XINJE

XS series PLC

User manual【Hardware】

Wuxi Xinje Electric Co., Ltd.

Data No. PS01 20211214EN 1.0.1

Basic description

- Thank you for purchasing the Xinje XS series programmable controller.
- This manual mainly introduces the hardware features of XS series programmable controllers.
- Before using the product, please read this manual carefully and conduct wiring on the premise of fully understanding the contents of the manual.
- Please deliver this manual to the end user.

Notes to users

- Only operators with certain electrical knowledge can conduct wiring and other operations on the product. If there is any unknown place, please consult our technical department.
- The examples listed in the manual and other technical data are only for users' understanding and reference, and do not guarantee certain actions.
- When using this product in combination with other products, please confirm whether it conforms to relevant specifications and principles.
- When using this product, please confirm whether it meets the requirements and is safe.
- Please set up backup and safety functions by yourself to avoid possible machine failure or loss caused by the failure of this product.

Statement of responsibility

- Although the contents of the manual have been carefully checked, errors are inevitable, and we cannot guarantee complete consistency.
- We will often check the contents of the manual and make corrections in subsequent versions. We welcome your valuable comments.
- The contents described in the manual are subject to change without notice.

Contact us

If you have any questions about the use of this product, please contact the agent and office who purchased the product, or you can directly contact the company.

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November 2021

Safety precautions

Before using this product, please read this part carefully and operate after fully understanding the use, safety, precautions, etc. of the product. Please correctly conduct product wiring under the premise of paying great attention to safety.

The problems that may arise during the use of the product are basically included in the safety precautions, which are indicated in two levels of attention and danger. For other unfinished matters, please follow the basic electrical operation procedures.

Attension	When used incorrectly, it may cause danger, moderate injury or minor injury, and property damage.
Danger	When it is used incorrectly, it may cause danger, cause personal injury or serious injury, and may cause serious property damage.

- Confirmation upon receiving the product

Attension
Do not install damaged controllers, controllers with missing parts, or controllers with unqualified models. Danger of injury.

- Product system design

Danger
Please design a safety circuit outside the controller to ensure that the whole system can operate safely when the controller operates abnormally. There is a risk of misoperation and failure.

Attension
Do not tie the control wiring and power wiring together. In principle, they should be separated by 10cm. It may cause malfunction and product damage.

- Product installation

Danger
Before installing the controller, be sure to disconnect all external power supplies. Danger of electric shock.

Attension
1. Please install and use this product under the environmental conditions specified in the general specifications of the manual. Do not use in damp, high temperature, places with dust, smoke, conductive dust, corrosive gas, flammable gas, vibration and impact. It may cause electric shock, fire, misoperation, product damage, etc. 2. Do not directly touch the conductive part of the product. It may cause malfunction and fault. 3. Please use DIN46277 guide rail, M3 screw or Xinje XG-EB to fix the product and install it on a flat surface. Incorrect installation may cause malfunction and product damage. 4. When processing the screw hole, please do not let the cutting powder and wire debris fall into the product cover. It may cause malfunction and fault. 5. when connecting the expansion module with the expansion cable, please confirm that the connection is tight and the contact is good. It may lead to poor communication and misoperation. 6. when connecting peripheral devices, expansion devices, batteries and other devices, be sure to cut off power for operation. It may cause malfunction and fault.

- Product wiring

Danger
1. Before wiring the controller, be sure to disconnect all external power supplies. Danger of electric shock. 2. Please correctly connect the DC power supply to the dedicated power terminal of the controller. If the power supply is connected incorrectly, the controller may be burned. 3. Before the controller is powered on and operated, please cover the cover plate on the terminal block. Danger of electric shock.

Attension
1. Do not use external 24V power supply to connect to 24V and 0V terminals of the controller or expansion module. It may cause damage to the product. 2. Please use 2mm^2 wire to carry out the third kind of grounding for the grounding terminal of the controller and expansion equipment, and do not share the grounding with the strong current system. It may cause failure, product damage, etc. 3. Do not make external wiring to the empty terminal. It may cause malfunction and product damage. 4. When processing the screw hole, please do not let the cutting powder and wire debris fall into the product cover.

May cause malfunction, fault, etc. 5. When using wires to connect terminals, be sure to tighten them, and do not make conductive parts contact other wires or terminals. It may cause malfunction and product damage.

- Operation and maintenance of products

 Danger
1. Do not touch the terminal after the controller is powered on. Danger of electric shock. 2. Do not connect or remove the terminal with electricity. Danger of electric shock. 3. Please stop the program in the controller before changing it. It may cause malfunction.

 Attension
1. Do not disassemble or assemble this product without authorization. It may cause damage to the product. 2. Please plug and unplug the connecting cable in case of power failure. It may cause cable damage and malfunction. 3. Do not make external wiring to the empty terminal. It may cause malfunction and product damage. 4. Please cut off the power before removing the expansion device, peripheral device and battery. It may cause malfunction, fault, etc. 5. When the product is discarded, please treat it as industrial waste.

Catalog

Preface

The following will introduce the scope of application, conventions and related manuals of this manual.

Manual application range

This manual is the hardware manual of XS series programmable controller products. The manual covers the following product information:

1. XSDH series PLC

Type	Series	Product model
Basic unit	XSDH series	XSDH-60A32-E
Expansion module	I/O expansion	XD-E8X, XD-E16X, XD-E32X
		XD-E8Y, XD-E16Y, XD-E32Y
		XD-E8X8Y, XD-E16X16Y
	AD/DA expansion	AD type: XD-E4AD, XD-E8AD, XD-E8AD-A, XD-E8AD-V, XD-E12AD-V
		DA type: XD-E2DA, XD-E4DA
		AD/DA type: XD-E4AD2DA
	Temperature expansion	XD-E4PT3-P, XD-E6PT-P, XD-E2TC-P, XD-E6TC-P, XD-E6TC-P-H
	Mixed expansion	XD-E3AD4PT2DA, XD-E2AD2PT2DA
	Weighing extension	XD-E1WT-C, XD-E2WT-C, XD-E4WT-C XD-E1WT-D, XD-E2WT-D, XD-E4WT-D
	SSI encoder expansion	XD-E4SSI
	Macro measurement extension	XD-E2GRP

2.XS3 series PLC

Type	Series	Product model
Basic unit	XS3 series	XS3-26T4
Expansion module	I/O expansion	XG-E16X, XG-E32X, XG-E64X
		XG-E16YR, XG-E16YT, XG-E32YT, XG-E64YT
		XG-E8X8YR, XG-E8X8YT, XG-E16X16YT
	AD/DA expansion	AD type: XG-E8AD-A-S, XG-E8AD-V-S
		DA type: XG-E4DA-S
		AD/DA type: XG-E4AD2DA
	Temperature measurement	XG-E8PT3-P, XG-E8TC-P
Accessories	Power supply module	XG-P75-E
	Bus connector	XG-EUC-1, XG-EUCT-1
	Mounting rail	XG-EB-170, XG-EB-260, XG-EB-385, XG-EB-590, XG-EB-880, XG-EB-1500
	External terminal block	JT-G26

Type	Series	Product model
	Connecting cable for external terminal block	JC-G26-NN05 (0.5m), JC-G26-NN10 (1.0m), JC-G26-NN15 (1.5m)
	Elbow XVP cable	JC-EL-25 (2.5m), JC-EL-50 (5.0m), JC-EL-100 (10m)
	USB convertor	USB-COM
	USB download cable	JC-UA-15

3.XSLH series PLC

Type	Series	Product model
Basic unit	XSLH series	XSLH-30A32
Expansion module	I/O expansion	XL-E16X, XL-E16PX, XL-E32X, XL-E32PX
		XL-E16YR, XL-E16YT, XL-E16YT-A, XL-E32YT
		XL-E8X8YR, XL-E8PX8YR, XL-E8X8YT, XL-E8PX8YT
		XL-E16X16YT, XL-E16PX16YT, XL-E16X16YT-A, XL-E16PX16YT-A
	AD/DA expansion	AD type: XL-E4AD, XL-E8AD-A, XL-E8AD-V, XL-E8AD-A-S, XL-E8AD-V-S
		DA type: XL-E2DA, XL-E4DA
		AD/DA type: XL-E4AD2DA
	Temperature measurement	XL-E4TC-P, XL-E4PT3-P
	Pressure measurement	XL-E1WT-D, XL-E2WT-D, XL-E4WT-D

Conventions in the manual

Due to space limitations, some abbreviations may be used in the manual to replace the original names. These names that may be involved are listed in the following table for comparison.

Abbreviation	Explanation
XS series PLC	XS series programmable controller
Basic unit or main body	XS series programmable controller basic unit
Expansion module	XS series programmable controller expansion modules
I/O expansion	XS series programmable controller I/O expansion modules
Analog expansion	XS series programmable controller analog expansion modules
Peripherals	Programming software, HMI, network modules
Programming software	Codesys programming software
HMI	TG, OP series HMI products
TG series	TG series HMI
OP series	OP series operate panel

Related manuals

This manual only covers the hardware of XS series PLC. For other applications, please refer to the relevant manuals. Relevant manuals are listed below for users' reference.

Manual	Introduction	Note
Software manual		
XS series PLC user manual [software]	This paper introduces the use methods and skills of Codesys programming tool software	PDF
Instruction manual		
XS series PLC user manual [motion control]	Introduce the usage of XS series PLC advanced motion control instructions	PDF
Expansion module manual		
XD series PLC expansion module user manual	Introduce the specification parameters and terminal wiring of XSDH series expansion module	PDF
XG series PLC expansion module user manual	Introduce the specification parameters and terminal wiring of XS3 series expansion module	PDF
XL series PLC expansion module user manual	Introduce the specification parameters and terminal wiring of XSLH series expansion module	PDF

1. XS series PLC overview

1-1. Product features

1-1-1. XSDH series basic unit

(1) Model explanation

The basic unit of XSDH series medium-sized PLC currently has one product model.

- I/O points 60 points
- Output type Transistor
- Input type NPN
- Power supply AC220V

Series	Description
XSDH	Includes 60 points specifications. Based on Codesys programming platform, it supports PLCopen programming specification, with larger internal resource space. The main processor has a dominant frequency of 1GHz, supports Ethernet communication, EtherCAT bus function, EtherCAT remote IO, 32-channel electronic cam, online download, and supports 16 expansion modules, which can meet most user needs.

(2) Powerful function

XSDH series PLC has substantial basic functions and a variety of special functions.

Basic functions

- **High speed operation**
  The main processor of XSDH series PLC has a main frequency of 1GHz, which can meet the requirements of high-speed operation.
- **Rich expansion modules**
  XSDH series PLC can support 16 XD series expansion modules.
- **Multi-communication ports**
  The basic unit has four communication ports, which support RS232, RS485. It supports LAN port and EtherCAT communication.
- **Large memory**
  XSDH series PLC has 32M user program capacity and 32M data capacity.
- **6 kinds of programming method**
  XSDH series PLC support ST, SFC, FBD, CFC, LD and IL.
- **Rich instruction set**
  XSDH series PLC supports PLCopen programming specification, and can reference many standard function libraries to develop proprietary function blocks and instruction libraries.
- **Real-time clock**
  XSDH series PLC has built-in clock to control the time.
- **Easy to install**
  XSDH series PLC is easy to install. It can be installed directly on the guide rail or fixed with M3 screws.

Enhanced special functions

- **EtherCAT bus**
  XSDH series PLC supports EtherCAT bus communication, supports up to 32 stations (32-axis motors can be controlled synchronously), and supports communication with EEPROM slave stations, such as Xinje-DS5C, Inovance servo, Panasonic EtherCAT servo, Kollmorgen servo, etc.
  XSDH series PLC supports 32-channel electronic cam function and connection of EtherCAT remote IO module through EtherCAT bus. Please refer to XS series programmable controller user manual [motion control] for specific use.
- **Ethernet communication**
  XSDH series PLC supports Ethernet communication, which can realize faster and more stable program / data download and better real-time performance. It supports PLC access to the Internet, and realizes remote search, online monitoring, uploading and downloading of PLC program.
- **High speed counter, up to 200KHz**
  The basic unit of XSDH series PLC is equipped with 4-channel, 2-phase high-speed counter and high-speed counting comparator, which can count in two modes: single-phase and AB phase. The single-phase frequency can reach 200kHz and AB phase can reach 100kHz.
- **Interrupt function**
  XSDH series PLC has 14-channel external interrupt function.
- **Online download**
  XSDH series PLC supports online download function to truly realize PLC non-stop operation.
- **Simulation**
  In the case of no hardware, it supports simulation, which is helpful for programming.
- **Dial switch**
  It is used to initialize IP, power on without loading the user program, start normally, without special treatment, load the user program, update the product.

(3) Easy programming

XSDH series PLC is programmed in Codesys programming software. Please refer to XS series PLC user manual [software] for specific use.

1-1-2. XS3 series basic unit

(1) Model explanation

At present, the basic unit of XS3 series medium-sized PLC has one product model.

- I/O points 26 points
- Output type Transistor
- Input type NPN
- Power supply DC24V

Series		Description
XS3	XS3-26T4	Includes 26-point specifications. The basic Codesys programming platform supports PLCopen programming specification, with larger internal resource space. The main processor frequency is 800MHz, supports Ethernet communication, EtherCAT bus function, EtherCAT remote IO, 32-channel electronic cam, online download, and supports 16 expansion modules, which can meet most of the user's needs.

XS3 series PLC has substantial basic functions and a variety of special functions.

Basic functions

- **High speed operation**
  The main processor of XS3 series PLC has a main frequency of 800MHz, which can meet the requirements of high-speed operation.
- **Rich expansion modules**
  XS3 series PLC can support 16 XG series expansion modules.
- **Multi-communication ports**
  The basic unit has five communication ports, which support RS232, RS485. It supports LAN port and EtherCAT communication.
- **Large memory**
  XS3 series PLC has 32M user program capacity and 32M data capacity.
- **6 kinds of programming method**
  XS3 series PLC support ST, SFC, FBD, CFC, LD and IL.
- **Rich instruction set**
  XS3 series PLC supports PLCopen programming specification, and can reference many standard function libraries to develop proprietary function blocks and instruction libraries.
- **Real-time clock**
  XS3 series PLC has built-in clock to control the time.
- **Easy to install**
  XS3 series PLC is easy to install. It can be installed directly on the guide rail.

Enhanced special functions

- **EtherCAT bus**
  XS3 series PLC supports EtherCAT bus communication, supports up to 32 stations (32-axis motors can be controlled synchronously), and supports communication with EEPROM slave stations, such as Xinje-DS5C, Inovance servo, Panasonic EtherCAT servo, Kollmorgen servo, etc.
  XS3 series PLC supports 32-channel electronic cam function and connection of EtherCAT remote IO module through EtherCAT bus.
- **Ethernet communication**
  XS3 series PLC supports Ethernet communication, which can realize faster and more stable program / data download and better real-time performance. It supports PLC access to the Internet, and realizes remote search, online monitoring, uploading and downloading of PLC program.
- **High speed counter, up to 200KHz**
  The basic unit of XS3 series PLC is equipped with 4-channel, 2-phase high-speed counter and high-speed counting comparator, which can count in two modes: single-phase and AB phase. The frequency can reach 200kHz.
- **High speed pulse output, up to 100KHz** [*1]
  XS3 series PLC has 4 pulse output terminals, the frequency up to 100KHz [*1].
- **Interrupt function**
  XS3 series PLC has 6-channel external interrupt function.

Note: PLC can output high-speed pulses up to 200kHz, but can not guarantee the normal operation of all servos. Please connect a resistance of about 500 Ω between the output terminal and 24V power supply.

(2) Easy programming

XS3 series PLC is programmed in Codesys programming software. Please refer to XS series PLC user manual [software] for specific use.

1-1-3. XSLH series basic unit

(1) Model explanation

At present, the basic unit of XS3 series medium-sized PLC has one product model.

- I/O points 30 points
- Output type Transistor
- Input type NPN
- Power supply DC24V

Series	Description
XSLH	Include 30 points specifications. Based on CODESYS programming platform, it supports PLCopen programming specification, has larger internal resource space, the main frequency of the main processor is 1GHz, supports Ethernet communication, CANopen communication, EtherCAT bus function, CANopen bus function, EtherCAT remote IO, 32 channels electronic cam, online download, and supports 16 expansion modules, which can meet most user needs.

(2) Powerful function

XSLH series PLC has substantial basic functions and a variety of special functions.

Basic function

- **High speed operation**
  The main frequency of the main processor of the XSLH series PLC is up to 1GHz, which can meet the requirements of high-speed operation. The minimum execution time of bit operation is 33ns, the minimum execution time of word operation is 33ns, and the minimum execution time of floating-point operation is 80ns.
- **Rich expansion modules**
  XSLH series PLC can support 16 XL series expansion modules of different types and models
- **Multi-communication ports**
  The basic unit has 6 communication ports, supporting RS232 and RS485 ports to connect multiple external devices, supporting LAN port access to the LAN, and supporting EtherCAT and CANopen communication.
- **Large memory**
  XSLH series PLC has 32M user program capacity, 32M data capacity and 6M power failure holding capacity.
- **6 kinds of programming method**
  XSLH series PLC support ST, SFC, FBD, CFC, LD and IL.
- **Rich instruction set**
  XSLH series PLC supports PLCopen programming specification, can reference many standard function libraries, and develop proprietary function blocks and instruction libraries.
- **Real time clock**

XSLH series PLC built-in clock for time control

- **Easy to install**

  XSLH series PLC is easy to install, which can be directly installed by guide rail or fixed with M3 screws.

Enhanced special functions

- **EtherCAT bus**

  XSLH series PLC supports EtherCAT bus communication, supports up to 32 stations (32-axis motors can be controlled synchronously), and supports communication with EEPROM slave stations, such as Xinje-DS5C, Inovance servo, Panasonic EtherCAT servo, Kollmorgen servo, etc.

  XSLH series PLC supports 32-channel electronic cam function and connection of EtherCAT remote IO module through EtherCAT bus.

- **CANopen bus**

  The physical layer of CAN bus is very stable. The data link layer is reliable, flexible, highly compatible, and highly interoperable. It supports a maximum of 16 stations (16-axis motors can be controlled synchronously).

- **Ethernet communication**

  XSLH series PLC supports Ethernet communication, which can realize faster and more stable program / data download and better real-time performance. It supports PLC access to the Internet, and realizes remote search, online monitoring, uploading and downloading of PLC program.

- **High speed pulse counter, up to 200KHz**

  The basic unit of XSLH series PLC supports 2-channel OC signal and 2-channel differential signal input, and can count in single-phase and AB phase modes. The differential model can be up to 1MHz, the single-phase can be up to 80KHz, and the AB phase can be up to 50KHz.

- **Interrupt function**

  XSLH series PLC has 10 channels external interrupt function.

- **Online downloading**

  XSLH PLC supports online download function, which truly realizes PLC non-stop operation.

- **Simulation**

  It supports simulation without connecting hardware, which is helpful for programming.

- **Dial switch**

  Used to initialize IP, power on without loading user program, normal startup, no special processing, loading user program, and updating the product.

(3) Easy programming

XSLH series PLC is programmed in Codesys programming software. Please refer to XS series PLC user manual [software] for specific use.

1-1-4．XSDH series expansion modules

In order to better meet the field control requirements, XSDH series PLC can be extended with 16 XD expansion modules.

- Rich types: including input and output expansion module, analog module and temperature control module.
- I/O expansion module
  Input 8~32 points. Output points: 8~32. Output type: transistor, relay. Power supply: DC24V.
- Analog module
  Type: AD, DA, AD/DA. Channels: AD 4~8, DA 2~4. Power supply: DC24V.
- Temperature control module
  Type: PT100, thermocouple. Channels: 8. PID control: built in, transistor. Power supply: DC24V.

1-1-5．XS3 series expansion modules

In order to better meet the field control requirements, XS3 series PLC can be extended with 16 XD expansion modules.

- Rich types: including input and output expansion module, analog module and temperature control module.
- I/O expansion module
  Input 8~32 points. Output points: 8~32. Output type: transistor, relay. Power supply: DC24V.
- Analog module
  Type: AD, DA, AD/DA. Channels: AD 4~8, DA 2~4. Power supply: DC24V.
- Temperature control module
  Type: PT100, thermocouple. Channels: 8. PID control: built in, transistor. Power supply: DC24V.

1-1-6．XSLH series expansion modules

In order to better meet the field control requirements, XSLH series PLC can be extended with 16 XL expansion modules.

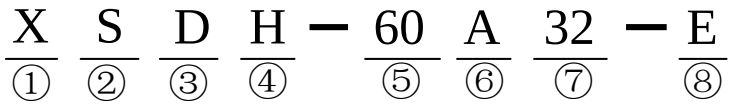
- Rich types: including input and output expansion module, analog module and temperature control module.
- I/O expansion module
  Input 8~32 points. Output points: 8~32. Output type: transistor, relay. Power supply: DC24V.
- Analog module
  Type: AD, DA, AD/DA. Channels: AD 4~8, DA 2~4. Power supply: DC24V.
- Temperature control module
  Type: PT100, thermocouple. Channels: 8. PID control: built in, transistor. Power supply: DC24V.

1-2. Model composition and model table

1-2-1. XSDH basic unit and models

(1) Model composition of basic unit

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



①Product type	X: Controller
②Use platform	S: CODESYS
③Appearance structure	D: Same to XDH
④Performance level	H: Motion control enhanced type
⑤I/O points	60: 36 inputs/24 outputs
⑥Connection symbol	A: Axis
⑦Control axis number	32: can control 32 EtherCAT axes
⑧Power supply	E: AC220V

(2) Basic unit model list

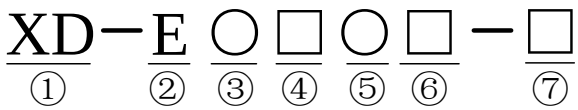
- XSDH model list

Model							Input points (DC24V)	Output points (R, T)
AC power supply				DC power supply				
	Relay output	Transistor output	Relay&transistor mixed output	Relay output	Transistor output	Relay&transistor mixed output		
NPN model	-	XSDH-60A32-E	-	-	-	-	36	24

1-2-2. XSDH expansion unit model composition and model table

(1) I/O expansion model

I/O model composition of the expansion module is as follows:



①:	Series name	XD
②:	Expansion module	E
③:	Input points	8/16/32
④:	Special for input	NPN input: X
		PNP input: PX
⑤:	Output points	8/16/32
⑥:	Output mode	YR: relay output
		YT: transistor output

⑦： Power supply E: AC220V
C: DC24V

- I/O expansion module model list

Model				I/O points	Input points (DC24V)	Output points (R, T)
	Input	Output				
		Relay output	Transistor output			
NPN type	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

(2) Analog and temperature control modules

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

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

①： Expansion E: Expansion module
②： Analog input 4AD：4 channels analog input
8AD：8 channels analog input
12AD：12 channels analog input
③： Analog output 2DA：2 channels analog output
4DA：4 channels analog output
④： Temperature meansurement 6PT：6 channels platinum thermistor input
4PT3：4 channels platinum thermistor input (3-wire)
⑤： Temperature measurement 6TC：6 channels thermocouple input
⑥： Pressure measurement 1WT：1 channel pressure measurement
2WT：2 channels pressure measurement
4WT：4 channels pressure measurement
⑦： Encoder detection 4SSI：4 channels encoder detection
⑧： Model difference P：PID control
A：Hardware is new version (only for WT module)
Input is current (only for 8AD module)
B：analog voltage output -5V~5V or -10V~10V (only for 4AD2DA module)

Hardware version difference (only for WT module)

C：Hardware version difference (only for WT module)

D：Hardware version difference (only for WT module)

V：Input is voltage type (for 8AD, 12AD module)

⑨： Isolation

None：standard

H：Each channel is isolated from each other (only for 6TC-P-H module)

- Analog, temperature expansion module list

Model		Description
Analog input	XD-E4AD	4 channels analog input
	XD-E8AD	8 channels analog input, 4 channels voltage, 4 channels current
	XD-E8AD-A	8 channels analog input, current type
	XD-E8AD-V	8 channels analog input, voltage type
	XD-E12AD-V	12 channels analog input, voltage type
Analog I/O	XD-E4AD2DA	4 channels analog input, 2 channels analog output
	XD-E4AD2DA-B	4 channels analog input, 2 channels analog output
Analog output	XD-E2DA	2 channels analog output
	XD-E4DA	4 channels analog output
Temperature measurement	XD-E6PT-P	6 channels PT100 input, built-in PID control
	XD-E4PT3-P	4 channels PT100 input, built-in PID control
	XD-E6TC-P	6 channels K type thermocouple input, built-in PID control
	XD-E6TC-P-H	6 channels K type thermocouple input, built-in PID control, each channel is isolated from each other
	XD-E2TC-P	2 channels K type thermocouple input, built-in PID control
Pressure measurement	XD-E1WT-A	1 channel pressure measurement, -39.06mV～39.06mV
	XD-E2WT-A	2 channels pressure measurement, -39.06mV～39.06mV
	XD-E4WT-A	4 channels pressure measurement, -39.06mV～39.06mV
	XD-E2WT-B	2 channels pressure measurement, 0～10mV
	XD-E1WT-C	1 channel pressure measurement, 0～10mV, 20 bits conversion accuracy
	XD-E2WT-C	2 channels pressure measurement, 0～10mV, 20 bits conversion accuracy
	XD-E4WT-C	4 channels pressure measurement, 0～10mV, 20 bits conversion accuracy
	XD-E1WT-D	1 channel pressure measurement, 0～10mV, 22 bits conversion accuracy
	XD-E2WT-D	2 channels pressure measurement, 0～10mV, 22 bits conversion accuracy
	XD-E4WT-D	4 channels pressure measurement, 0～10mV, 22 bits conversion accuracy

1-2-3．XS3 model composition and model table of basic unit

(1) Model composition of basic unit

XS3 series PLC basic unit model composition is generally as follows:

$$\frac{X}{①}\ \frac{S}{②}\ \frac{3}{③}\ -\ \frac{26}{④}\ \frac{T}{⑤}\ \frac{4}{⑥}$$

① Product type X: Controller

② Use platform S: CODESYS

③ Appearance structure 3: 3 series

④ I/O points 26: 18 inputs/8 outputs

⑤ Transistor output T: transistor output

⑥ Pulse channel 4: 4 channels pulse output

(2) Basic unit model list

- XS3 series model list

Model							Input points (DC24V)	Output points (R, T)
	AC power supply			DC power supply				
	Relay output	Transistor output	Relay&transistor mixed output	Relay output	Transistor output	Relay&transistor mixed output		
NPN type	-	-	-	-	XS3-26T4	-	18	8

Note: XS3-26T4 some input points are in differential input mode.

1-2-4. XS3 expansion unit model composition and model table

(1) I/O expansion module

The model composition of I/O expansion module is as follows:

XG－E ○ □ ○ □

1 2 3 4 5 6

1：Series name XG

2：Expansion module E

3：Input points 8/16/32/64

4：Special for input X

5：Output points 8/16/32/64

6：Output mode YR: relay output

YT: transistor output

- I/O expansion module model list

Model				I/O points	Input points (DC24V)	Output points (R, T)
Type	Input	Output				
		Relay output	Transistor output			
NPN/PNP	-	XG-E8X8YR	XG-E8X8YT	16	8	8
	XG-E16X	-	-	16	16	-
		XG-E16YR	XG-E16YT	16	-	16
	-	-	XG-E16X16YT	32	16	16
	XG-E32X	-	-	32	32	-
	-	-	XG-E32YT	32	-	32
	XG-E64X	-	-	64	64	-
	-	-	XG-E64YT	64	-	64

Note: XG-E64X is NPN input module.

(2) Analog, temperature expansion module

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

XG－E 4AD 2DA 8PT3 8TC－A

① ② ③ ④ ⑤ ⑥

1：	Expansion	E：Expansion module
2：	Analog input	4AD：4 channels analog input 8AD：8 channels analog input
3：	Analog output	2DA：2 channels analog output
4：	Temperature measurement	8PT3：8 channels 3-wire Platinum thermistor input
5：	Temperature measurement	8TC：8 channels thermocouple input
6：	Analog type	A：current type V：voltage type

- Analog, temperature expansion model list

Model		Description
Analog I/O	XG-E8AD-A	8 channels analog input, current type
	XG-E8AD-V	8 channels analog input, voltage type
	XG-E4AD2DA	4 channels analog input, 2 channels analog output
	XG-E4DA	4 channels analog output
Temperature measurement	XG-E8PT3-P	8 channels PT100 temperature measurement, built-in PID control
	XG-E8TC-P	8 channels themocouple temperature measurement, built-in PID control

1-2-5. XSLH basic unit model composition and model table

(1) Model composition of basic unit

XSLH series PLC basic unit model composition is generally as follows:

X S L H － 30 A 32

① ② ③ ④ ⑤ ⑥ ⑦

①	Product type	X: Controller
②	Use platform	S: CODESYS
③	Appearance structure	L: Same to XLH appearance
④	Performance level	H: Motion control enhanced model
⑤	I/O points	30: 14 inputs/16 outputs
⑥	Connection symbol	A: Axis
⑦	Control axis number	32: 32 EtherCAT axis

(2) Basic unit model list

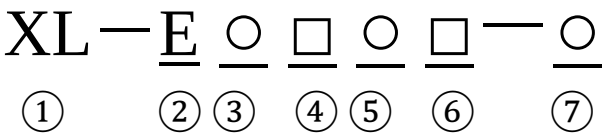
- XSLH series model list

Model							Input points (DC24V)	Output points (R, T)
	AC power supply			DC power supply				
	Relay output	Transistor output	Relay&transistor mixed output	Relay output	Transistor output	Relay&transistor mixed output		
NPN type	-	XSLH-30A32	-	-	-	-	14	16

1-2-6. XSLH expansion unit model composition and model table

(1) I/O expansion module

The model composition of I/O expansion module is as follows:



①	Series name	XL
②	Expansion module	E
③	Input points	8 or 16 or 32
④	Special for input	NPN input: X PNP input: PX
⑤	Output points	8 or 16 or 32
⑥	Output mode	YR: relay output YT: transistor output
⑦	Wiring terminal type	A: horn terminal

- I/O expansion module model list

Model		Function
NPN input	PNP input	
XL-E8X8YR	XL-E8PX8YR	8 channels digital input, 8 channels relay output
XL-E8X8YT	XL-E8PX8YT	8 channels digital input, 8 channels transistor output
XL-E16X	XL-E16PX	16 channels digital input
XL-E16YR	-	16 channels relay output
XL-E16YT	-	16 channels transistor output
XL-E16YT-A	-	16 channels transistor output (horn terminals)
XL-E16X16YT	XL-E16PX16YT	16 channels digital input, 16 channels transistor output
XL-E16X16YT-A	XL-E16PX16YT-A	16 channels digital input, 16 channels transistor output (horn terminals)

XL-E32X	XL-E32PX	32 channels digital input
XL-E32YT	-	32 channels transistor output

(2) Analog, temperature expansion modules

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

XL－E 4AD 2DA 4PT3 4TC 1WT－P－S

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①：	Expansion	E: expansion module
②：	Analog input	4AD: 4 channels analog input
		8AD: 8 channels analog input
③：	Analog output	2DA: 2 channels analog output
		4DA: 4 channels analog output
④：	Temperature measurement	4PT3: 4 channels platinum thermistor input (3-wire)
⑤：	Temperature measurement	4TC: 4 channels thermocouple Input
⑥：	Pressure measurement	1WT: 1 channel pressure measurement
		2WT: 2 channels pressure measurement
		4WT: 4 channels pressure measurement
⑦：	Model differences	P: with PID control
		A: new hardware version (for WT module)
		Input is current (for 8AD module)
		D: hardware version differences (for WT module)
		V: input is voltage (for 8AD module)
⑧：	Accuracy	S:16-Bit

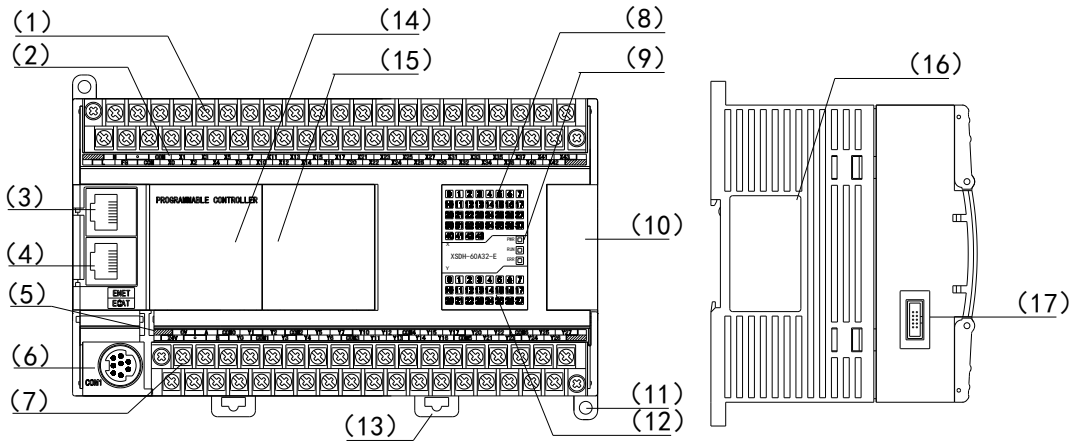
- List of analog quantity and temperature expansion module models

Model		Description
Analog input	XL-E4AD	12-Bit, 4 channels analog input
	XL-E8AD-A	14-Bit, 8 channels analog input, current type
	XL-E8AD-V	14-Bit，8 channels analog input, voltage type
	XL-E8AD-A-S	16-Bit，8 channels analog input, current type
	XL-E8AD-V-S	16-Bit，8 channels analog input, voltage type
Analog I/O	XL-E4AD2DA	4 channels analog input, 2 channels analog output
Analog output	XL-E2DA	2 channels analog output
	XL-E4DA	4 channels analog output
Temperature measurement	XL-E4TC-P	4 channels PT100 temperature measurement, built-in PID control
	XL-E4PT3-P	4 channels PT100 (3-wire) temperature measurement, built-in PID control
Pressure measurement	XL-E1WT-D	1 channel pressure measurement, 0~10mV, 22-bit conversion precision
	XL-E2WT-D	2 channels pressure measurement, 0~10mV, 22-bit conversion precision

Model		Description
	XL-E4WT-D	4 channels pressure measurement, 0~10mV, 22-bit conversion precision

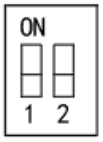
1-3. Part introduction

1-3-1. XSDH series structure composition



The names of each part are as follows:

(1): Input terminal, power supply input
(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 action indicator
(9): System indicator
PWR: power supply indicator
RUN: run indicator
ERR: error indicator
(10): Expansion module interface
(11): Installation hole (2 holes)
(12): Output action indicator
(13): Guide rail mounting hook (2 hooks)
(14): Vacant
(15): Dial switch

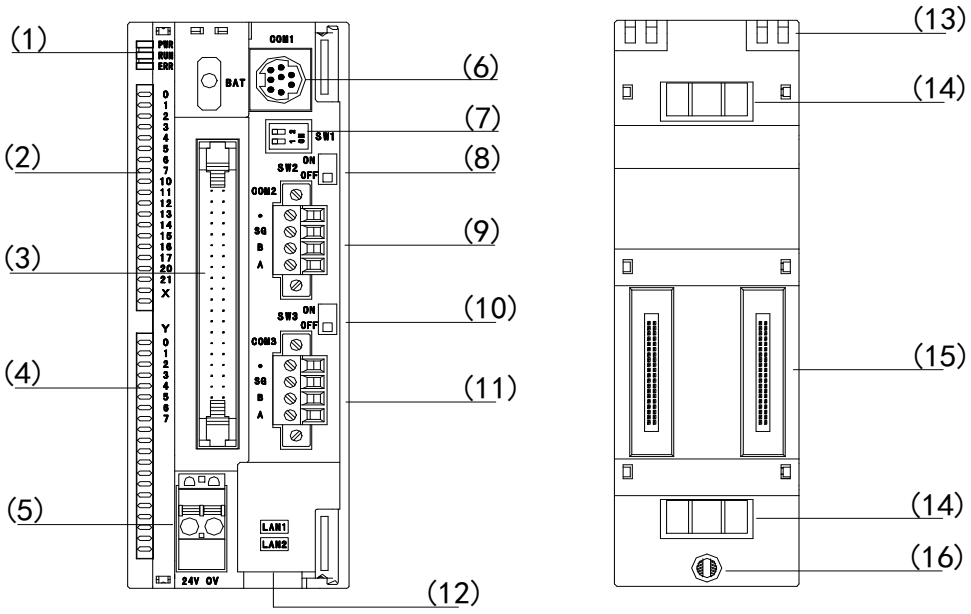


(16): Product label
(17): Vacant

Note: the dial switch at location (15):

DIP1	DIP2	Function
OFF	OFF	Start PLC normally and use it normally
OFF	ON	The user program is not loaded when the power is on. After the user downloads the empty program, turn the DIP2 to the off state and then power on the PLC again
ON	OFF	Initialize the IP to 192.168.6.6 (it takes effect after the PLC is powered on again)

1-3-2．XS3 series structure composition



The names of each part are as follows:

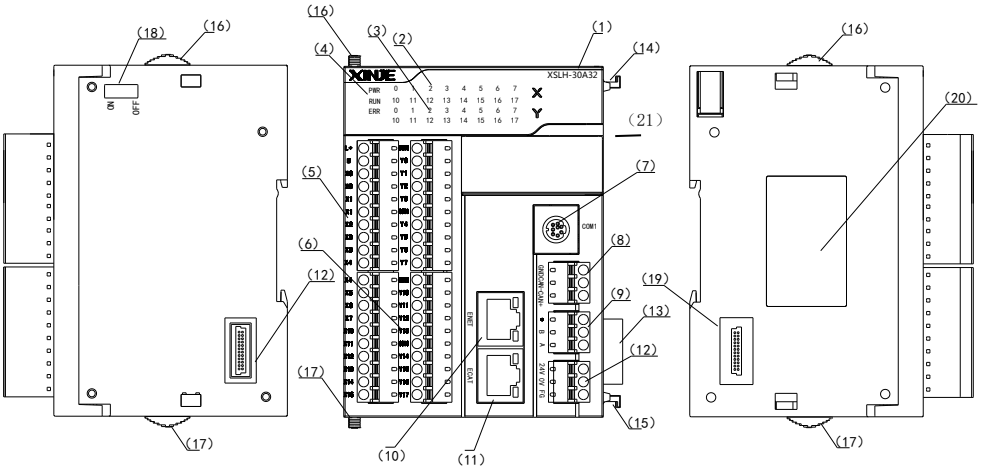
(1): System indicator
PWR: power supply indicator
RUN: run indicator
ERR: error indicator
(2): Input label and indicator
(3): I/O wiring terminals
(4): Output label and indicator
(5): Power supply input terminal
(6): RS232 port (COM1)
(7): PLC self updating dial switch
(8): RS485 port (COM2) dial switch
(9): RS485 port (COM2)
(10): RS485 port (COM3) dial switch
(11): RS485 port (COM3)
(12): RJ45 port (LAN1, LAN2)
(13): Installation hook
(14): Grounding metal sheet
(15): Expansion module interface
(16): Mounting screw hole

Note:

※ 1: when the dial switches SW2 and SW3 are used for RS485 communication, whether the PLC is a terminal. When the PLC is at the beginning or end of the bus, please turn the dial switch to on.

※ 2: Input and output wiring shall be used in conjunction with external terminal blocks and adaptive connecting cables. Refer to section 3-2-4 for details.

1-3-3．XSLH series structure composition



(1): PLC model
(2): Input label and indicator
(3): Output label and indicator
(4): System indicator
PWR: power indicator
RUN: run indicator
ERR: error indicator
(5): Input terminals
(6): Output terminals
(7): RS232 port (COM1)
(8): RS485 port (COM2)
(9): CAN port
(10): RJ45 port (ENET)
(11): RJ45 port (ECAT)
(12): 24V power supply input
(13): right expansion module interface
(14): Fixing module hook (up)
(15): Fixing module hook (down)
(16): Sliding latch (up)
(17): Sliding latch (down)
(18): Empty
(19): left expansion module interface (COM3)
(20): Product label
(21): SD card slot, dial switch

Note:

Location (21) SD card under the cover plate is temporarily closed to users.

The purpose of the dial switch under the cover plate location (21) is as follows:

DIP1	DIP2	Function
OFF	OFF	Start the PLC normally and use it normally
OFF	ON	The user program is not loaded after power on. After the user downloads the empty program, turn DIP2 to OFF and power on the PLC again
ON	OFF	The initialization IP is 192.168.6.6 (it takes effect after the PLC is powered on again)

DIP3	DIP4	Function
OFF	OFF	Start the PLC normally and use it normally
ON	ON	Terminal resistance of CAN OPEN

2. Main body specification parameters

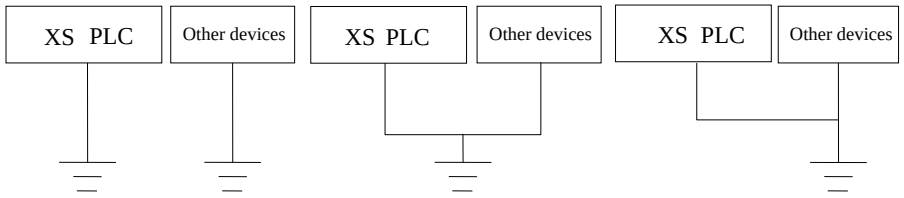
2-1. Specification parameters

2-1-1. General specification

This specification parameter table is also applicable to XSDH, XSLH and XS3 series PLC.

Item	Specification
Anti-noise	Noise voltage 1000Vp-p 1us pulse 1 minute
Air	No corrosive and combustible gas
Ambient temperature	0℃~60℃
Ambient humidity	5%~95% (no condensation)
Communication port 1	RS232 (COM1), connect upper computer, HMI for programming or debugging
Communication port 2	RS485 (COM2), connect intelligent instrument, frequency converter, etc
Communication port 3	RJ45 (LAN1), support Ethernet communication, realize remote control of industrial field equipment
Communication port 4	RJ45 (LAN2), support EtherCAT bus control
Communication port5	CAN, support CANopen bus control (only for XSLH)
Installation	Fix with M3~M4 screws
Grounding (FG)	The third grounding (It shall not be grounded in common with strong current system)※

Note: Separate grounding or common grounding shall be adopted for grounding, and public grounding shall not be adopted.



Separate grounding Common grounding Public grounding

2-1-2. Performance specification

Item		XSDH-60A32-E	XS3-26T4	XSLH-30A32
Programming method		ST, SFC, FBD, CFC, LD, IL		
Main processor		Dominant frequency 1GHz	Dominant frequency 800MHz	Dominant frequency 1GHz
User program capacity※1		32MB		
Data capacity		32MB		
Power-off holding capacity		6MB		
I/O points	Total	60 points	26 points	30 points
	Input	36 points X0~X43	18 points X0~X21	14 points X0~X15

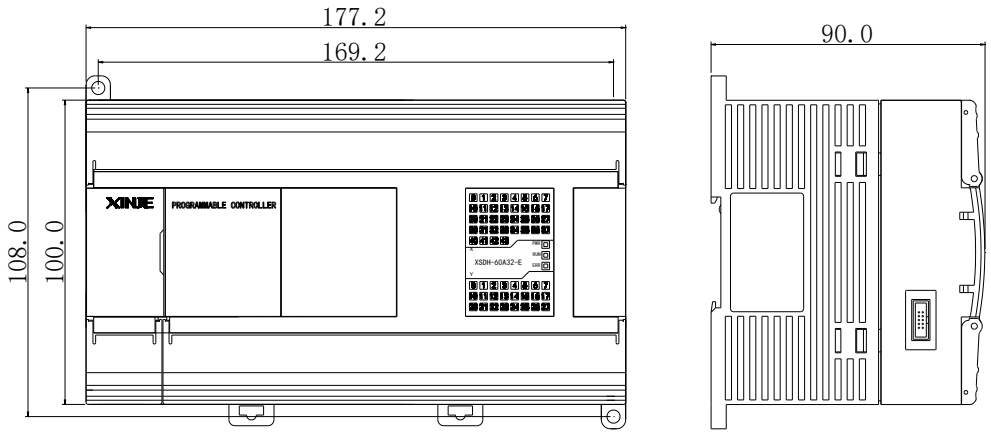
Item		XSDH-60A32-E	XS3-26T4	XSLH-30A32
※2	Output	24 points Y0~Y27	8 points Y0~Y7	16 points Y0~Y17
Max I/O points		572 points	1050 points	542 points
High speed processing function		High speed count, external interrupt		
External interrupt point		X2~X7, X10~X13, X16, X21, X24, X27	X2, X5, X10, X13, X16, X21, HSC0, HSC2, HSC4, HSC6	X2~X7, X10~X13

Note: I/O points refers to the terminal numbers user can access from outside and output signal.

2-2. Dimension

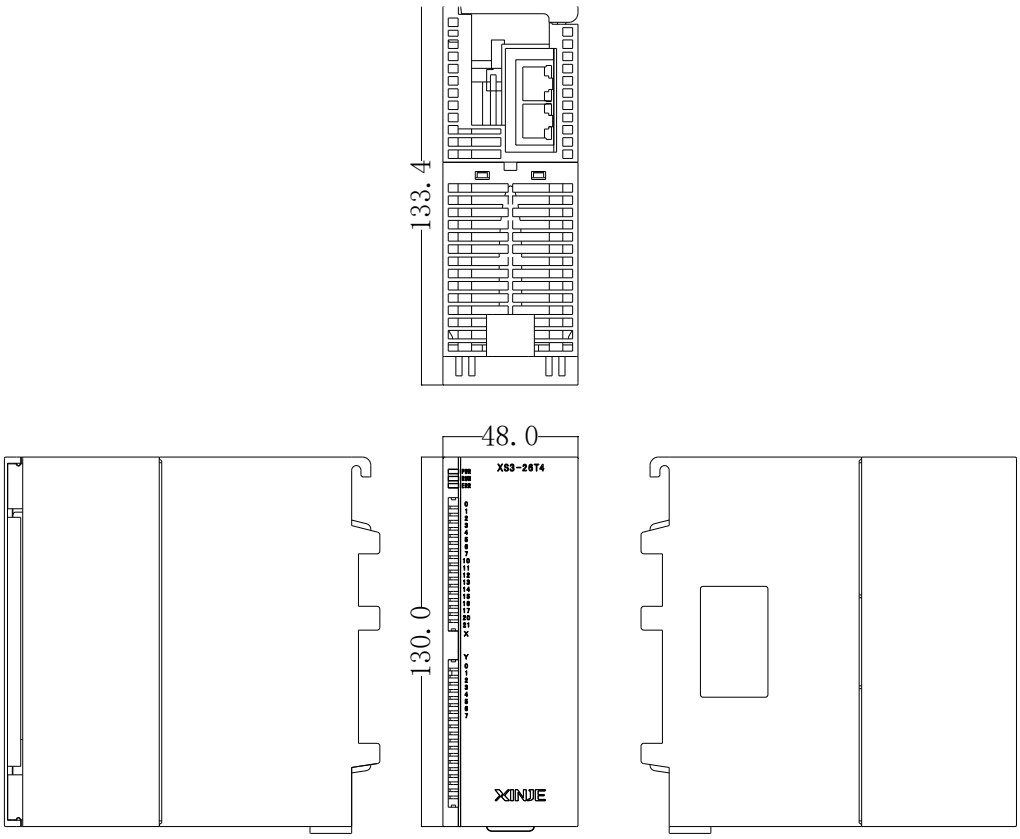
2-2-1. XSDH series PLC dimension

(Unit: mm)



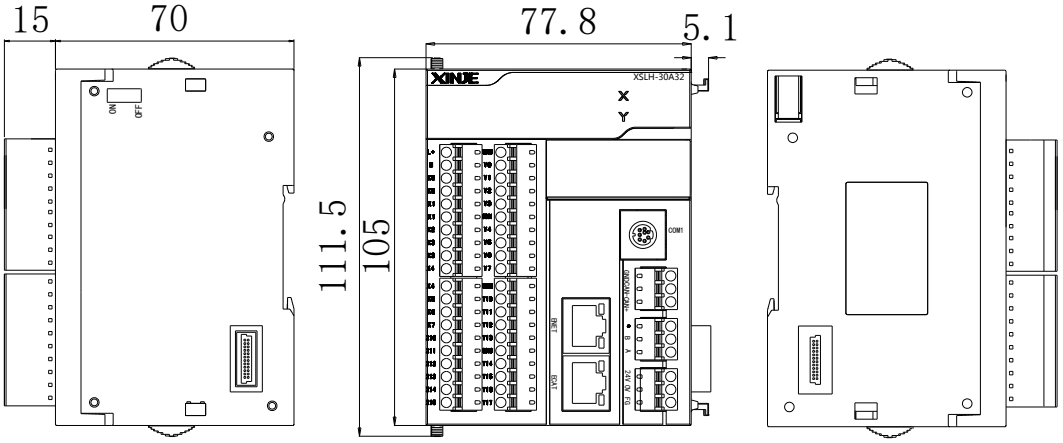
2-2-2. XS3 series dimension

(Unit: mm)



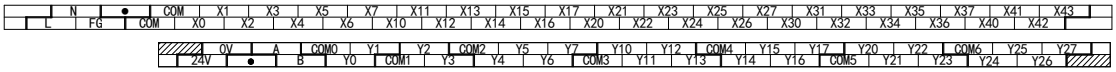
2-2-3. XSLH series PLC dimension

(Unit: mm)



2-3. Terminal arrangement

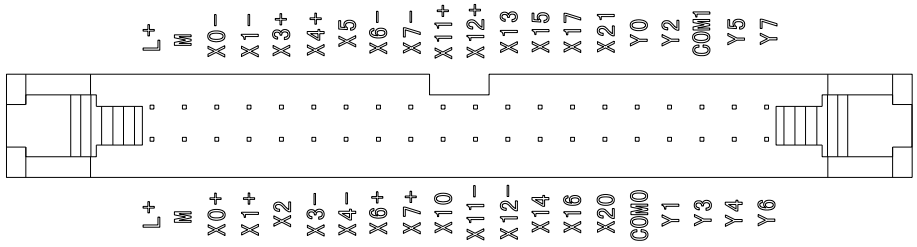
2-3-1. XSDH series terminal arrangement



Note: refer to chapter 5-1 for details.

2-3-2. XS3 series terminal arrangement

(1) Main body terminals



(2) External terminal block

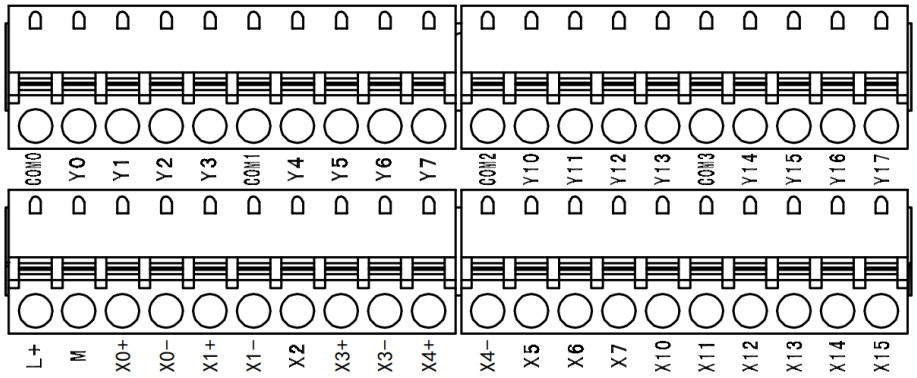
L+	X0+	X1+	X2	X3-	X4-	X6+	X7+	X10	X11-	X12-	X14	X16	X20	COM0	Y1	Y3	COM1	Y5	Y7
M	X0-	X1-	X3+	X4+	X5	X6-	X7-	X11+	X12+	X13	X15	X17	X21	Y0	Y2	•	Y4	Y6	•

Note:

※1: COM0 at the output terminal corresponds to Y0~Y3, and COM1 corresponds to Y4~Y7

※2: Refer to chapter 5-1 for wiring details.

2-3-3. XSLH series terminal arrangement



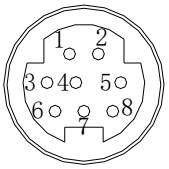
Note: refer to chapter 5-1 for details.

2-4. Communication ports

XS series generally has COM1 (RS232), COM2 (RS485) and 2 LAN ports (RJ45). COM1 and COM2 are mainly used for communication. Ethernet port can connect PLC to LAN or realize EtherCAT communication.

(1) RS232 port

XS series PLC has one RS232 port (COM1), which is used to connect HMI or some meters, and supports MODBUS communication modes.

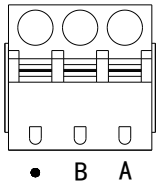


4：RxD
5：TxD
8：GND

Mini Din 8-core plug

(2) RS485 port

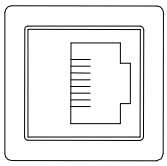
On the output terminal block, terminals are A and B, where A is RS485+, and B is RS485-. It can be used to connect the touch screen, communicate with some instruments, etc.



(3) LAN port

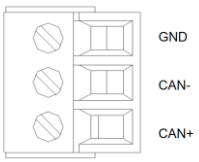
Ethernet RJ45 port: the Ethernet port is RJ45 interface, with stable and convenient communication mode. It can be used for uploading and downloading programs, online monitoring, remote monitoring, etc., and can communicate with other TCP IP devices in the LAN.

EtherCAT communication port: the EtherCAT communication port is an RJ45 interface with convenient communication connection mode and can communicate with other equipment supporting EtherCAT communication.



(4) CAN port

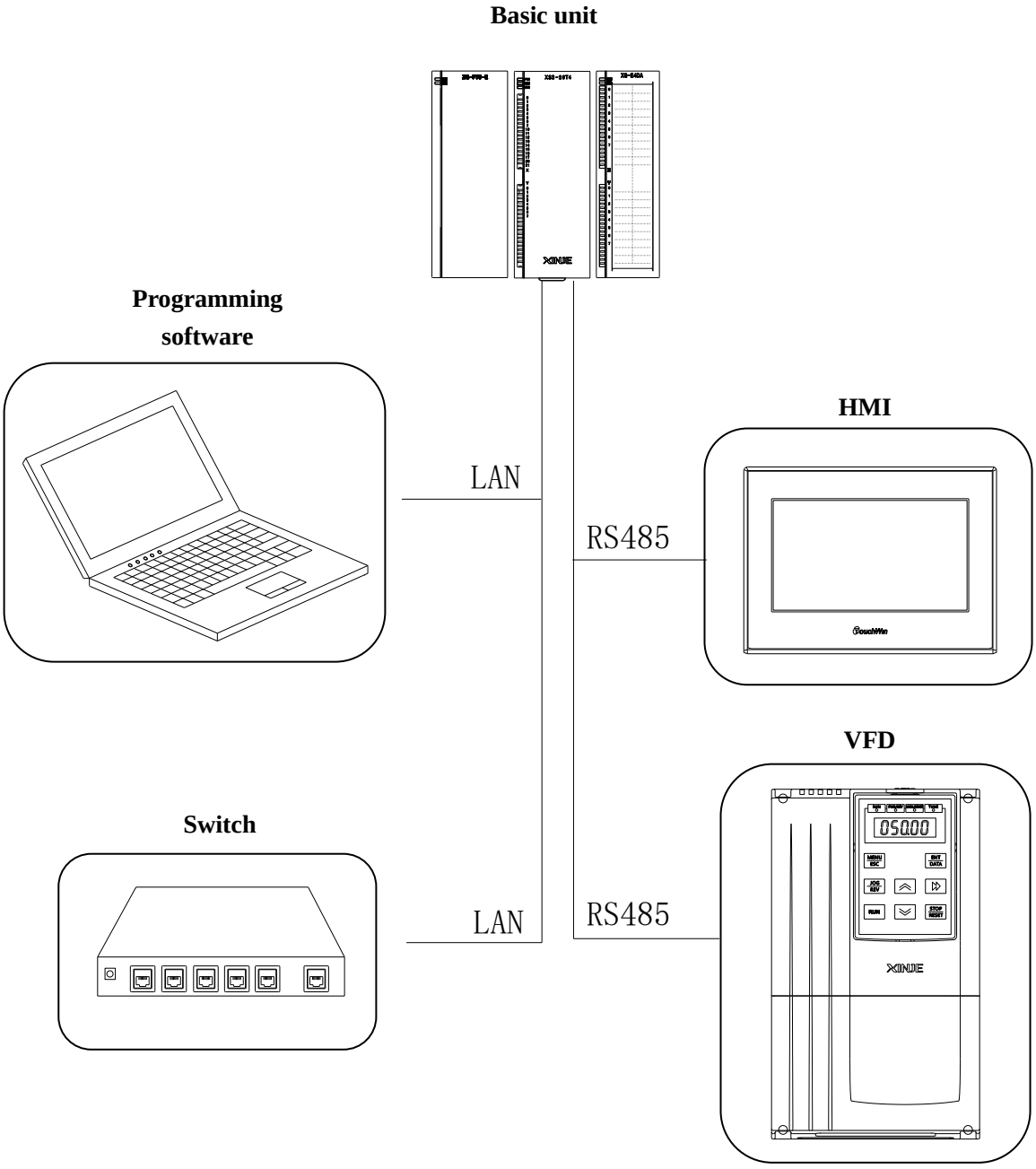
On the output terminal block, the terminals are GND, CAN+ and CAN-, which can communicate with other devices that support CANopen communication.



3. System composition

3-1. System composition

The following figure is the system structure diagram constructed according to the basic configuration of XS3 series PLC. Through this diagram, you can roughly understand the connection between PLC and peripheral equipment, expansion equipment, etc., as well as the typical applications of PLC communication, connection and expansion ports.



Note: The connecting devices of the above communication ports are only used as examples. The actual communication ports can connect a variety of devices.

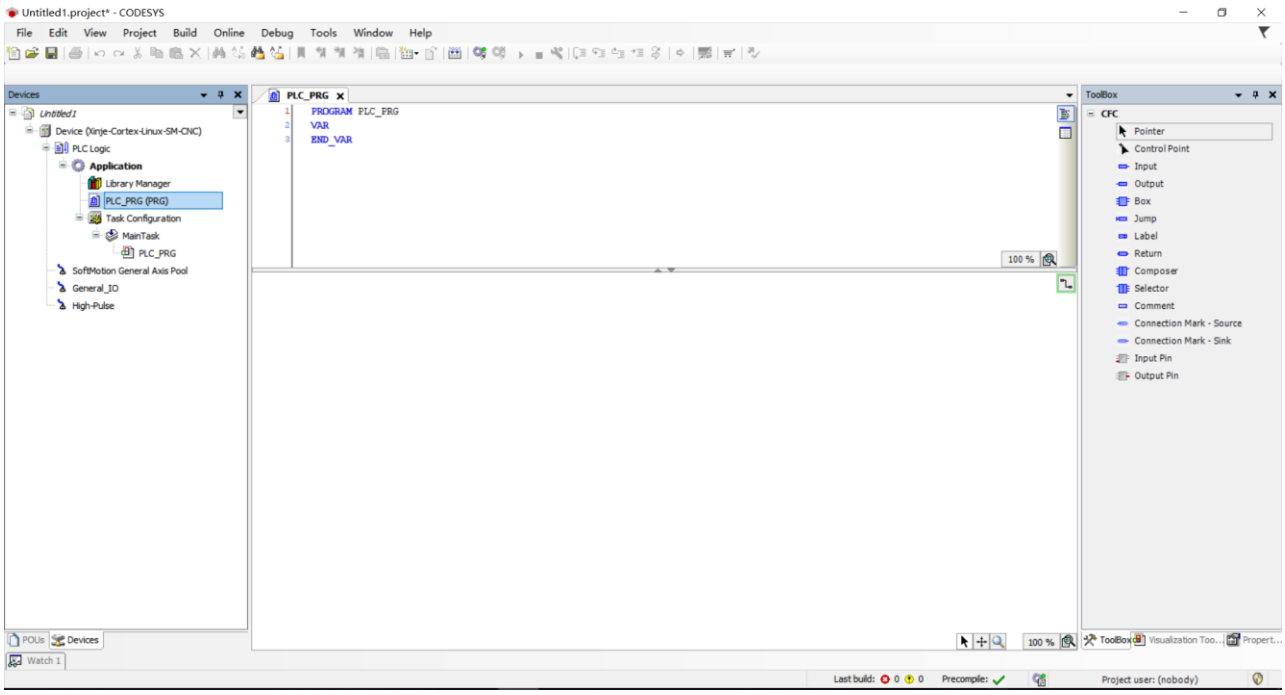
3-2. Peripherals

The use of basic units of XSDH, XSLH and XS3 series PLC involves a variety of peripheral devices.

3-2-1. Programming software

In Codesys programming software, functions such as writing or uploading programs to XS series PLC, real-time monitoring PLC operation, configuring PLC, etc. can be realized.

- Software interface



3-2-2. HMI

The HMI is an interactive interface between PLC and operators. The HMI can easily and quickly send the operator's instruction to the PLC, and then the PLC executes the action.

The basic unit of XS series PLC supports the connection of various HMI. The connection is established on the basis of consistent communication protocols, generally through Modbus TCP protocol. The specific parameters depend on the HMI connection.

The HMI of Xinje company can be directly connected with the basic unit for communication (the communication parameters have been consistent). At present, Xinje HMI products are divided into touch screen TG series and text display OP series.

(1) TG series

- Size: 4.3”, 7”, 8”, 10.1”, 15.6”
- Display: 16.77 million colors, 65536 colors
- Operation: touch operation in display area
- Interface: RS232, RS422, RS485, USB, RJ45
- Communication: it can communicate directly with Xinje frequency converter, various PLCs, frequency converters and instruments. Direct drive panel printer, supporting multiple printers.
  Equipped with two ports, which can connect two different devices at the same time.
  Support free format protocol, and users can freely write drivers.

- Recipe: multiple groups of recipe data can be input, to find the corresponding recipe group through the index number
- Screen: rich 3D image library, text effects, data collection, data backup, etc
- Password: nine level permission setting
- Advance: advanced functions, animation track design, etc

(2) OP series

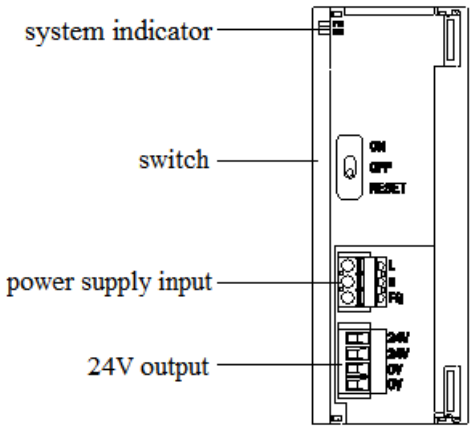
- Size: 3.7”
- Display: STN-LCD
- Button: 7 or 20, screen cannot be touched
- Interface: RS232, RS485, RS422
- Communication: directly communicate with various PLC and Xinje frequency converter
- Clock: built-in clock

3-2-3. Power supply module

XS3 series medium-sized PLC is equipped with a special power module, the model is XG-P75-E, and its basic specifications are as follows:

Item	Specification
Power supply	AC100~240V
Output voltage	24VDC
Output power	75W
Ambient temperature	0℃~60℃
Ambient humidity	5%RH~95%RH (no condensation)
Installation	Directly installed on Xinje XG-EB series guide rail

■ Structure description

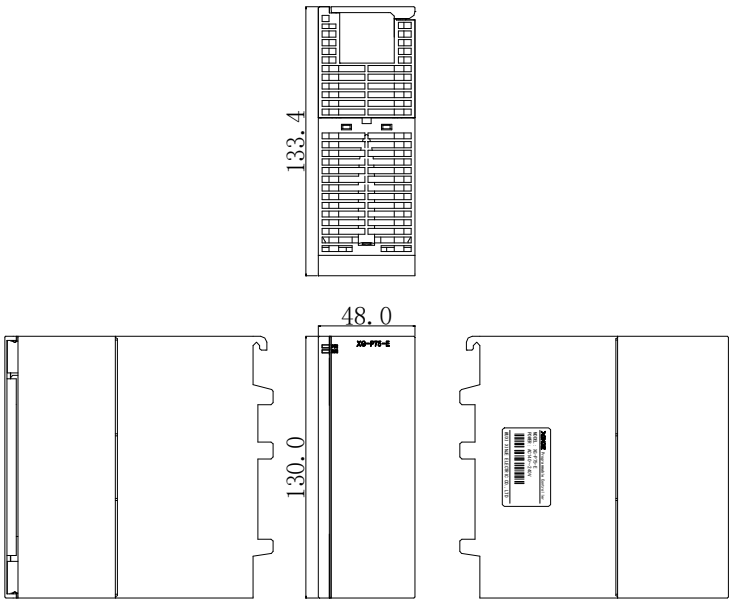


The main parts are described as follows:

Name	Explanation
System indicator	PWR: the power indicator is always green when AC220V power is connected RUN: the operation indicator light is always green when the power module is in normal operation
Switch	ON: normal output 24V OFF: stop output 24V RESET: undefined

Name	Explanation
Power supply input	L, N: power supply input terminal FG: grounding terminal
24V output	24V, 0V: a group of 24VDC power supply can be output to supply power to XS3 body

■ Dimension (Unit: mm)



3-2-4. Terminal block and connection cable

External terminal blocks can be selected for XS3 series wiring. Xinje provides terminal blocks and connecting cables required by XS3 for users to choose.

List of terminal blocks and connecting cable models:

Main body	Terminal block	Connection cable
XS3-26T4	JT-G26	JC-G26-NN05 (0.5m) JC-G26-NN10 (1.0m) JC-G26-NN15 (1.5m)

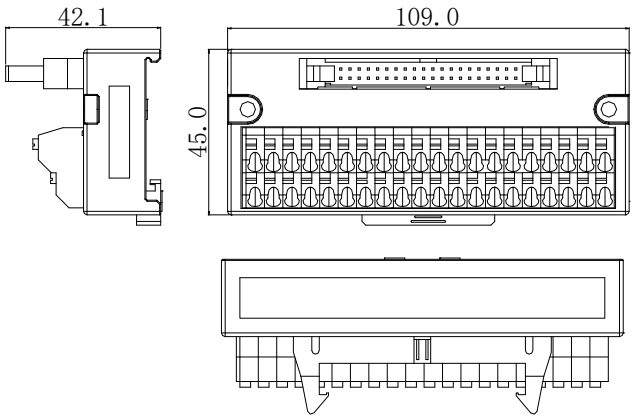
(1) Terminal block

■ Terminal arrangement of terminal block

L+	X0+	X1+	X2	X3-	X4-	X6+	X7+	X10	X11-	X12-	X14	X16	X20	COM0	Y1	Y3	COM1	Y5	Y7
M	X0-	X1-	X3+	X4+	X5	X6-	X7-	X11+	X12+	X13	X15	X17	X21	Y0	Y2	•	Y4	Y6	•

Note: COM0 at the output terminal corresponds to Y0~Y3, and COM1 corresponds to Y4~Y7.

■ Terminal block dimension Unit: mm



■ Wiring method

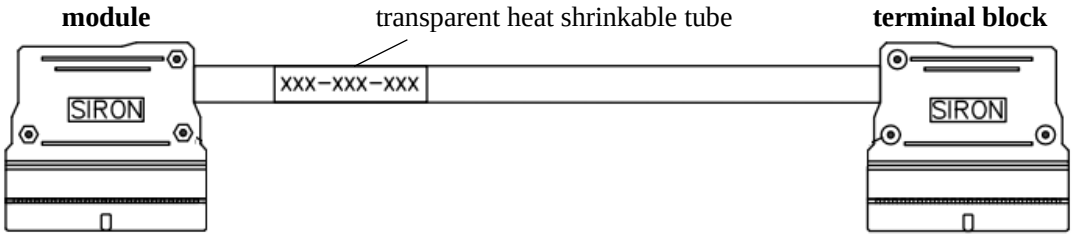
When wiring, press the spring switch with screw driver, insert the wire into the corresponding hole, and release the spring switch. The terminal block requires that the stripped length of the conductor is 1.5cm.

■ Installation

The terminal block shall be installed on a 35mm wide guide rail.

(2) Connection cable

Connecting cables shall be used in conjunction with external terminal blocks. Xinje provides JC-G26-NN05, JC-G26-NN10, JC-G26-NN15 cables of different lengths and specifications for users to choose. Please note that when connecting, one end of the model wrapped by a transparent heat shrinkable tube is connected to XS, and the other end is connected to the terminal block. Do not reverse the connection!!!
The connection diagram is as follows:



Note: When connecting with the terminal block, please pay attention to the slot position of the terminal block, and do not reverse the connection.

3-3. Constitution principle

(1) About communication port

- The basic units of XSDH/XS3/XSLH series are generally equipped with multiple communication ports, including COM1, COM2, COM3, etc.
- Most communication ports can be used for programming download and communication.
- Each port is independent of each other.

(2) About expansion devices

- Generally speaking, the basic unit can be expanded with different types of expansion modules, or mixed expansion, input and output expansion, analog and temperature expansion.
- The XSDH/XS3/XSLH series can expand up to 16 modules.
- After connecting the basic unit and the expansion module with the bus connector, the PWR indicator of the expansion module is on, and the expansion module can be used normally.

(3) About the calculation of points

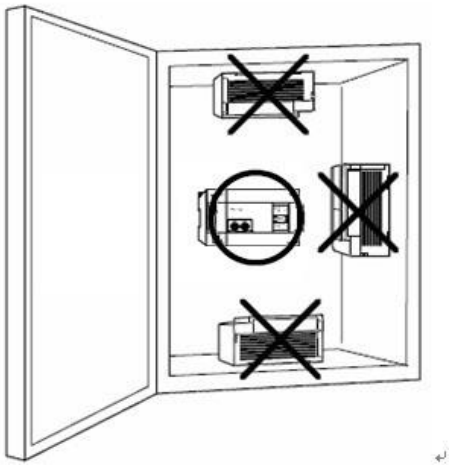
- Points are the actual input and output points.
- When the expansion module is connected, the total number of points = the number of points of the basic unit + the number of points of the expansion module.
- The serial number of input / output digital value is octal.
- The serial number of input and output analog quantity is decimal.

Point calculation example

Basic unit XS3-26T4 (18I/8O) connects 5 XG-E8X8YR modules, the total points will be:
Input points: 18 + 8 *5 = 58
Output points: 8 + 8 *5= 48
Total points: 58+48= 106

3-4. Product installation

3-4-1. Installation location

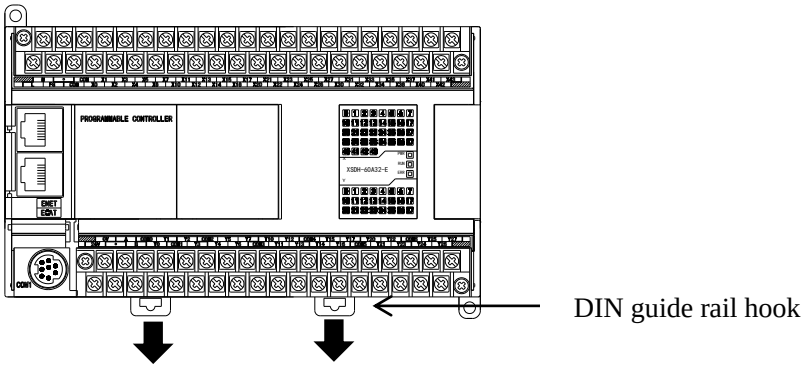


3-4-2. Installation method

(1) XSDH series installation

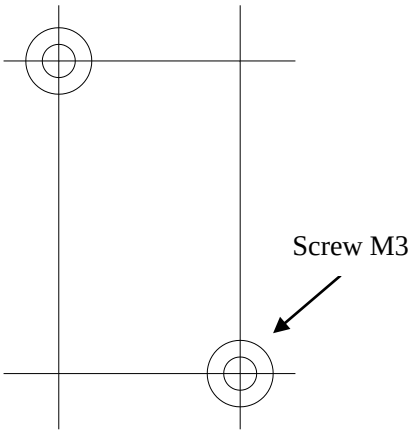
For the installation of XSDH series basic unit and expansion module, guide rail installation or direct screw installation can be selected.

- Install with DIN46277 guide rail



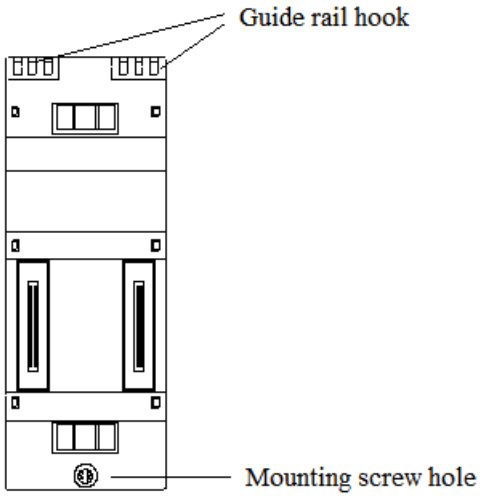
The unit and expansion module are installed on DIN46277 guide rail (35mm wide). To remove, just pull down the assembly hook of the DIN rail and remove the product.

- Screw direct installation

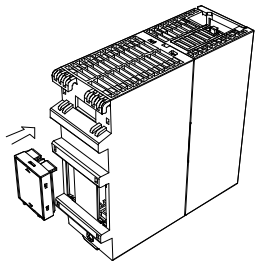
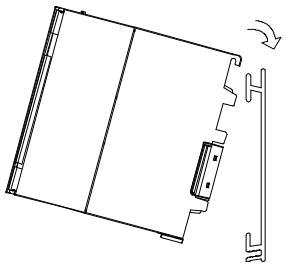
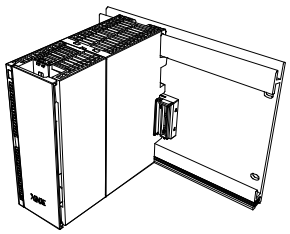
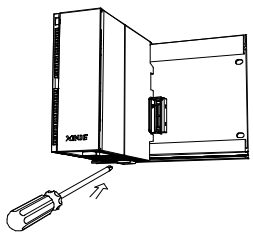


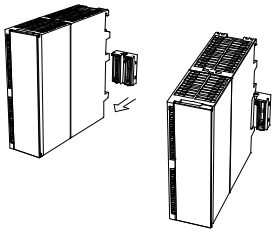
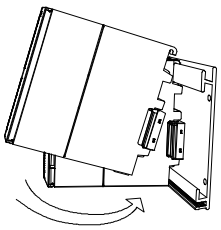
(2) XS3 series installation

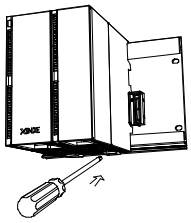
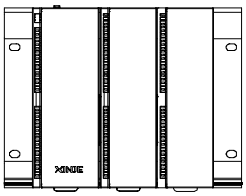
The XS3 series basic unit and expansion module are installed with XG-EB series guide rails.



Connect the power module, XS3 body and XG expansion module to the guide rail through the U-connector, and fix them with the bottom screw. The installation steps are as follows:

①Insert the L Port of the U-shaped connector into the left interface on the back of the PLC body. (on the right in front view)	②Hang the installation hook on the upper side of the PLC body to the upper side of the installation guide rail according to the direction shown in the figure
	
③Fix the PLC to the mounting rail as shown in the following figure	④Screw holes under PLC shall be fixed with screws
	
⑤Plug the L Port of the U-connector into the left interface on the back of the #1 expansion module (on the right in front view)	⑥Hang the installation hook on the upper side of the #1 module to the upper side of the installation guide rail according to the direction shown in the figure. The expansion port on the left side of the module is connected with the R port of the U-connector on the body

⑦ Please use screws to fix the screw hole under the module #1	⑧Continue to install the following modules in the same way. The effect is shown in the following figure.
	

Note:

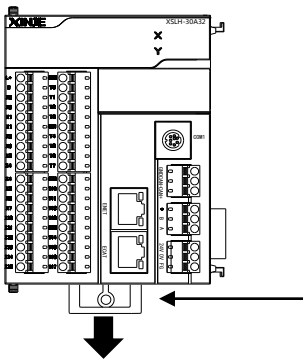
※1: If the power module XG-P75-E is selected, please install the power module to the left side of the PLC body according to the installation steps ① ~ ④.

※2: The R port on the back of the last expansion module does not need to install U-connector.

(3) XSLH series installation

Installation of basic unit and expansion module, rail installation is optional.

- Use DIN46277 rail to install



The unit and expansion module are installed on DIN46277 guide rail (35mm wide). To remove, just pull down the assembly hook of the DIN rail and remove the product by translating it to the right.

3-4-4. Installation environment

Please install the product under the environmental conditions specified in chapter 2-1-1.

4. Power supply specification

4-1. Power supply specification

The power specification of XSDH series PLC only supports AC power type.
The power specification of XS3 series PLC only supports DC power type.
The power specification of XSLH series PLC only supports DC power type.

(1) AC power type

Item	Content
Rated voltage	AC100V~240V
Voltage allowable range	AC90V~265V
Rated frequency	50/60Hz
Allowable instantaneous power off time	Interrupt time ≤0.5AC cycle, space ≥1s
Impact current	Max below 40A 5ms/AC100V max below 60A 5ms/AC200V
Maximum power consumption	30W
Power supply for sensor	24VDC±10% max 400mA

Note:
※1: Please use more than 2mm^2 wires for power cables to prevent voltage drop.
※2: Even in case of power failure within 10ms, the programmable controller can still continue to work. When the power is cut off for a long time or the abnormal voltage drops, the programmable controller will stop working and the output will also be in off state. When the power supply is restored, the programmable controller will automatically start running.
※3: The grounding terminal FG of basic unit and expansion module can be connected with each other and reliably grounded (the third kind of grounding).

(2) DC power type

Item	Content
Rated voltage	DC24V
Voltage allowable range	DC21.6V~26.4V
Input current (basic unit)	120mA DC24V
Allowable instantaneous power off time	10ms DC24V
Impact current	10A DC26.4V
Maximum power consumption	12W

Note: ● terminal is empty, please do not use it as external wiring or relay terminal.

5. Input specification and wiring

5-1. Input specification

5-1-1. XSDH series input specification

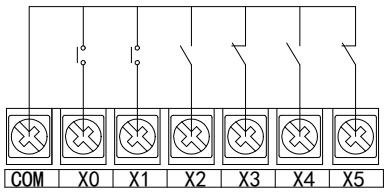
XSDH series PLC supports NPN and PNP input mode. The specific specifications and wiring mode are described below:

(1) NPN input

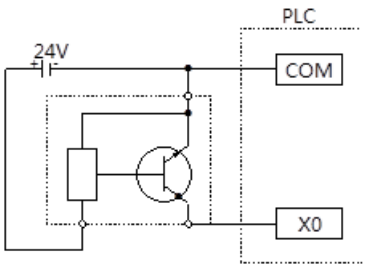
Item	Content
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Below 1.5mA
Input response time	About 10ms
Input signal mode	Contact input or NPN open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED is on when input is on

Note: X2, X5, X10, X13 are high-speed optocoupler, which are reserved high-speed interrupt port.

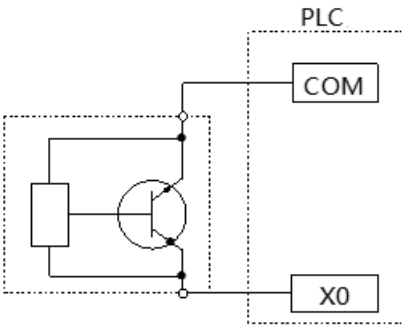
NPN wiring example:



Switch button wiring diagram example



3-wire (NPN type) proximity switch wiring diagram



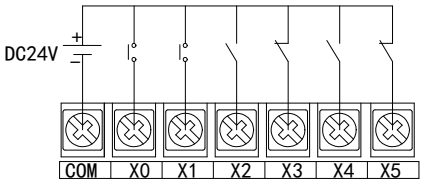
2-wire (NPN type) proximity switch wiring diagram

(2) PNP input

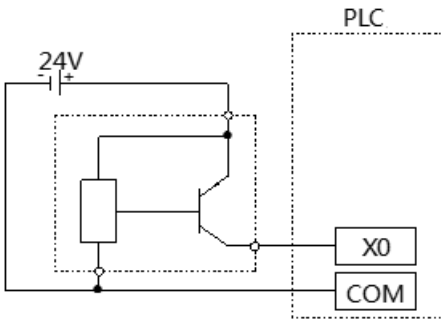
Item	Content
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Below 1.5mA

Input response time	About 10ms
Input signal mode	Contact input or PNP open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED is on when input is on

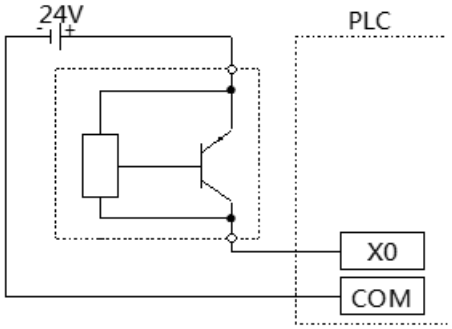
PNP wiring example:



Switch button wiring diagram example



3-wire (PNP type) proximity switch wiring diagram



2-wire (PNP type) proximity switch wiring diagram

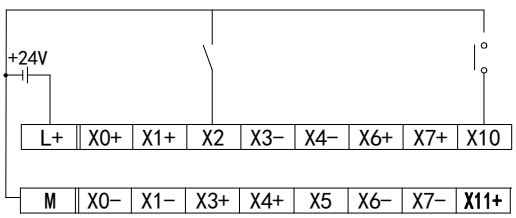
5-1-2. XS3 series input specification

XS3 series PLC supports NPN and differential input modes. The specific specifications and wiring mode are described below:

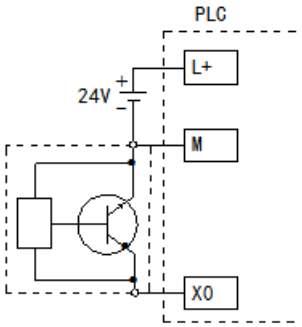
(1) NPN mode

Item	Content
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Below 1.5mA
Input response time	About 10ms
Input signal mode	Contact input or NPN open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED lights when input is ON

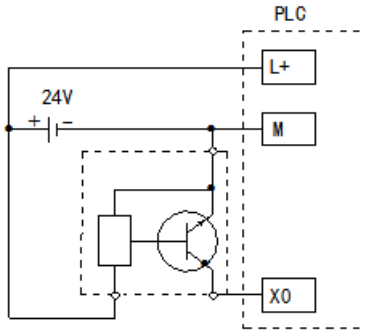
NPN wiring example:



switch button wiring diagram example



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

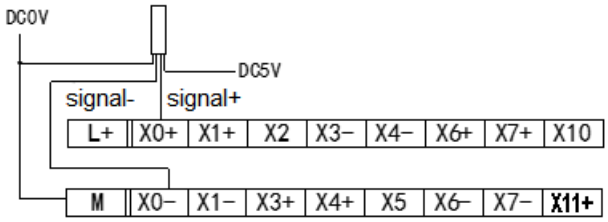


3-wire (NPN type) proximity switch wiring diagram

(2) Differential mode

Item	Content
Input signal voltage	DC5V±10%
Input signal current	12mA/DC5V
Input ON current	Above 4.5mA
Input OFF current	Below 1.5mA
Input response features	Max 200KHz
Input signal mode	Differential input
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED lights when input is ON

Differential input wiring example:



Differential wiring diagram example

5-1-3. XSLH series input specification

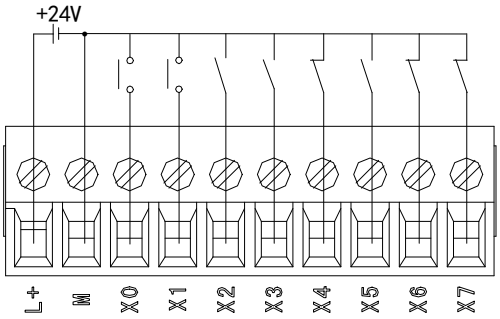
XSLH series PLC supports NPN and differential input modes. The specific specifications and wiring mode are described below:

(1) NPN mode

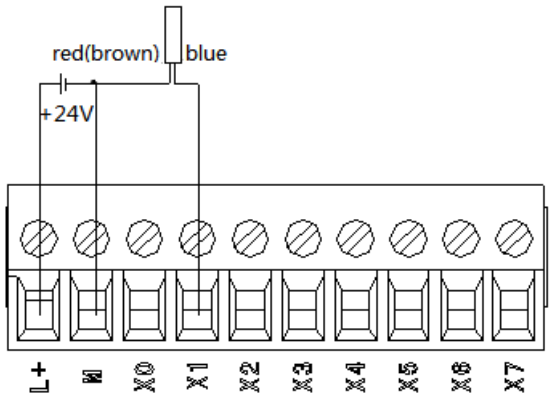
Item	Content
NPN input points	12 points (X2, X5~X15)
High speed counter input	4 points (X6, X7, X11, X12), single phase 80KHz, AB phase 50KHz
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON current	Above 4.5mA
Input OFF current	Below 1.5mA
Input response time	About 10ms
Input signal mode	Contact input or NPN open collector transistor

Item	Content
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED lights when input is ON

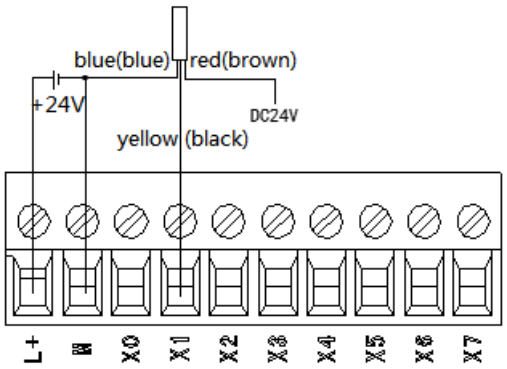
NPN wiring example:



switch button wiring diagram example



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

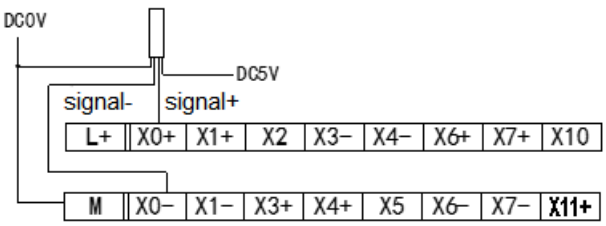


3-wire (NPN type) proximity switch wiring diagram

(2) Differential mode

Item	Content
Differential input	4 points (X0, X1, X3, X4)
Input signal	5V differential signal
Input max frequency	1MHz
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED lights when input is ON

Differential input wiring example:



Differential wiring diagram example

5-2. DC input signal

(1) NPN mode

■ Input terminal

Input terminal and M terminal is connected by no voltage contactor or NPN open collector transistor, then the input is ON, the corresponding LED lights.

■ Input circuit

The input primary circuit and secondary circuit are insulated by optical coupler, and the secondary circuit is equipped with C-R filter. This is set to prevent misoperation caused by input contact vibration or input line mixed noise.

Due to the above reasons, for input ON→OFF，OFF→ON changes, the response time lags about 6ms inside the PLC. Digital filter is built in the input terminal.

■ Input sensitivity

The input current of the programmable controller is DC24V 7mA, but for the sake of reliable operation, when it needs to be on, it is more than 4.5mA, and when it is off, it is less than 1.5mA.

(2) Differential mode (not support by XSDH series)

■ Input terminal

Input terminal and M terminal is connected by DC5V contactor, then the input is ON, the corresponding LED lights.

■ Input circuit

The input primary circuit and secondary circuit are insulated by optical coupler, and the secondary circuit is equipped with C-R filter. This is set to prevent misoperation caused by input contact vibration or input line mixed noise.

Due to the above reasons, for input ON→OFF，OFF→ON changes, the response time lags about 10ms inside the PLC. Digital filter is built in the input terminal.

■ Input sensitivity

The input current of the programmable controller is DC5V 12mA, but for the sake of reliable operation, when it needs to be on, it is more than 4.5mA, and when it is off, it is less than 1.5mA.

(3) PNP mode

■ Input terminal

When DC24V voltage contact or PNP open collector transistor is used between the input terminal and COM terminal, the input is ON, and the corresponding input LED is on. Multiple input COM terminals can be connected in the programmable controller.

■ Input circuit

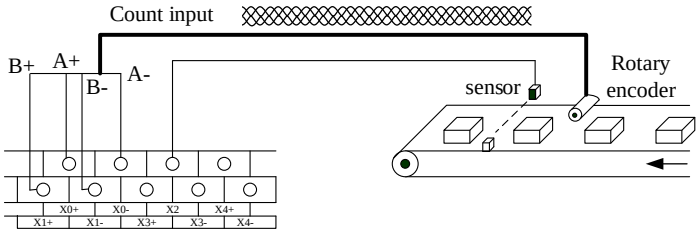
The input primary circuit and secondary circuit are isolated by optical coupler, and the secondary circuit is equipped with C-R filter. This is set to prevent misoperation caused by vibration of input contact or noise mixed with input circuit. Because of the above reasons, for the changes of input ON → OFF, OFF → ON, the response time lags about 10ms in the programmable controller. The input terminal is equipped with a digital filter.

■ Input sensitivity

The input current of the programmable controller is DC24V 7mA, but for reliable operation, when it needs to be turned on, it is more than 4.5mA, and when it is turned off, it is less than 1.5mA.

5-3. High speed count input

XSDH/XS3/XSLH series PLC has a high-speed counting function independent of the scanning cycle of the programmable controller. By selecting different counters, it can measure the high-speed input signals such as the measurement sensor and rotary encoder. The maximum measurement frequency of XS3 can reach 200kHz. The high-speed counting input of XS3 series PLC can only receive differential signal (DIFF) and cannot receive open collector signal. Please be sure to select the encoder of differential signal (DIFF).



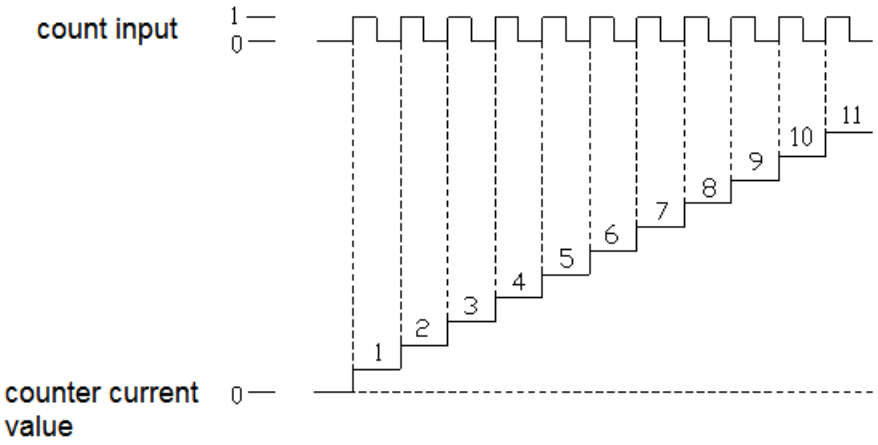
When the counting frequency is higher than 25Hz, please select the high-speed counter.

5-3-1. Count mode

XSDH/XS3/XSLH series high-speed counting function has two counting modes, namely, incremental mode and AB phase mode.

(1) Incremental mode

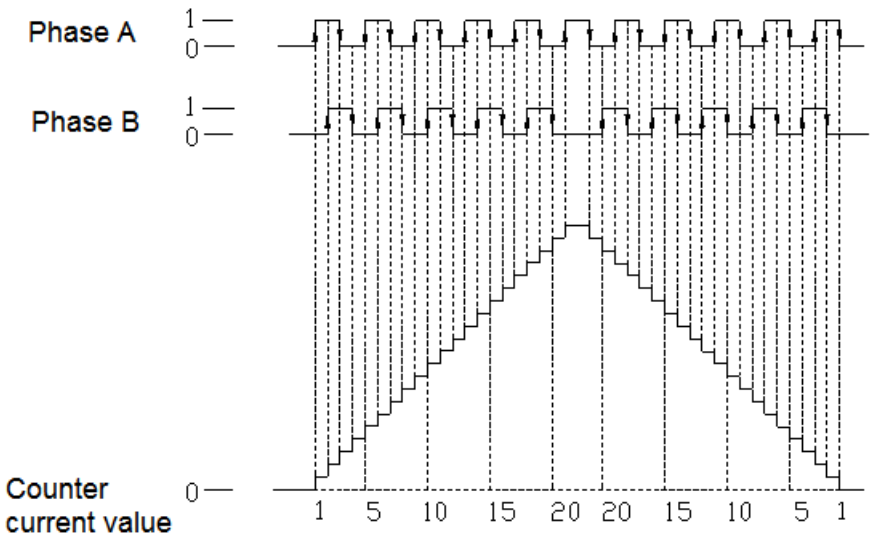
In this mode, the input pulse signal is counted, and the count value increases with the rising edge of each pulse signal.



(2) AB phase mode

In this mode, the high-speed count value is incremented or decremented according to two differential signals (phase A and phase B), and the counting mode is quadruple frequency mode.

Quadruple mode



5-3-2. High-speed counter range

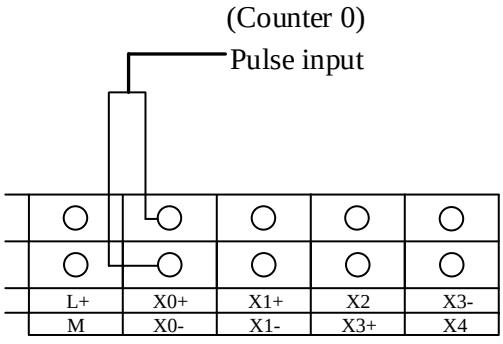
The counting range of high-speed counter is: -2147483648 ~ +2147483647. When the count value exceeds this range, overflow or underflow occurs.

The overflow means that the count value jumps from +2147483647 to -2147483648 and continues counting. When underflow occurs, the count value jumps from -2147483648 to +2147483647 and continues counting.

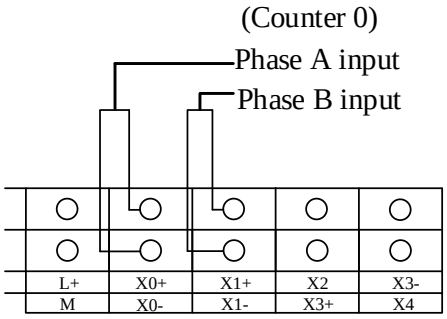
5-3-3. High-speed counter input wiring

For the counting pulse input terminal wiring, it is slightly different according to the programmable controller type and counter model. Several typical input terminal wiring methods are shown in the following figure:

(1) Incremental mode



(2) AB phase mode



5-3-4. Input terminal assignment

(1) XSDH/XS3/XSLH series PLC high speed counter channels:

PLC model		High speed counter channel	
		Incremental mode	AB phase mode
XSDH	60 points	4	4
XS3	26 points	4	4
XSLH	30 points	4	4

(2) High speed counter input terminal definition:

U	A	B
Counting pulse input	Phase A input	Phase B input

Under normal circumstances, the maximum frequency of XSDH and XS3 series high-speed counting terminals can reach 200KHz in single-phase mode, 100kHz in AB phase mode for XSDH and 200kHz for XS3. XSLH can up to 1MHz in differential mode, 80KHz in single phase mode and 50Khz in AB phase mode. When the X input terminal is not used as a high-speed input port, it can be used as a common input terminal. The specific port allocation and functions are shown in the following table:

XS3-26T4								
	Single phase incremental mode				AB phase mode			
CounterID	0	1	2	3	0	1	2	3
Max frequency	200k	200k	200k	200k	200k	200k	200k	200k
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+	
X6-			U-				A-	
X7+							B+	
X7-							B-	
X10								
X11+				U+				A+
X11-				U-				A-
X12+								B+
X12-								B-
X13								

XSLH-30A32								
	Single phase incremental mode				AB phase mode			
CounterID	0	1	2	3	0	1	2	3
Max frequency	1M	1M	80k	80k	1M	1M	50k	50k
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								
X14								
X15								

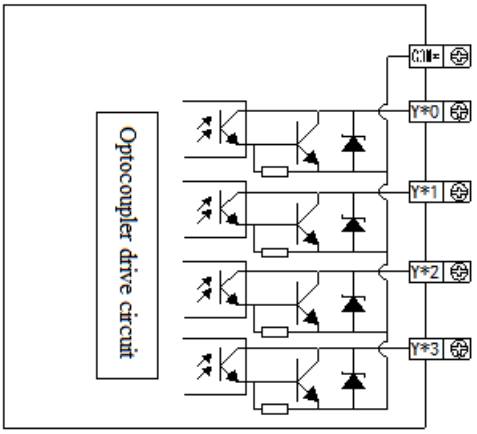
XSDH-60A32-E								
	Single phase incremental mode				AB phase mode			
CounterID	0	1	2	3	0	1	2	3
Max frequency	200k	200k	200k	200k	100k	100k	100k	100k
X0	U				A			
X1					B			
X2								
X3		U				A		
X4						B		
X5								
X6			U				A	
X7							B	
X10								
X11				U				A
X12								B
X13								

6. Output specification and wiring method

6-1. Output specification

(1) Normal transistor output

External power supply		Below DC5~30V
Circuit insulation		Optocoupler insulation
Action indicator		LED light
Max load	Resistive load	0.3A
	inductive load	7.2W/DC24V
	Light load	1.5W/DC24V
Min load		DC5V 2mA
Open circuit leakage current		< 0.1mA
Response time	OFF→ON	< 0.2ms
	ON→OFF	< 0.2ms



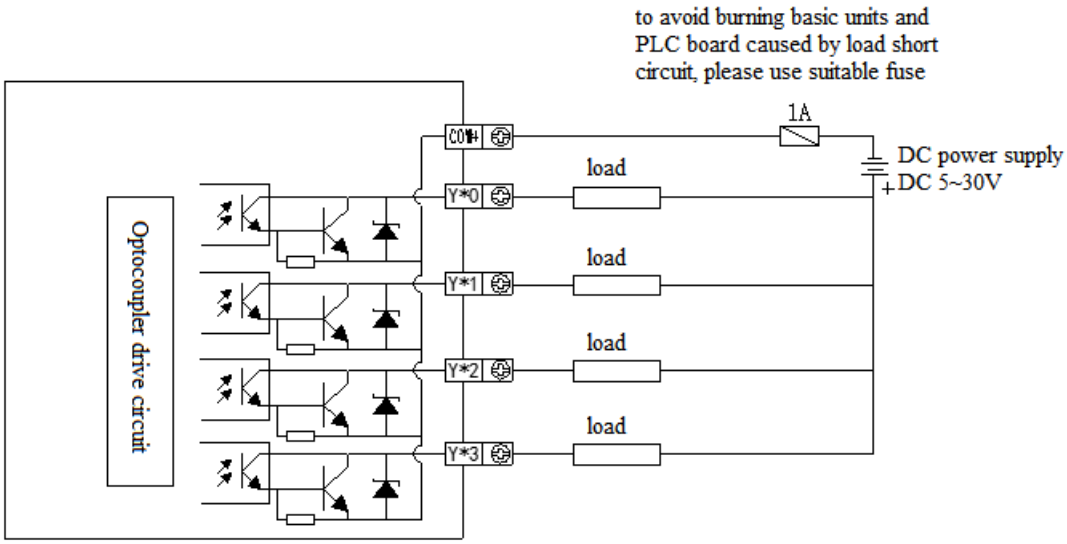
Note:

The PLC is generally equipped with a plug-in spring connector to facilitate wiring when it leaves the factory. The connector requires that the stripped length of the wire shall be at least 1.5cm. When wiring, press the yellow spring switch with a small screw drive, insert the wire into the corresponding socket, and release the spring switch.

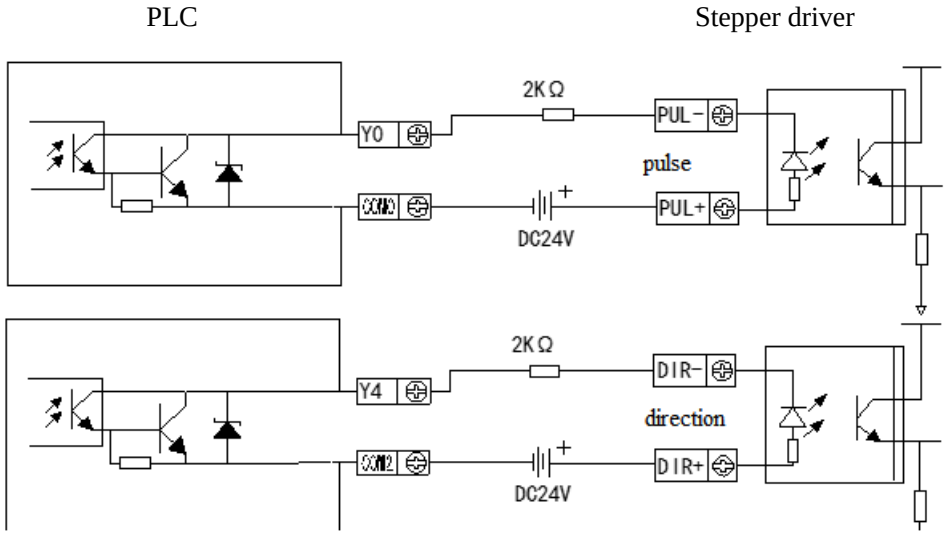
6-2. Transistor output

(1) General transistor output

- 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
- 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.



Example: the following is the wiring diagram of T-type PLC and stepper motor driver.

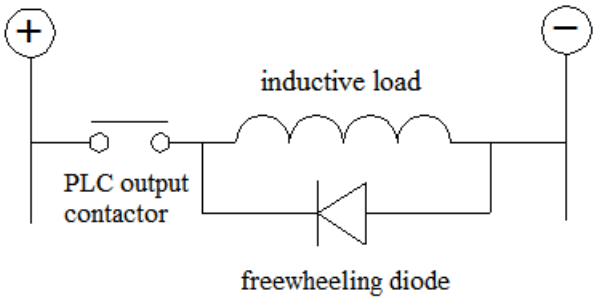


(Make sure the driver's photoelectric coupling input terminal has 8~15mA reliable current)

(2) Output circuit protection

For inductive load of DC circuit, freewheeling diode shall be added, as shown in the following figure:

- DC load



Note: freewheeling diode is 1N4007.

7. Operation, commissioning and maintenance

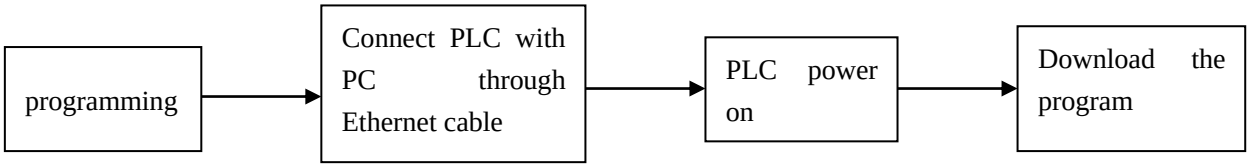
7-1. Operation and commissioning

(1) Product inspection

After receiving the product, please first check whether the input and output terminal blocks of the product are intact and whether there are missing parts. Generally speaking, the PLC at this time can be directly connected to the power cable for power on inspection, and the PWR and RUN indicators should be always on.

(2) Programming and downloading

After confirming that the product is in good condition, the PLC can be programmed. The programming is carried out in the personal computer. The completed program can be downloaded to PLC. The general operation steps are as follows:



(3) Debugging

Ideally, the PLC is in normal operation, but if the program in the PLC is found to be wrong and needs to be modified, it is necessary to rewrite the program to the running PLC.

- Use Ethernet cable to connect PLC and computer
- Upload the program in the PLC
- Modify the uploaded program, and save the modified program
- Pause the operation of PLC and download the modified program to PLC
- Monitor PLC through software debugging function
- If the requirements are still not met, continue to modify the program and download it to PLC until the requirements are met.

(4) PLC indicator light

- When the PLC is in normal operation, the indicator lights PWR and RUN should always be on.
- When the indicator ERR is always on, it indicates that there is a problem with the PLC operation. Please correct the program in time.
- If the indicator PWR is not on, there is a problem with the power supply. Check the power wiring.

7-2. Routine maintenance

(1) Regular inspection of products

Although the programmable controller has certain anti-interference and strong stability, it should also form the habit of regular inspection and maintenance of the controller. The inspection items include:

- Whether the input and output terminals and power supply terminals of PLC are loose
- Whether the communication port is intact
- Whether the power indicator and input / output indicator can be lit
- Remove the accumulated dust outside the PLC to avoid dust and conductive dust falling inside the PLC
- Try to make the PLC operation and storage environment conform to the standards described in section 2-1-1 of this manual.

(2) About the battery

There are no components inside the programmable controller that can seriously shorten its service life, so it can be used all the time. However, if it is a PLC with clock function, the battery shall be replaced regularly.

- The service life of the battery is generally 3-5 years.
- Please replace the battery as soon as possible after the battery power drops.
- After replacing the battery, please power on the PLC immediately, otherwise the battery may be exhausted.

(3) Discard

If you decide to discard this product, please treat it as industrial waste.

Appendix

Appendix 1. PLC function configuration list

This part is mainly for the convenience of users to check the function configuration of products of various series models. Through this table, it is easy to judge the selection of product models.
For detailed introduction of the following functions, please refer to XS series PLC user manual [motion control] and XS series PLC user manual [software].

○ user select × not support √ support

Series	Clock	USB	RS232	RS485	RJ45	CAN port	Communication		Expansion module	HSC channel		External interrupt
							Ethernet	EtherCAT		Incremental mode	AB phase	
XSDH-60A32-E	√	×	1	1	2	×	√		16	4	4	14
XS3-26T4	√	×	1	2	2	×	√		16	4	4	6
XSLH-30A32	√	×	1	1	2	1	√		16	4	4	10

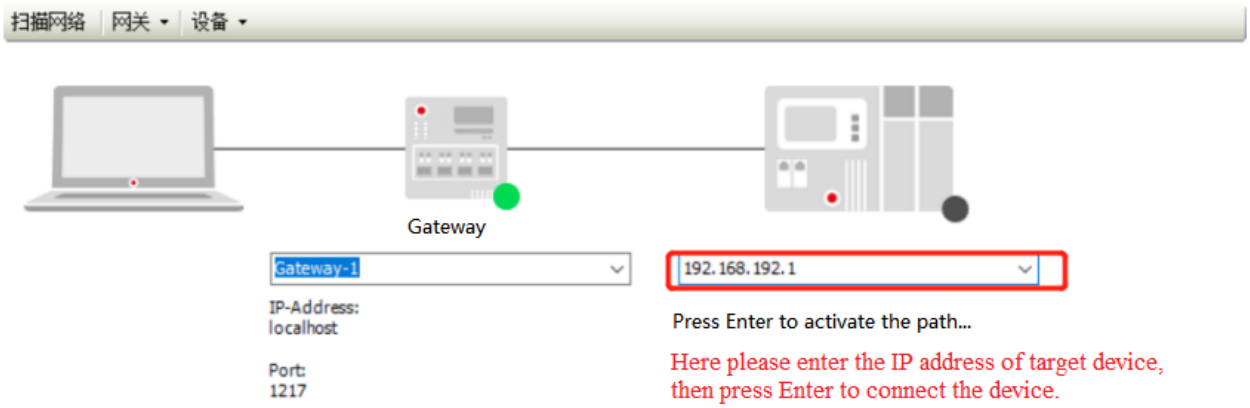
Appendix 2. Q&A

When running or debugging PLC, users may encounter some difficult problems due to lack of experience. This part mainly aims at the problems that users are most likely to encounter, and puts forward solutions for users' reference.

Q1: Why can't PLC communicate with peripheral devices?
A1: Communication failure is generally summarized as the following problems:
(1) Communication parameters: the communication parameter settings of PLC communication port and peripheral equipment may be inconsistent.
(2) Communication cable: the connection may be incorrect or the contact may be poor. The user can replace the communication cable and try again.
(3) If the above are excluded, please contact our company.

Q2: How long can the battery power in the PLC be maintained?
A2: Generally, it can last for 2-3 years.

Q3: Why can't connect to the PLC device?
A3: Failure to connect PLC is generally summarized as follows:
1. Confirmed as XS series products (XD and XG series products have been regarded as XS series in many cases).
2. Confirm that the upper computer engineering equipment is consistent with the target equipment, otherwise the equipment will not be scanned.
3. Confirm whether the IP addresses of both parties are the same network segment and can be ping. If the IP address cannot be confirmed, try to set dial 1 to ON and restart the device (the initial IP address is 192.168.6.6 after power on), and then scan and connect again. If the network segment is the same but the subnet mask is different, the device cannot be scanned, but you can directly enter the IP address to connect the device.



4. If the IP is confirmed to be correct or the device cannot be connected, it may be that the PLC program crashes (there is an endless loop in the program or the load capacity of the PLC is exceeded). At this time, set dial 2 to ON (power on does not load the user program), and scan the connected device again. If the connection can be scanned, an empty program will be downloaded at this time. After the abnormal program is erased, the dialing status will be restored. At the same time, check the abnormal program (whether there is an excessively long cycle or the task cycle time is too small).

5. If the above steps still fail to connect the device, please contact us.

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