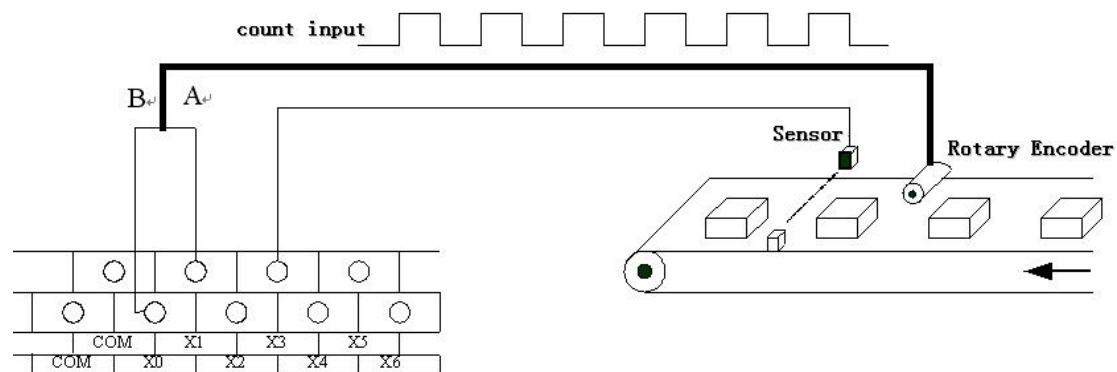


5-3. High Speed Counter Input

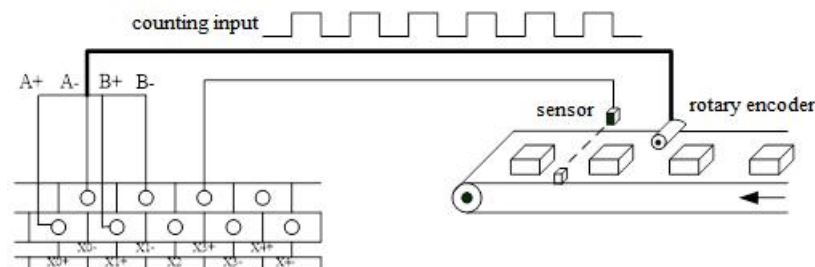
XD/XL series PLC support high speed count function which is irrelevant with the scan cycle and can test high speed input signal of measuring sensors and rotary encoders etc by selecting different counter, max measuring frequency can be up to 80KHz (differential model can up to 1MHz).

Note:

※1: For PLCs with NPN mode input, please use an encoder with DC24V NPN open collector output (OC). For PLCs with PNP mode input, please use an encoder with DC24V PNP open collector output (OC).



※2: The high speed counter of the PLC which can accept differential signal (DIFF), please use differential signal encoder.



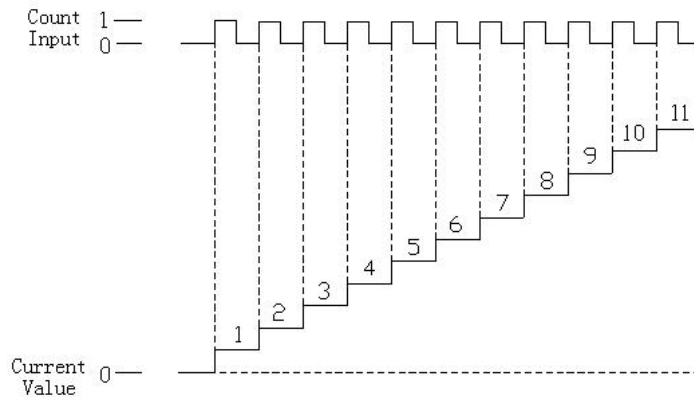
※3: When the input frequency is above 25Hz, please use high speed counter.

5-3-1. Counting mode

XD/XL series HSC function has two counting modes: Increment mode and AB-phase mode.

1) Increment mode

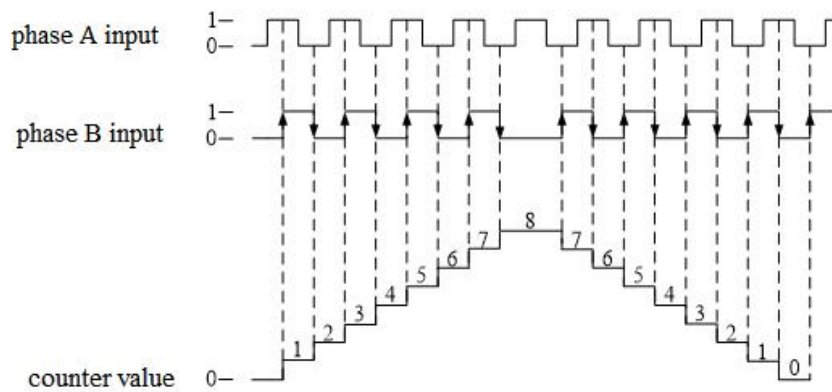
Under this mode, if counting input pulse signal, the counting value will increase one along with the rising edge of every pulse signal.



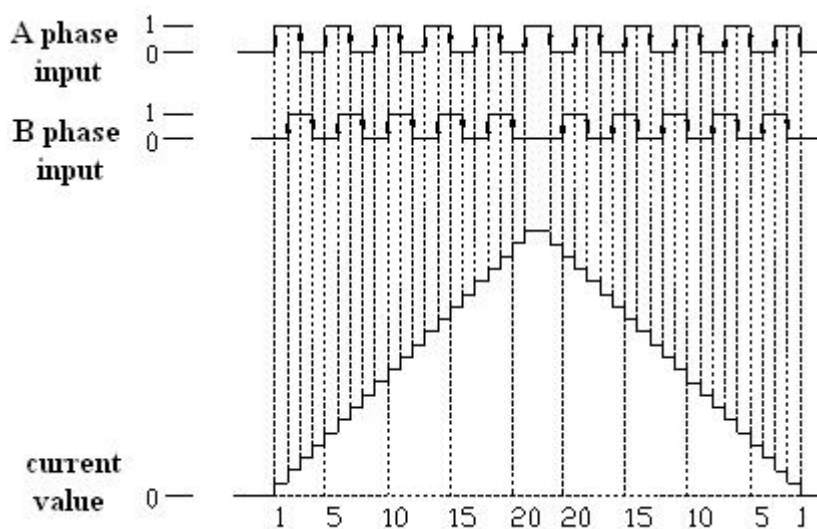
2) AB-phase

In this mode, the high-speed count value is incremented or decremented according to two differential signals (A phase and B phase), and can be divided into two modes: second harmonic and fourth harmonic according to the frequency doubling. However, the default counting mode is fourth harmonic mode.

● Two-time Frequency Mode



● Four-time Frequency Mode



5-3-2. High Speed Counting Range

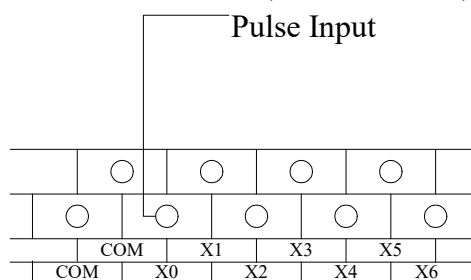
The HSC's counting range is: K-2,147,483,648 ~ K+2,147,483,647. If the counting value exceeds this range, up-flow or down-flow appears.

The up-flow means the counting value jumps from K+2,147,483,647 to K-2,147,483,648 and then continue to count. The down-flow means the counting value jumps from K-2,147,483,648 to K+2,147,483,647 and then continue to count.

5-3-3. The Input Wiring Of HSC

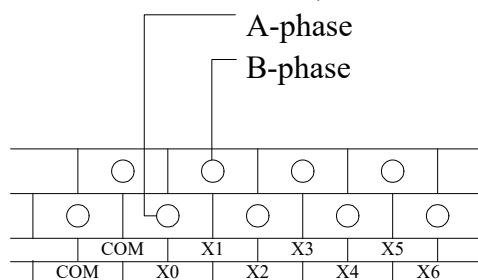
For input terminal wiring of pulse counting, it differs according to PLC types and counting modes. Some typical wiring methods are as below (take XD3-32 PLC as an example):

(Counter HSC0)



Increment Mode

(Counter HSC0)



AB-phase Mode

5-3-4. Input Terminals Assignment

1) High Speed Counters assignment of XD series PLC:

PLC model		HSC channel number	
		Increment mode	AB-phase mode
XD1	10/16/24/32	0	0
XD2	16/24/32/42/48/60	3	3
XD3	16/24/32/48/60	3	3
	24T4	3	3
	32T4	3	3
XD5	16/24/32/42/48/60/80	3	3
	24T4/32T4/48T4/60T4	4	4
	24D2T2	2	2
	48D4T4	8	8
	48T6/60T6	6	6

PLC model		HSC channel number	
		Increment mode	AB-phase mode
	60T10	10	10
XDM	24T4/32T4/48T4/60T4	4	4
	60T10	10	10
XDC	24/32/48/60	4	4
XD3E	24/32/48/60	3	3
XD5E	24/30/48/60	3	3
	30T4	4	4
	60T4	4	4
	60T6	6	6
	60T10	10	10
XDME	30T4/60T4	4	4
	60T10	10	10
XDH	24A8(L)/30A16(L)/60A32/60T4/60A64	4	4
XL1	16	0	0
XL3	16/32	3	3
XL5	16/32	3	3
	32T4	4	4
	64T10	10	10
XL3E	16/32	3	3
XL5E	16/32	3	3
	32T4	4	4
	64T6	6	6
	64T10	10	10
XL5N	32	3	3
XLME	16T4	3	3
	32T4	4	4
	64T10	10	10
XLH	24A16(L)/30A32(L)	4	4
XL5H	24A8(L)	3	3

Note: XL5E-64T6 hardware versions starting with H4 support 6-way high-speed counting, while versions starting with H3 only support 4-way high-speed counting.

2) Input Terminals definition of HSC:

Each letter's description:

U	A	B	Z
Counter's pulse input	A-phase input	B-phase input	Z-phase pulse capture

Note: Z phase function is in developing.

Normally, the input frequency of terminal X0, X1 can reach 80KHz and 50KHz separately under single-phase and AB-phase mode; while other input terminals highest frequency can reach 10KHz

under single-phase and 5KHz under AB phase mode. If X input terminals are not used as high speed input port, they can be used as common input terminals. Frequency times in the table: '2' stands for fixed 2 times frequency, '4' stands for fixed 4 times frequency, '2/4' stands for 2 or 4 times frequency adjustable. The detailed port assignment is shown as below:

XD2-16												
	Single phase incremental mode							AB phase mode				
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC0	HSC2	HSC4	HSC6	HSC8
Highest frequency	10K	10K	10K					5K	5K	5K		
4 times frequency								2/4	2/4	2/4		
Counter interruption	√	√	√					√	√	√		
X000	U							A				
X001								B				
X002								Z				
X003		U							A			
X004									B			
X005									Z			
X006			U							A		
X007										B		

XD3-16、XL3-16												
	Incremental mode							AB phase mode				
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC0	HSC2	HSC4	HSC6	HSC8
Highest frequency	80K	10K	10K					50K	5K	5K		
4 times frequency								2/4	2/4	2/4		
Counter interruption	√	√	√					√	√	√		
X000	U							A				
X001								B				
X002								Z				
X003		U							A			
X004									B			
X005									Z			
X006			U							A		
X007										B		

XD2-24/32/42/48/60、XD3-24/32/42/48/60、XD5-16/24/32/42/48/60/80、XL3-32、XL5-16/32、XD3E-24/30/48/60、XD5E-24/30/48/60、XL3E-16/32、XL5E-16/32、XL5N-32T												
	Single phase incremental mode							AB phase mode				

	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC0	HSC2	HSC4	HSC6	HSC8
Highest frequency	80K	80K	10K					50K	50K	5K		
4 times frequency								2/4	2/4	2/4		
Counter interruption	√	√	√					√	√	√		
X000	U							A				
X001								B				
X002								Z				
X003		U							A			
X004									B			
X005									Z			
X006			U							A		
X007										B		
X010										Z		

XL3-16T4、XL5-16T4、XLME-16T4、XL5H-24A8(L)												
	Single phase incremental mode							AB phase mode				
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC0	HSC2	HSC4	HSC6	HSC8
Highest frequency	80K	80K	80K					50K	50K	50K		
4 times frequency								2/4	2/4	2/4		
Counter interruption	√	√	√					√	√	√		
X000	U							A				
X001								B				
X002								Z				
X003		U							A			
X004									B			
X005									Z			
X006			U							A		
X007										B		
X010										Z		

XD5-24T4/32T4/48T4/60T4、XDM-24T4/32T4/60T4/60T4L、XDC-24/32/48/60T、XD5E-30T4/60T4、XDME-30T4/60T4、XL5-32T4、XL5E-32T4、XLME-32T4、XLH-24A16/24A16L												
	Single phase incremental mode						AB phase mode					
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10
Highest frequency	80K	80K	80K	80K			50K	50K	50K	50K		

4 times frequency							2/4	2/4	2/4	2/4		
Counter interruption	√	√	√	√			√	√	√	√		
X000	U						A					
X001							B					
X002							Z					
X003		U						A				
X004								B				
X005								Z				
X006			U						A			
X007									B			
X010									Z			
X011				U						A		
X012										B		
X013										Z		

XDH-24A8/24A8L/30A16/30A16L/60T4/60A32/60A64												
	Single phase incremental mode						AB phase mode					
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10
Highest frequency	200K	200K	200K	200K			100K	100K	100K	100K		
4 times frequency							2/4	2/4	2/4	2/4		
Counter interruption	√	√	√	√			√	√	√	√		
X000	U						A					
X001							B					
X002							Z					
X003		U						A				
X004								B				
X005								Z				
X006			U						A			
X007									B			
X010									Z			
X011				U						A		
X012										B		
X013										Z		

XD5-24D2T2、XLH-30A32																
	Single phase incremental mode								AB phase mode							
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14
Highest	1M	1M	80K	80K					1M	1M	50K	50K				

XD5-24D2T2、XLH-30A32																
	Single phase incremental mode								AB phase mode							
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14
frequency																
4 times frequency									2/4	2/4	2/4	2/4				
Counter interruption	√	√	√	√					√	√	√	√				
X0+	U+								A+							
X0-	U-								A-							
X1+									B+							
X1-									B-							
X2																
X3+		U+							A+							
X3-		U-							A-							
X4+									B+							
X4-									B-							
X5																
X6			U								A					
X7											B					
X10																
X11				U								A				
X12												B				
X13																

[Note]: When XD5-24D4T4 uses AB phase 100 segment high-speed Counter interruption, the maximum counting frequency of HSC0 and HSC2 at 2 times frequency is 220K, and the maximum counting frequency of HSC0 and HSC2 at 4 times frequency is 110K.

XD5-48D4T4																
	Single phase incremental mode								AB phase mode							
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14
Highest frequency	1M	1M	1M	1M	80K	80K	80K	80K	1M	1M	1M	1M	50K	50K	50K	50K
4 times frequency									2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4
Counter interruption	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
X0+	U+								A+							
X0-	U-								A-							
X1+									B+							
X1-									B-							

XD5-48D4T4																
	Single phase incremental mode								AB phase mode							
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14
X2																
X3+		U+								A+						
X3-		U-								A-						
X4+										B+						
X4-										B-						
X5																
X6+			U+							A+						
X6-			U-							A-						
X7+										B+						
X7-										B-						
X10																
X11+				U+							A+					
X11-				U-							A-					
X12+											B+					
X12-											B-					
X13																
X14					U								A			
X15													B			
X16																
X17						U								A		
X20														B		
X21																
X22							U								A	
X23															B	
X24																
X25								U								A
X26																B
X27																

XD5-48T6/60T6、XD5E-60T6、XL5E-64T6													
	Single phase incremental mode						AB phase mode						
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	
Highest frequency	80K	80K	80K	80K	80K	80K	50K	50K	50K	50K	50K	50K	50K
4 times frequency							2/4	2/4	2/4	2/4	2/4	2/4	2/4
Counter interruption	√	√	√	√	√	√	√	√	√	√	√	√	√
X000	U						A						
X001							B						
X002							Z						

XD5-48T6/60T6、XD5E-60T6、XL5E-64T6												
	Single phase incremental mode						AB phase mode					
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10
X003		U						A				
X004								B				
X005								Z				
X006			U						A			
X007									B			
X010									Z			
X011				U						A		
X012										B		
X013										Z		
X014					U						A	
X015											B	
X016											Z	
X017						U						A
X020												B
X021												Z

[Note]: When XD5-48D4T4 uses AB phase 100 segment high-speed Counter interruption, the highest counting frequency of HSC0, HSC2, HSC4, and HSC6 at 2 times frequency is 220K, and the highest counting frequency of HSC0, HSC2, HSC4, and HSC6 at 4 times frequency is 110K.

XD5-60T10、XDM-60T10、XD5E-60T10、XDME-60T10、XL5-64T10、XL5E-64T10、XLME-64T10												
	Single phase incremental mode											
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC16	HSC18	HSC20	HSC22
Highest frequency	80K	80K	80K	80K	80K	80K	80K	80K	80K	80K		
4 times frequency												
Counter interruption	√	√	√	√	√	√	√	√	√	√		
X000	U											
X001												
X002												
X003		U										
X004												
X005												
X006			U									
X007												
X010												
X011				U								
X012												
X013												

XD5-60T10、XDM-60T10、XD5E-60T10、XDME-60T10、XL5-64T10、XL5E-64T10、XLME-64T10

	Single phase incremental mode											
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC16	HSC18	HSC20	HSC22
X014					U							
X015												
X016												
X017						U						
X020												
X021												
X022							U					
X023												
X024												
X025								U				
X026												
X027												
X030									U			
X031												
X032												
X033										U		
X034												

XD5-60T10、XDM-60T10、XD5E-60T10、XDME-60T10、XL5-64T10、XL5E-64T10、XLME-64T10

	AB phase mode											
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC16	HSC18	HSC20	HSC22
Highest frequency	50K	50K	50K	50K	50K	50K	50K	50K	50K	50K		
4 times frequency	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4		
Counter interruption	√	√	√	√	√	√	√	√	√	√		
X000	A											
X001	B											
X002	Z											
X003		A										
X004		B										
X005		Z										
X006			A									
X007			B									
X010			Z									
X011				A								
X012				B								
X013				Z								

XD5-60T10、XDM-60T10、XD5E-60T10、XDME-60T10、XL5-64T10、XL5E-64T10、
XLME-64T10

	AB phase mode											
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC16	HSC18	HSC20	HSC22
Highest frequency	50K	50K	50K	50K	50K	50K	50K	50K	50K	50K		
4 times frequency	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4		
Counter interruption	√	√	√	√	√	√	√	√	√	√		
X014					A							
X015					B							
X016					Z							
X017						A						
X020						B						
X021						Z						
X022							A					
X023							B					
X024							Z					
X025								A				
X026								B				
X027								Z				
X030									A			
X031									B			
X032									Z			
X033										A		
X034										B		
X035										Z		

5-3-5. AB Phase Counter's Frequency Multiplication Setting

To AB phase counter, users can modify the value in FLASH data registers SFD321, SFD322, SFD323.....SFD330 to set the frequency multiplication value. When the value is 1, it is 1 time frequency; when the value is 4, it is 4 times frequency.

Register	Function	Setting value	Content
SFD320	Frequency Multiplication of HSC0	2	2 times
		4	4 times
SFD321	Frequency Multiplication of HSC2	2	2 times
		4	4 times
SFD322	Frequency Multiplication of HSC4	2	2 times
		4	4 times
SFD323	Frequency Multiplication of HSC6	2	2 times
		4	4 times
SFD324	Frequency Multiplication of HSC8	2	2 times
		4	4 times
SFD325	Frequency Multiplication of HSC10	2	2 times
		4	4 times
SFD326	Frequency Multiplication of HSC12	2	2 times
		4	4 times
SFD327	Frequency Multiplication of HSC14	2	2 times
		4	4 times
SFD328	Frequency Multiplication of HSC16	2	2 times
		4	4 times
SFD329	Frequency Multiplication of HSC18	2	2 times
		4	4 times

Note:

※1: More about high speed counter application, please refer to XD/XL series PLC users' manual [Instruction] .

※2: To some special models, only one axis can be set as 2 times frequency or 4 times frequency, the other two axis are separately 2 times frequency and 4 times frequency.

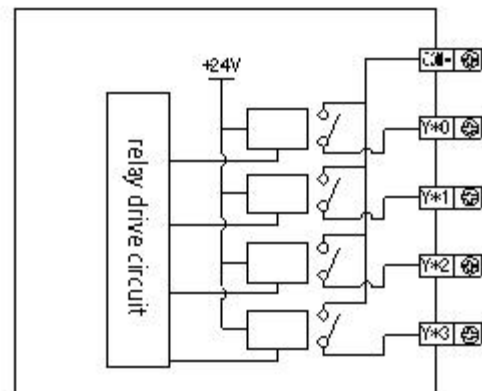
※3: After setting the SFD register, please restart the high speed counter (cut off the trigger condition and turn on again) to make the setting effective!

6 Output Specification and Wiring Methods

6-1. Output Specification

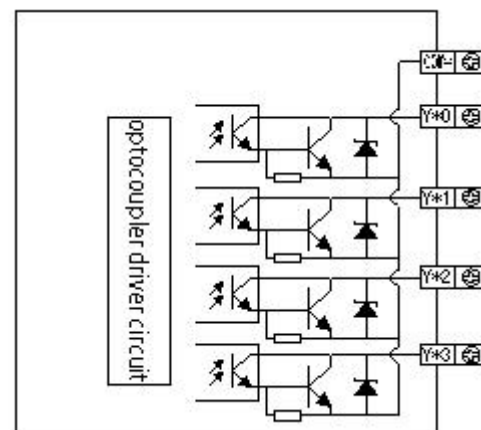
1) Relay Output

Items		Content
External power		Below AC250V, DC30V
Circuit insulation		Mechanical insulation
Action indicator		LED
Max load	Resistant load	3A
	Inductive load	80VA
	Lamp load	100W
Mini load		DC5V 2mA
Response time	OFF→ON	10ms
	ON→OFF	10ms



2) Normal Transistor Output

Items		Content
External power		Below DC5~30V
Circuit insulation		Light coupling insulation
Action indicator		LED
Max load	Resistant load	0.3A
	Inductive load	7.2W/DC24V
	Lamp load	1.5W/DC24V
Mini load		DC5V 2mA
Response time	OFF→ON	Below 0.2ms
	ON→OFF	Below 0.2ms



3) High Speed Pulse Output

Model	RT, T, Tn models						
High speed pulse output terminals	None	Y0, Y1	Y4, Y6	Y0~Y3	Y0~Y5	Y0~Y11	Y10, Y12, Y14, Y16
Corresponding model	XD1 XL1	Normal models	XD5-24D 2T2	XD3-24T4 XD3-32T4 XD5-24T4 XD5-32T4 XDM-24T4 XDM-32T4 XDM-60T4 XDM-60T4L XD3E-30NP	XD5-48T6 XD5-60T6 XD5E-60T6 XL5E-64T6	XDM-60T10 XD5E-60T10 XDME-60T10 XL5-64T10 XL5E-64T	XD5-48D4T4

				T4-E XD3E-48NP T4-E XD3E-60NP T4-E XD5E-30T4 XD5E-60T4 XDME-30T4 XDH-24A8 XDH-24A8L XDH-30A16 XDH-30A16 L XDH-60A32 XDH-60T4 XDH-60A64 XL3-16T4 XL5-16T4 XL5-32T4 XL5E-32T4 XLME-32T4 XLH-24A16 XLH-24A16 L XLH-30A32 XLH-30A32 L		10 XLME-64 T10	
External power supply	Below DC5~30V						
Action indicator	LED indicator						
Max current	50mA						
Max output frequency	100KHz (The maximum output frequency of Y2 and Y3 for XD3-24T4/32T4 is 10KHz)						

Note:

When using high-speed pulse output function, the PLC can output 100KHz ~ 200KHz pulse, but it can not guarantee the normal operation of all servos. Please connect about 500 ohms of resistance between the output and 24V power supply. PNP and NPN high-speed pulse output terminals are the same.

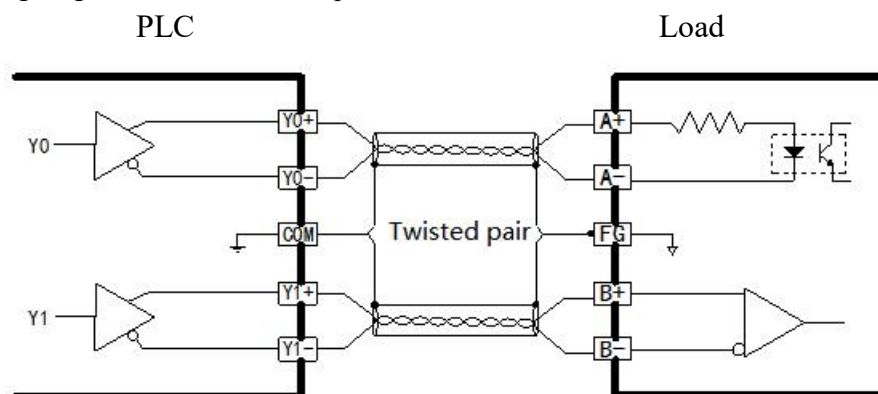
4) Differential High Speed Pulse Output

XD5 part of the models support differential output mode, the specification and wiring are shown as below:

Model	XD5-48D4T4-E	XD5-24D2T2-E
Differential output	Single phase Y0, Y2, Y4, Y6	Single phase Y0, Y2,
	AB phase: Y0/Y1, Y2/Y3,	AB phase: Y0/Y1, Y2/Y3

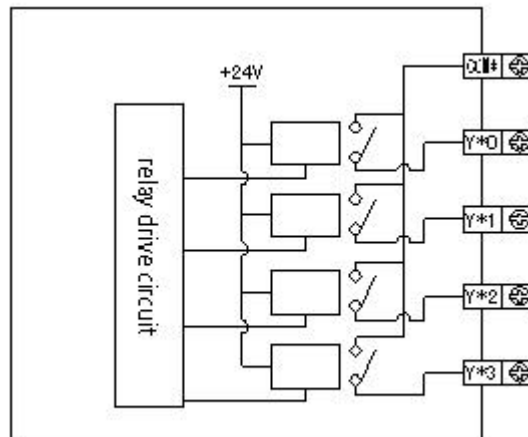
		Y4/Y5, Y6/Y7	
Output signal	5V differential signal		
Max frequency	920KHz		
Circuit insulation	Optoelectronic coupling insulation		
Action indicator	LED light		
Response time	OFF→ON	Below 0.2ms	

Wiring diagram of differential output:



6-2. Relay Output Type

1) Relay Output Circuit

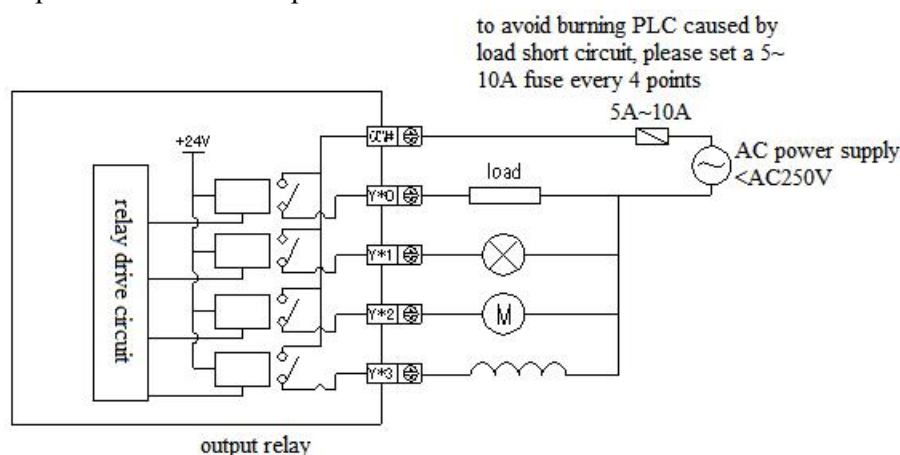


- **Output terminals**
Relay output type has 2~4 public terminals. So each public-terminal unit can drive power system with different voltages (E.g.: AC200V, AC100V, DC24V etc.) load.
- **Circuit's insulation**
Between the relay output coils and contacts, PLC's interior circuits and exterior load circuits are electrical insulating. Besides, each public terminal and block are separate from each other.
- **Action display**
LED lamp lights when output relays' coils energize, output contacts are ON.
- **Response time**
From the output relay energize (or cut off) to output contact ON (or OFF), the response time is about 10ms.
- **Output current**
The output current that current and voltage below AC250V can drive the load made up of resistance is 3A per point, inductive load below 80VA (AC100V or AC200V) and lamp load below 100W (AC100V or AC200V).
- **Open circuit's leak current**
When output contact is OFF, there will be no leak current and can directly drive Ne lamp etc.
- **The life of relay output contacts**
Standard life of AC inductive load such as contactor, electromagnetic valve: according to company's useful life test, about 500 thousand times for 20VA load; about 300 thousand times for 35VA; about 100 thousand for 80VA. But if the load parallel connect with surge absorber, the useful life will greatly improve.
- **Inductive load**
When the inductive load stops, there will be a large directional electromotive force between the load and the contact, and there will be arc discharge in this process.
- **Capacity load**

During the use of capacitive load, the instantaneous impact current is about 20~40 times of the conventional current. Please note that the impact current should conform to the current value in the resistance load specification.

[Note]: Capacity load may also exist when the load is composed of a circuit such as a frequency converter.

2) Output Connection Example



3) Constitution of output circuit

For DC inductive load, please parallel connect with freewheel diode. Otherwise, contactor useful life will greatly decrease. Please select freewheel diode that can stand inverse voltage over 5~10 times of load voltage and forward current over load current.

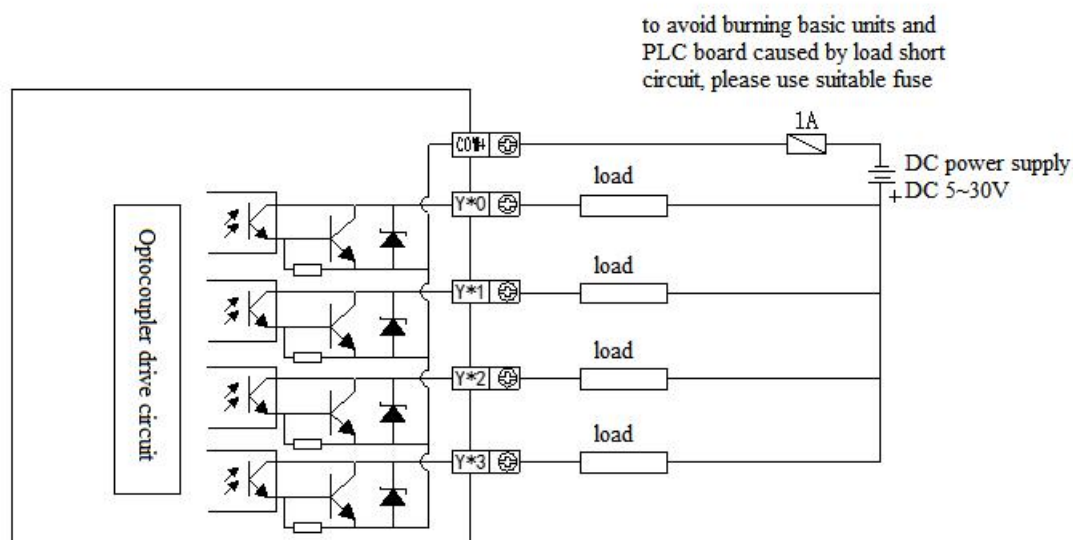
Parallel connection AC inductive load with surge absorber will decrease noise and increase service life of output delay.

DC load	AC load
The diagram shows a DC circuit with a positive terminal (+) and a negative terminal (-). A 'PLC output contact' is connected in series with an 'inductive load' (represented by a coil). A 'freewheel diode' is connected in parallel with the inductive load, with its cathode towards the positive terminal. The freewheeling diode shall meet the following requirements: 1. Reverse voltage $\approx (5\sim10) \times$ load voltage. 2. Forward current $>$ load current.	The diagram shows an AC circuit with two terminals connected to an AC source (represented by a circle with a tilde). A 'PLC output contact' is connected in series with an 'inductive load' (represented by a coil). A 'surge absorber' (represented by a rectangle with a diagonal line) is connected in parallel with the inductive load. The surge absorber shall meet the following requirements: 1. The rated voltage matches the load. 2. Electrostatic capacity $\approx 0.1\mu\text{f}$. 3. Resistance value $\approx 100\sim200\Omega$.

6-3. Transistor Output Type

Normal Transistor Output

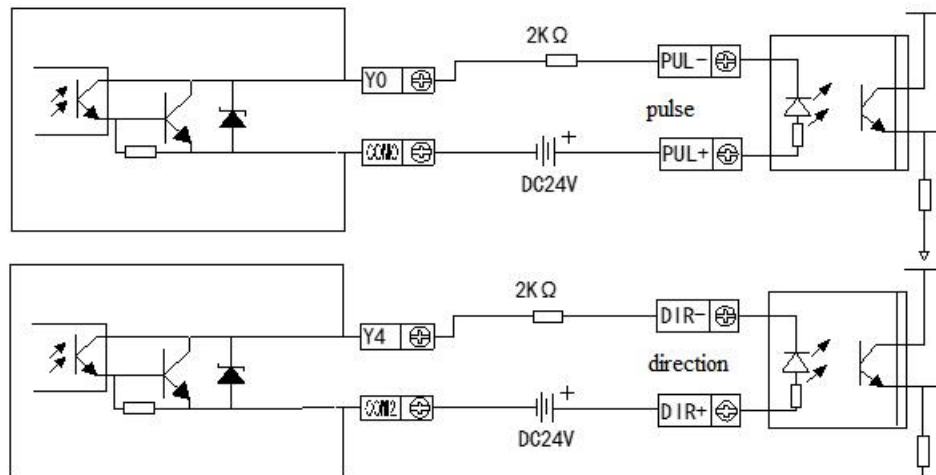
- Output Terminals
There are 1~4 COM outputs of CPU unit transistor outputs.
- External Power Supply
Please use DC5~30V power supply to drive the load.
- Circuit Isolation
Inside PLC, we use photoelectric couplers to isolate between internal circuits and output transistors; besides, the COM terminal blocks are separate from each other.
- Action Display
When photoelectric couplers drive, LED will be ON and the output transistors will be ON.
- Response Time
The time interval that PLC from photoelectric couplers energizing (or cutting) to transistor ON (or OFF) is below 0.2ms.
- Output current
The current it outputs is 0.3A per point. But limited by the temperature rising, every 4 points current add up to 0.5A.
- Open circuit current
Below 0.1mA



E.g.: Below is the connection of RT/T type PLC and servo driver diagram:

PLC side

Servo driver



(Make sure the driver's photoelectric coupling input terminal has 8~15mA reliable current)

7 Run, Debug, Maintenance

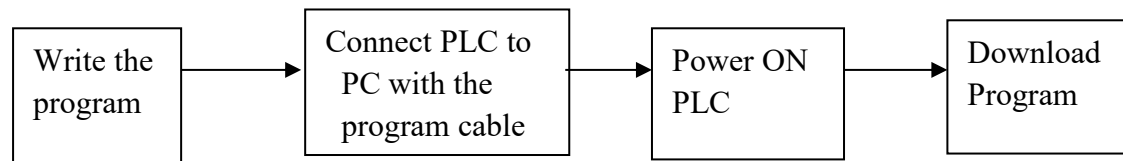
7-1. Run and Debug

1) Check the Products

Please check if the input/output terminals are correct and if there is any component missed when the users get the products. Generally, you can power on the PLC directly at this time and if products are normal, the PWR and RUN indicators will be ON.

2) Write and Download the Program

After confirming the products, write the program for PLC in your PC, and then download the program to PLC. The general operation steps are listed below:



Note: Please connect the programming cable before powering on the PLC, as this can effectively prevent the serial port from being burned out! The same operation applies to connecting the BD board to the expansion module and expanding the ED module.

3) Debug the Products

In ideal condition, PLC is in running mode. But if you find some mistakes in the program and need modify, you should write program to the running PLC again.

- (1) Connect PLC to PC with the program cable;
- (2) Upload the program in PLC;
- (3) Modify the uploaded program; and the modified program is suggested to save backup;
- (4) Pause the running of PLC, and download the modified program to PLC;
- (5) Use ladder monitor, free monitor to etc monitor PLC
- (6) If the program still can't fulfill your requirement, you can go on modify it and download to PLC.

4) LED on PLC

When PLC is running correctly, the PWR and RUN LED should be ON;

If ERR LED is ON, it indicates that PLC running is in error, please correct the program in time.

If PWR LED is OFF, it indicates that the power supply is in error, please check your wiring.

7-2. Daily Maintenance

1) Regular Check on Products

Even the PLC has certain anti-interference ability and strong stability, you should check the PLC regularly.

The check items include:

- Check if the input/output terminals, power supply terminals are loosen;
- Check if the ports are correct;
- Check if the PWR LED, I/O LED can be ON;
- Clear the dusts on PLC to avoid the dusts falling into PLC
- Manage to make PLC running and storage environment fits the standards described in chapter 2-1-1.

2) About the battery

The PLC can keep working if there is not component that could short its service life. But if the PLC supports clock function, its battery should be changed regularly.

- Battery service life normally is 3~5 years.
- Please change the battery once you find the battery power down.
- Please power the PLC on immediately after changing the battery. Otherwise, the battery power may run out.

3) Abandon

Abandon as industrial wast.

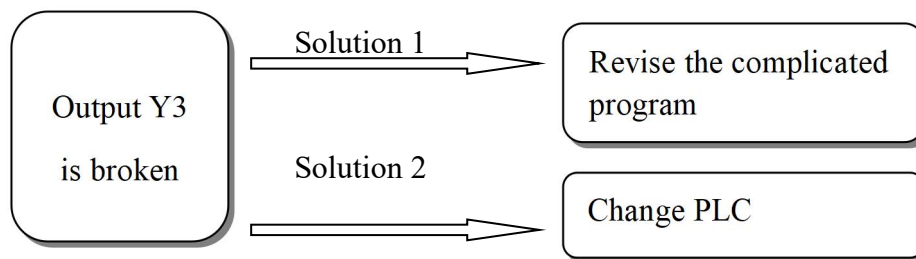
8 Switch between Soft Components

8-1. Function Summary

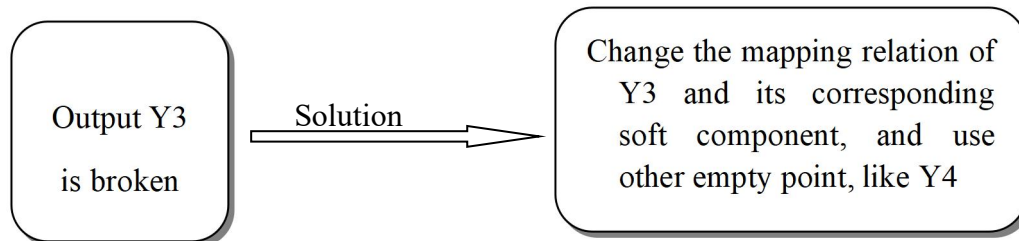
When the internal lighting coupling, relays or transistor are damaged, the corresponding input/output terminals will be out of use. Users either revise the program or ask the manufactures for help, which is very troublesome and affects the users' normal work schedule.

The new type PLC developed independently by Xinje can break the one-to-one correspondence, users only need to change the soft component's value by HMI, then the corresponding terminal will activate.

Before(Complicated and not effective)



Now (Simple, fast and effective)



8-2. Operation Method

It no needs to revise the program when we change the damaged input/output point mapping relation and replace the damaged point. In PLC special registers, we allocate certain address section for users to change the mapping relation. Users just need to find and revise the damaged input/output mapping register, and replace the value in this special register with value of replaced input/output.

Method 1: modify the FD register, below is the table for modifying the input/output points' mapping ID:

Table1 Mapping relation of the input and soft component

ID	Function	Description
SFD10	I00 correspond to X**	0 of input corresponds to the number of X**
SFD11	I01 correspond to X**	
SFD12	I02 correspond to X**	
.....		
SFD87	I77 correspond to X**	Default is 77 (octal number)

Table2 mapping relation of the output and soft component

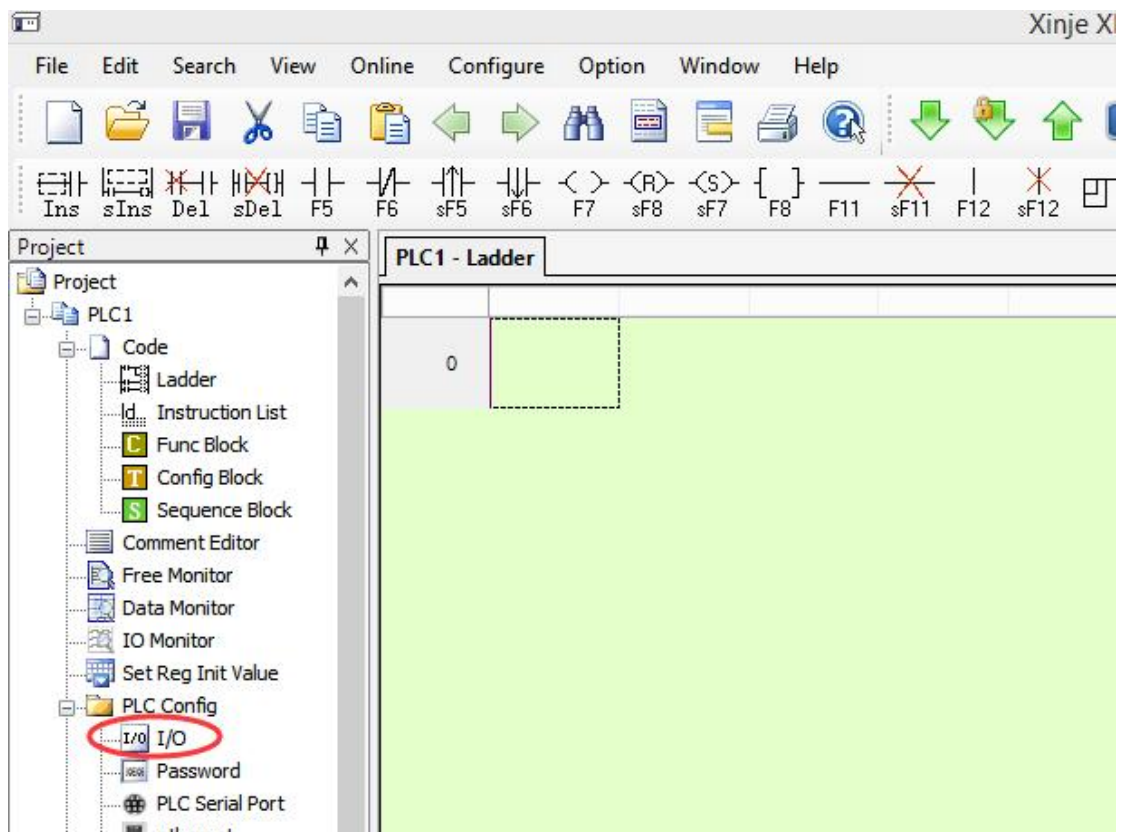
ID	Function	Description
SFD110	O00 correspond to Y**	0 of output corresponds to the number of Y**
SFD111	O01 correspond to Y**	
SFD112	O02 correspond to Y**	
.....		
SFD187*	O77 correspond to Y**	Default is 77 (octal number)

As show in the table above, the default value in SFD10 is 0. If we replace it with value '7', then all X0 in the program will correspond to external input X7. But meantime you should replace the value in SFD17 with 0, to realize exchange. Then original X0 will correspond to X7, and original X7 will correspond to external input X0.

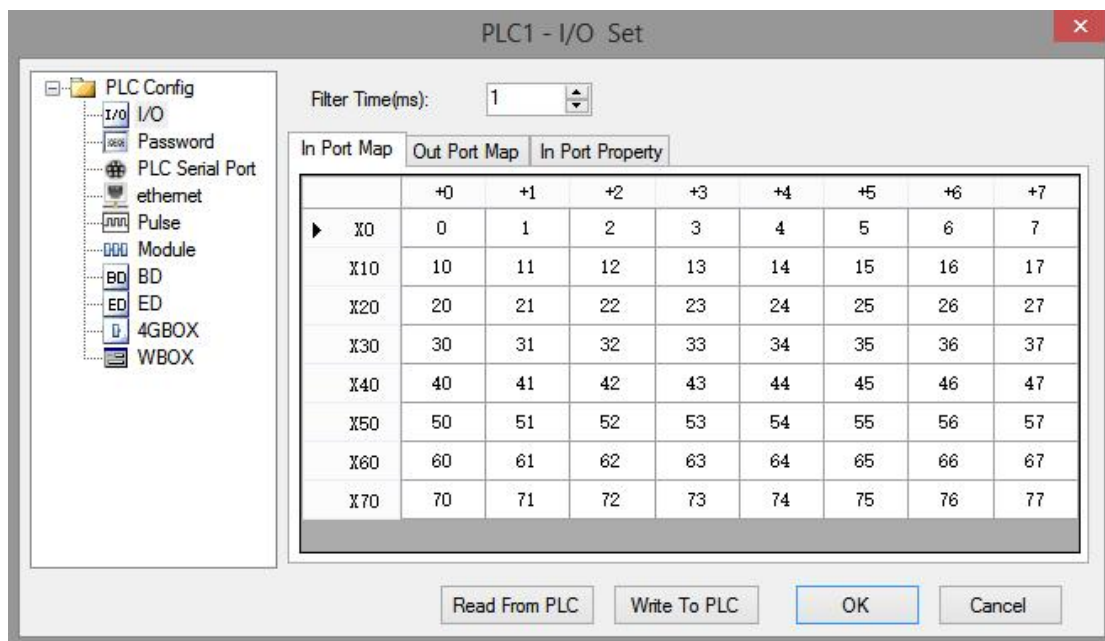
Note:

- ※1: After changing the mapping relation, please power on PLC again.
- ※2: When change the mapping relation, please pay attention, input/output data is octal number while ID is decimal number.
- ※3: Exchange the mapping relation when change. i.e. if modify X0 ID to be 5, make sure to change X5 ID to be 0;
- ※4: Mapping relation, one terminal corresponds to one soft component.
- ※5: Users can modify the SFD value in the software, please see method 2.

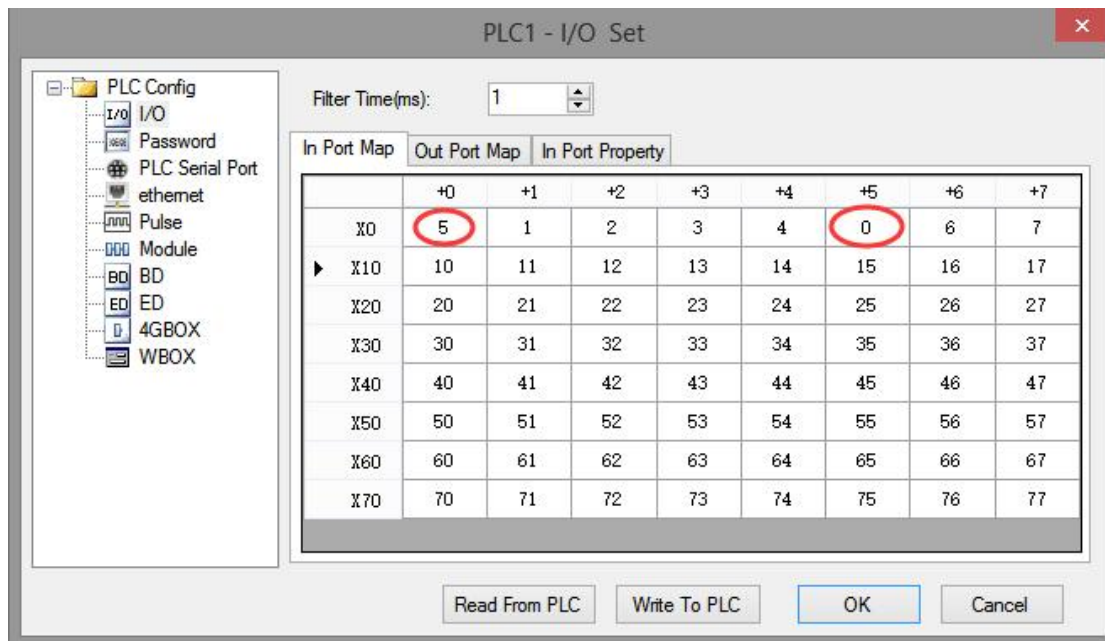
Method 2: Modify in the software directly. Click the project bar/PLC config/I/O.



Change it in below window:



For example, it needs to switch X0 and X5, please change the mapping value of X0 to 5, X5 to 0.



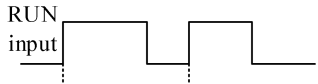
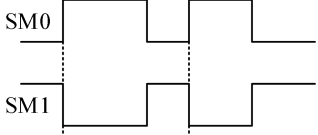
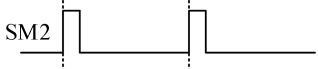
Appendix

Appendix 1 Special Soft Element Schedules

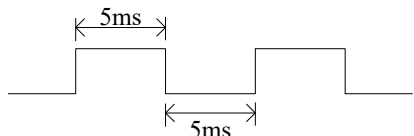
Appendix 1 mainly introduces the functions and uses of special software components, data registers, and FlashROM registers in XD/XL series PLCs. In addition, it also involves the allocation table of extended module addresses for users to quickly browse and search.

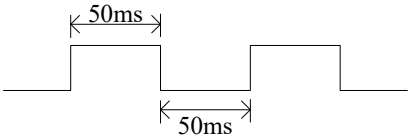
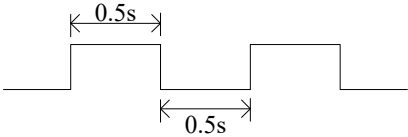
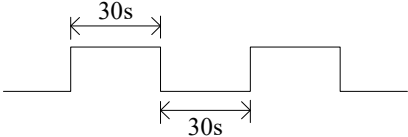
Appendix 1-1. Special Auxiliary Relay Schedule

1) Initial Status(SM0-SM7)

ID	Function	Description
SM000	Normally ON coil when operation	 SM000 keeps ON when PLC running
SM001	Normally OFF coil when operation	 SM001 keeps OFF when PLC running
SM002	Initial positive pulse coil	 SM002 is ON in first scan cycle
SM003	Initial negative pulse coil	 SM003 is OFF in first scan cycle
SM004	PLC running error	When SM4 sets ON, it indicates that there is an error in the operation of PLC. (Firmware version V3.4.5 and above supports this function by PLC)
SM005	Battery low alarm coil	When the battery voltage is less than 2.5V, SM5 will put ON (at this time, please replace the battery as soon as possible, otherwise the data will not be maintained)

2) Oscillatory pulse (SM11~SM14)

ID	Function	Description
SM011	10ms frequency cycle	

SM012	100ms frequency cycle	
SM013	1s frequency cycle	
SM014	1min frequency cycle	

3) Mark(SM20-SM22)

ID	Function	Description
SM020	Zero bit	SM020 is ON when plus/minus operation result is 0
SM021	Borrow bit	SM021 is ON when minus operation overflows
SM022	Carry bit	SM022 is ON when plus operation overflows

4) PC Mode(SM30-SM34)

ID	Function	Description
SM030	PLC initialization	PLC restored to factory settings
SM032	Retentive register reset	When SM032 is ON, ON/OFF mapping memory of HM,HS and current values of HT,HC,HD will be reset.
SM033	Clear user's program	When SM033 is ON, all PLC user's program will be cleared.
SM034	All output forbidden	When SM034 is ON, all PLC external contacts will be set OFF.

5) Stepping Ladde (SM40)r

ID	Function	Description
SM040	The process is running	Set ON when the process is running

6) Interruption ban(SM50-SM90)

ID	Address	Function	Description
SM050	I0000/I0001	Forbid input interruption 0	After executing EI instruction, the input interruption couldn't act independently when SM acts, even if the
SM051	I0100/I0101	Forbid input interruption 1	
SM052	I0200/I0201	Forbid input interruption 2	
SM053	I0300/I0301	Forbid input interruption 3	

SM054	I0400/I0401	Forbid input interruption 4	interruption is allowed. E.g. : when SM050 is ON, I0000/I0001 is forbidden.
.....			
SM069	I1900/I1901	Forbid input interruption 19	
SM070	I40**	Forbid timing interruption 0	After executing EI instruction, the timing interruption couldn't act independently when SM acts, even if the interruption is allowed.
SM071	I41**	Forbid timing interruption 1	
SM072	I42**	Forbid timing interruption 2	
SM073	I43**	Forbid timing interruption 3	
SM074	I44**	Forbid timing interruption 4	
.....			
SM089	I59**	Forbid timing interruption 19	
SM090		Forbid all interruptions	Forbid all interruptions

7) High Speed Ring Counter(SM99)

Address	Function	Note
SM099	High Speed Ring Counting enable	SM99 set ON, SD99 add one per 0.1ms, cycle between 0 and 32767

8) High speed count complete(SM100-SM109)

Address	Function	Note
SM100	HSC0 count complete flag(100 segments)	
SM101	HSC2 count complete flag(100 segments)	
SM102	HSC4 count complete flag(100 segments)	
SM103	HSC6 count complete flag(100 segments)	
SM104	HSC8 count complete flag(100 segments)	
SM105	HSC10 count complete flag(100 segments)	
SM106	HSC12 count complete flag(100 segments)	
SM107	HSC14 count complete flag(100 segments)	
SM108	HSC16 count complete flag(100 segments)	
SM109	HSC18 count complete flag(100 segments)	

9) High speed counter direction(SM110-SM119)

Address	Function	Note
SM110	HSC0 direction flag	
SM111	HSC2 direction flag	
SM112	HSC4 direction flag	
SM113	HSC6 direction flag	
SM114	HSC8 direction flag	
SM115	HSC10 direction flag	
SM116	HSC12 direction flag	
SM117	HSC14 direction flag	
SM118	HSC16 direction flag	

SM119	HSC18 direction flag	
-------	----------------------	--

10) High speed counter error(SM120-SM129)

Address	Function	Note
SM120	HSC0 error flag	
SM121	HSC2 error flag	
SM122	HSC4 error flag	
SM123	HSC6 error flag	
SM124	HSC8 error flag	
SM125	HSC10 error flag	
SM126	HSC12 error flag	
SM127	HSC14 error flag	
SM128	HSC16 error flag	
SM129	HSC18 error flag	

11) High speed counter overflow(SM130-SM139)

Address	Function	Note
SM130	HSC0 overflow flag	
SM131	HSC2 overflow flag	
SM132	HSC4 overflow flag	
SM133	HSC6 overflow flag	
SM134	HSC8 overflow flag	
SM135	HSC10 overflow flag	
SM136	HSC12 overflow flag	
SM137	HSC14 overflow flag	
SM138	HSC16 overflow flag	
SM139	HSC18 overflow flag	

12) Communication(SM140-SM193)

Series port	Address	Function	Note
Serial port 0	SM140	Modbus instruction execution flag	When the instruction starts to execute, set ON When execution is complete, set OFF
	SM141	X-NET instruction execution flag	When the instruction starts to execute, set ON When execution is complete, set OFF
	SM142	Free format communication sending flag	When the instruction starts to execute, set ON When execution is complete, set OFF

	SM143	Free format communication receive complete flag	When receiving a frame of data or receiving data timeout, set ON. Require user program to set OFF
Serial port 1	SM150	Modbus instruction execution flag	Same to SM140
	SM151	X-NET instruction execution flag	Same to SM141
	SM152	Free format communication sending flag	Same to SM142
	SM153	Free format communication receive complete flag	Same to SM143
Serial port 2	SM160	Modbus instruction execution flag	Same to SM140
	SM161	X-NET instruction execution flag	Same to SM141
	SM162	Free format communication sending flag	Same to SM142
	SM163	Free format communication receive complete flag	Same to SM143
Serial port 3	SM170	Modbus instruction execution flag	Same to SM140
	SM171	X-NET instruction execution flag	Same to SM141
	SM172	Free format communication sending flag	Same to SM142
	SM173	Free format communication receive complete flag	Same to SM143
Serial port 4	SM180	Modbus instruction execution flag	Same to SM140
	SM181	X-NET instruction execution flag	Same to SM141
	SM182	Free format communication sending flag	Same to SM142
	SM183	Free format communication receive complete flag	Same to SM143
Serial port 5	SM190	Modbus instruction execution flag	Same to SM140
	SM191	X-NET instruction execution flag	Same to SM141
	SM192	Free format communication sending flag	Same to SM142
	SM193	Free format communication	Same to SM143

		receive complete flag	
--	--	-----------------------	--

13) Sequence Function BLOCK(SM300-SM399)

ID	Function	Description
SM300	BLOCK1 running flag	SM300 will be ON when block1 is running
SM301	BLOCK2 running flag	SM301 will be ON when block2 is running
SM302	BLOCK3 running flag	SM302 will be ON when block3 is running
SM303	BLOCK4 running flag	SM303 will be ON when block4 is running
SM304	BLOCK5 running flag	SM304 will be ON when block5 is running
SM305	BLOCK6 running flag	SM305 will be ON when block6 is running
.....		
SM396	BLOCK97 running flag	SM396 will be ON when block97 is running
SM397	BLOCK98 running flag	SM397 will be ON when block98 is running
SM398	BLOCK99 running flag	SM398 will be ON when block99 is running
SM399	BLOCK100 running flag	SM399 will be ON when block100 is running

14) Error check(SM400-SM414)

ID	Function	Description
SM400	I/O error	ERR LED keeps ON, PLC don not run and output, check when power on
SM401	Expansion module communication error	
SM402	BD communication error	
.....		
SM405	No user program	Internal code check wrong
SM406	User program error	Implement code or configuration table check wrong
SM407	SSFD check error	ERR LED keeps ON, PLC don not run and output, check when power on
SM408	Memory error	Can not erase or write Flash

SM409	Calculation error	
SM410	Offset overflow	Offset exceeds soft element range
SM411	FOR-NEXT overflow	Reset when power on or users can also reset by hand.
SM412	Invalid data fill	When offset of register overflows, the return value will be SM372 value
SM413	Encryption check error	
SM414	Flash register data error	

15) Error Message(SM450-SM465)

ID	Function	Description
SM450	System error check	
SM451	Hardfault interrupt flag	
SM452		
SM453	SD card error	
SM454	Power supply is cut off	
.....		
SM460	Extension module ID not match	
SM461	BD/ED module ID not match	
SM462	Extension module communication overtime	
SM463	BD/ED module communication overtime	
SM464	Extension module communication data overflow	
SM465	BD/ED module communication data overflow	

16) Expansion Modules, BD Status(SM500)

ID	Function	Description
SM500	Module status read is finished	

Appendix 1-2. Special Data Register Schedule

1) Battery (SD5)

ID	Function	Description
SD005	Battery register	When the battery voltage is 3.1V, it displays 100; When the battery voltage is below 2.5V, it will display as 0. Please replace the battery as soon as possible, otherwise the data will not be able to be maintained after power failure. Note: This register is only applicable to non Ethercat bus models. Ethercat bus models use supercapacitors to write data to the internal chip for data retention.

2) Clock(SD10-SD019)

ID	Function	Description
SD010	Current scan cycle	100us, us is the unit
SD011	Min scan time	100us, us is the unit
SD012	Max scan time	100us, us is the unit
SD013	Second (clock)	0~59
SD014	Minute (clock)	0~59
SD015	Hour (clock)	0~23
SD016	Day (clock)	0~31
SD017	Month (clock)	0~12
SD018	Year (clock)	2000~2099
SD019	Week (clock)	0(Sunday)~6(Saturday)

3) Flag (SD020-SD031)

ID	Function	Note
SD020	Model type	
SD021	model(low-8) series(high-8)	
SD022	Compatiable system version(low) system version(high)	
SD023	Compatiable model version(low) model version(high)	
SD024	Model info	
SD025	Model info	
SD026	Model info	
SD027	Model info	
SD028	Suitable software version	
SD029	Suitable software version	
SD030	Suitable software version	
SD031	Suitable software version	

4) Step ladder(SD040)

ID	Function	Description
SD40	Flag of the executing process S	

5) High speed loop counter(SD99)

ID	Function	Description
SD099	High speed loop counter	When SM99 is ON, SD99 add 1 every 0.1ms, cycle from 0 to 32767

6) High Speed Counting(SD100-SD109)

ID	Function	Description	Note
SD100	Current segment (No. n segment)		HSC00
SD101	Current segment (No. n segment)		HSC02
SD102	Current segment (No. n segment)		HSC04
SD103	Current segment (No. n segment)		HSC06
SD104	Current segment (No. n segment)		HSC08
SD105	Current segment (No. n segment)		HSC10
SD106	Current segment (No. n segment)		HSC12
SD107	Current segment (No. n segment)		HSC14
SD108	Current segment (No. n segment)		HSC16
SD109	Current segment (No. n segment)		HSC18

7) High speed counter error(SD120-SD129)

ID	Function	Note
SD120	HSC0 error info	
SD121	HSC2 error info	
SD122	HSC4 error info	
SD123	HSC6 error info	
SD124	HSC8 error info	
SD125	HSC10 error info	
SD126	HSC12 error info	
SD127	HSC14 error info	
SD128	HSC16 error info	
SD129	HSC18 error info	

8) Communication(SD140~SD199)

Series port	ID	Function	Note
Serial port 0	SD140	Modbus read write instruction execution result	0: correct 100: receive error 101: receive overtime

			180: CRC error 181: LRC error 182: station error 183: send buffer overflow 400: function code error 401: address error 402: length error 403: data error 404: slave station busy 405: memory error(erase FLASH)
	SD141	X-Net communication result	0: correct 1: communication overtime 2: memory error 3: receive CRC error 420: XNET read write error
	SD142	Free communication format send result	0: correct 410: free format send buffer overflow
	SD143	Free communication format receive result	0: correct 410: send data length overflow 411: receive data short 412: receive data long 413: receive error 414: receive overtime 415: no start character 416: no end character
	SD144	Free communication format receive data numbers	In bytes, there are no start and stop characters
			
	SD149		
Serial port 1	SD150	Modbus read write instruction execution result	0: correct 100: receive error 101: receive overtime 180: CRC error 181: LRC error 182: station error 183: send buffer overflow 400: function code error 401: address error 402: length error 403: data error 404: slave station busy

			405: memory error(erase FLASH)
	SD151	X-Net communication result	0: correct 1: communication overtime 2: memory error 3: receive CRC error
	SD152	Free communication send result	0: correct 410: free format send buffer overflow
	SD153	Free communication format receive result	0: correct 410: send data length overflow 411: receive data short 412: receive data long 413: receive error 414: receive overtime 415: no start character 416: no end character
	SD154	Free communication format receive data numbers	In bytes, not include start and stop characters
			
	SD159		
Serial port 2	SD160	Modbus read write instruction execution result	0: correct 100: receive error 101: receive overtime 180: CRC error 181: LRC error 182: station error 183: send buffer overflow 400: function code error 401: address error 402: length error 403: data error 404: slave station busy 405: memory error(erase FLASH)
	SD161	X-Net communication result	0: correct 1: communication overtime 2: memory error 3: receive CRC error
	SD162	Free communication format send result	0: correct 410: free format send buffer overflow
	SD163	Free communication format	0: correct

		communication receive result	410: send data length overflow 411: receive data short 412: receive data long 413: receive error 414: receive overtime 415: no start character 416: no end character
	SD164	Free communication format receive data numbers	In bytes, there are no start and stop characters
			
	SD169		
Serial port 3	SD170~SD179		
Serial port 4	SD180~SD189		
Serial port 5	SD190~SD199		

9) Sequence Function Block(SD300-SD399)

ID	Function	Description
SD300	Executing instruction of BLOCK1	The value will be used when BLOCK monitors
SD301	Executing instruction of BLOCK2	The value will be used when BLOCK monitors
SD302	Executing instruction of BLOCK3	The value will be used when BLOCK monitors
SD303	Executing instruction of BLOCK4	The value will be used when BLOCK monitors
SD304	Executing instruction of BLOCK5	The value will be used when BLOCK monitors
SD305	Executing instruction of BLOCK6	The value will be used when BLOCK monitors
.....		
SD396	Executing instruction of BLOCK97	The value will be used when BLOCK monitors
SD397	Executing instruction of BLOCK98	The value will be used when BLOCK monitors
SD398	Executing instruction of BLOCK99	The value will be used when BLOCK monitors
SD399	Executing instruction of BLOCK100	The value will be used when BLOCK monitors

10) Error Check(SD400-SD414)

ID	Function	Note
SD400		
SD401	Extension module no. of communication error	Means module no.n is error
SD402	BD/ED module no. of communication error	
SD403	FROM/TO error type	
SD404	PID error type	
.....		
SD409	Calculation error code	1: divide by 0 error 2: MRST, MSET front operand address less than back operand 3: ENCO, DECO data bits of encoding and decoding instructions exceed the limit. 4: BDC code error 7: Radical sign error
SD410	The number of offset register D when offset crosses the boundary	
SD411		
SD412	Invalid data fill value (low 16 bits)	
SD413	Invalid data fill value (high 16 bits)	
SD414	Flash register data error type	

11) Error Check(SD450-SD465)

ID	Function	Description
SD450	1: Watchdog act (Default 200ms) 2: Control block application fail 3: Visit illegal address	
SD451	Firmware error type: 1: Register error 2: Bus error 3: Usage error	
SD452	Hardware error	
SD453	SD card error	
SD454	Power-off time	
SD460	Extension module ID not match	
SD461	BD/ED module ID not match	
SD462	Extension module communication overtime	
SD463	BD/ED module communication overtime	

SD464	Extension module communication data overflow	
SD465	BD/ED module communication data overflow	

12) Expansion Modules, BD Status(SD500-SD516)

ID	Function	Description	
SD500	Module number Expansion modules : #10000~10015 BD: #20000~20001 ED: #30000		
SD501~516	Expansion module, BD /ED status		16 registers

13) Module info(SD520-SD823)

ID	Function	Explanation	Note
SD520~SD535	Extension module info	Extension module 1	Each extension module, BD, ED occupies 16 registers
.....			
SD760~SD775	Extension module info	Extension module 16	
SD776~SD791	BD module info	BD module 1	
SD792~SD807	BD module info	BD module 2	
SD808~SD823	ED module info	ED module 1	

14) Expansion Module Error Information (SD860~SD943)

ID	Function	Description	Note
SD860	Error times of module read		Expansion module 1
SD861	Error types of module read	Module address error. Module accepted data length error. Module CRC parity error when PLC is accepting data. Module ID error. Module overtime error.	
SD862	Error times of module write		
SD863	Error types of module write		
SD864	Error times of module read		Expansion module 2
SD865	Error types of module read	Module address error. Module accepted data length error. Module CRC parity error when PLC	

		is accepting data. Module ID error. Module overtime error.	
SD866	Error times of module write		
SD867	Error types of module write		
.....			
SD920	Error times of module read		Expansion module 16
SD921	Error types of module read	Module address error. Module accepted data length error. Module CRC parity error when PLC is accepting data. Module ID error. Module overtime error.	
SD922	Error times of module write		
SD923	Error types of module write		
SD924	Error times of module read		
SD925	Error types of module read		BD module 1
SD926	Error times of module write		
SD927	Error types of module write		
SD928	Error times of module read		BD module 2
SD929	Error types of module read		
SD930	Error times of module write		
SD931	Error types of module write		
SD932	Error times of module read		ED module 1
SD933	Error types of module read		
SD934	Error times of module write		
SD935	Error types of module write		

15) Version info(SD990~SD993)

ID	Function	Explanation	Note
SD990	Firmware version date	Low 16-bit	
SD991	Firmware version compilation date	High 16-bit	
SD992	FPGA version compilation date	Low 16-bit	
SD993	FPGA version compilation date	High 16-bit	

16) Special function(HSD50~HSD55) (Firmware version V3.4.6 and above support)

ID	Function	Note
HSD50	FLASH erasure count	Check the data changing if the value of SFD, FD is abnormal
HSD51	Power failure detection	CPU working time after power failure, unit: 100us
HSD52	Last PLC run time (low 16-bit)	Double word, unit: 1s
HSD53	Last PLC run time (high 16-bit)	
HSD54	Current PLC run time (low 16-bit)	Double word, unit: 1s
HSD55	Current PLC run time (high 16-bit)	

17) Error history record(HSD80~HSD179) (Firmware version V3.4.6 and above support)

ID	Function	Note
HSD79	Error list index value	(1) XDC series PLC only supports to store 4 error history information; (2)This feature requires support from programming software version V3.5.3 (20190326) or higher..
HSD80~HSD84	Error information 1	
HSD85~HSD89	Error information 2	
HSD90~HSD94	Error information 3	
HSD95~HSD99	Error information 4	
HSD100~HSD104	Error information 5	
HSD105~HSD109	Error information 6	
HSD110~HSD114	Error information 7	
HSD115~HSD119	Error information 8	
HSD120~HSD124	Error information 9	
HSD125~HSD129	Error information 10	
HSD130~HSD134	Error information 11	
HSD135~HSD139	Error information 12	
HSD140~HSD144	Error information 13	
HSD145~HSD149	Error information 14	

HSD150~HSD154	Error information 15	
HSD155~HSD159	Error information 16	
HSD160~HSD164	Error information 17	
HSD165~HSD169	Error information 18	
HSD170~HSD174	Error information 19	
HSD175~HSD179	Error information 20	

Appendix 1-3. Special Flash Register schedule

* means it works only after repower on the PLC

1) I filtering

ID	Function	Description
SFD0*	Input filtering timing value, default 10ms	
SFD2*	Watchdog run-up time, default value is 200ms	

2) Special function configuration (Firmware version v3.4.6b and above)

ID	Function	Note
SFD3*	Special function configuration (default value is 0x0000)	Bit0: power down memory register fault handling. 0: the system will clear it; 1: it will not be processed. Bit1: execute user program in external interrupt program. 0: execute in task; 1: execute in interrupt (in this mode, user interrupt program cannot contain C language function block). This mode is usually used in the situation where the real-time performance of external signal is very high. Bit2: whether to raise the external interrupt priority, 0: no promotion, 1: promotion (to the highest).

3) Testing mode configuration (Firmware version v3.4.6b and above)

ID	Function	Note
SFD4*	Testing mode configuration (default value is 0x0000)	It is generally used to diagnose problems when PLC crashes. Bit0: enable test mode. 0: not enabled; 1: enabled (ERR light will continue to flash). Bit1: ERR light flashing state. 0: 1ms task flicker (1Hz); 1: 100us interrupt blink (10Hz). Bit2: whether to increase 100us interrupt priority. 0: no increase; 1: increase (to the highest).

4) I Mapping

ID	Function	Description	
SFD10*	I00 corresponds to X**	Input terminal 0 corresponds to X** number	0xFF means terminal bad, 0xFE means terminal idle

SFD11*	I01 corresponds to X**		
SFD12*	I02 corresponds to X**		
.....			
SFD73*	I77 corresponds to X**	Default value is 77(Octonary)	

5) O Mapping

ID	Function	Description	
SFD74*	O00 corresponds to Y**	Output terminal 0 correspond to Y** number	0xFF means terminal bad, 0xFE means terminal idle
		Default value is 0	
.....			
SFD137*	O77 corresponds to Y**	Default value is 77(Octonary)	

6) I Attribute

ID	Function	Description	
SFD138*	I00 attribute	Attribute of input terminal 0	0: positive logic others : negative logic
SFD139*	I01 attribute		
.....			
SFD201*	I77 attribute		

7) High Speed Counting

ID	Function	Description
SFD310	HSC0 single-phase counting edge configuration	0: Rising edge count, 1: Falling edge count, 2: Both rising and falling edges count
SFD311	HSC2 single-phase counting edge configuration	0: Rising edge count, 1: Falling edge count, 2: Both rising and falling edges count
SFD312	HSC4 single-phase counting edge configuration	0: Rising edge count, 1: Falling edge count, 2: Both rising and falling edges count
SFD313	HSC6 single-phase counting edge configuration	0: Rising edge count, 1: Falling edge count, 2: Both rising and falling edges count
SFD320	HSC0 frequency times	2 : 2 times frequency ; 4: 4 times frequency(effective at AB phase counting mode)
SFD321	HSC2 frequency times	Ditto
SFD322	HSC4 frequency times	Ditto
SFD323	HSC6 frequency times	Ditto

SFD324	HSC8 frequency times	Ditto
SFD325	HSC10 frequency times	Ditto
SFD326	HSC12 frequency times	Ditto
SFD327	HSC14 frequency times	Ditto
SFD328	HSC16 frequency times	Ditto
SFD329	HSC18 frequency times	Ditto
SFD330	Bit selection of HSC absolute and relative(24 segment)	bit0 corresponds to HSC0, bit1 corresponds to HSC2, and so on, bit9 corresponds to HSC18 0: relative 1: absolute
SFD331	Interrupt circulating of 24 segments high speed counting	bit0 corresponds to HSC0, bit1 corresponds to HSC2, and so on, bit9 corresponds to HSC18 0: single 1: loop
SFD332	CAM function	bit0 corresponds to HSC0, bit1 corresponds to HSC2, and so on, bit9 corresponds to HSC18 0: do not support CAM function 1: support CAM function

8) Expansion Module Configuration

ID	Function	Explanation
SFD340	Extension module configuration status(#1#2)	Configuration Status of Extension Modules 1 and 2
SFD341	Extension module configuration status(#3#4)	Configuration Status of Extension Modules 3 and 4
.....		
SFD347	Extension module configuration status(#15#16)	Configuration Status of Extension Modules 15 and 16
SFD348	BD module configuration status(#1#2)	Configuration Status of BD Modules 1 and 2
SFD349	ED module configuration status(#1)	Configuration Status of ED Module 1
SFD350~359	Extension module configuration	Configuration of Extension Module 1
SFD360~SFD369	Extension module configuration	Configuration of Extension Module 2
.....		
SFD500~SFD509	Expansion module configuration	16th expansion module configuration
SFD510~SFD519	BD module configuration	BD module 1 configuration

SFD520~SFD529	BD module configuration	BD module 2 configuration
SFD530~SFD539	ED module configuration	ED Module 1 Configuration

9) Communication

ID	Function	Note
SFD600	COM1 free format communication buffer bit numbers	0: 8-bit 1: 16-bit
SFD610	COM2 free format communication buffer bit numbers	0: 8-bit 1: 16-bit
SFD620	COM3 free format communication buffer bit numbers	0: 8-bit 1: 16-bit
SFD630	COM4 free format communication buffer bit numbers	0: 8-bit 1: 16-bit
SFD640	COM5 free format communication buffer bit numbers	0: 8-bit 1: 16-bit

Appendix 2 Instruction Schedule

In appendix 2 all instructions that XD/XL series PLC support will be listed, including basic instructions, application instructions, special function instructions and motion control instructions and all instructions' corresponding application range will also be listed.

This part helps the users refer to instruction functions quickly. More about instructions application, please refer to the XD/XL Series Programmable Controller User Manual for Basic Instructions and Motion Control. .

Appendix 2-1. Basic Instruction List

Mnemonic	Function
LD	Initial logical operation contact type: NO(normally open)
LDI	Initial logical operation contact type: NC (normally closed)
OUT	Final logic operation type: coil drive
AND	Serial connection of NO
ANI	Serial connection of NC
OR	Parallel connection of NO
ORI	Parallel connection of NC
LDP	Operation start of pulse rising edge
LDF	Operation start of pulse falling edge
ANDP	Serial connection of pulse rising edge
ANDF	Serial connection of pulse falling edge
ORP	Parallel connection of pulse rising edge
ORF	Parallel connection of pulse rising edge
LDD	Read directly from the contact state
LDDI	Read directly NC
ANDD	Read directly from the contact state and connect serially
ANDDI	Read NC and connect serially
ORD	Read directly from the contact state and parallel connection
ORDI	Read NC and parallel connection
OUTD	Output the point directly
ORB	Parallel connection of serial circuit
ANB	Serial connection of parallel circuit
MCS	New bus line start
MCR	Bus line return
ALT	Alternate coil state
PLS	Connect on a scan cycle of pulse rising edge
PLF	Connect on a scan cycle of pulse falling edge
SET	Set coil on
RST	Set coil off

OUT	Drive counting coil
RST	Set coil off and current value rest to zero
END	I/O process and return to step 0
GROUP	Instruction block fold start
GROUPE	Instruction block fold end
TMR	Timing

Appendix 2-2. Application Instruction List

Sort	Mnemonic	Function
Program flow	CJ	Condition jump
	CALL	Call subroutine
	SRET	Subroutine return
	STL	Flow start
	STLE	Flow end
	SET	Open the assigned flow and close the current flow
	ST	Open the assigned flow and do not close the current flow
	FOR	Start of a FOR-NEXT loop
	NEXT	END of a FOR-NEXT loop
	FEND	End of main program
Data compare	LD=※1	LD activate if (S1) =(S2)
	LD>※1	LD activate if (S1) >(S2)
	LD<※1	LD activate if (S1) <(S2)
	LD<>※1	LD activate if (S1) ≠(S2)
	LD>=※1	LD activate if (S1) ≥(S2)
	LD<=※1	LD activate if (S1) ≤(S2)
	AND=※1	AND activate if (S1) =(S2)
	AND>※1	AND activate if (S1) >(S2)
	AND<※1	AND activate if (S1) <(S2)
	AND<>※1	AND activate if (S1) ≠(S2)
	AND>=※1	AND activate if (S1) ≥(S2)
	AND<=※1	AND activate if (S1) ≤(S2)
	OR=※1	OR activate if (S1) =(S2)
	OR>※1	OR activate if (S1) >(S2)
	OR<※1	OR activate if (S1) <(S2)
	OR<>※1	OR activate if (S1) ≠(S2)
	OR>=※1	OR activate if (S1) ≥(S2)
	OR<=※1	OR activate if (S1) ≤(S2)
Data move	CMP※1	Data compare
	QCMP	64-bit data compare
	ZCP※1	Data zone compare

	MOV ^{※1}	Move
	BMOV	Block move
	PMOV	Block move
	FMOV ^{※1}	Multi-bit data move
	EMOV	Float move
	EDMOV	Double precision floating point number transmission
	FWRT ^{※1}	FlashROM written
	MSET	Multi data set
	ZRST	Zone reset
	SWAP	Switch high bytes and low bytes
	XCH ^{※1}	Exchange data
	QMOV	64-bit move
	QFWRT	64-bit FlashROM write in
Data operation	ADD ^{※1}	Addition
	SUB ^{※1}	Subtraction
	MUL ^{※1}	Multiplication
	DIV ^{※1}	Division
	INC ^{※1}	Increase 1
	DEC ^{※1}	Decrease 1
	MEAN ^{※1}	Mean
	WAND ^{※1}	Logic and
	WOR ^{※1}	Logic or
	WXOR ^{※1}	Logic exclusive or
	CML ^{※1}	Complement
	NEG ^{※1}	Negative
	QADD	64-bit addition
	QMUL	64-bit multiplication
	QINC	64-bit increase 1
	QSUB	64-bit subtraction
	QDIV	64-bit division
	QDEC	64-bit decrease 1
Data shift	SHL ^{※1}	Arithmetic shift left
	SHR ^{※1}	Arithmetic shift right
	LSL ^{※1}	Logic shift left
	LSR ^{※1}	Logic shift right
	ROL ^{※1}	Rotation shift left
	ROR ^{※1}	Rotation shift right
	SFTL ^{※1}	Bit shift left
	SFTR ^{※1}	Bit shift right
	WSFL	Word shift left
	WSFR	Word shift right
Data switch	WTD	Single word integer convert to double word integer

	FLT ^{※1}	16 bits integer convert to float
	FLTD ^{※1}	64 bits integer convert to float
	INT ^{※1}	Float convert to integer
	BIN	BCD convert to binary
	BCD	Binary convert to BCD
	ASCI	Hex convert to ASCII
	HEX	ASCII convert to Hex
	DECO	Coding
	ENCO	High bit coding
	ENCOL	Low bit coding
	QFLTD	64 bits integer to double precision floating-point number
	QINTD	double precision floating-point number to 64 bits integer
	DFLTD	Convert doubleword integer to double precision floating-point number
	DINTD	Convert double precision floating point number to doubleword integer
	BDWTD	Double digit integer to four digit integer batch conversion
	BECON	Floating point number to double precision floating point number batch conversion
	DWTD	Convert two character integers to four character integers
	ECON	Convert floating-point numbers to double precision floating-point numbers
Float Operation	ECMP ^{※2}	Float compare
	EZCP ^{※2}	Float zone compare
	EADD ^{※2}	Float addition
	ESUB ^{※2}	Float subtraction
	EMUL ^{※2}	Float multiplication
	EDIV ^{※2}	Float division
	ESQR ^{※2}	Float square root
	SIN ^{※2}	Sine
	COS ^{※2}	Cosine
	TAN ^{※2}	tangent
	ASIN ^{※2}	Float arcsin
	ACOS ^{※2}	Float arccos
	ATAN ^{※2}	Float arctan
	EDADD	Double precision addition
	EDMUL	Double precision multiplication
	EDCMP	Double precision compare
	EDSUB	Double precision subtraction

	EDDIV	Double precision division
Clock	TRD	Read RTC data
	TWR	Write RTC data
	MOV	Precise RTC BD board data reading
	TO	Precise RTC BD board data writing
	TADD	Clock data add
	TSUB	Clock data subtraction
	HTOS	Hour, minute, second convert to second
	STOH	Second convert to hour, minute, second
	TCMP	Time (hour, minute, second) comparison
	DACMP	Date (year, month, day) comparison

Note:

※1: All the instructions are 16 bits and no 32 bits format in general. ※1 has 32 bits. 32 bits instructions are added D in front of its 16 bits instruction. Such as ADD(16 bits) / DADD(32 bits).

※2: These instructions are 32 bits, and have no 16 bits format.

Appendix 2-3. Special Instructions List

Sort	Mnemonic	Function
Pulse	PLSR ^{※1}	multi-segment pulse output
	PLSF ^{※1}	variable frequency pulse output
	DRVI ^{※2}	Relative single segment pulse output
	DRVA ^{※2}	Absolute single segment pulse output
	STOP	Pulse stop
	GOON	Pulse continue
	ZRN ^{※1}	Mechanical origin return
Motion Control	DRV	Quick location
	LIN	linear interpolation
	CCW	Reverse arc (center coordinates)
	CCW_R	Reverse arc (circle radius)
	FOLLOW	Follow up (single-phase incremental mode)
	DRVR	Quick positioning (polar coordinates)
	CW	Circular arc (center coordinates)
	CW_R	Straight arc (radius of circle)
	ARC	Three-point arc
	FOLLOW_AB	Follow up (AB phase mode)
ETHERCAT Bus-H	A_PWR	Axis Enable

Sport - Single Axis Function	A_WRITE	Modify the electrical origin point
	A_STOP	Stop exercising
	A_MOVEA	Absolute position motion
	A_CMOVEA	Continuous motion in absolute position
	A_VELMOVE	Speed controlled motion
	A_HOME	HM returns to its original state
	A_GEARIN	Gear binding
	A_DRVA	Simple absolute position motion
	A_PROBE	Probe function
	A_CYCVEL	Periodic speed control motion
	A_PLSR	Multistage velocity displacement
	A_FOLLOW	Pulse following
	A_PITCHCOMP	Pitch compensation
	X_UPDATEPARA	Continuous electric updates
	A_RST	Axis error clearing
	A_MODE	Modify control mode
	A_HALT	Pause
	A_MOVER	Relative position motion
	A_CMOVER	Continuous movement in relative position
	A_MOVESUP	Superposition motion
	A_ZRN	Return to origin
	A_GEAROUT	Gear unbinding
	A_DRVI	Simple relative position motion
	A_CYCPOS	Periodic position control motion
	A_CYCTRQ	Periodic torque control motion
	A_PLSF	Variable speed output
	A_CYCSUP	Periodic superposition
	A_BACKLASHCOMP	Backgap compensation
ETHERCAT Bus-H Motion Axis Group Function	G_PWR	Axis group enable
	G_PTP	point-to-point motion
	G_CIRCLE	Circular interpolation
	G_MOVSUP	Superposition motion
	G_COMPOFF	Compensation cancellation
	G_GOON	Continue exercising
	G_PATHSEL	Select processing path
	G_SETOVRD	Modify magnification
	G_CFGAXIS	Modify the composition axis
	G_LINE	linear interpolation
	G_HELICAL	Spiral motion

	G_COMPON	Compensatory motion
	G_INTR	Interrupt movement
	G_PATHMODE	Specify path mode selection
	G_PATHMOV	Path motion
ETHERCAT Bus-H Motion Cam Function	CAMTBLSEL	Cam table loading
	CAMOUT	Cam release
	CAMRD	Cam reading
	CAMPOINTADD	Key points increase
	CAMTBLDEL	Unloading of cam table
	CAMIN	Cam start
	CAMPHASE	phase compensation
	CAMWR	Cam table writing
	CAMPOINTDEL	Key point deletion
High speed count	CNT※2	Single-phase high speed count
	CNT_AB※2	AB phase high speed count
	RST	High speed counter reset
	DMOV※2	Read and write the high speed counter
High speed counter interruption	CNT※2	Single-phase 100 segments high speed counter(with interruption)
	CNT_AB※2	AB-phase 100 segments high speed counter(with interruption)
MODBUS communication	COLR	MODBUS coil read
	INPR	MODBUS input coil read
	COLW	MODBUS single coil write
	MCLW	MODBUS multi coil write
	REGR	MODBUS register read
	INRR	MODBUS input register read
	REGW	MODBUS single register write
	MRGW	MODBUS multi register write
	SEND	Free format communication for sending data
	CFGCR	Reading serial port parameters
	RCV	Free format communication for receiving data
	CFGCW	Writing of serial port parameters
Ethernet communication	S_OPEN	Create TCP connection/UDP port listening
	S_SEND	Free format communication sending
	M_TCP	MODBUS TCP communication
	S_CLOSE	Communication terminated
	S_RCV	Free format communication

		reception
	IPSET	IP address setting
CANopen communication	EC_SDORD	SDO read instruction
	EC_SDOWR	SDO write instruction
Precision timing	STR ^{※2}	Precision timing
	DMOV ^{※1}	Read precise timing register
	STOP	Stop precise timing
Interrupt	EI	Enable interrupt
	DI	Disable interrupt
	IRET	Interrupt return
BLOCK	SBSTOP	BLOCK stop
	SBGOON	Carry on the suspensive BLOCK
	WAIT	Wait
	FROM	Read module/BD data
	TO	Write module/BD data
Others	PWM ^{※1}	Pulse width modulation
	FRQM	Frequency measurement
	PID	PID operation control
	NAME_C	C function block

Note:

※1: All the instructions are 16 bits except the instructions with ※1 which has 32 bits. 32 bits instructions are added D in front of its 16bits instruction. Such as ADD(16bits) / DADD(32bits).

※2: The table doesn't include X-NET instructions, please refer to [X-NET fieldbus manual].

Appendix 3 PLC Configuration List

This section is mainly for the convenience of users to check the functional configuration of various series and models of products. Through this table, it is easy to make judgments on the selection of product models. For detailed introductions of the following functions, please refer to the "XD/XL Series Programmable Controller User Manual [Basic Instructions]" and "XD/XL Series Programmable Controller User Manual [Positioning Control]".

○ Selectable × Not support √ Support

Series	USB	232	485	Ethernet	Extension module	BD	ED	HSC SP/AB		Pulse output		External interrupt
								OC	Diff	normal	Differen- tial	
XD1												
XD1-10	×	2	×	×	×	×	×	×	×	×	×	6
XD1-16	×	2	×	×	×	×	×	×	×	×	×	6
XD1-24	×	2	1	×	×	×	×	×	×	×	×	10
XD1-32	×	2	1	×	×	×	×	×	×	×	×	10
XD2												
XD2-16	×	2	1	×	×	×	1	3	×	2	×	6
XD2-24	×	2	1	×	×	1	1	3	×	2	×	10
XD2-32	×	2	1	×	×	1	1	3	×	2	×	10
XD2-42	×	2	1	×	×	1	1	3	×	2	×	10
XD2-48	×	2	1	×	×	2	1	3	×	2	×	10
XD2-60	×	2	1	×	×	2	1	3	×	2	×	10
XD3												
XD3-16	1	1	1	×	10	×	1	3	×	2	×	6
XD3-24	1	1	1	×	10	1	1	3	×	2	×	10
XD3-24T4	1	1	1	×	10	1	1	3	×	4	×	10
XD3-32	1	1	1	×	10	1	1	3	×	2	×	10
XD3-32T4	1	1	1	×	10	1	1	3	×	4	×	10
XD3-42	1	1	1	×	10	1	1	3	×	4	×	10
XD3-48	1	1	1	×	10	2	1	3	×	2	×	10
XD3-60	1	1	1	×	10	2	1	3	×	2	×	10
XD5												
XD5-16	1	1	1	×	16	×	1	3	×	2	×	6
XD5-24	1	1	1	×	16	1	1	3	×	2	×	10
XD5-32	1	1	1	×	16	1	1	3	×	2	×	10
XD5-42	1	1	1	×	16	1	1	3	×	2	×	10
XD5-48	1	1	1	×	16	2	1	3	×	2	×	10
XD5-60	1	1	1	×	16	2	1	3	×	2	×	10
XD5-80	1	1	1	×	16	2	1	3	×	2	×	10
XD5-24T4	1	1	1	×	16	1	1	4	×	4	×	10

Series	USB	232	485	Ethernet	Extension module	BD	ED	HSC SP/AB		Pulse output		External interrupt
								OC	Diff	normal	Differential	
XD5-24D2T2	1	1	1	×	16	1	1	2	2	2	2	10
XD5-32T4	1	1	1	×	16	1	1	4	×	4	×	10
XD5-48T4	1	1	1	×	16	2	1	4	×	4	×	10
XD5-48D4T4	1	1	1	×	16	2	1	4	4	4	4	10
XD5-48T6	1	1	1	×	16	2	1	6	×	6	×	10
XD5-60T4	1	1	1	×	16	2	1	4	×	4	×	10
XD5-60T6	1	1	1	×	16	2	1	6	×	6	×	10
XD5-60T10	1	1	1	×	16	2	1	10	×	10	×	10
XDM												
XDM-24T4	1	1	1	×	16	1	1	4	×	4	×	10
XDM-32T4	1	1	1	×	16	1	1	4	×	4	×	10
XDM-60T4	1	1	1	×	16	2	1	4	×	4	×	10
XDM-60T4L	1	1	1	×	16	2	1	4	×	4	×	10
XDM-60T10	1	1	1	×	16	2	1	10	×	10	×	10
XDC												
XDC-24	×	2	1	×	16	1	1	4	×	2	×	10
XDC-32	×	2	1	×	16	1	1	4	×	2	×	10
XDC-48	×	2	1	×	16	2	1	4	×	2	×	10
XDC-60	×	2	1	×	16	2	1	4	×	2	×	10
XD3E												
XD3E-24	×	1	1	2	10	1	1	3	×	2	×	10
XD3E-30	×	1	1	2	10	1	1	3	×	2	×	10
XD3E-48	×	1	1	2	10	2	1	3	×	2	×	10
XD3E-60	×	1	1	2	10	2	1	3	×	2	×	10
XD3E-30NPT4	×	1	1	2	10	1	1	3	×	4	×	10
XD3E-48NPT4	×	1	1	2	10	2	1	3	×	4	×	10
XD3E-60NPT4	×	1	1	2	10	2	1	3	×	4	×	10
XD5E												
XD5E-24	×	1	1	2	16	1	1	3	×	2	×	10
XD5E-30	×	1	1	2	16	1	1	3	×	2	×	10
XD5E-30T4	×	1	1	2	16	1	1	4	×	4	×	10
XD5E-48	×	1	1	2	16	2	1	3	×	2	×	10
XD5E-60	×	1	1	2	16	2	1	3	×	2	×	10
XD5E-60T4	×	1	1	2	16	2	1	4	×	4	×	10
XD5E-60T6	×	1	1	2	16	2	1	6	×	6	×	10
XD5E-60T10	×	1	1	2	16	2	1	10	×	10	×	10
XDME												
XDME-30T4	×	1	1	2	16	1	1	4	×	4	×	10
XDME-60T4	×	1	1	2	16	2	1	4	×	4	×	10
XDME-60T10	×	1	1	2	16	2	1	10	×	10	×	10

Series	USB	232	485	Ethernet	Extension module	BD	ED	HSC SP/AB		Pulse output		External interrupt
								OC	Diff	normal	Differen tial	
XDH												
XDH-24A8	×	1	1	2	16	×	1	4	×	4	×	10
XDH-24A8L	×	1	1	2	16	×	1	4	×	4	×	10
XDH-30A16	×	1	1	2	16	×	1	4	×	4	×	10
XDH-30A16L	×	1	1	2	16	×	1	4	×	4	×	10
XDH-60A32	×	1	1	2	16	1	1	4	×	4	×	10
XDH-60A64	×	1	1	2	16	1	1	4	×	4	×	10
XDH-60T4	×	1	1	2	16	1	1	4	×	4	×	10
XL1												
XL1-16	×	2※ ¹	1	×	×	×	×	×	×	×	×	6
XL1-16T-U	1	1	1	×	×	×	×	×	×	×	×	6
XL3												
XL3-16	1	1	1	×	10	×	1	3	×	2	×	6
XL3-16T4	1	1	1	×	10	×	1	3	×	4	×	6
XL3-32	1	1	1	×	10	×	1	3	×	2	×	10
XL3E												
XL3E-16T	×	1	1	2	10	×	1	3	×	2	×	6
XL3E-32T	×	1	1	2	16	×	1	3	×	2	×	10
XL5												
XL5-16	1	1	1	×	16	×	1	3	×	2	×	6
XL5-16T4	1	1	1	×	16	×	1	3	×	4	×	6
XL5-32	1	1	1	×	16	×	1	3	×	2	×	10
XL5-32T4	1	1	1	×	16	×	1	4	×	4	×	10
XL5-64T10	1	1	1	×	16	×	1	10	×	10	×	10
XL5E												
XL5E-16	×	1	1	2	16	×	1	3	×	2	×	6
XL5E-32	×	1	1	2	16	×	1	3	×	2	×	10
XL5E-32T4	×	1	1	2	16	×	1	4	×	4	×	10
XL5E-64T6	×	1	1	2	16	×	1	6	×	6	×	10
XL5E-64T10	×	1	1	2	16	×	1	10	×	10	×	10
XL5N												
XL5N-32	×	1	1	2	16	×	1	3	×	2	×	10
XLME												
XLME-16T4	×	1	1	2	16	×	1	3	×	4	×	6
XLME-32T4	×	1	1	2	16	×	1	4	×	4	×	10
XLME-64T10	×	1	1	2	16	×	1	10	×	10	×	10
XL5H												
XL5H-24A8	×	1	1	2	16	×	1	3	×	2	×	10
XL5H-24A8L	×	1	1	2	16	×	1	3	×	2	×	10
XLH												

Series	USB	232	485	Ethernet	Extension module	BD	ED	HSC SP/AB		Pulse output		External interrupt
								OC	Diff	normal	Differential	
XLH-24A16	×	1	1	2	16	×	1	4	×	4	×	10
XLH-24A16L	×	1	1	2	16	×	1	4	×	4	×	10
XLH-30A32	×	1	1	2	16	×	1	2	2	4	×	10
XLH-30A32L	×	1	1	2	16	×	1	2	2	4	×	10

Note:

- 1: The XL1-16T with hardware version below H4 has only one RS232 port (COM1).
- 2: All models are equipped with clock function as standard.
- 3: Only models with transistor output support the pulse output function.

Appendix 4 Common Questions Q&A

When running or debugging a PLC, users may encounter some difficult problems due to a lack of experience. This section mainly focuses on the problems that users are most likely to encounter and proposes solutions for their reference.

Q1: Why the coil is not set when the condition is satisfied?

A1: The possible reasons:

- (1) Users may use one coil for many times, which leads to double coils output. And at this time, the later coil has priority.
- (2) Coil may be reset, users can find the reset point by monitor function and modify the program.

Q2: What's the difference between COM1 and COM2?

A2: Both COM1 and COM2 support Modbus-RTU and Modbus-RTU/ASCII format. The difference is COM1 parameters can be set to default value by power on and off function of PLC.

Q3: Why PLC can not communicate with other devices?

A3: The possible reasons:

- (1) communication parameters: PLC com port and device parameters must be the same.
- (2) communication cable: Confirm connection correct and good and change cable to try again.
- (3) communication serial port: Check the port by downloading PLC program. Rule out this problem if download successfully.
- (4) contact manufacturer if all the above are ruled out.

Q4: How long can the PLC battery be used?

A4: Normally for 2~3 years.

XINJE



WUXI XINJE ELECTRIC CO., LTD.

No. 816, Jianzhu West Road, Binhu District, Wuxi City,
Jiangsu Province, China

en.xinje.com

Mail: sales@xinje.com tech@xinje.com

Whatsup: +86 180 6833 9655