XINJE

XDQ/XLQ Series PLC

User Manual［Hardware］

WUXI XINJE ELECTRIC CO., LTD.

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XINJE

XDQ/XLQ Series PLC

User Manual［Hardware］

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General Descriptions

- Thank you for purchasing XINJE XDQ/XLQ series PLC.
- This manual mainly introduces XDQ/XLQ 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.
- Please set up backup and safety functions by yourself to avoid machine failure or loss that may be caused by the malfunction of this product.

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

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April 2025

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 clastic 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 24 V or 0V terminals of the controller or expansion module. May cause damage to the product.

2. Use 2mm^2 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 clastic 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.

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Preface

Manual Content Structure

This manual includes XDQ/XLQ series PLC types and system constitutions. It mainly introduces XDQ/XLQ series PLC basic units' specification, I/O wiring, run and maintenance, and XDQ/XLQ series PLC expansion modules' parameters, appearance and features etc.
This manual has 10 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 XDQ/XLQ 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 XDQ/XLQ series programmable logic controllers (PLCs).
3	System Configuration	This chapter mainly introduces the system architecture centered on XDQ/XLQ 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 XDQ/XLQ 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 XDQ/XLQ series programmable logic controllers (PLCs).
6	Output Specifications &	This chapter mainly introduces the output specifications, relay output processing and

	Wiring Methods	transistor output processing of XDQ/XLQ series programmable logic controllers (PLCs).
7	Operation, Commissioning and Maintenance	This chapter mainly describes the operation, commissioning procedures and routine maintenance of XDQ/XLQ series programmable logic controllers (PLCs).
8	Soft Element Switching	This chapter introduces a distinctive feature of XDQ/XLQ 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 XDQ/XLQ series programmable logic controllers (PLCs).
-	Manual update log	Mainly introduce the revision information and updated content of this manual.

Manual Scope of Application

This manual is hardware manual of XDQ/XLQ series PLC, contents are as follows:

1．XDQ Series PLC Basic Units

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

2．XLQ Series PLC Basic Units

It includes XLQ series basic units, XLQ series expansion modules, XLQ series extended ED modules and XLQ series power supply modules.
Refer to the model table in Chapter 1-2 for specific product models.

3. Version Requirements

- The XDQ series PLC requires the software version to be v3.2 and above.
- The XLQ 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.

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
XLQ series PLC	General name of XLQ series programmable logic controllers
XDQ series PLC	General name of XDQ series programmable logic controllers
Basic units or bodies	Short name of XDQ series PLC basic units
Expansion devices or expansion units	General name of XDQ series PLC expansion modules and BD cards
Expansion modules	General name of XDQ series PLC all expansion modules.
Input and output expansion or I/O expansion	Short name of XDQ series PLC all input and output expansion modules
Analog expansions	Short name of XDQ 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 XDQ/XLQ series PLC hardware, about more application such as programming and instructions, please refer to relevant manuals.

Manual Name	Manual Description	Remarks
Programming Software Manual		
XD/XL/XG Series PLC User Manual (Software Volume)	Introduces operation methods and skills of XINJE PLC programming software Electronic version	Available upon separate request
Instruction Programming Manual		
XDQ/XLQ Series Programmable Logic Controller User Manual [Basic Instructions Volume]	It introduces the application of basic instructions for XDQ and XLQ 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/XG2 Series Programmable Logic Controller User Manual [Advanced Motion Control Volume]	It introduces the usage of advanced motion control instructions for XDH/XLH/XG2 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
Ethernet Communication Manual		
Ethernet Communication User Manual	It introduces the Ethernet communication functions of Ethernet-type PLCs.	Available upon separate request
EtherCAT Communication Manual		
EtherCAT Operation Control User Manual	Introduce the functions and usage of EtherCAT motion	Available upon separate request

Manual Name	Manual Description	Remarks
	control master station	
Expansion Equipment Manual		
XD Series PLC Expansion Module User Manual	It introduces features, parameters, overall dimensions, terminals and wiring of XDQ 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 XDQ 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 XLQ 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 XLQ series ED expansion modules.	Available upon separate request

Manual Acquisition

Ways to Obtain the Above Manuals:

◆ Electronic version

Log on to XINJE official website en.XINJE.com, enter the Download Center to search and download.

1 Product Overview

1-1. Product Specifications

1-1-1. XDQ Series CPU Units

1-1-1-1 XDQ Series Basic Unit

1) Rich variety of models

The XDQ series basic units cover 4 sub-series product lines with abundant models and freely combinable configurations.

- I/O Points 16, 24, 30, 32, 60,points
- Output Type Transistor
- Input Type PNP, NPN
- Power Type AC220V

Series	Description
XDQ3 (Standard Type)	Include 16, 32, 60 points. Fully featured to meet the application requirements of most users. It supports expansion modules, ED expansion modules and BD expansion modules (16-point model excluded).
XDQ5 (Enhanced Type)	Include 32 points. It inherits all functions of XDQ3, it supports high-speed pulse output for 2 axes and provides larger internal resource storage. Compatible with expansion modules, ED expansion modules and BD expansion modules,It Supports SD card expansion.
XDQ3E (Ethernet Type)	Include 24 points. It supports most functions of XDQ3, comes with Ethernet communication function, and supports high-speed pulse output of 2 axes. It can be fitted with expansion modules, ED expansion modules and BD expansion modules.
XDQ5E (Ethernet Type)	Include 30, 60 points. It supports Ethernet communication, as well as high-speed pulse output for 4 to 10 axes. It can be connected with expansion modules, ED expansion modules and BD expansion modules. **Models XDQ5E-30T4 and XDQ5E-60T10-E**

	support online download function.
XDQ7 (EtherCAT Bus Type)	Contains 30, 60 points functions. It supports most functions of XDQ 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 (30-point models are not supported).

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

2) Powerful functions

XDQ 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 (XDQ7 can up to 4MB).
- **Abundant expansions**
  XDQ 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 XDQ7 series features larger internal memory capacity.
- **Two programming types**
  XDQ 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**
  XDQ series PLC has built-in clock to control time, for time control..
- **Compact size, convenient to install**
  XDQ series PLC feature compact dimensions and easy installation, supporting DIN and screw two installation modes.

Enhanced special function

- **EtherCAT bus**
  XDQ7 series PLCs support EtherCAT motion bus and can synchronously control up to 32 axes with a control cycle ≤ 1 ms. For detailed operation, please refer to User Manual for 《 XDH/XLH Series Programmable Controllers (Advanced Motion Control)》.
- **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 upload and download, online monitoring, remote monitoring, and communication with other TCP/IP devices. For specific applications, please refer to 《Ethernet Communication User Manual》.
- **X-NET fieldbus**
  XDQ series PLC support X-NET fieldbus, which can fast communicate with XDQ series PLC and TG series HMI.
- **High-speed counter, frequency up to 80KHz**
  XDQ series PLC※1 basic units have 3~10 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.**
  XDQ series PLC※1 usually have 2~10 pulse output terminals, pulse frequency up to 100KHz.
- **Interruption function**
  XDQ series PLC interruption functions include external interruption, timing interruption and high-speed counting interruption to meet different interruption demands.
- **I/O points switch freely**
  XDQ series PLCs adopt exclusive special functions, a technology developed to handle terminal damage. Normal operation can be realized without program modification.
- **C language editing 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**

XDQPPro 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 , and call them in programs.

- **PID function on CPU units**
  XDQ series PLC※1 basic 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**
  XDQ 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)**
  XDQ series PLC※1 PWM function can be used to control DC motor.
- **Frequency measure**
  XDQ series PLC※1 can measure frequency.
- **Precise time**
  XDQ series PLC※1can realize 1ms and 32bit precise timing.
- **Online download※3**
  Partial models of XDQ5E and XDQ7 series PLCs support online download, enabling uninterrupted PLC operation.

3) Easy to program

When programming the XDQ series PLCs using XINJE PLC programming software, users can clearly appreciate the software's user-friendly design and ease of use.

- 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/XG Series Programmable Controllers (Software)》.

Note:

※1: Here, XDQ series PLC refers to the PLC that can realize the described functions, that is to say, not all XDQ 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《XD/XL/XG Series Programmable Controllers (Software)》.

1-1-1-2. XDQ Series Expansions Units

1) Expansion Modules

To meet control requirement better, XDQ series PLC can work with expansions, , cannot connect expansion modules, and XDQ3, XDQ3E can link 10 expansion modules, XDQ5, XDQ5E, XDQ7 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; Power supply: DC24V.

- 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, 60 points type can connect 2 BD boards.

- 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: XDQ full series 16 point PLC, and XDQ7 series 30 point do not support expanding BD boards.

3) Expansion ED Module

XDQ series left expansion ED board is for wireless communication. It can connect 1 ED board. The main models of communication-type ED modules include the following:

- Wifi communication module:

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

- Wireless transparent transmission module:

  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.

- CANopen communication module

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

- 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.

- 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.

[Note]: XDQ7 only supports the XD-NES-ED extension.

1-1-2. Features of XLQ series product

1-1-2-1. XLQ series basic unit

1) Model Introduction

The XLQ series PLCs are slim programmable controllers.

- I/O Points 24, 30 points
- Output Type Transistor
- Input Type NPN, PNP, Difference
- Power Type DC24V

Series	Description
XLQ7 (EtherCAT bus Type)	Includes 24 points, 30 points specifications. It 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.

2) Powerful functions

XLQ 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 (XLQ7 can up to 2MB) .
- **Abundant expansions**
  XLQ series PLC※1 generally supports 16 different types and models of right expansion modules and 1ED expansion modules.
- **Multiple communication ports**
  CPU units have 1~3 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.The XLQ7 series features greater internal capacity.
- **Two programming types**

XLQ 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**
  XLQ series PLC has built-in clock to control time , used for time control.
- **Compact size, convenient to install**
  XLQ series PLC has mini size and is easy to install on the DIN rail.

Enhanced special function

- **EtherCAT bus**
  The XLQ7 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)》.
- **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》.
- **X-NET fieldbus**
  XLQ series PLC support X-NET fieldbus, which can fast communicate with XDQ/XLQ series PLC and TG/TN series HMI. Refer to《X-NET fieldbus manual》for details.
- **High-speed pulse counter, frequency up to 80KHz**
  XLQ series PLC units have 4 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.**
  XLQ series PLC usually have 4 pulse output terminals, pulse frequency up to 100KHz.
- **Interruption function**
  XLQ series PLC interruption functions include external interruption, timing interruption and high-speed counting interruption to meet different interruption demands.
- **I/O points switch freely**
  XLQ series PLC unique function. Do not need to change program when terminals are damaged.
- **C language editing 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**
  XDQPPro V3.7.17b supports POU functions, including functions (FC), function blocks (FB) and programs. Users can write FC and FB through ladder diagram, C language, and then call them in the program.
- **Body PID function**
  XLQ 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 simplify the program writing.
- **100 segments high speed counting interruption**
  XLQ 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)**
  XLQ series PLC PWM function can be used to control DC motor.
- **Frequency measure**
  XLQ series PLC can measure frequency.
- **Precise time**
  XLQ series PLC can realize 1ms and 32 bits precise timing.
- **Online Download※3**
  XLQ7 series PLCs support online download function, realizing uninterrupted PLC operation.

3) Easy to program

Programming of XLQ 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)》.

1-1-2-2．XLQ Expansions

1) Expansion Modules

To meet control requirement better, XLQ series PLC can work with expansions, XLQ7 can link 16 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 module

XLQ series PLCs can be equipped with ED expansion modules on the left side, with a maximum of one ED module in general.

- 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-COBOX-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.

[Note]: XLQ7 only supports the XD-NES-ED expansion module.

1-2．Model Composition and Model List

1-2-1．XDQ Series Basic Unit Model and List

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

1）Basic unit model

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

XDQ ③ － ⑥ ② ④ ⑤ － ⑦

①	Series type	3：	XDQ3 Series: Standard Type
		5：	XDQ5 Series: Enhanced Type
		3E：	XDQ3E Series: Ethernet Communication Type
		5E：	XDQ5E Series: Ethernet Communication Type
		7：	XDQ7 Series: EtherCAT Bus Type
②	I/O points	16：	8I / 8O
		24：	14I /10O (Or 12I /12 O)
		30：	16I /14O (Or 16I /16 O)
		32：	18I /14 O
		60：	36I /24 O
③	Input point type	-：	NPN type
		P：	PNP type
④	EtherCAT motion control function	A16：	Control 16-axis EtherCAT slaves
		A32：	Control 32-axis EtherCAT slaves
⑤	Output Point Type, Number of Transistor Pulse Output Channels	T：	Transistor Output, 2-channel pulse output
		T4：	Transistor Output, 4-channel pulse output
		T10：	Transistor Output, 10-channel pulse output
⑥	Power supply	E：	DC power supply (24V)

2) Basic unit model list

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

XDQ3 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	-	XDQ3-16T-E	-	-	-	-	8	8
	-	XDQ3-32T-E	-	-	-	-	18	14
	-	XDQ3-60T-E	-	-	-	-	36	24
PNP	-	XDQ3-16PT-E	-	-	-	-	8	8
	-	XDQ3-32PT-E	-	-	-	-	18	14
	-	XDQ3-60PT-E	-	-	-	-	36	24

XDQ5 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	-	-	XDQ5-32RT-E	-	-	-	18	14

XDQ3E 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	-	XDQ3E-24T-E	-	-	-	-	14	10

XDQ5E 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	-	XDQ5E-30T4-E	-	-	-	-	16	14
	-	XDQ5E-60T10-E	-	-	-	-	36	24
PNP	-	XDQ5E-30PT4-E	-	-	-	-	16	14
	-	XDQ5E-60PT10-E	-	-	-	-	36	24

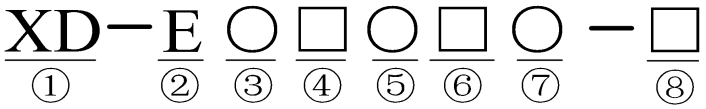
XDQ7 series list

Type							Input points (DC24 V)	Output points (R, T)
	AC power			DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN		XDQ7-30A16-E	-	-	-	-	16	14
	-	XDQ7-60A32-E	-	-	-	-	36	24
PNP	-	XDQ7-30PA16-E	-	-	-	-	16	14
	-	XDQ7-60PA32-E	-	-	-	-	36	24

1-2-1-2．XDQ Series Expansion Unit Model Composition and Model List

1）I/O expansion modules

I/O expansion modules name constitute:



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	Special for output	Empty: NPN output type P: PNP output type
⑧	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－E①　4AD②　2DA③　6PT④　6TC⑤　1WT⑥　4SSI⑦－P⑧－H⑨

①	Expansion module	E：	Refers to expansion modules
②	Analog input	4AD： 8AD： 12AD：	4-channel analog input 8-channel analog input 12-channel analog input
③	Analog output	2DA： 4DA：	2-channel analog output 4-channel analog output
④	Temperature input	6PT： 4PT3：	6-channel platinum thermal resistance input 4-channel platinum thermal resistance input (3-wire system)
⑤	Temperature input	6TC：	6-channel thermocouple input
⑥	Pressure measurement	1WT： 2WT： 4WT：	1-channel pressure measurement 2-channel pressure measurement 4-channel pressure measurement
⑦	Encoder test	4SSI：	4-channel encoder detection
⑧	Model Distinction	P： A： B：	With PID control New hardware version (only for WT modules) Current input type (only for 8AD modules) 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 list

Type		Function
Analog input	XD-E4AD	4 channels analog input
	XD-E8AD	8 channels analog input, 4 voltage and 4 current
	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 voltage 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-E4PT3-P	4 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-2TC-P	2 channels K-type thermocouple temperature measurement, with PID control
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
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 23-bit
	XD-E2WT-D	2 channels pressure measurement, 0～10mV, precision 23-bit
	XD-E4WT-D	4 channels pressure measurement, 0～10mV, precision 23-bit
Special Module	XD-E4SSI	4-channel encoder position detection, supports 10bit~31bit

3) Extension BD Board

The naming rule of extension BD board:

$$XD - \underset{①}{NE} - \underset{②}{BD}$$

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 4PT: 4 channel platinum resistance thermometer input 1TC: 1 channel thermocouple input
④：	Communication	NES：RS232 or RS485 WBOX：WIFI communication module 4GBOX：4G communication module SBOXT：Wireless transparent transmission communication module COBOX：CANopen communication module
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
Temperature measure	XD-1TC-ED	1 channel thermocouple temperature control

	XD-4PT-ED	4 channel platinum resistance thermometer temperature control
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．XLQ Series Basic Unit Model and List

1-2-2-1. XLQ Series Basic Unit Model Composition and Model List

1) Basic Unit Mode Composition

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

XLQ ① 7 — ② 30 ③ P ④ A16

①	Type	H：	XLQ7 series EtherCAT type
②	I/O points	24：	12I /12O
		30：	14I /16O
③	Input type	-：	NPN
		P：	PNP
④	EtherCAT motion control	A16：	Control 16 axis EtherCAT slave station
		A32：	Control 32 axis EtherCAT slave station

2) List of basic unit models

XLQ7 series List

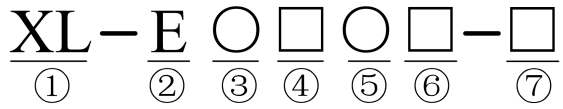
Type							Input points (DC24V)	Output points (R, T)
	AC power			DC power				
	Relay output	Transistor output	Relay/transistor mixed	Relay output	Transistor output	Relay/transistor mixed		
NPN	-	-	-	-	XLQ7-24A16	-	12	12
	-	-	-	-	XLQ7-30A32	-	14	16

PNP	-	-	-	-	XLQ7-24PA16	-	12	12
	-	-	-	-	XLQ7-30PA32	-	14	16

1-2-2-2. XLQ Series Expansion Unit Model Composition and Model Table

1) I/O expansion modules

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



①	Series	XLQ: XLQ 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
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	-

2) Analog quantity and temperature expansion module

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

XL－E ○ □ ○ □－□
① ② ③ ④ ⑤ ⑥ ⑦

①	Series	XLQ: XLQ 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 Measure	XL-E4PT3-P	4 channels PT100 temperature measuring, built-in PID function

Type		Description
	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
	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:

XL－2AD①2DA②2PT③NES④－A⑤－ED⑥

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

Left expansion ED module list:

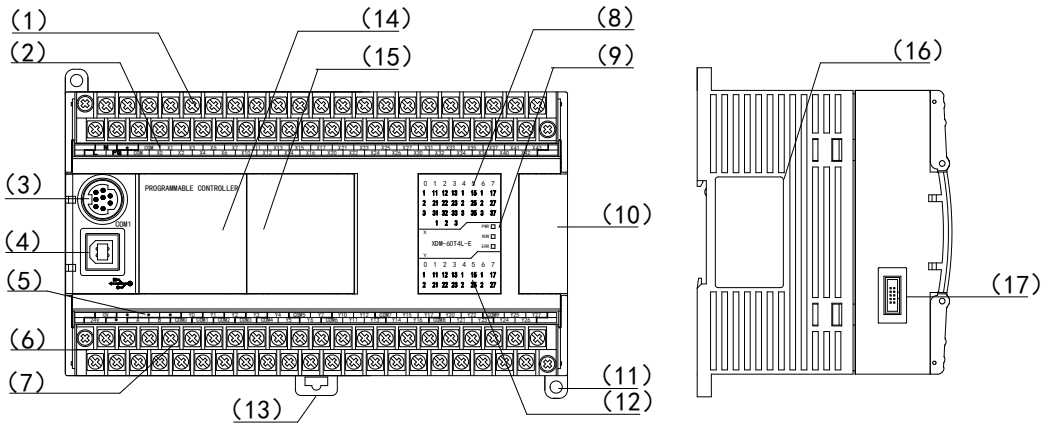
Model		Description
Analog input	XL-4AD-A-ED	4 channels analog current input
	XL-4AD-V-ED	4 channels analog voltage input
Analog output	XL-4DA-A-ED	4 channels analog current output
	XL-4DA-V-ED	4 channels analog voltage output
Analog I/O	XL-2AD2DA-A-ED	2 channels analog current input, 2 channels analog current output
	XL-2AD2DA-V-ED	2 channels analog voltage input, 2 channels analog voltage output
Analog temperature mixed type	XL-2AD2PT-A-ED	2 channels analog current input, 2 channels PT100 temperature input
	XL-2AD2PT-V-ED	2 channels analog voltage input, 2 channels PT100 temperature input
	XL-2PT2DA-A-ED	2 channels PT100 temperature input, 2 channels analog current output
	XL-2PT2DA-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 Description

1-3-1. XDQ Series Structure

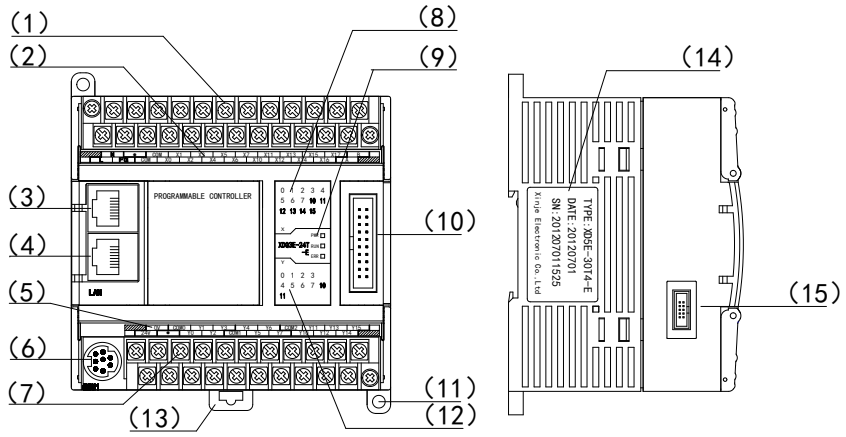
1-3-1-1.XDQ Series Basic Structural Composition



Each part name is listed below:

(1): Input & power supply terminals
(2): Input terminal label
(3): RS232 port (COM 1)
(4): USB port
(5): Output terminal label
(6): 24V output terminal, RS485 port (COM 2)
(7): Output terminal
(8): Input action display
(9): System LED
PWR: power supply
RUN: running
ERR: error
(10): Expansion module connection port
(11): Installation hole (2 holes)
(12): Output action display
(13): Rail mounting hook (1 hooks)
(14): Expansion BD (COM 4)
(15): Expansion BD (COM 5)
(16): Product label
(17): Left expansion ED module interface (COM 3)

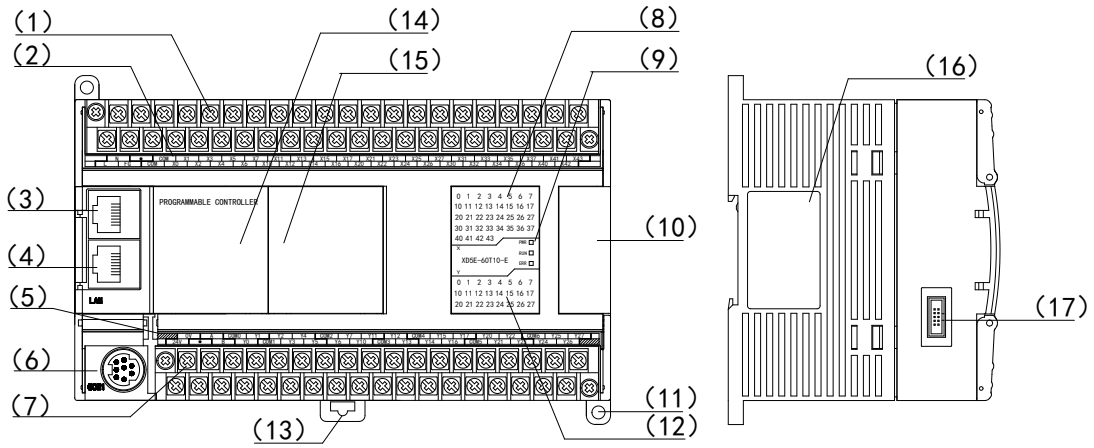
1-3-1-2．XDQ3E-24, XDQ5E-30, XDQ7-30 structure



Each part name is listed below:

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

1-3-1-3．XDQ5E-60, XDQ7-60 Structure

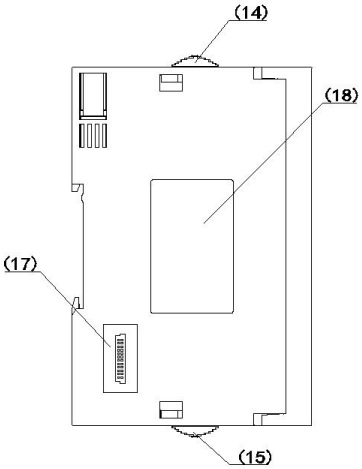


Each part name is listed below:

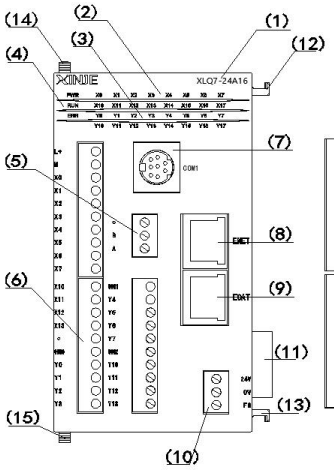
（1）：Input terminals, power supply terminals
（2）：Input label
（3）：RJ45 port 1
（4）：RJ45 port 2
（5）：Output label
（6）：RS232 port（COM1）
（7）：Output terminal、RS485 port（COM2）
（8）：Input indicator light
（9）：System indicator light
PWR：power supply
RUN：running
ERR：error
（10）：Expansion module interface
（11）：Installation hole (2 holes)
（12）：Output indicator light
（13）：Rail installation hook (1 hook)
（14）：Expansion BD（COM4）
（15）：Expansion BD（COM5）
（16）：Product label
（17）：left extension ED module interface（COM3）

1-3-2. XLQ Series Structure

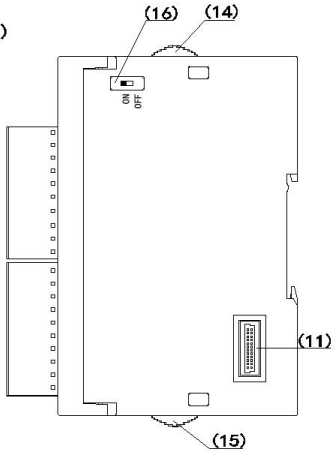
1-3-2-1. Basic Structural Composition of XLQ Series



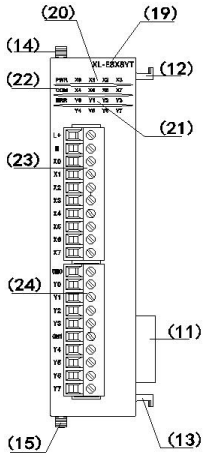
Left side of CPU unit



CPU unit



Right side of CPU unit

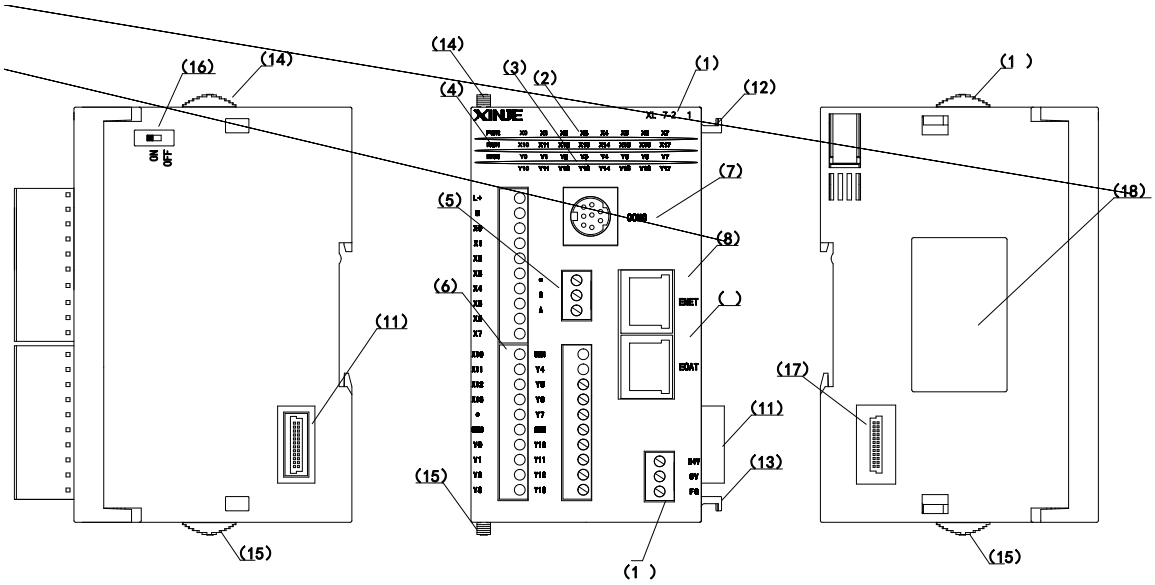


Right expansion module

Each part name is listed below:

(1) ： PLC model
(2) ： input label and indicator light
(3) ： output label and indicator light
(4) ： system indicator light
PWR: power
RUN: running
ERR: error
(5) ： RS485 port (COM2)
(6) ： input/output terminal
(7) ： RS232 port (COM1)
(8) ： RJ45 port 1 (ENET)
(9) ： RJ45 port 2 (ECAT)
(10) ： power input terminal
(11) ：right expansion module interface
(12) ： module fixed hook (up)
(13) ： module fixed hook (down)
(14) ： slide lock (up)
(15) ： slide lock (down)
(16) ： none
(17) ：left expansion ED module interface (COM3)
(18) ： product label
(19) ： expansion module model
(20) ： expansion module input label and indicator light
(21) ：expansion module output label and indicator light
(22) ：expansion module system indicator light
PWR：power
RUN: running
ERR：error
(23) ： expansion module input terminal
(24) ： expansion module output terminal

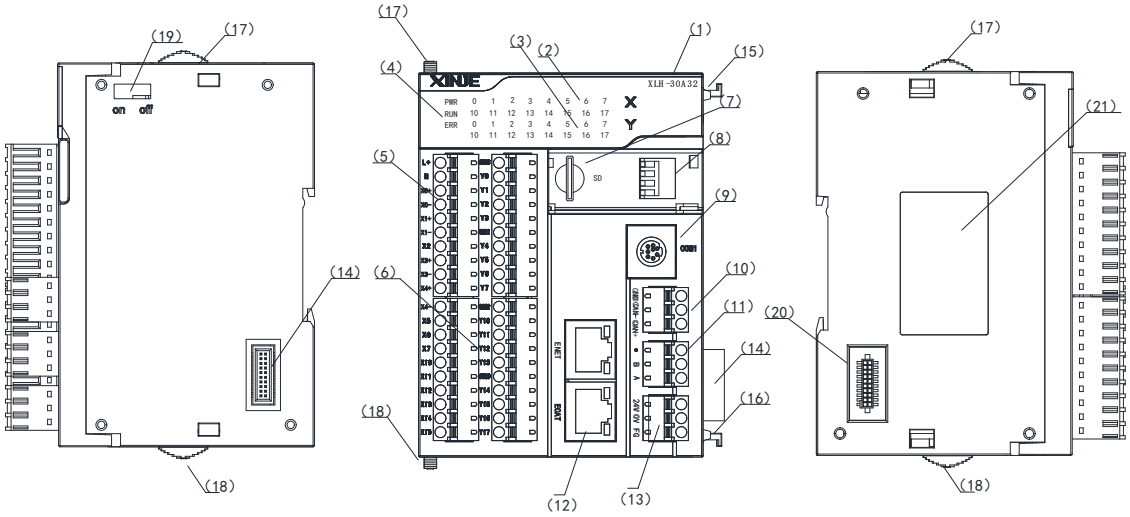
1-3-2-2．XLQ7-24 Series Structure



Each part name is listed below:

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

1-3-2-3. XLQ7-30 Structural Composition



The names of each part are as follows:

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

2 Main Body Specifications Parameters

2-1．Specifications and Parameters

2-1-1．General Specifications

This specification is fit for XDQ and XLQ 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℃~60℃ 0℃~50℃ (XDQ7 series) 0℃~55℃ (XLQ series)
Ambient humidity	5%~95% (NO condensation)
Altitude	Within 2000 meter
USB port	USB download port, connect PC to upload/download/online monitoring
COM1	RS232, to connect upper computer, HMI for program or debug.
COM2	RS485, 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)

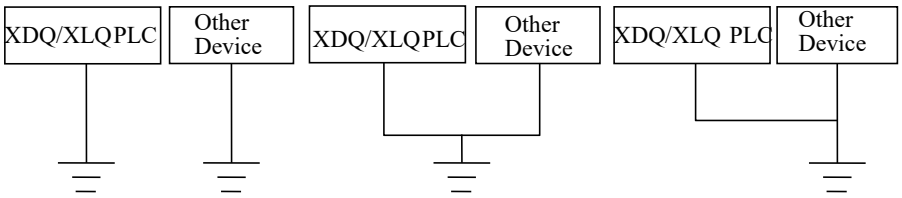
Note:

※ 1:XDQ3E, XDQ5E,XDQ7 series models do not have USB ports.

※ 2: Ethernet port is only available for XDQ3E, XDQ5E, XDQ7,XLQ7 PLCs.

※ 3: The specification of the guide rail is DIN46277, and the width is 35mm. XLQ series PLC only supports the installation of the guide rail.

※ 4: Separate grounding or common grounding should be used instead of public grounding.



2-1-2. Performance and Specifications

1) XDQ Series PLC Specifications:

Item		Specification				
Program execution mode		Cyclic scanning mode				
Programming mode		Command, ladder chart				
Processing speed		XDQ3/XDQ5/XDQ7-30: 0.02~0.05us XDQ3E/XDQ5E/XDQ7-60: 0.01~0.03us				
Power-off holding		General PLC uses FlashROM and lithium battery (3V button battery)				
User program capacity※1		XDQ3/XDQ3E：256KB				
		XDQ5：512KB				
		XDQ5E：1MB				
		XDQ7：2MB(30 points）/ 4MB(60 points)				
I/O※2	Total	16	24	30	32	60
	Input points	8	14 or 12	16	18 or 16	36
		X0~X7	X0~X15 or X0-X13	X0~X17	X0~X21 or X0~X17	X0~X43
	Output points	8	10 or 12	14	14 or 16	24
		Y0~Y7	Y0~Y11 or Y0-Y13	Y0~Y15	Y0~Y15 or Y0~Y17	Y0~Y27
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	XDQ3/XDQ3E：M0~M7999			
		70000 points	XDQ5/XDQ5E：M0~M69999			
		200000 points	XDQ7：M0~M199999			

Item		Specification	
	Power-off holding HM※5	960 points	XDQ3/XDQ3E：HM0~HM959
		12000 points	XDQ5/XDQ5E：HM0~HM11999
		20000 points	XDQ7：HM0~HM19999
	Special use SM※6	2048 points	XDQ3/XDQ3E：SM0~SM2047
		5000 points	XDQ5/XDQ5E：SM0~SM4999
		50000 points	XDQ7：SM0~SM49999
Flow	General use S	1024 points	XDQ3/XDQ3E：S0~S1023
		8000 points	XDQ5/XDQ5E：S0~S7999
		20000 points	XDQ7：S0~S19999
	Power-off holding HS※5	128 points	XDQ3/XDQ3E：HS0~HS127
		1000 points	XDQ5/XDQ5E：HS0~HS999
		2000 points	XDQ7：HS0~HS1999
Timer	General use T	576 points	XDQ3/XDQ3E：T0~T575
		5000 points	XDQ5/XDQ5E：T0~T4999
		20000 points	XDQ7：T0~T19999
	Power-off holding HT※5	96 points	XDQ3/XDQ3E： HT0~HT95
		2000 points	XDQ5/XDQ5E/XDQ7： HT0~HT1999
	Precise timing ET	26 points	Precise timing ET0~ET25(XDQ7 Not support)
	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	XDQ3/XDQ3E：C0~C575
		5000 points	XDQ5/XDQ5E：C0~C4999

Item		Specification	
		20000 points	XDQ7：C0~C19999
	Power-off holding HC※5	96 points	XDQ3/XDQ3E：HC0~HC95
		2000 points	XDQ5/XDQ5E/XDQ7：HC0~HC1999
	High speed counter	32 points	XDQ3/XDQ3E: High speed counters HSC0~HSC31
		40 points	XDQ5/XDQ5E/XDQ7： High speed counters HSC0~HSC39
	Specification	16-bit counter: K0~32,767 32-bit counter: -2147483648~＋2147483647	
Data register	General use D	8000 points	XDQ3/XDQ3E：D0~D7999
		70000 points	XDQ5/XDQ5E：D0~D69999※7
		500000 points	XDQ7-30A16：D0~D499999
		1000000 points	XDQ7-60A32：D0~D999999
	Power-off holding HD※5	1000 points	XDQ3/XDQ3E：HD0~HD999
		25000 points	XDQ5/XDQ5E：HD0~HD24999
		50000 points	XDQ7-30A16：HD0~HD49999
		100000 points	XDQ7-60A32：HD0~HD99999
	Special use SD※6	2048 points	XDQ3/XDQ3E：SD0~SD2047
		5000 points	XDQ5/XDQ5E：SD0~SD4999
		50000 points	XDQ7：SD0~SD49999
	Special power-off holding HSD	500 points	XDQ3/XDQ3E：HSD0~HSD499
		2000 points	XDQ5/XDQ5E：HSD0~HSD1999
		50000 points	XDQ7：HSD0~HSD49999
Flash ROM	Power-off holding	5120 points	XDQ3/XDQ3E：FD0~FD5119

Item		Specification	
register	FD※5	8192 points	XDQ5/XDQ5E：FD0~FD8191
		65536 points	XDQ7：FD0~FD65535
	special use SFD※6	2000 points	XDQ3/XD3QE：SFD0~SFD1999
		6000 points	XDQ5/XDQ5E：SFD0~SFD5999
		65488 points	XDQ7：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) XLQ Series PLC Specifications:

Item		Specification	
Program execution mode		Cyclic scanning mode	
Programming mode		Command, ladder chart	
Processing speed		XLQ7-24: 0.02~0.05us； XLQ7-30：0.01~0.03us	
Power-off holding		General PLC uses FlashROM and lithium battery (3V button battery)	
User program capacity※1		XLQ7：2MB (24 points)、4MB (30 points)	
I/O※2	Total	24	30
	Input points	12 X0~X13	14 X0~X17
	Output points	12 Y0~Y13	16 Y0~Y17
Internal coil(X) ※3		1280 points	XLQ7：X0~X77, X10000~X11777, X20000~X20177, X30000~X30077
Internal coils(Y) ※4		1280 points	XLQ7：Y0~Y77, Y10000~Y11777, Y20000~Y20177, Y30000~Y30077

Item		Specification	
Internal coils	General use M	200000 points	XLQ7：M0~M199999
	Power-off holding HM※5	20000 points	XLQ7：HM0~HM19999
	Special use SM※6	50000 points	XLQ7：SM0~SM49999
Flow	General use S	20000 points	XLQ7：S0~S19999
	Power-off holding HS※5	2000 points	XLQ7：HS0~HS1999
Timer	General use T	20000 points	XLQ7：T0~T19999
	Power-off holding HT※5	2000 points	XLQ7：HT0~HT1999
	Sepcification	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	20000 points	XLQ7：C0~C19999
	Power-off holding HC※5	2000 points	XLQ7：HC0~HC1999
	High speed counter	40 points	High speed counters HSC0~HSC39
	Specification	16-bit counter: K0~32,767 32-bit counter: -2147483648~＋2147483647	
Data register	General use D	500000 points	XLQ7-24A16：D0~D499999
		1000000 points	XLQ7-30A32：D0~D999999
	Power-off holding HD※5	50000 points	XLQ7-24A16：HD0~HD49999

Item		Specification	
		1000000 points	XLQ7-30A32：HD0~HD99999
	Special use SD※6	50000 points	XLQ7：SD0~SD49999
	Special power-off holding HSD	50000 points	XLQ7：HSD0~HSD49999
Flash ROM register	Power-off holding FD※5	65536 points	XLQ7：FD0~FD65535
	Special use SFD※6	65488 points	XLQ7：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	
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 numbers of input coils, output relays/transistors are octal numbers, and the numbers of other memories are decimal numbers.

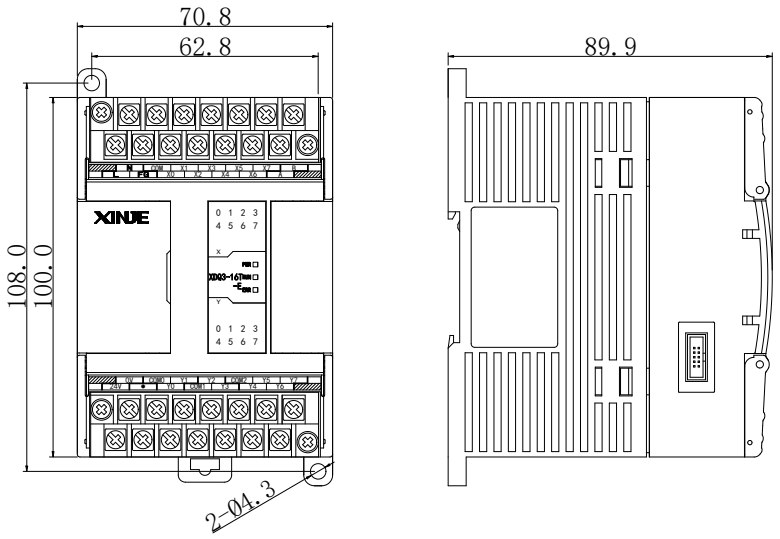
※ 8: The I/O not connected to the peripheral equipment can be used as a fast internal relay.

※ 9: XDQ7 and XLQ7 do not support accurate timing temporarily.

2-2. Dimensions

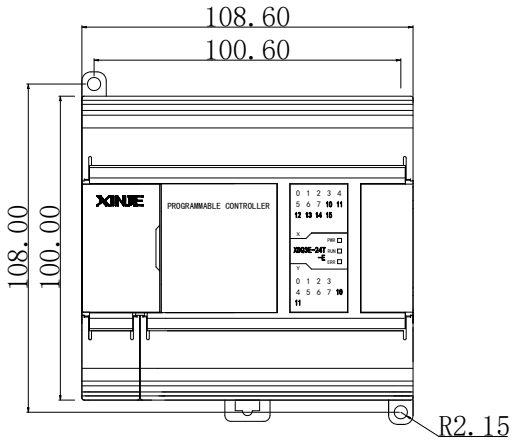
2-2-1. XDQ series dimensions

(Unit: mm)



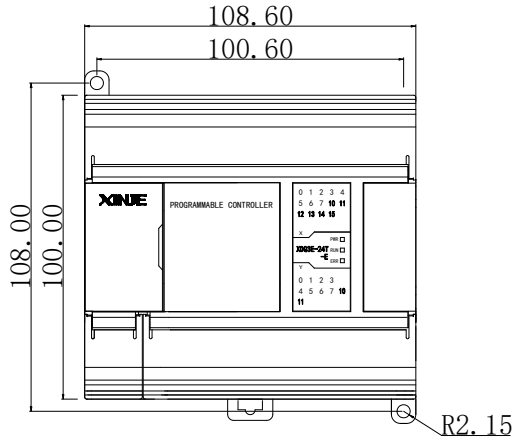
Suitable Model:

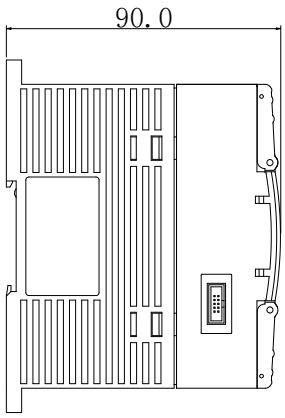
Series	Points
XDQ3	16



Suitable Model:

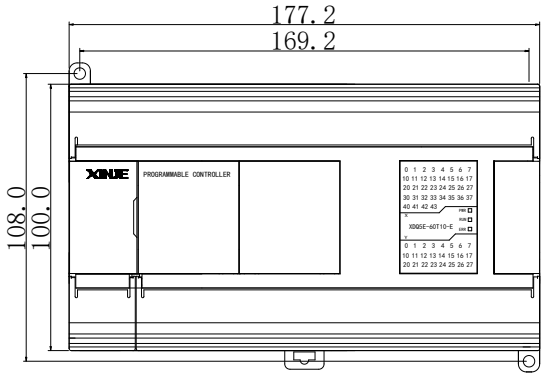
Series	Points
XDQ3	32
XDQ5	

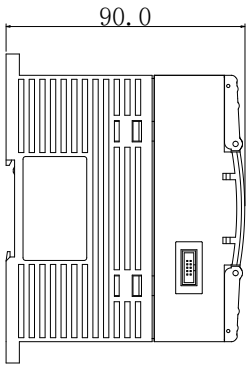




Suitable Model:

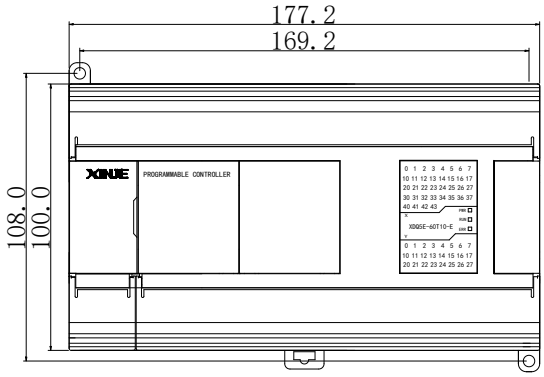
Series	Points
XDQ5E	30
XDQ7	

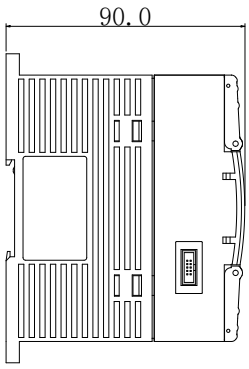




Suitable Model:

Series	Points
XDQ3	60



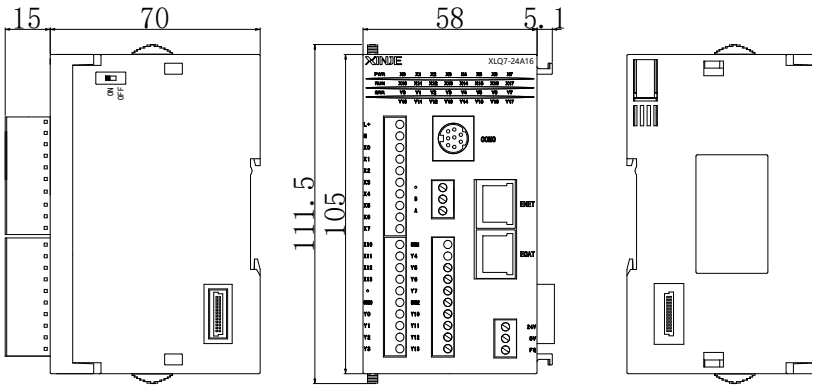


Suitable model:

Series	Points
XDQ5E	60
XDQ7	

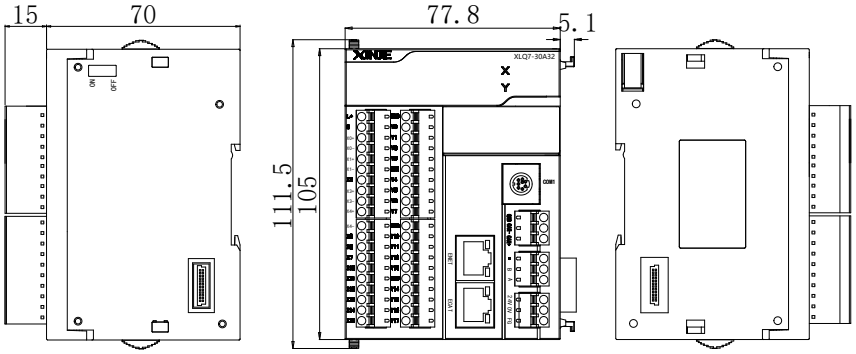
2-2-2．XLQ series dimensions

(Unit: mm)



Suitable model:

Series	Points
XLQ7	24



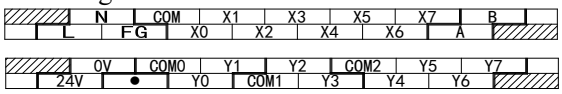
Suitable model:

Series	Points
XLQ7	30

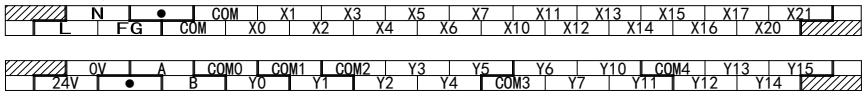
2-3．Terminal arrangement

2-3-1．XDQ series terminal arrangement

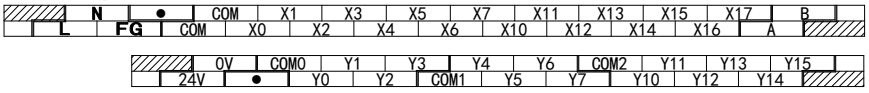
- Diagram 1



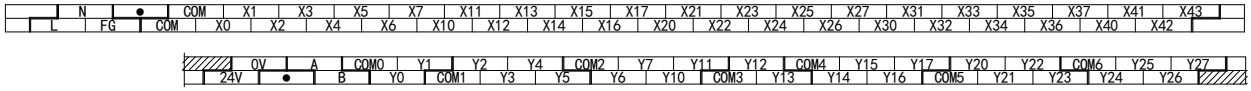
- Diagram 2



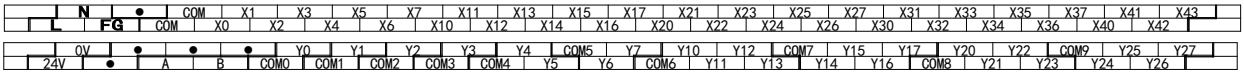
- Diagram 3



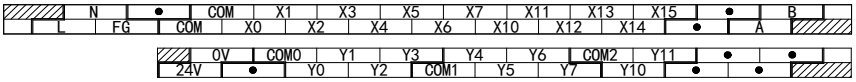
- Diagram 4



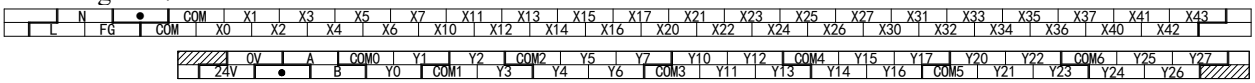
- Diagram 5



- Diagram 6



- Diagram 7



The graph for the model:

Diagram	Suitable model	Note
Diagram 1	XDQ3-16	8 I /8 O
Diagram 2	XDQ3-32、XDQ5-32	18 I /14 O
Diagram 3	XDQ5E-30T4、XDQ7-30A16	16 I /14 O
Diagram 4	XDQ5E-60T10	36 I /24 O
Diagram 5	XDQ3-60	36 I /24 O
Diagram 6	XDQ3E-24T	14 I /10 O
Diagram 7	XDQ7-60A32	36 I /24 O

Note:

※ 1: The above terminal arrangement diagram is -E type PLC (power input terminals are L, N).

※ 2: 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.

※ 3: FG is a grounding terminal, which is used to shield interference and can be grounded separately as required.

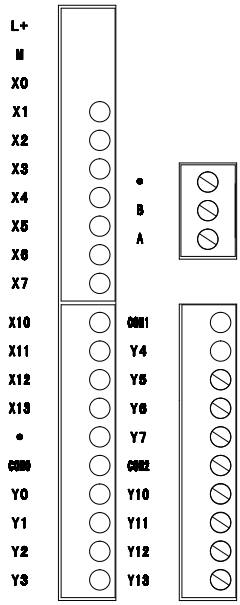
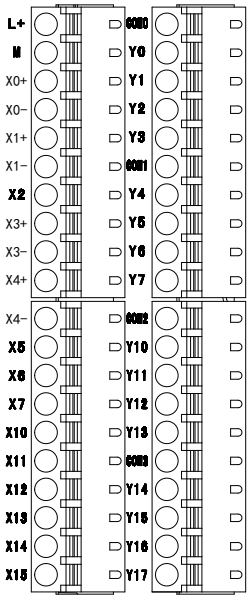
※ 4: Common terminal COM of input terminal corresponds to all input points; COM on the output terminal block corresponds to different Y output points. When using, please wire according to the actual division on the PLC output label.

※ 5: Terminals A and B on the terminal block are RS485 communication interfaces, A is RS485+, B is RS485 -.

※ 6: The above terminal arrangement diagram is applicable to both NPN type and PNP type.

2-3-2. XLQ Series Terminal Arrangement

1) Input/output terminal block

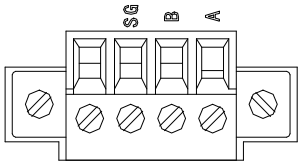
XLQ7-24A16	XLQ7-30A32
	

The terminal arrangement of XLQ series PNP PLC is the same as that of NPN PLC.

The XLQ 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 -.

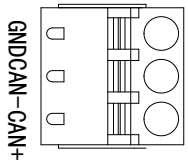
The common terminal of the input terminal is M; the common terminal of the output terminals Y0~Y3 is CM0/COM0; The common terminals of Y4~Y7 are CM1/COM1; The common terminal of Y10~Y13 is COM2; The common terminal of Y14~Y17 is COM3.

2) RS485 communication terminal block



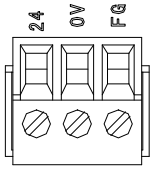
- A is RS485+, B is RS485-. Please connect A to A, B to B when communicating.
- SG is communication ground terminal, it can connect to SG terminal of servo drive in general.

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 XLQ 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 mm^2.
(3) Flexible conductors with tubular pre-insulated end is 0.25-0.5 mm^2.

2-4. Communication Ports

XDQ series generally has USB port (not available for individual models),COM1 (RS232), COM2 (RS485), and Ethernet port (supported by XDQ3E/XDQ5E/E/XDQ7).

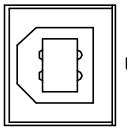
The XLQ series generally has COM1 (RS232)、COM2(RS485) 、 Ethernet port , CAN communication port (supported by firmware 3.7.3 and above XLQ7-30A32).

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 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 XDQ7 is used for EtherCAT bus control, which can control up to 32 axes at the same time.
- The CAN port can communicate with other devices that support CAN bus communication.

1) USB port

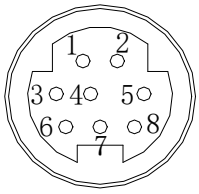
USB port only can download program but cannot communicate with other device.
Please use printer USB cable or XINJE USB cable JC-UA-15 to download.



Note: XDQ5E,XDQ7,XLQ7 series models have no USB port

2) RS232 port

RS232 port can upload, download program and communication. COM1 support X-NET and Modbus mode. The pin diagram of COM1, COM2 are shown as below:



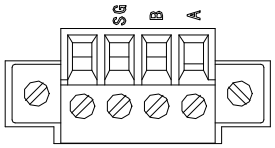
4: RXDQ
5: TXDQ
8: GND

Mini Din 8-core plug-in (holes)

3) RS485 port

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

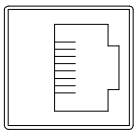
The COM2 of XLQ series PLC is separately, they are terminal A, B and SG(signal ground). A is RS485+, B is RS485-, SG is signal ground.



4) Ethernet port

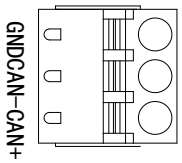
The Ethernet port is an RJ45 interface, with stable and convenient communication methods. It can be used for downloading programs, online monitoring, remote monitoring, etc., and can communicate with other TCP IP devices within the local area network. Please refer to the Ethernet Communication User Manual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

In addition, the LAN2 port of XDQ7/XLQ7 can be used for EtherCAT bus control. XDQ7 /XLQ7 can control 16~32 axes simultaneously, with a control cycle of ≤ 1ms. For the usage of EtherCAT bus, please refer to the《XDH/XLH/XG2 Series Programmable Controller User Manual (Advanced Motion Control Chapter)》.



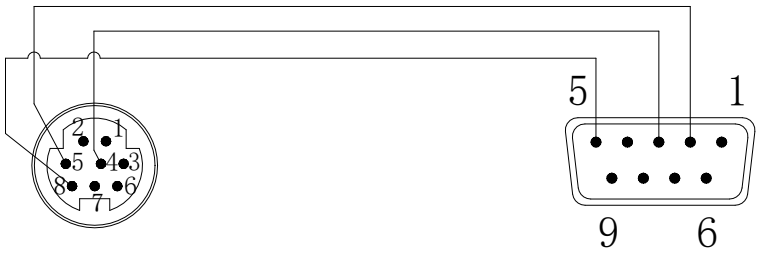
5) CAN communication port

XLQ7-30A32 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:



Mini Din 8-pin (pins) DB9-pin (holes)

Note:

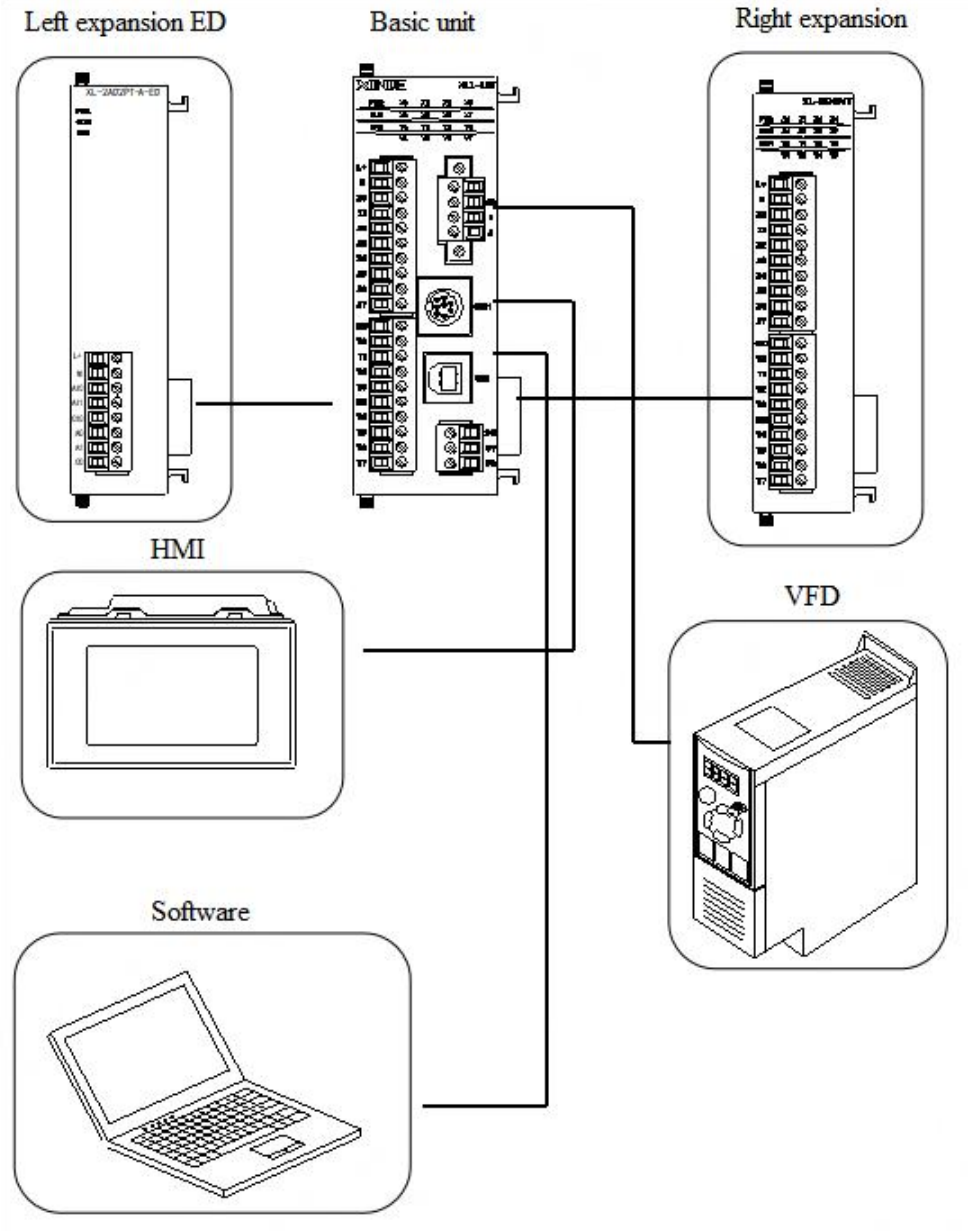
※ 1: The above diagram is a DVP wiring diagram. The colors of the wires on pins 2, 3, and 5 on the DB9 plug (hole) side are brown, red, and black, respectively.

※ 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 XDQ/XLQ series PLC (using XLQ 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.

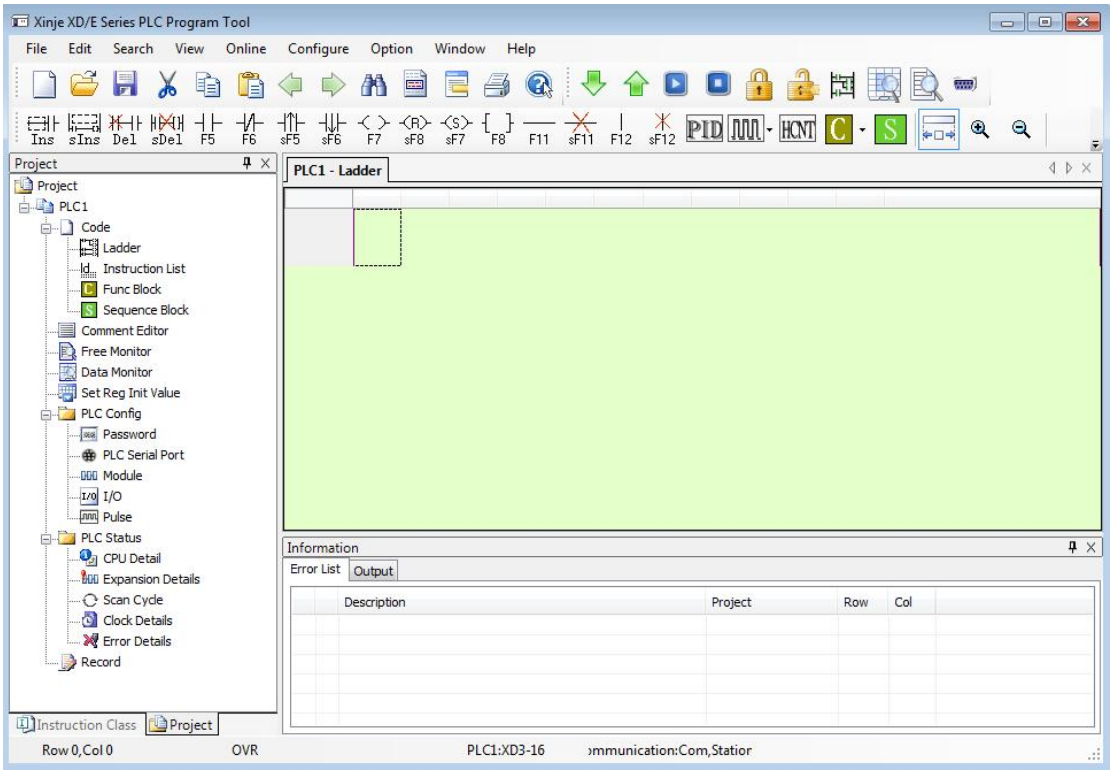
3-2. Peripheral Devices

XDQ/XLQ 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.

- 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.

XDQ/XLQ series PLC support diverse brands of HMI; The connection is established on the basis of consistent communication protocols. 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 1677 million colors,65536 color
- Operation touch screen
- Interface RS232, RS422, RS485, USB, Ethernet 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 STN-LCD
- Buttons Nr. 7, 20 not touch screen
- Interface RS232, RS422, RS485
- Communication Work with many PLC brands.
  Communicate with XINJE Inverters
- RTC Built-in

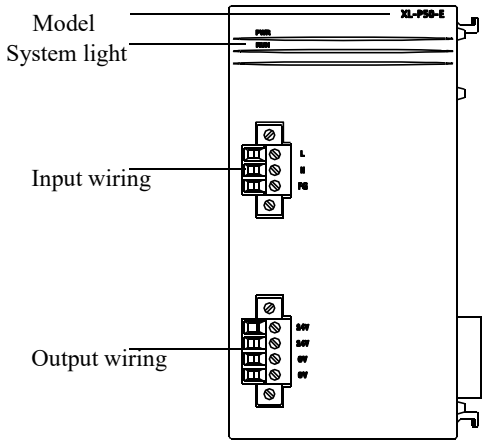
3-2-3 XLQ Adapter Power Supply

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

1) Basic Specification

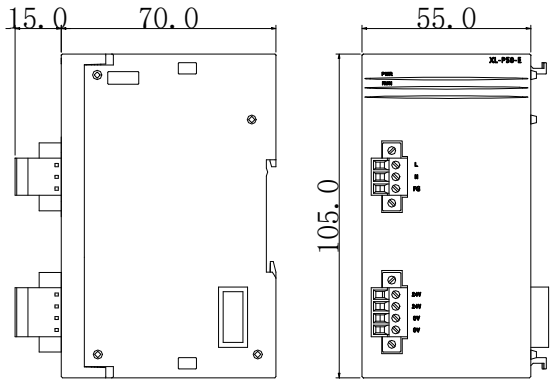
Item	Specification
Power supply	AC100-240V
Output voltage	DC24V
Output current	2A
Atmosphere	No corrosive and combustible gas
Ambient temperature	0℃~60℃
Ambient humidity	5%RH~95%RH (no condensation)
Installation	Install on the rail directly
Ground	The third ground (cannot connect to ground with strong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

2) Structure



Structure name	Function
Model	The model of the product
System indicate 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 XLQ 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

XDQ/XLQ series PLC (XDQ7/XLQ7 cannot support) or ZG/ZP series integrated controller.

(2) Version

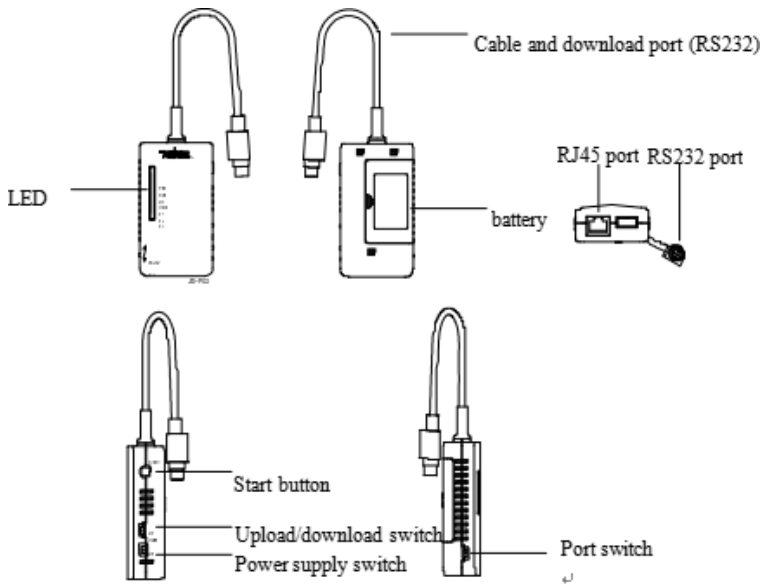
Model	Upload (PLC→downloader)	Download (downloader→PLC)
PLC without Ethernet port	PLC firmware V3.4.6 and above	PLC firmware V3.4 and above
PLC with Ethernet port (Non online download)	PLC firmware V3.5.3 and above	PLC firmware V3.5 and above
PLC with Ethernet port (Online download)	PLC firmware V3.7.4.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

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

(3) Basic specification

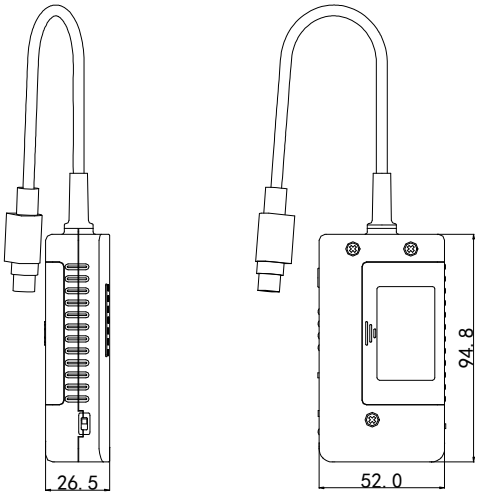
Item	Specification
Dimension	94.8mm×52.0mm×26.5mm
Using environment	No corrosive gas
Environment temperature	0℃~60℃
Environment humidity	5~95%

(4) Structure



Name		Function
LED	POWER	After the Downloader is powered on, the PWR is always on
	COM	When RS232 port has data receiving and sending, the COM flashes
	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 light is off, the COM light 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)
XDQ3-32T-E	About 1h50min	About 5h40min

(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

3-3. Configuration Principle

1) COM port

- XDQ/XLQ series PLC (CPU units) are usually equipped with COM1, COM2 and USB port （XLQ7has not USB port）.
- Both COM1 and COM2 communication ports can be used for programming and data download. 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.
- XDQ3 can work with 10 expansions and XDQ5E /XDQ7 can connect 16 modules.
- XLQ7 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

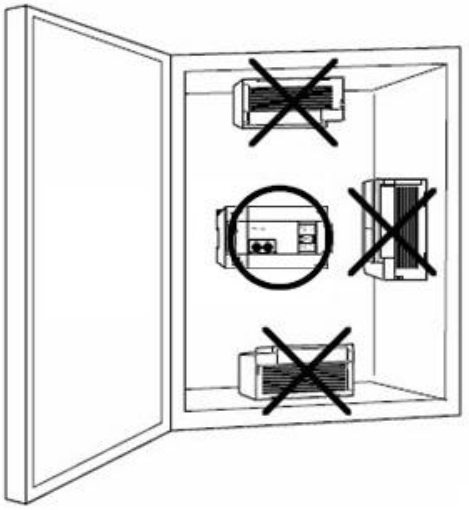
Basic Unit XDQ3-32R-E (18I/14O) connect with 5 XDQ-E8X8Y expansions, then the total I/O points should be:
Input Points: 18 + 8 *5 = 58
Output points: 14 + 8 *5= 54
Total points: Input+ Output = 58+54=112

3-4. Allocation of Extension Module Definition Numbers

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

3-5. Install The Products

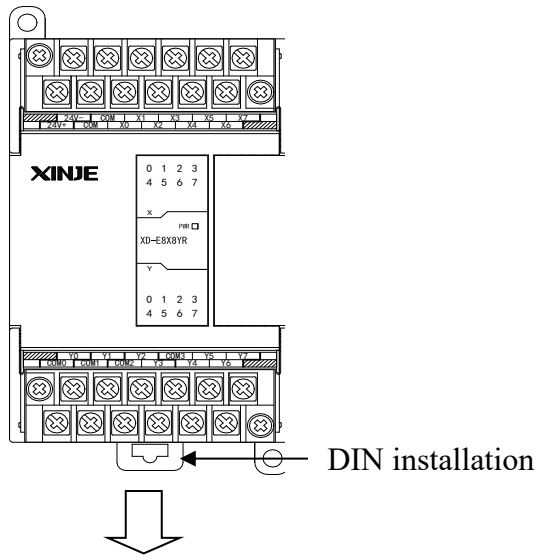
1) Installation Position



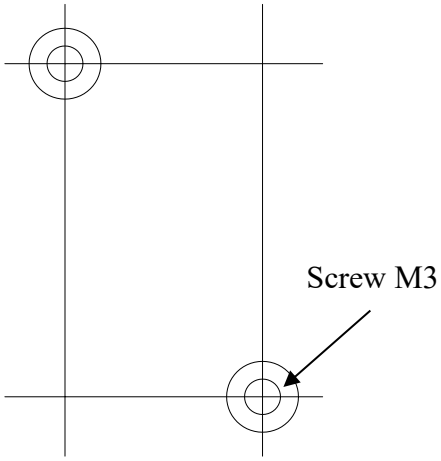
2) Installation Method

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

- DIN46277



- 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: XLQ 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 XDQ series PLC support AC power type (Type with '-E' is AC power).

XLQ 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 ≥ 1second
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±10% 16 points max is 200mA, 32 points max is 400mA

Note:

※1: Please use the wire cable more than 2mm^2 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±10% 16 points max is 200 mA, 32 points max is 400mA

Note:

※1: XDQ series PLC provides DC24V power supply (terminal 24V, 0V), it can be power supply for sensor, 16 points PLC DC24V is 200mA, 24~60 points PLC DC24V is 400mA. (The output is the rated current value. If the instantaneous current exceeds the rated current value, please use an external switching power supply for power supply). Note: This terminal cannot be powered by an external power source.

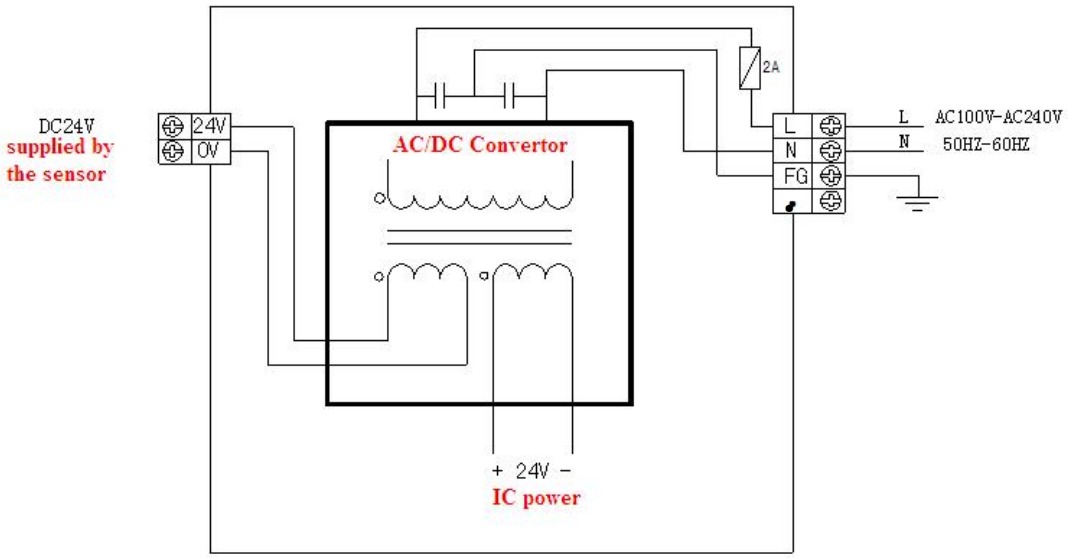
※2: ● is empty terminal, do not use it.

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

4-2. AC Power Supply and DC Input

The following content is only applicable to XDQ 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 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 COM terminals on basic units and expansions together.

5 Input Specifications and Wiring Methods

5-1. Input Specification

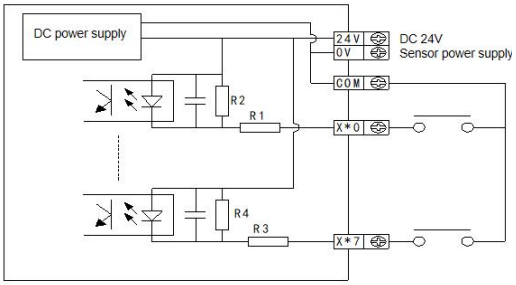
5-1-1. XDQ Series Input Specification

The input of XDQ series PLC is divided into two modes: NPN, PNP. The internal structure and wiring methods of these two modes are introduced below.:

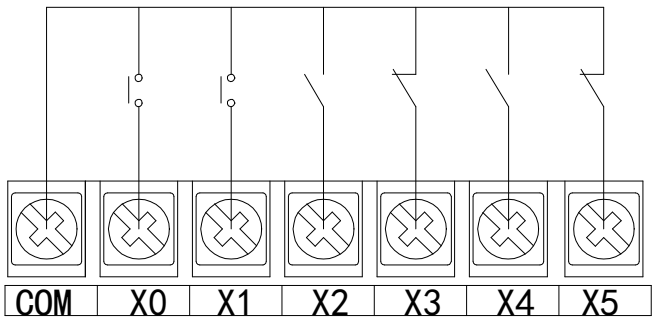
5-1-1-1. NPN Input Specifications

1) Input specification

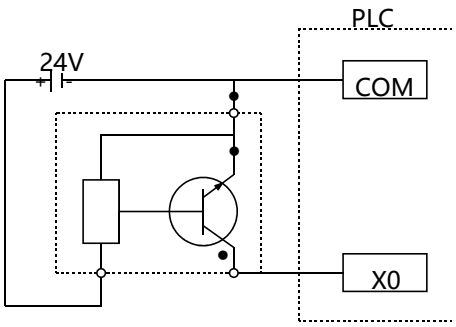
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal form	Contact input or NPN open collector transistor
Circuit insulation	Opto-coupling insulation
Input action display	LED light when input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



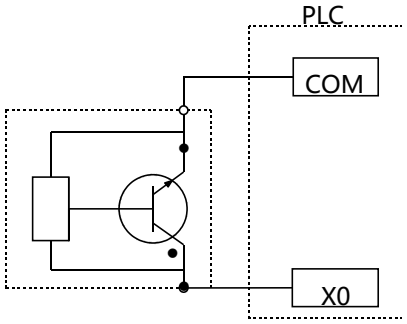
2) Wiring example



Switch button wiring diagram



3-wire (NPN) proximity switch wiring diagram

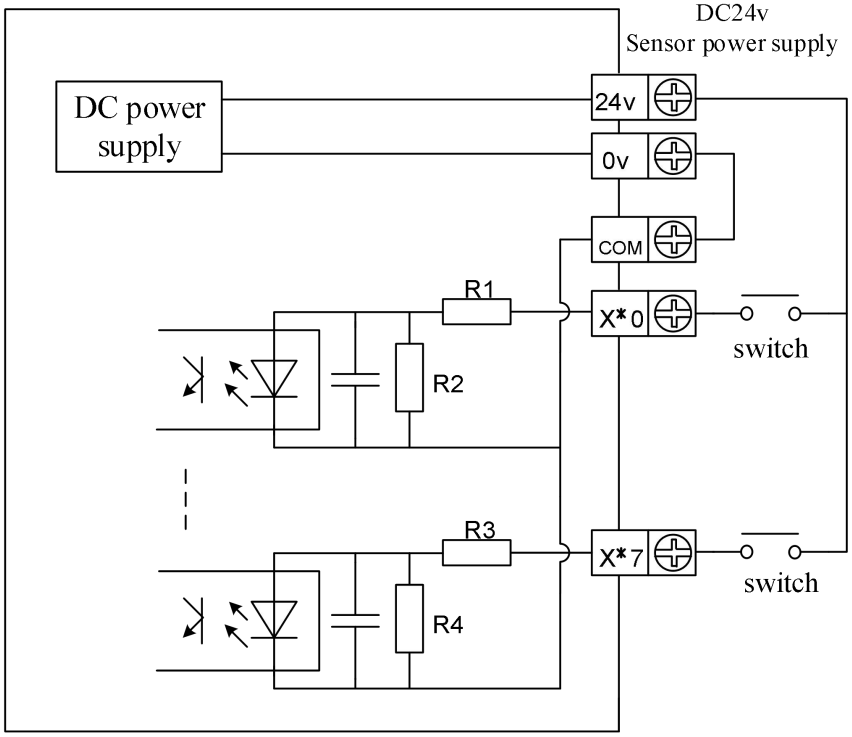


2-wire (NPN) proximity switch wiring diagram

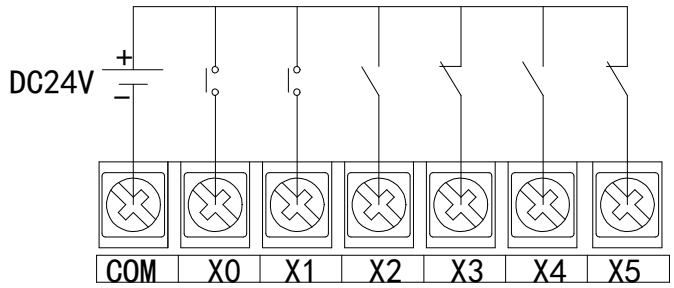
5-1-1-2. PNP Input Specifications

1) Input specification

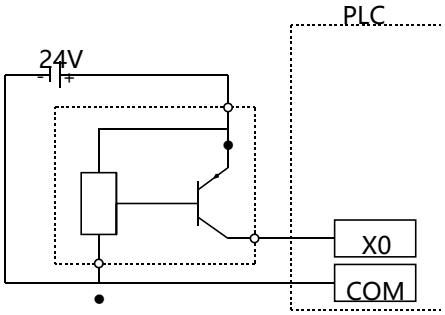
Items	Content
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Under 1.5mA
Input response time	About 10ms
Input signal form	Contact input or PNP open collector transistor
Circuit insulation	Opto-coupling insulation
Input action display	LED light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



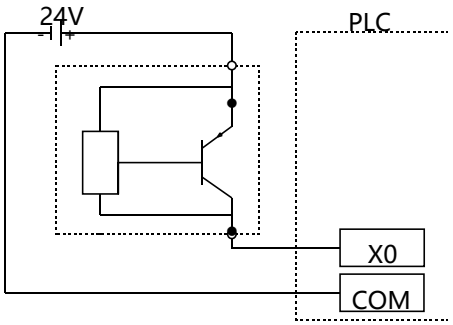
2) Wiring example



Switch button wiring diagram



3-wire (PNP) proximity switch wiring diagram



2-wire (PNP) proximity switch wiring diagram

Note: If DC24V is 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.

5-1-2. XLQ Series Input Specification

The input of XLQ series PLC is divided into three modes: NPN, PNP and differential.The following introduces the input specifications and wiring methods of the PLC and its expansion modules.

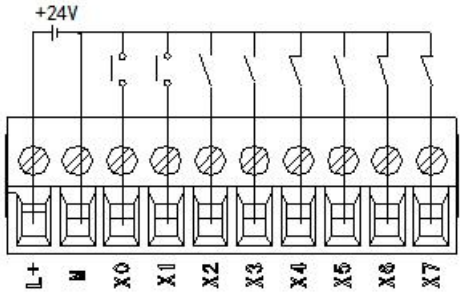
5-1-2-1. NPN Input Specifications

1) Input Specification

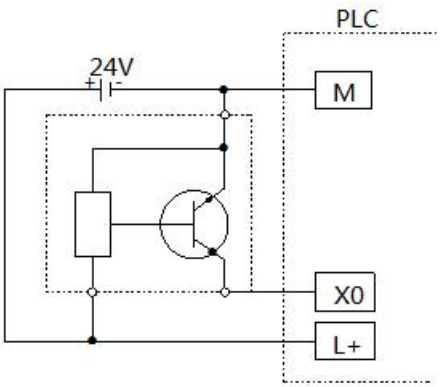
- General models:

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

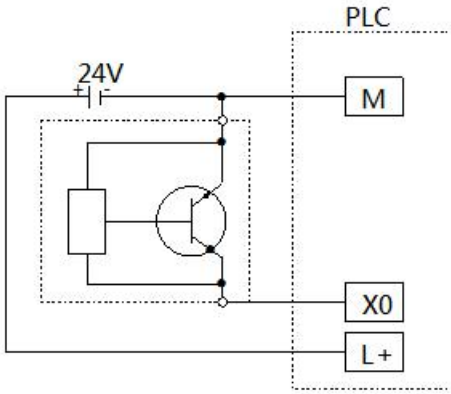
2) NPN Input Wiring Example



Switch button wiring diagram



3-wire (NPN) proximity switch wiring diagram



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

- Input terminal

Since the PLC does not have a built-in DC24V power supply, when performing the input wiring, 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.

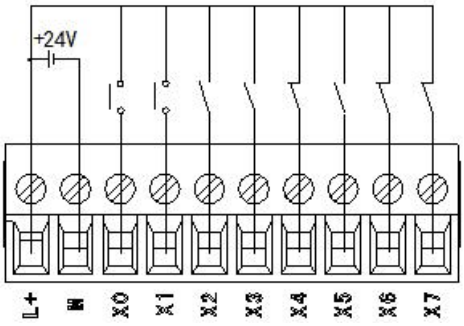
5-1-2-2. PNP Input Specifications

PNP series models need to be distinguished from product models, please refer to 1-2-2 XLQ series basic unit model and list.

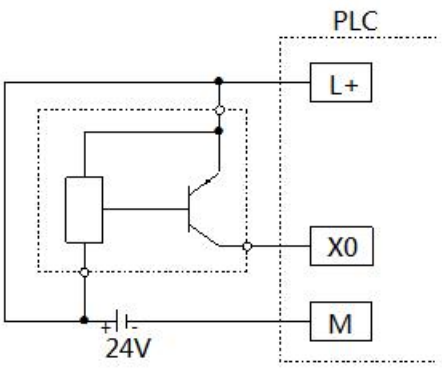
1) Input specification

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

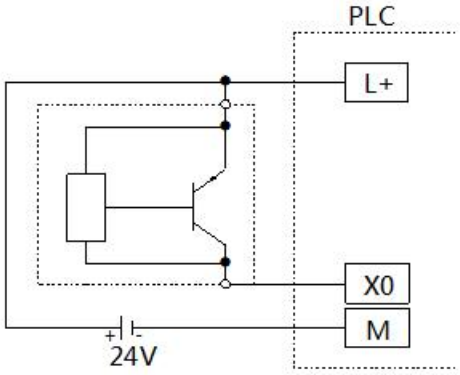
2) Wiring example



Switch button wiring diagram



3-wire (PNP) proximity switch wiring diagram



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

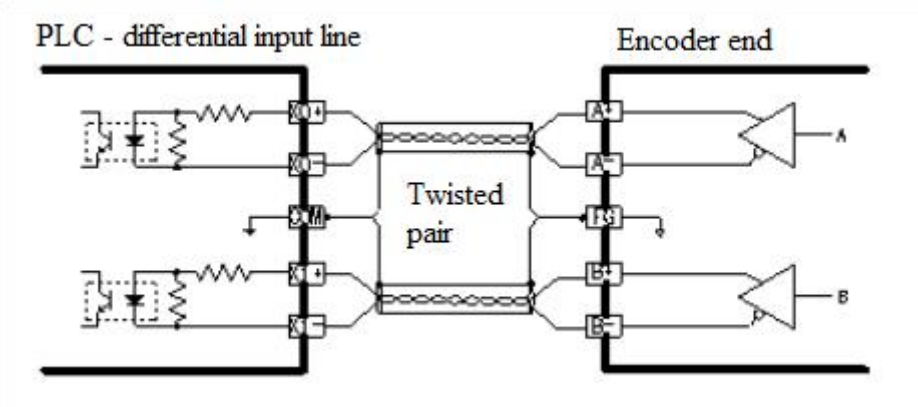
5-1-2-3. Differential Input Specification

1) Input Specification

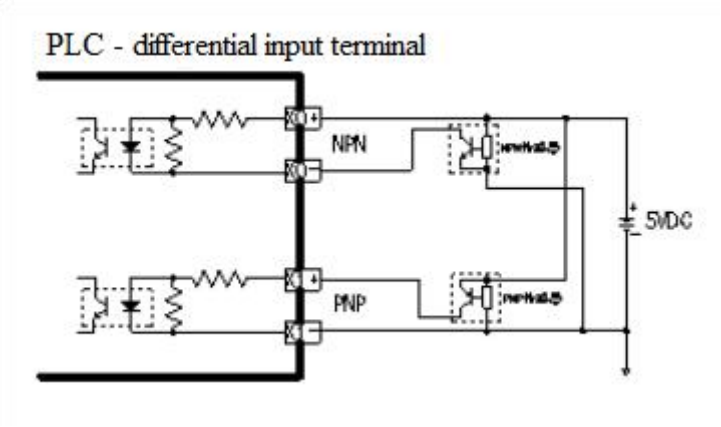
The XLQ7 series differential PLC supports differential input mode, and its specifications and wiring methods are as follows:

Items	XLQ7-30A32
Differential input point	4 points (X0, X1, X3, X4)
Input signal	5V differential signal
Enter the highest frequency	1MHz
Circuit insulation	Opto-coupling insulation
Input action display	When the input is ON, the LED light is on

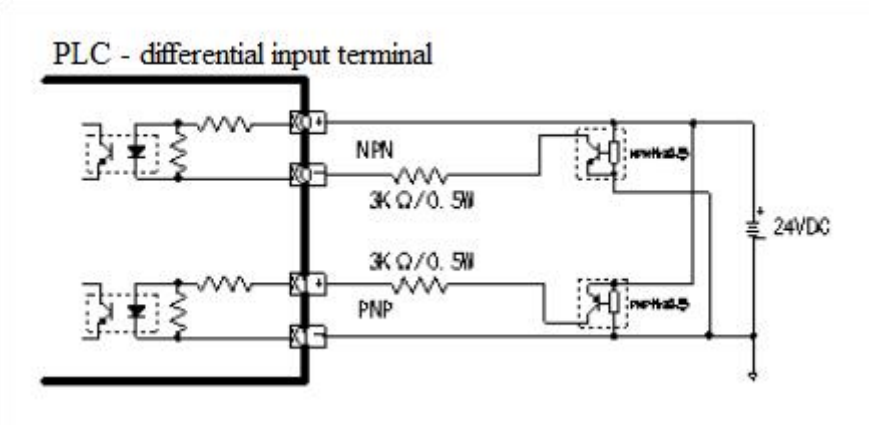
2) Wiring example



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

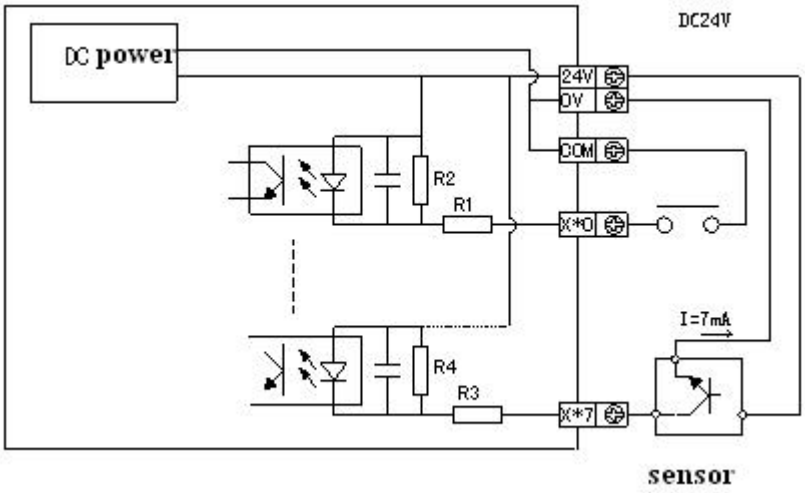
Note: When the differential input terminal receives 5V/24V single ended NPN and PNP signals, The maximum counting frequency is 80 kHz for single-phase operation and 50 kHz for AB-phase operation.

5-2．DC Input Signal (AC power supply)

Below contents are only fit for XDQ 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.

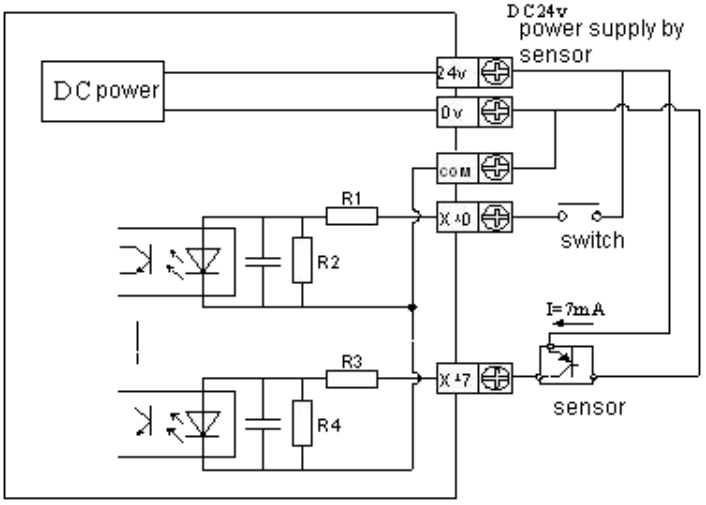
- Input circuits

  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.

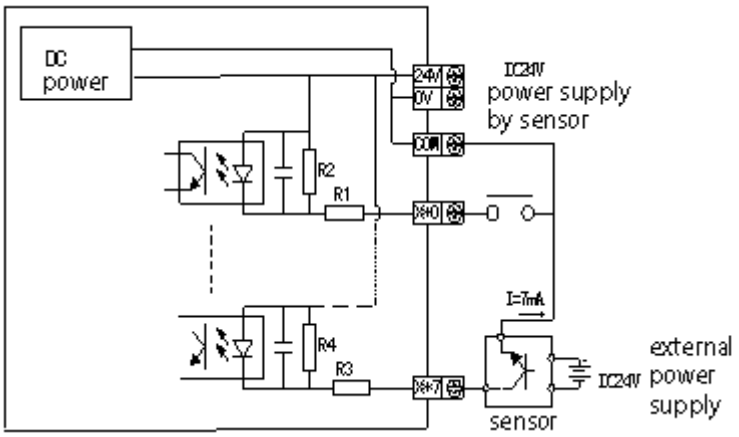
- Input sensitivity

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

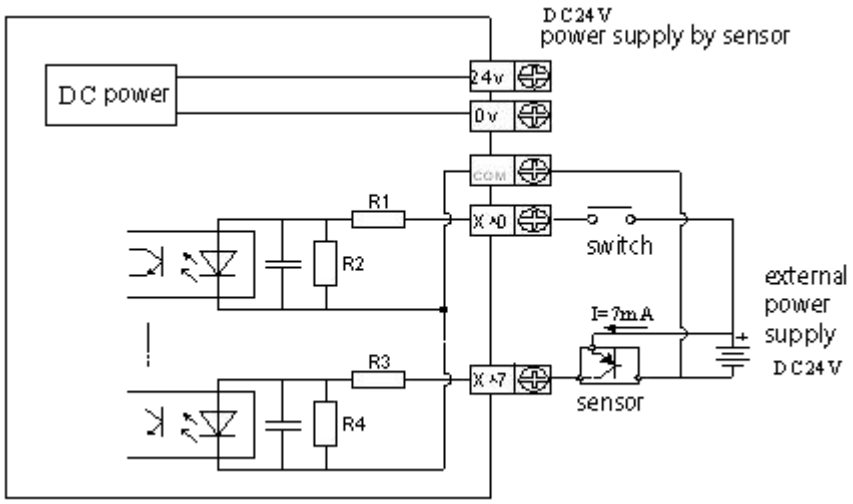
- NPN Mode

XDQ 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.



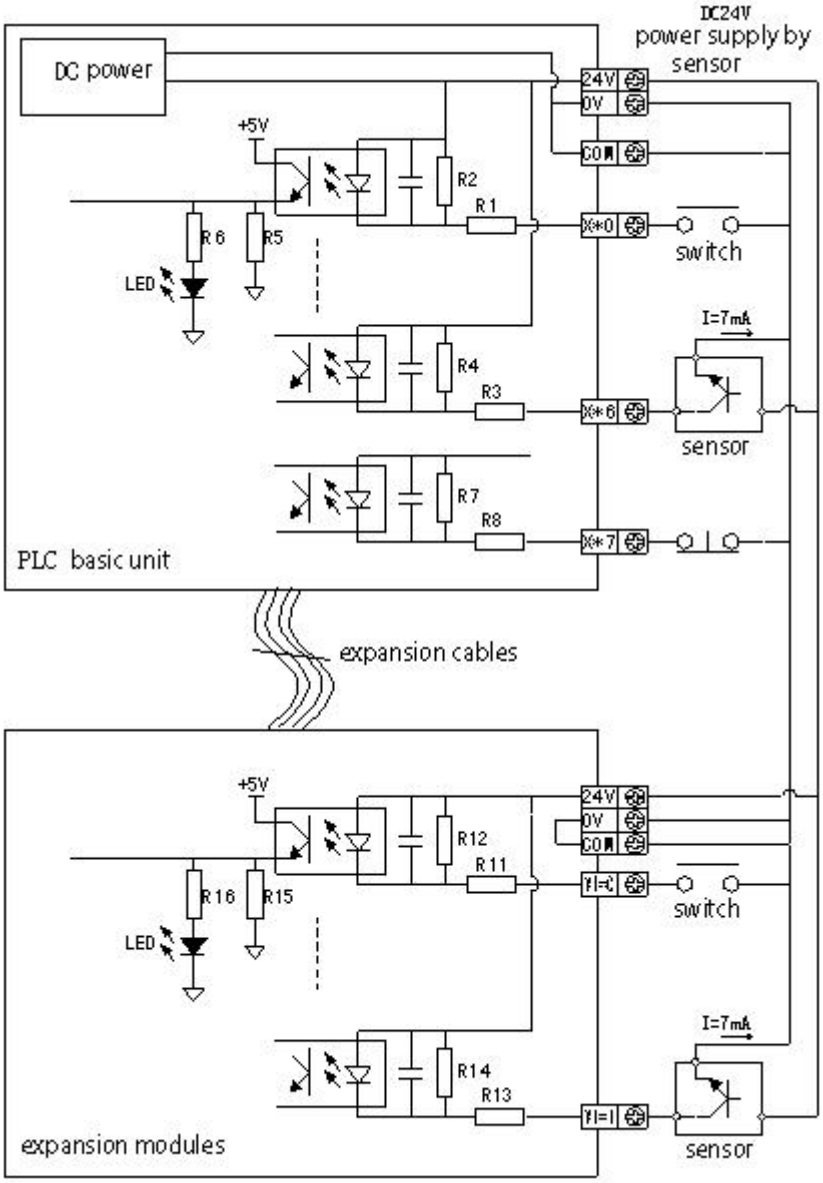
- PNP Mode

XDQ 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.

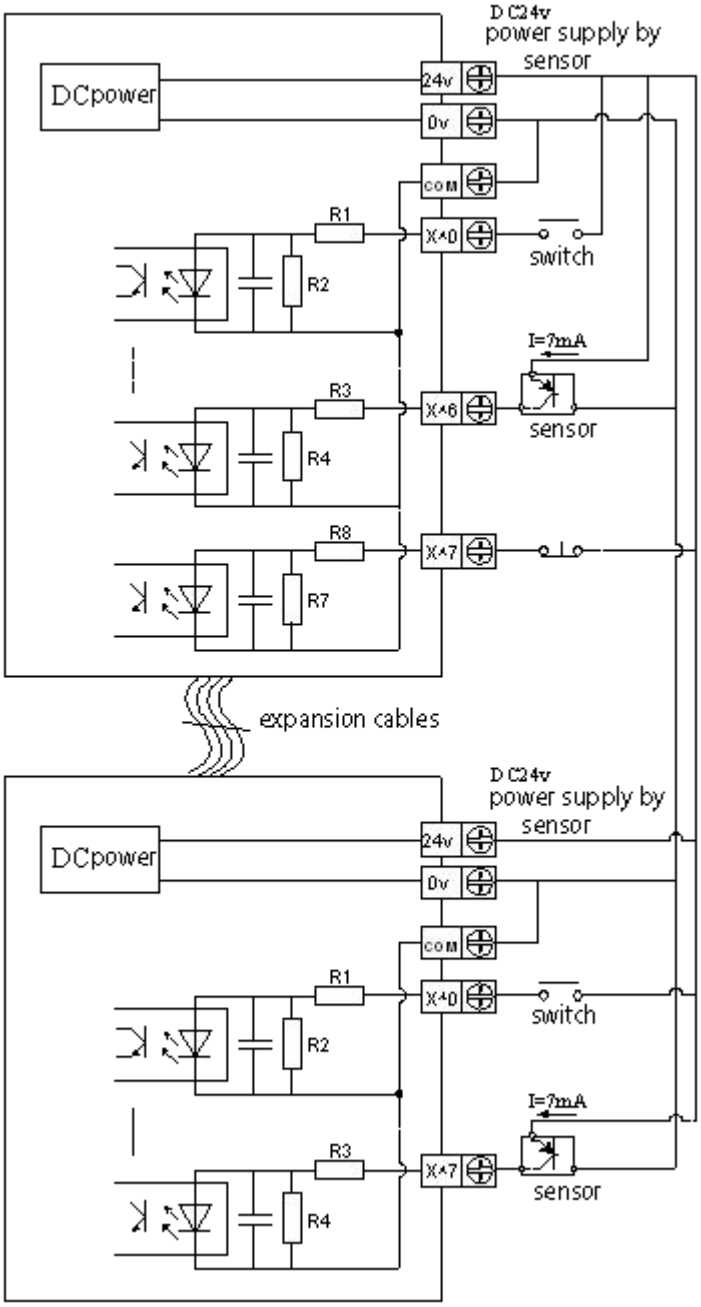


3) Input Wiring

- NPN mode



- PNP mode

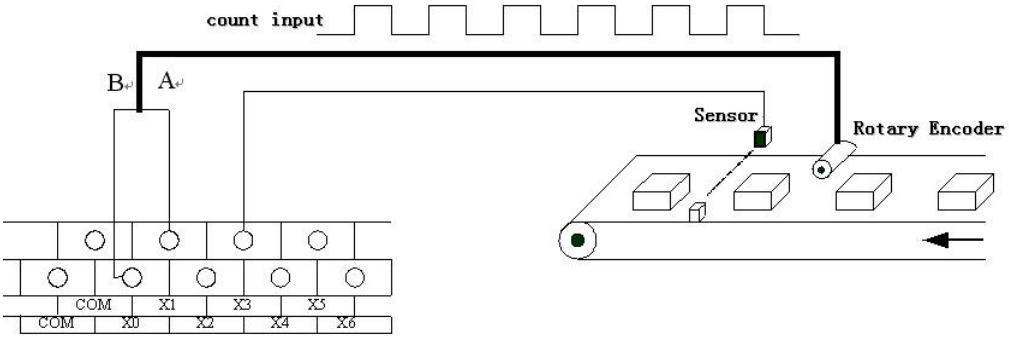

DC24v
power supply by
sensor
DCpower
24v
0v
com
R1
X*0
switch
R2
I=7mA
R3
X*6
sensor
R4
R8
X*7
R7
expansion cables
DC24v
power supply by
sensor
DCpower
24v
0v
com
R1
X*0
switch
R2
I=7mA
R3
X*7
sensor
R4

5-3．High Speed Counter Input

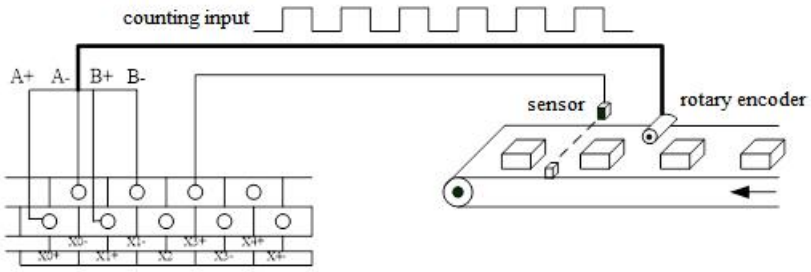
XDQ/XLQ series PLC support high speed count function which is irrelevant with the scan cycle and can test high speed input signal of measuring sensors and rotary encoders etc by selecting different counter, max measuring frequency can be up to 80KHz (differential model can up to 1MHz).

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.



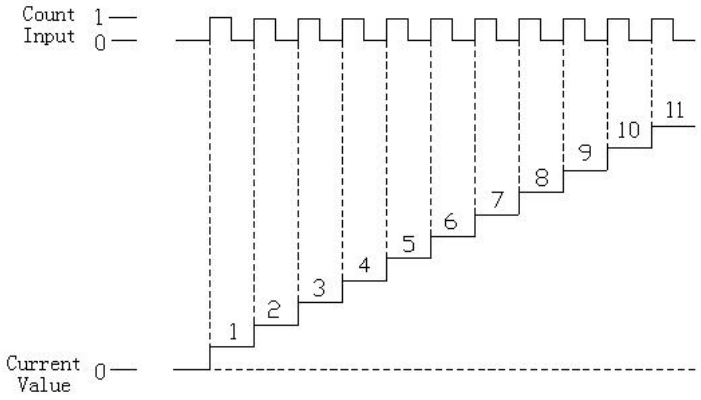
※3: When the input frequency is above 25Hz, please use high speed counter.

5-3-1．Counting Mode

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

1) Increment mode

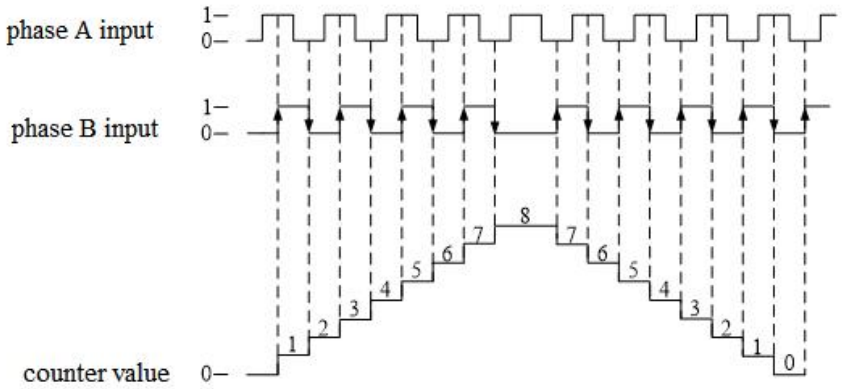
Under this mode, if counting input pulse signal, the counting value will increase one along with the rising edge of every pulse signal.



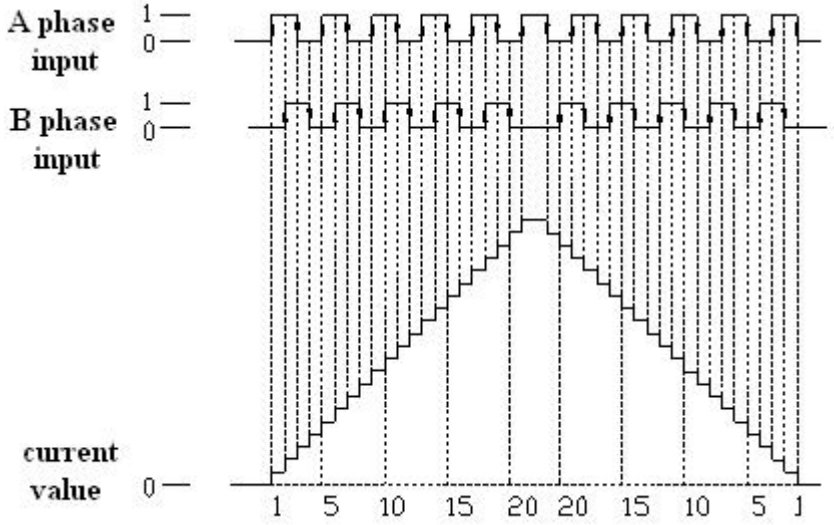
2) AB-phase

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



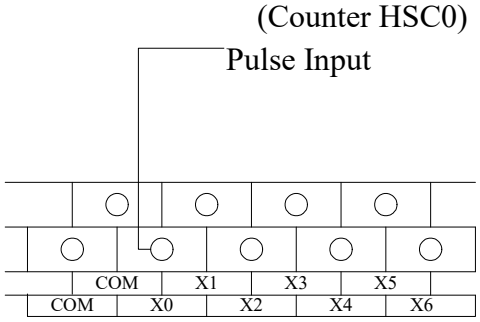
5-3-2. High Speed Counting Range

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.

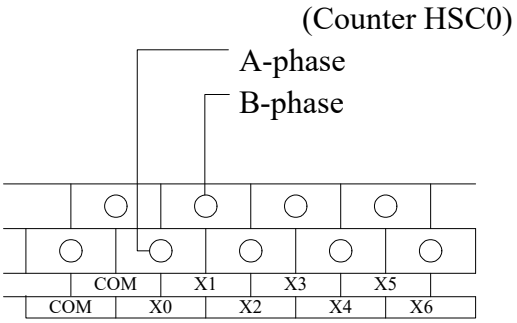
The up-flow means the counting value jumps from K+2,147,483,647 to K-2,147,483,648 and then continue to count. The down-flow means the counting value jumps from K-2,147,483,648 to K+2,147,483,647 and then continue to count.

5-3-3. High-Speed Counter Input Wiring

For input terminal wiring of pulse counting, it differs according to PLC types and counting modes. Some typical wiring methods are as below (take XDQ3-32 PLC as an example):



Increment Mode



AB-phase Mode

5-3-4. Input Terminals Assignment

1) High Speed Counters assignment of XDQ series PLC:

PLC model		HSC channel number	
		Increment mode	AB-phase mode
XDQ3	16/32/60	3	3
XDQ5	32	3	3
XDQ3E	24	3	3
XDQ5E	30T4	3	3
	60T10	10	10
XDQ7	30A16/60A32	4	4
XLQ7	24A16/30A32	4	4

2) Definition of High-Speed Counting Input Terminals:

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 developping.

Normally, the input frequency of terminal X0, X1can 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:

XDQ3-16												
	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		

XDQ3-32/60、XDQ5-32、XDQ3E-24												
	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				

XDQ3-32/60、XDQ5-32、XDQ3E-24												
	Single phase incremental mode							AB phase mode				
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC0	HSC2	HSC4	HSC6	HSC8
X003		U							A			
X004									B			
X005									Z			
X006			U							A		
X007										B		
X010										Z		

XDQ5E-30T4、XLQ7-24A16												
	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		

XDQ7-30A16/60A32												
	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					

XDQ7-30A16/60A32												
	Single phase incremental mode						AB phase mode					
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10
X002							Z					
X003		U						A				
X004								B				
X005								Z				
X006			U						A			
X007									B			
X010									Z			
X011				U						A		
X012										B		
X013										Z		

XLQ7-30A32																
	Single phase incremental mode								AB phase mode							
	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14	HSC0	HSC2	HSC4	HSC6	HSC8	HSC10	HSC12	HSC14
Highest frequency	80M	80M	80K	80K					50M	50M	50K	50K				
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																

XDQ5E-60T10												
	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												
X014					U							
X015												
X016												
X017						U						
X020												
X021												
X022							U					
X023												
X024												
X025								U				
X026												
X027												
X030									U			
X031												
X032												
X033										U		
X034												

XDQ5E-60T10												
	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								
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 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 2, it is 2 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 XDQ/XLQ 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.

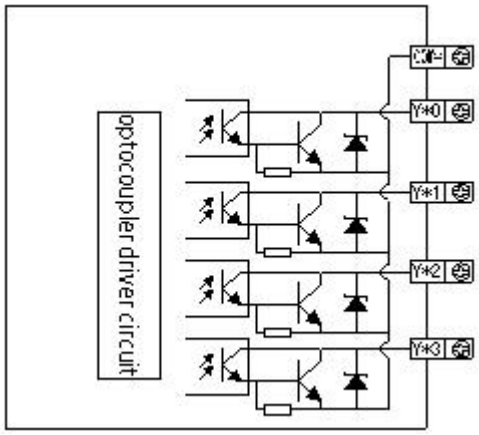
※3: After setting the SFD register, please restart the high speed counter (cut off the trigger condition and turn on again) to make the setting effective!

6 Output Specification and Wiring Methods

6-1. Output Specification

1) 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
Open-circuit leakage current		Below 0.1 Ma
Response time	OFF→ON	Below 0.2ms
	ON→OFF	Below 0.2ms



2) Transistor High Speed Pulse Output

Model	T, Tn models		
High speed pulse output terminals	Y0, Y1	Y0~Y3	Y0~Y11
Corresponding model	Normal models	XDQ5E-30T4 XDQ7-30A16 XDQ7-60A32 XLQ7-24A16 XLQ7-30A32	XDQ5E-60T10
External power supply	Below DC5~30V		
Action indicator	LED indicator		
Max current	50mA		
Max output frequency	100KHz		

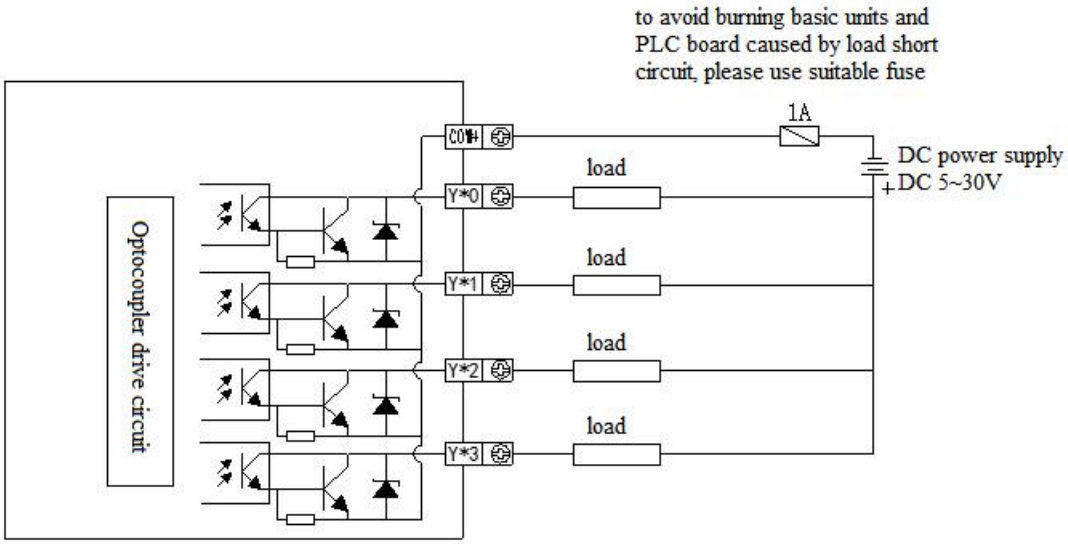
Note:

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.

6-2．Transistor Output Type

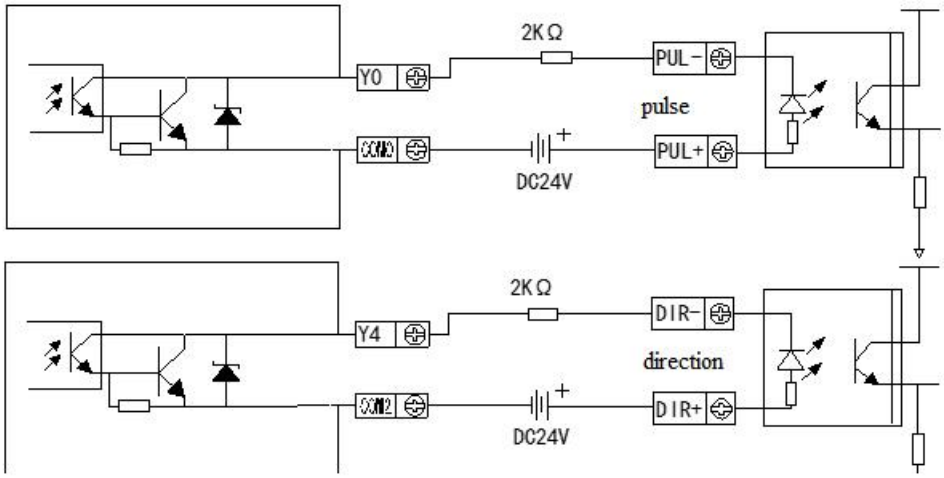
Normal Transistor Output

- 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

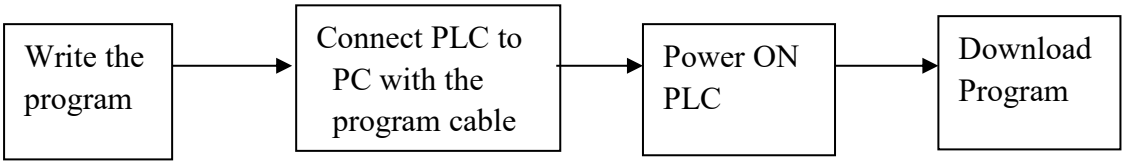
7-1. Run and Debug

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

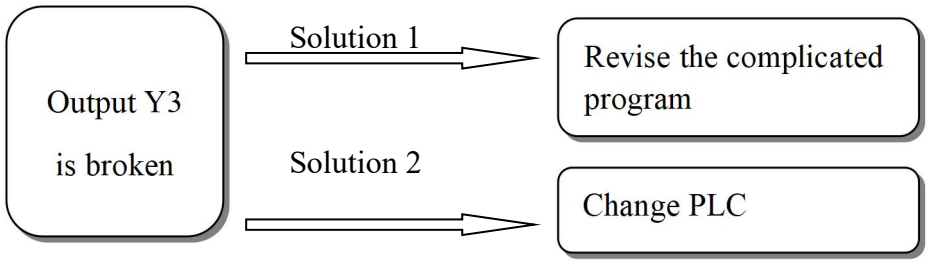
8 Switch between Soft Components

8-1. Function Summary

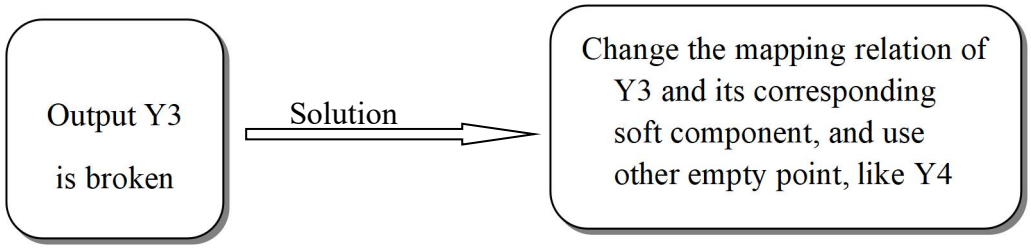
When the internal lighting coupling, relays or transistor are damaged, the corresponding input/output terminals will be out of use. Users either revise the program or ask the manufactures for help, which is very troublesome and affects the users' normal work schedule.

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:

Table 1 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)

Table 2 mapping relation of the output and soft component

ID	Function	Description
SFD110	O00 correspond to Y**	0 of output corresponds to the number of
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.

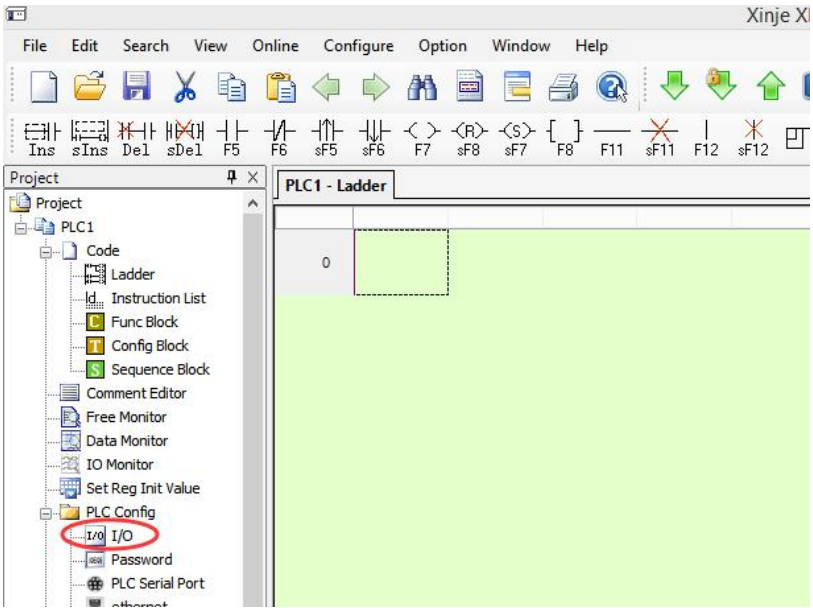
※2： When change the mapping relation, please pay attention, input/output data is octal number while ID is decimal number.

※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;

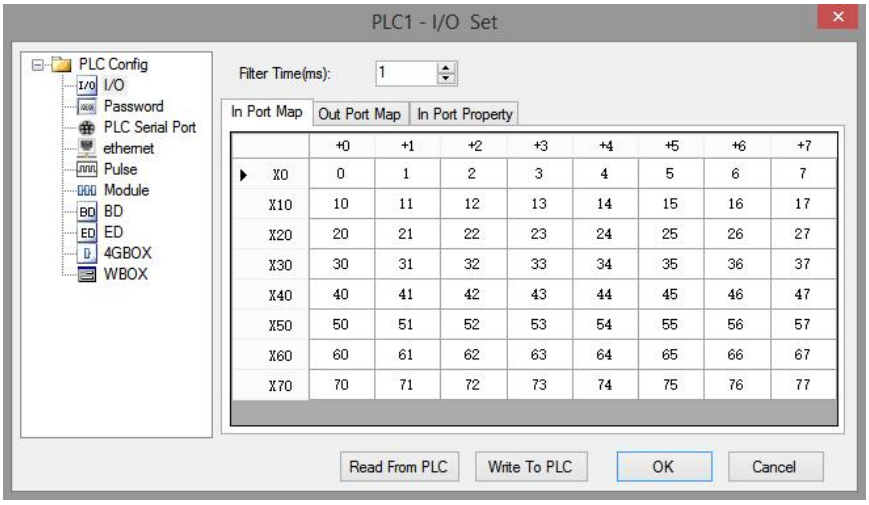
※4：Mapping relation, one terminal corresponds to one soft component.

※5：Users can modify the SFD value in the software, please see method 2.

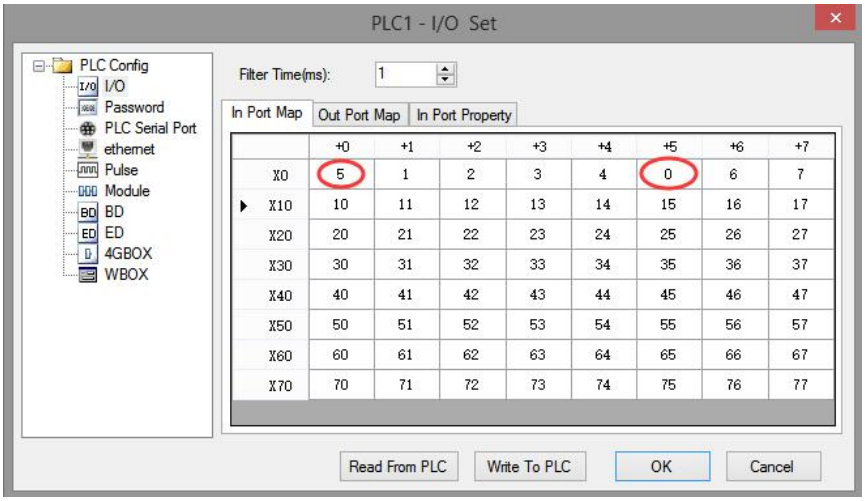
Method 2: Modify in the software directly. Click the project bar/PLC config/I/O.



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.



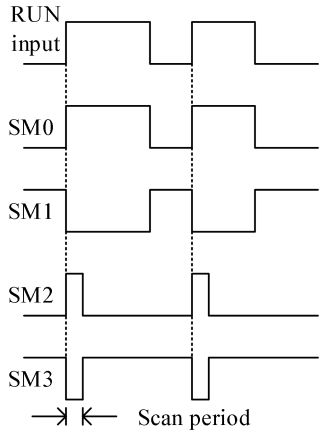
Appendix

Appendix 1 Special Soft Element Schedules

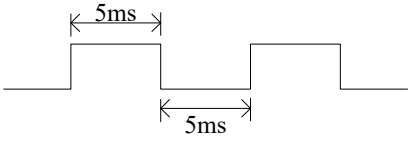
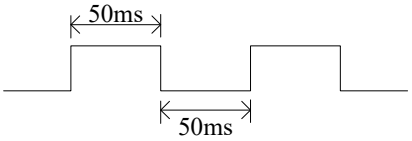
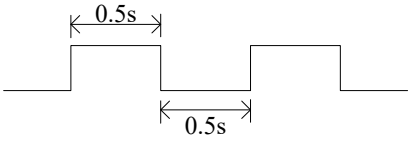
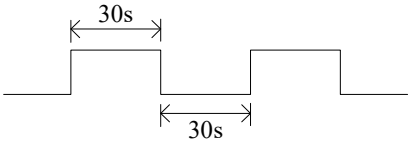
Appendix 1 mainly introduces the functions and uses of special software components, data registers, and FlashROM registers in XDQ/XLQ series PLCs. In addition, it also involves the allocation table of extended module addresses for users to quickly browse and search.

Appendix 1-1. Special Auxiliary Relay Schedule

1) Initial Status(SM0-SM5)

<table>
<tr><th>ID</th><th>Function</th><th colspan="2">Description</th></tr>
<tr><td>SM000</td><td>Normally ON coil when operation</td><td rowspan="4">
</td><td>Keeping ON when PLC running</td></tr>
<tr><td>SM001</td><td>Normally OFF coil when operation</td><td>Keeping OFF when PLC running</td></tr>
<tr><td>SM002</td><td>Initial positive pulse coil</td><td>After the PLC starts running, the first scanning cycle is in the "ON" state.</td></tr>
<tr><td>SM003</td><td>Initial negative pulse coil</td><td>After the PLC starts running, the first scanning cycle is in the "OFF" state.</td></tr>
<tr><td>SM004</td><td>PLC running error</td><td colspan="2">When SM4 sets ON, it indicates that there is an error in the operation of PLC.</td></tr>
<tr><td>SM005</td><td>Battery low alarm coil</td><td colspan="2">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)</td></tr>
</table>

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, and 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.
SM034	All output forbidden	The output indicator lights of the PLC are all off, but the output status of the Y terminal remains unchanged. If it is used for pulse output, the software will also monitor the pulse changes. However, there is no actual output. The pulse stops being sent by emergency stop. The output of the expansion module is also prohibited.

5) Stepping Ladder (SM40)

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 interruption is allowed. E.g.：when SM050 is ON, I0000/I0001 is forbidden.
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	
……	……	……	
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 1	SM150	Modbus instruction execution flag	When the instruction starts to execute, set it to ON. When the execution is completed, set it to OFF.
	SM151	X-NET instruction execution flag	When the instruction starts to execute, set it to ON. When the execution is completed, set it to OFF.
	SM152	Free format communication sending flag	When the instruction starts to execute, set it to ON. When the transmission is completed, set it to OFF.
	SM153	Free format communication receive complete flag	When a frame of data is received or the data reception timeout occurs, set to ON; The user program needs to set it to OFF
Serial port 2	SM160	Modbus instruction execution flag	Same to SM150
	SM161	X-NET instruction execution flag	Same to SM151
	SM162	Free format communication sending flag	Same to SM152
	SM163	Free format communication receive complete flag	Same to SM153

Serial port 3	SM170	Modbus instruction execution flag	Same to SM150
	SM171	X-NET instruction execution flag	Same to SM151
	SM172	Free format communication sending flag	Same to SM152
	SM173	Free format communication receive complete flag	Same to SM153
Serial port 4	SM180	Modbus instruction execution flag	Same to SM150
	SM181	X-NET instruction execution flag	Same to SM151
	SM182	Free format communication sending flag	Same to SM152
	SM183	Free format communication receive complete flag	Same to SM153
Serial port 5	SM190	Modbus instruction execution flag	Same to SM150
	SM191	X-NET instruction execution flag	Same to SM151
	SM192	Free format communication sending flag	Same to SM152
	SM193	Free format communication receive complete flag	Same to SM153

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 block97is 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	
SM401	Expansion module communication error	
SM402	BD communication error	
SM403	FROM/TO command error flag	
SM404	PID command error flag	
SM405	No user program	Internal code check wrong
SM406	User program error	Implement code or configuration table check wrong
SM407	SSFD check error	
SM408	Memory error	Can not erase or write Flash
SM409	Calculation error	
SM410	Offset overflow	Offset exceeds soft element range
SM411	FOR-NEXT overflow	
SM412	Invalid data fill	
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	

SM455	Power loss causes incorrect data retention	
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 level display register	When the battery voltage is 3.1V, it displays 100; when the battery voltage drops below 2.5V, it shows 0. At this point, please replace the battery as soon as possible; otherwise, the data will not be able to be saved by power-off.

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	Compatible system version(low) system version(high)	
SD023	Compatible 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	HSC14	

	segment)		
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 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 420：XNET read/write error
	SD152	Free format communication	0: correct 410: free format send buffer

		send result	overflow
	SD153	Free format communication 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 format communication receive data numbers	In bytes, not include start and stop characters
	SD155	Slave ID with Modbus command communication fault	0: Indicates that SD150 contains no error messages; Not 0: Indicates that an error exists in SD150, and the station number of the current faulty station is displayed (supported only by Ethernet models running firmware version 3.7.4 or later).
	……		
	SD159		
Serial port 2	SD160	Modbus read write instruction execution result	Same as SD150
	SD161	X-Net communication result	Same as SD151
	SD162	Free format communication send result	Same as SD152
	SD163	Free format communication receive result	Same as SD153
	SD164	Free format communication receive data numbers	Same as SD154
	SD165	Slave ID with Modbus command	Same as SD155

		communication fault	
	……		
	SD169		
Serial port 3	SD170~SD 179		
Serial port 4	SD180~SD 189		
Serial port 5	SD190~SD 199		

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	I/O type of error	
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	
SD405	No user program	
SD406	User program error type	
SD407	SSDF Error Type	
SD408	Erasing FLASH 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	Offset error type	
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	System error types	1：Watchdog act (Default 200ms) 2：Control block application fail 3：Visit illegal address

SD451	Firmware error types	1：Register error 2：Bus error 3：Usage error
SD452	Hardware error	
SD453	SD card error	
SD454	Power-off time	unit(ms)
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 register

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		Expansion

	module read		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		BD module 1
SD925	Error types of module read		
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)

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) This function is only supported by programming software versions 3.5.3 (20190326) and above..
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 re-power 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

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

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 faulty, 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) 0 Mapping

ID	Function	Description	
SFD74*	O00 corresponds to Y**	Output terminal 0 correspond to Y** number	0xFF means terminal faulty, 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(100 segment)	bit0 corresponds to HSC0， bit1corresponds to HSC2，and so on, bit9 corresponds to HSC18 0：relative 1：absolute
SFD331	100 high-speed counts Interrupt loop	bit0 corresponds to HSC0， bit1corresponds to HSC2, and so on, bit9 corresponds to HSC18 0：single 1：circulation
SFD332	CAM function	bit0 corresponds to HSC0， bit1corresponds 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 XDQ/XLQ 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 substraction
	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
Position Control	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 Sport - Single Axis Function	A_PWR	Axis Enable
	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 "XDQ/XLQ 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	Differential	
XDQ3												
XDQ3-16	1	1	1	×	10	×	1	3	×	2	×	6
XDQ3-32	1	1	1	×	10	1	1	3	×	2	×	10
XDQ3-60	1	1	1	×	10	2	1	3	×	2	×	10
XDQ5												
XDQ5-32	1	1	1	×	16	1	1	3	×	2	×	10
XDQ3E												
XDQ3E-24	×	1	1	2	10	1	1	3	×	2	×	10
XDQ5E												
XDQ5E-30T4	×	1	1	2	16	1	1	4	×	4	×	10
XDQ5E-60T10	×	1	1	2	16	2	1	10	×	10	×	10
XDQ7												
XDQ7-30A16	×	1	1	2	16	×	1	4	×	4	×	10
XDQ7-60A32	×	1	1	2	16	1	1	4	×	4	×	10
XLQ7												
XLQ7-24A16	×	1	1	2	16	×	1	4	×	4	×	10
XLQ7-30A32	×	1	1	2	16	×	1	2	2	4	×	10

Note:

1: All models are equipped with clock function as standard.

2: 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.

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