Extension ED module

XL-4AD-A-ED

Fast manual

Thanks for purchasing XINJE XL series PLC and extension module. This manual will introduce the electric features and using method of XL series extension ED module. Please read this manual carefully before using the products, make sure the wiring operation is safe.

Features of analog extension ED module XL-4AD-A-ED

- 4 channels analog input: current input mode, 0~20mA or 4~20mA.
- 12-bit high precision analog input.
- As the special function ED module of XL, XL series PLC can connect 1 XL-4AD-A-ED module.

Safety precautions

■ Control system design attentions

Dangerous!

- Make sure design the safety circuit, to ensure that the control system can still work safety when the external power supply cut off or PLC broken.
- Make sure set emergency braking circuit, protection circuit, interlock circuit of forward-reverse running in PLC external circuit and upper-lower limit switch to prevent from machine damage.
- In order to make the equipment safe operation, please design external protection circuit for important output signal.
- PLC CPU will close all the output when detecting the system error; the output will lose control when the PLC circuit has problem. Please design suitable external control circuit to ensure the device working normally.
- If the PLC relay or transistor unit is broken, the output cannot be ON or OFF.
- The PLC is designed for indoor environment, the lightning protection must be installed in the power supply system to avoid PLC and other device damage.

■ Installation and wiring attentions

Dangerous!

- Do not use the PLC in the following environment: dust, soot, corrosive gases, flammable gas, high temperature, condensation, vibration, impact, lightning, fire.
- Do not let the metal scrap and wire head drop into the ventilation hole of PLC, otherwise it will cause fire or error operation.
- Do not cover the ventilation hole of PLC, otherwise it will cause fire, error operation.
- The I/O wiring must be fixed enough, otherwise the bad contactor will cause fault.

Attention!

- It can use external power supply for extension module DC24V power.
- Please use shield cable for high frequency I/O wiring to avoid interference.

■ Run and maintenance

Dangerous!

- Please connect all the cable include PLC, extension module and BD board after shutting down the power supply.
- Please operate as the manual for online operation, forced output, RUN, STOP.

Attention!

- Please discard the product as industrial waste.
- Make sure cut off the power supply when installing or uninstalling the extension card.

Product information

■ Naming rule

XL– 4 AD - A - ED

① ②③ ④ ⑤

① Product series XL: XL series extension module

② Analog input channel: 4: 4 channels

③ Analog input AD: analog input

④ Input type A: current type for input

⑤ Module type ED: left extension ED module

■ Basic parameters

XL series PLC can connect 1 extension ED module, the type is not limited.

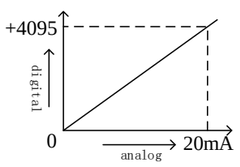
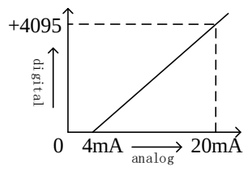
Table 1: analog extension module XL-4AD-A-ED general specifications

Item	Specifications
Using environment	No corrosive gas
Environment temperature	0℃~60℃
Storage temperature	-20~70℃
Environment humidity	5~95%RH
Storage humidity	5~95%RH
Installation	Install on the rail DIN46277(width 35mm)

Table 2: analog extension module XL-4AD-A-ED I/O precision

Item	Analog current input (mA)
Analog input range	0~20, 4~20mA
Max input range	0~40mA
Digital output range	12-bit binary number (0~4095)
Resolution	1/4095(12Bit)
integrated precision	1%
Transformation speed	10ms
Power supply for analog	DC24V±10%, 150mA

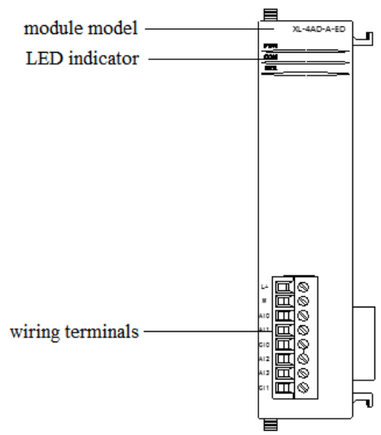
Table 3: analog extension module XL-4AD-A-ED AD transformation diagram

The relationship between analog input and transformed digital value	
0~20mA analog input	4~20mA analog input
	

Product appearance

Here listed I/O terminal configurations of XL series extension module XL-4AD-A-ED.

■ Product structure



Each part name:

Name		Function
Indicator light	PWR	The LED lights when the ED module has power supply
	COM	The LED lights when the ED module communication port works well
	ERR	The LED lights when the ED module has error
Wiring terminal	L+	ED module external power supply 24V +
	M	ED module external power supply 24V -
	AI0	Channel 1 analog input
	AI1	Channel 2 analog input
	CI0	AI0, AI1 ground
	AI2	Channel 3 analog input
	AI3	Channel 4 analog input
	CI1	AI2, AI3 ground

Product dimension and installation

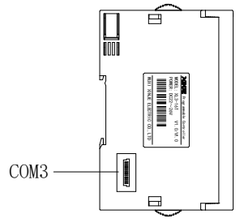
■ Installation

Do not install the module in below environment:

- Direct sunlight
- Environment temperature out of range 0-50℃
- Environment humidity out of range 35%-85% RH
- Condensation as severe changes in temperature
- Corrosive gas and flammable gas
- Dust, iron filing, salt, fume
- Vibration and impact
- Spray oil, water and medicine
- Strong magnetic field and strong electric field

XL series extension ED module can be installed in com3 port of XL series PLC.

Note: please cut off the power before operation!



Terminal specification:

When wiring the module, its connector shall meet the following requirements:

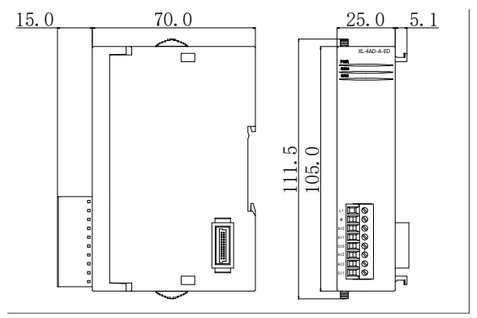
(1) Stripping length: 9mm.

(2) 0.25-1.5mm² flexible conductor with tubular bare ends.

(3) 0.25-0.5mm² of flexible conductors with tubular pre-insulated ends.

■ Product dimension (Unit: mm)

XL series extension ED module dimension is shown as below:



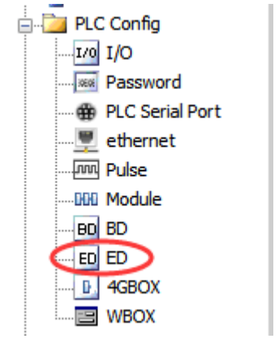
Electric design reference

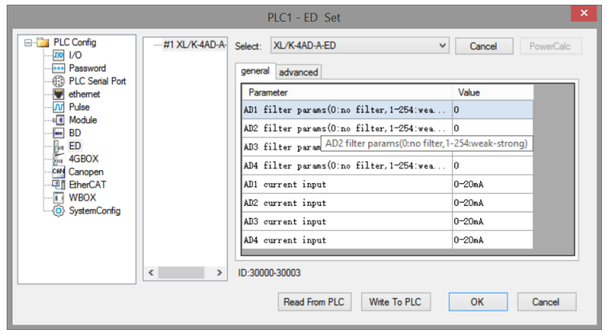
■ I/O address

XL series extension ED module will not occupy I/O unit, the transformed value is stored in PLC register. The following is the PLC register corresponding to each channel.

Channel	AD signal
0CH	ID30000
1CH	ID30001
2CH	ID30002
3CH	ID30003

■ Working mode setting





Steps:

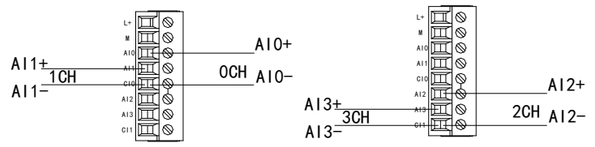
1. open the XDPpro software, find the left project bar, click PLC config/ED.
2. choose the correct module type.
3. set the module parameters such as current input range.
4. click write to PLC, then re-power on the PLC to make the setting effective.

Note: The first-order low-pass filtering method uses the sampling value of this time and the output value of the last filtering to obtain the effective filtering value. The filtering coefficient is set by the user to 0~254. The larger the value, the more stable the data will be, but the data may lag. Therefore, when the value is set to 1, the filtering effect is the weakest, and when the value is set to 254, the filtering effect is the strongest. The default value is 0, which means no filtering.

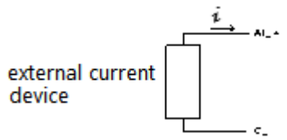
■ External connection

Please use shield cable to avoid interference, and single point connect to ground for the shield layer.

◆ **Current single-ended input**



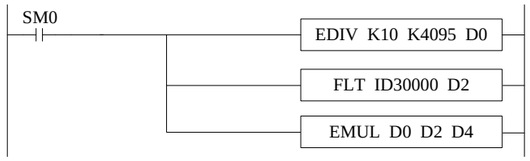
XL-4AD-A-ED current input wiring:



Programming example

Example: it needs to collect one channel pressure sensor signal (pressure sensor performance parameter: pressure range 0Mp~10Mp, output signal range 4~20mA).

Analysis: as the pressure sensor testing range is 0Mp~10Mp, and related analog output is 4~20mA, the ED module AD transformation range is 0~4095. So 0Mp~10Mp is related to digital range 0~4095. 10Mp/4096=0.0024414 is the pressure value related to digital value 1. So the real-time pressure=ID register value * 0.0024414. For example, ID register value is 1024, so the pressure is 2.5Mp.



Note: please use floating number for calculation, otherwise the calculation precision will be error!

Explanation:

SM0 is normally ON coil, it will be ON when PLC is running.

PLC will calculate the pressure value P related to digital value 1, then transform the ID30000 value to floating number. So the real-time pressure=ID30000*P.