XSLH-24 PLCopen standard controller

Fast manual [Data No.：S161177 1.1]

Thank you for purchasing Xinje XSLH-24 PLCopen controller. This manual mainly introduces the specifications, electrical characteristics and usage methods for your reference at any time. Before using the product, please read this manual carefully, and safer wiring operation under the premise of fully understanding the content of the manual. For the usage method of XSLH-24 series products, please refer to refer to XS series PLCopen controller instruction manual.

➡ XSLH-24 features：

- Based on the Codesys programming platform, fully supports the PLCopen programming specification.
- Many standard function libraries can be referenced to develop proprietary function blocks and instruction libraries.
- Supports EhterCAT motion control, EtherCAT remote IO, Ehternet communication, and OPC UA protocol.
- Supports up to 8,16 EtherCAT axes;
- Support rich bus motion control functions (such as multi axis interpolation and electronic cams);
- Up to 16 XL series right expansion modules and 1 XL series ED left expansion module can be expanded;
- The input is bipolar and compatible with both NPN and PNP modes;
- Support for online download function.

Safety notes

■ Control system design notes

⚠ ⚠
Dangerous！
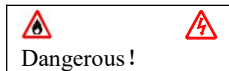
- Make sure to design safe circuit for application, ensure the control system can work safe when the external power outages or PLC has fault.
- It is important to set emergency brake circuit, protection circuit, interlock circuit for forward reverse rotation, position upper and lower limit interlock switch to prevent from machinery damage.
- For the safe operation of equipment, please design external protection circuit and safety mechanism for output signal related to major accident.
- All the output will be shut down when PLC found system error. The output maybe out of control when the controller circuit has error, please design suitable external control circuit to ensure the normal working of equipment.
- If the PLC output unit is broken, they cannot be controlled to be ON or OFF.
- PLC is designed for indoor electric environment, the power supply system should have lightning protection device, ensure that lightning overvoltage is not applied to the power input or signal input, output terminal of PLC, avoid equipment damage.

■ Installation and wiring notes

⚠ ⚠
Dangerous！
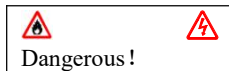
- Do not use the PLC in the following places: dust, lampblack, conductive dust, corrosive gas, flammable gas. Exposure to the environment of high temperature, dew, wind and rain. Electric shock, fire, vibration, malfunction, misoperation also can cause product damage.
- Do not make scrap metal and wire drop into the controller vent when wiring, it may cause fire, fault, wrong operation.
- After installing the PLC, make sure there is no foreign object covering the ventilation, otherwise the heat dissipation will be bad and cause fire, fault and wrong operation.
- The wiring of installation box must be solid and reliable, poor contact may result in wrong action.

⚠ **Caution!**
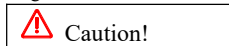
- Please use external power supply for extension module DC24V power
- For serious interference occassions, pls use shield cable for high frequency signal input and output to improve system anti-jamming capability.

■ Run and maintenance

⚠ ⚠
Dangerous！
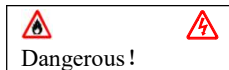
- Please connect and dismantle communication cable, extension card and control unit cable after the power supply is shut down, otherwise it may cause equipment damage

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or incorrect operation.

- For online modification, forced output, RUN, STOP, and other operations, it is necessary to thoroughly read the user manual and fully confirm its safety before proceeding with relevant operations.

⚠ **Caution!**
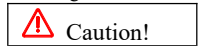
- When the product is discarded, please dispose of it as industrial waste;
- When loading and unloading expansion cards, be sure to cut off the power supply;
- The button battery needs to be replaced when power is on (ensure that the memory data is not lost); when the equioment is running,it must be operated by a professional electrical technicians wearing insulating gloves.

Production information

■ Naming rule

$$\underset{①}{X} \quad \underset{②}{S} \quad \underset{③}{L} \quad \underset{④}{H} - \underset{⑤}{24} \quad \underset{⑥}{A} \quad \underset{⑦}{16}$$

①	Product series	X：Controller
②	Use platform	S：CODESYS platform
③	Appearance structure	L：Same to XLH appearance
④	Performance level	H：Motion control enhanced model
⑤	I/O points	24: 12 inputs/12 outputs
⑥	Connection symbol	A：Axis
⑦	EtherCAT max number of control axes	8：8 EtherCAT axis
		16：16 EtherCAT axis

■ Basic parameters

Table 1：General specifications

| Item	Specifications
Insulation voltage	Above DC500V 2MΩ
Anti-jamming	Noise voltage 1000Vp-p 1us pulse 1 minute
Air	No corrosive, flammable gas
Ambient temperature	0℃~55℃
Ambient humidity	5%RH~95%RH (no condensation)
Installation	Directly installed on the rail
Ground	The third ground(cannot ground together with high voltage system)

Table 2：Performance specifications

Item		Specifications
I/O	Total	24
	Input	12
	Output	12
Maximum I/O points		536
High speed input	Single/AB phase	4-channel, single-phase up to 80K, AB phase up to 50K
	Input mode	OC input
Extend capability	Right expansion module	16
Interrupt	External interrupt	10
Communication function	RS232	1, MODBUS, connect HMI or communication devices
	RS485	1, MODBUS, connect HMI, communication equipment, etc
	RJ45 port1	ENET: Ethernet communication, supporting program download and monitoring debugging, and supporting OPC UA protocol
	RJ45 port2	ECAT：EtherCAT real-time bus master station
Bus motion control		EtherCAT bus, 8, 16 axis
Cam control		EtherCAT bus, 8, 16 axis
Program method		ST、SFC、FBD、CFC、LD 和 IL
Main processor		Main frequency 800MHz

User program capacity	32M
Data capacity	32M
SD card capacity	32G

Electrical design reference

■ Product structure
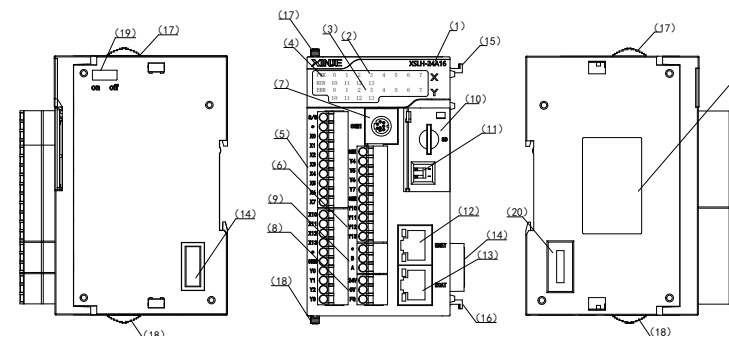
Part name：

(1): PLC body model
(2): Input labels and indicator lights
(3): Output labels and indicator lights
(4): System indicator light
   PWR: Power indicator light
   RUN: Running indicator light
   ERR: Error indicator light
(5): Input terminal
(6): Output terminal
(7): RS232 communication port (COM1)
(8): Power supply connection terminal
(9): RS485 communication port (COM2)

(10): SD card insertion port
(11): Dial switch
(12): RJ45 port 1
(13): RJ45 port 2
(14): Right expansion module access port
(15): Fixed module hook (upper)
(16): Fixed module hook (lower)
(17): Sliding latch (upper)
(18): Sliding latch (lower)
(19): Empty
(20): Left expansion module access port
(21): Product label

■ Communication port definition

XSLH-24 is configured with 4 communication ports, 1 RS232 serial port (COM1), 1 RS485 port (COM2), and 2 RJ45 ports (EtherNet, EtherCAT); One RS232 or RS485 communication port (COM3) can also be extended through the ED module (XL-NES-ED).

● RS232 port(COM1)

- The communication port COM1 pin diagram is as follows:
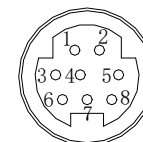
4：RXD
5：TXD
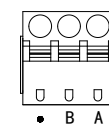8：GND

Mini Din 8-pin port

- Programming cable:

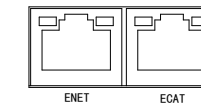Mini Din 8-pin male port   DB9 female port

Note: the above diagram is for DVP cable, if it is XVP cable, please connect pin 1 of Mini Din8 and pin 7 of DB9.

● RS485 serial port

Note: A is RS485+and B is RS485-. When communicating, A is connected to A and B is connected to B.

● RJ45 port (Ethernet, EtherCAT)

The Ethernet port supports MODBUS TCP communication and free format communication based on the TCP IP protocol. The EtherCAT port supports EtherCAT bus and can control up to 8/16 EtherCAT axes.
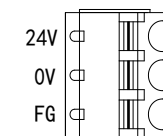
■ Dial switch

XSLH-24 is equipped with 2 dial switches, with corresponding functions as follows:

Switch	DIP1	DIP2	Functions
Status	OFF	OFF	Run normally
	ON	OFF	Initialize IP
	OFF	ON	The user progarm is not loaded when the power is on.
	ON	ON	None

■ Power supply specification

● PLC power wiring terminal block

Note:
(1) The power input terminals of the PLC are 24V and 0V.
(2) FG is a grounding terminal used to shield interference and can be grounded separately as needed.

● Power supply specification

DC power supply

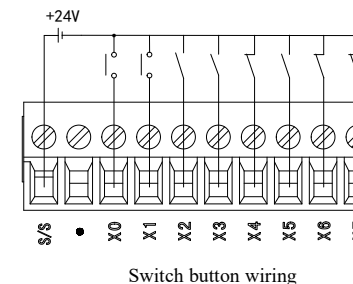| Item	Contents
Rated voltage	DC24V
Voltage allowable range	DC21.6V~26.4V
Input current	120mA, DC24V
Allowable instant power outage time	10ms, DC24V
Impact current	10A, DC26.4V
Max consumption power	12W

■ Input specification and wiring

The input of XSLH-24 is divided into two modes: NPN and PNP.The internal structure and connection mode of two modes are described below.
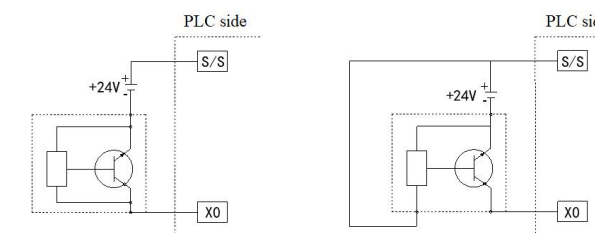
● NPN mode specification

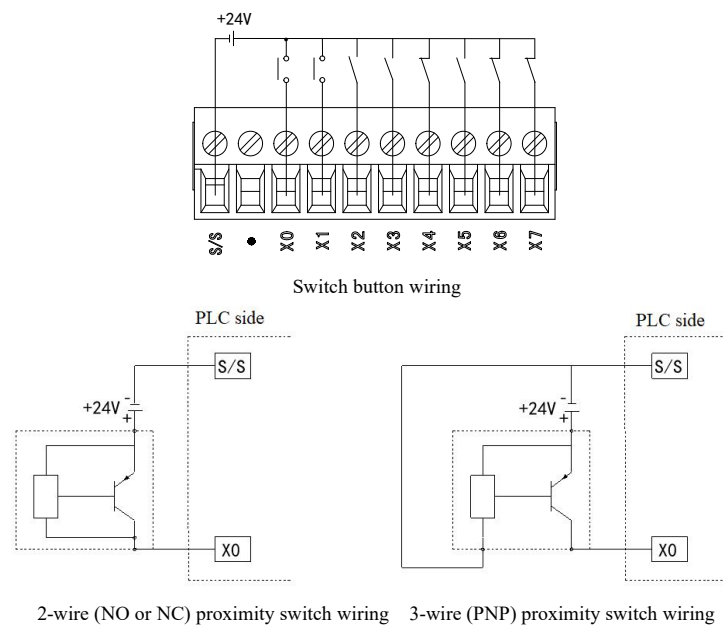| Item	Contents
Input signal voltage	DC24V±10%
Input signal current	7mA/DC24V
Input ON voltage	Below 9V
Input OFF voltage	Above 19V
Input response time	About 10ms
Input signal mode	Contactor input or NPN open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED lights up when the input is ON

● NPN wiring example

Switch button wiring

2-wire (NO or NC) proximity switch wiring   3-wire (NPN) proximity switch wiring

PNP mode specification

| Item	Contents
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	Contactor input or PNP open collector transistor
Circuit insulation	Optoelectronic coupling insulation
Input action display	LED lights up when the input is ON

PNP wiring example

Switch button wiring

PLC side   PLC side

2-wire (NO or NC) proximity switch wiring   3-wire (PNP) proximity switch wiring

■ Output specification and wiring

The output part is in transistor output mode, and the internal structure and wiring method of this mode will be introduced in detail below:

● Output specification

Ordinary transistor output

External power		DC5~30V
Circuit insulation		Optocoupler insulation
Action indication		LED indicator light
Max load	Resistive load	0.3A
	Inductive load	8W/DC24V
	Light load	1.5W/DC24V
Minimum load		DC5V 2mA
Open circuit leakage current		Below 0.1mA
Response time	OFF→ON	Below 0.2ms
	ON→OFF	Below 0.2ms

High speed pulse output

Model	XSLH-24
High speed pulse output bit	Y0~Y3
External power supply	Below DC5~30V
Action indication	LED indicator
Maximum current	50mA
Maximum pulse output frequency	100kHz

Note: When using high-speed pulse output of 100kHz~200kHz frequency, it is not guaranteed that all servo systems will operate normally. Please connect a resistance of approximately 500Ω between the output terminal and the 24V power supply.

● Transistor output processing

◆ The transistor output of the basic unit has three common outputs.

◆ Please use DC5~30V power supply to drive the load.

◆ The internal circuit of the PLC is insulated and isolated from the output transistor using a optocoupler; In addition, the common end blocks are also separated from each other.

◆ When photoelectric couplers drive, LED will be ON and the output transistors will be ON.

◆ The time interval that PLC from photoelectric couplers energizing (or cutting) to transistor ON (or OFF) is below 0.2ms.

◆ The current it outputs is 0.3A per point. But limited by the temperature rising, every 4 points current add up to 0.8A.
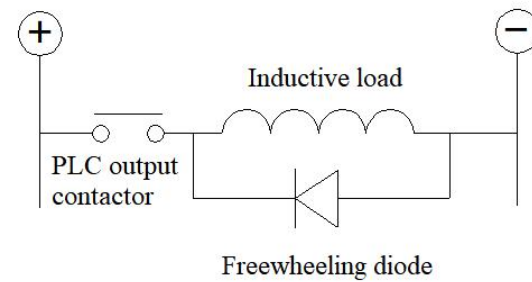
◆ The open circuit current is below 0.1mA.

Transistor output wiring diagram:
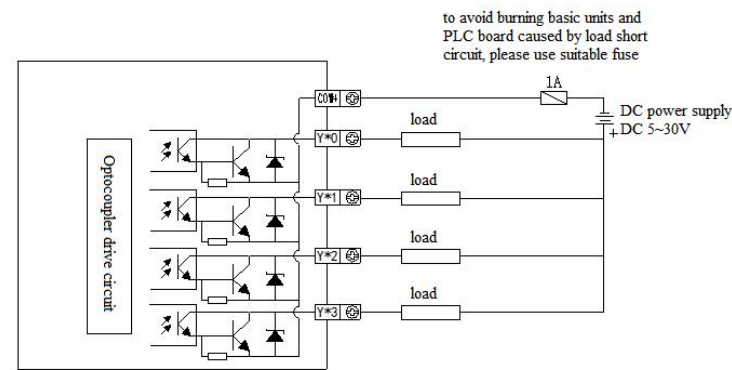
● Output circuit protection

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

◆ DC Load

Note: freewheeling diode 1N4007.

■ Terminal specifications for wiring terminals

When wiring XL series PLCs, the wiring lugs must meet the following requirements:
(1) Stripping length 9mm;
(2) Flexible conductor with tubular bare end, 0.25-1.5mm²;
(3) Flexible wire with tubular pre insulated ends, 0.25-0.5mm².

Product dimensions and installation

■ Installation instructions

The installation of basic units and expansion modules can be done using guide rails.

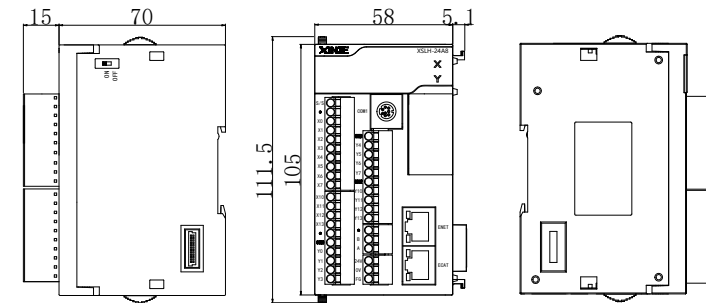## ● Use DIN46277 rail to install
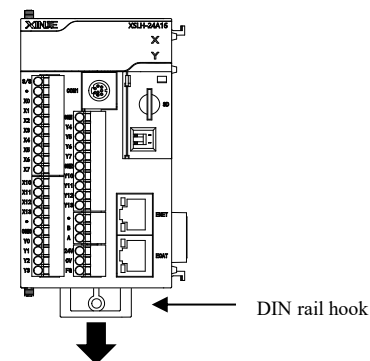
DIN rail hook

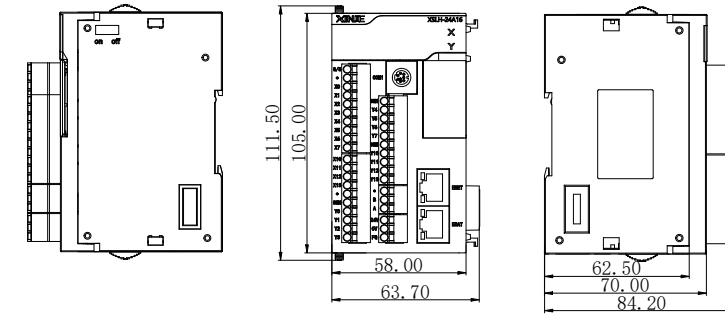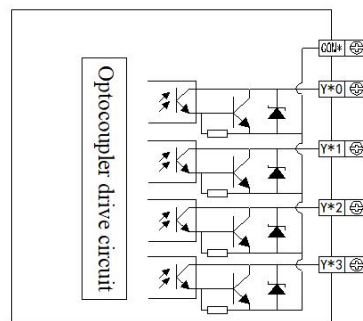This unit and expansion module are installed on DIN46277 guide rail (35mm wide). To

remove, simply pull off the assembly hook of the DIN rail and pan to the right to remove the product.

■ Dimension (unit:mm)

● XSLH-24A8

● XSLH-24A16

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