

XINJE

Extension ED module

XL-COBOX-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 extension module

XL-COBOX-ED

PLC exchange the data with other devices in the CANopen network through XL-COBOX-ED.

- Suitable for XL series PLC(XL1 series not supported), each PLC can extend one XL-COBOX-ED.
- XL-COBOX-ED can be used as CANopen master station or slave station in the network.

Safety precautions

■ Control system design attentions

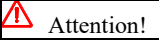


- ◆ Make sure design the safety circuit, to ensure that the control system can still work safety when the external power supply cut off or PLC broken.
- ◆ Make sure set emergency braking circuit, protection circuit, interlock circuit of forward-reverse running in PLC external circuit and upper-lower 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



- ◆ 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.



- ◆ 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



- ◆ 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.



- ◆ 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- COBOX - ED

- | | | |
|---|----------------|-------------------------------------|
| ① | Series | XL: XL series |
| ② | Type | COBOX: CANopen communication module |
| ③ | Extension type | ED: extension ED module |

■ Basic parameters

Table 1: Electric specification

Item	Specification
Power supply voltage	24VDC (±10%)
Consumption power	2W
Insulation voltage	500V

Table 2: General specification

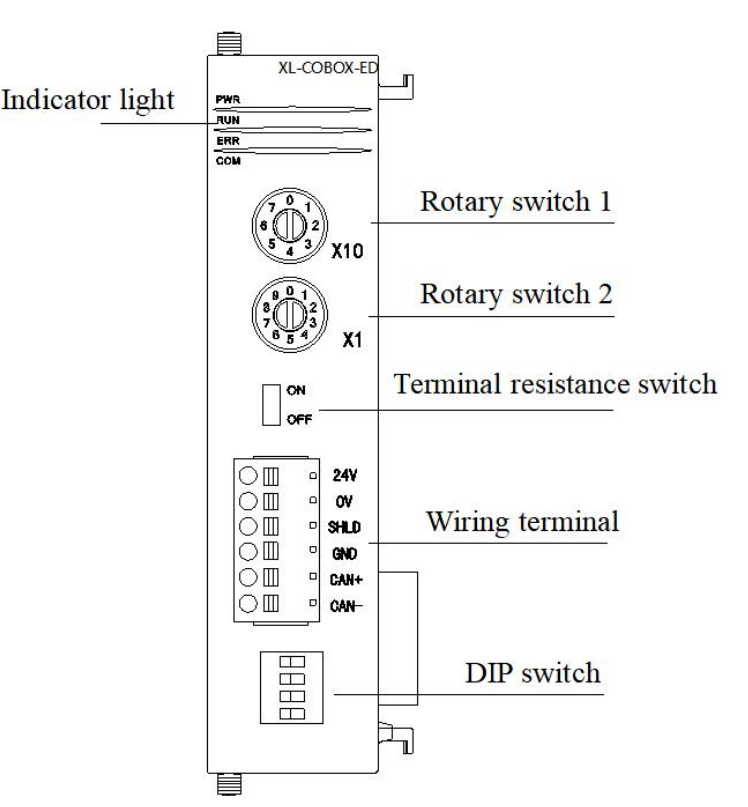
Item	Specification
Usage environment	No corrosive gas
Ambient temperature	0°C~55°C
Storage environment temperature	-20~70°C
Ambient humidity	5~95%RH
Storage environment humidity	5~95%RH
Installation	Directly installed on DIN46277 (35mm wide) guide rail
Dimensions	25.0mm*105.0mm*70.0mm

Table 3: Communication specification

Item	Specification
Transmission mode	CAN
Electrical isolation	500VDC
Transmission cable	Two communication cables, one shield cable and one grounding cable
Information type	PDO, SDO, SYNC, Emergency, NMT
Serial transmission speed	10 kbps, 20 kbps, 50 kbps, 100kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps

Product appearance

■ Product structure

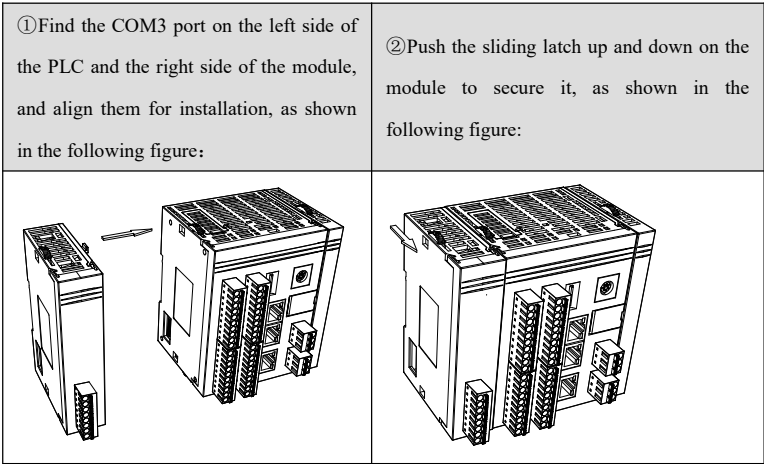


The name of the parts are as follows:

Name		Function
Screw mounting hole		For the installation and fixation of modules
Rotary switch 1, 2		Set the station number of XL-COBOX-ED in CANopen network
Indicator light	PWR	When the ED module is normally connected to the power supply, the indicator light is always on
	RUN	When the module is in normal operation, the indicator is always on or flashing
	ERR	When the module is in abnormal operation, the indicator light flashes red or is always on
	COM	When the communication port of ED module communicates normally, the indicator light flashes green
Terminal resistance switch		When the module is in the head or tail of CANopen network, please switch on
Wiring terminal	24V	Power terminal, connected with external power supply DC24 V+
	0V	Power terminal, connected with external power supply DC24 V-
	SHLD	Shielding terminal
	GND	Signal ground
	CAN+	CAN communication signal +
	CAN-	CAN communication signal -
Connection cable		To connect PLC
DIP switch		Set CAN communication baud rate of master/slave station

Product dimension and installation

■ Installation of products



Note: Please install in a power off state and do not operate with power on!

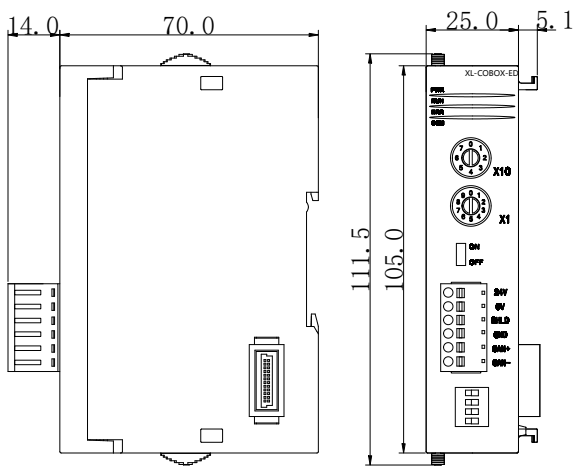
■ Installation explanation

Do not install the module in below environment:

- Direct sunlight
- Environment temperature out of range 0-50°C
- 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

■ Product dimension (unit: mm)



Function description

■ XL-COBOX-ED as master station

When XL-COBOX-ED is used as master station, the functions are as follows:

- Accord to CAN 2.0A standard
- Accord to CANopen standard communication sub-protocol DS301v4.02
- Support NMT Master service
- Error control: support Heartbeat /Node Guarding Protocol
- Support PDO service:
 - (1) RxPDO supports 100, and the data quantity 512 bytes at most
 - (2) TxPDO supports 100, and the data quantity 512 bytes at most
 - (3) PDO transmission type: support event trigger, time trigger, synchronous cycle, synchronous aperiodic
 - (4) PDO mapping: each PDO can map objects with a maximum size of 8 bytes (64 bits).
 - (5) Supported mapping data types:

Storage space	Data type
8bit	INT8U, INT8S
16bit	INT16U, INT16S
32bit	INT32U, INT32S
64bit	INT64U, INT64S

- Support SDO service:
 - (1) Client: 1
 - (2) Supports standard SDO fast transmission mode (expedited SDO)
 - (3) Support SDO service to read and write slave data in PLC ladder diagram
 - (4) Support upper computer to read slave object dictionary with SDO
- Support Emergency Protocol:
 - (1) It can save three latest emergency information for each slave station
 - (2) Emergency information can be read through PLC ladder diagram
- Synchronous information generator (SYNC producer, range 0-65535ms)
- As the interface between Xinje X-NET config software and CANopen network, the configuration software can directly configure CANopen network through XL-COBOX-ED module.
- It can automatically exchange data with PLC. When programming, users only need to program the D register mapped in PLC, without writing instructions; when connecting with PLC, registers after D6000 will be used temporarily.

■ XL-COBOX-ED as slave station

When XL-COBOX-ED is used as slave station, the functions are as follows:

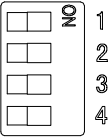
- Accord to CAN 2.0A standard
- Accord to CANopen standard communication sub-protocol DS301v4.02
- Support NMT Slave service
- Error control: support Heartbeat /Node Guarding Protocol
- Support PDO service:
 - (1) RxPDO supports 4, and the data quantity 32 bytes at most
 - (2) TxPDO supports 4, and the data quantity 32 bytes at most
 - (3) PDO transmission type: support event trigger, time trigger, synchronous cycle, synchronous aperiodic
 - (4) PDO mapping: each PDO can map objects with a maximum size of 8 bytes (64 bits).
 - (5) Supported mapping data types:

Storage space	Data type
8bit	INT8U, INT8S
16bit	INT16U, INT16S
32bit	INT32U, INT32S
64bit	INT64U, INT64S

- Support SDO service:
- (1) Server side: up to 63
- (2) Supports standard SDO fast transmission mode (expedited SDO)
- Support Emergency Protocol
 - It can automatically exchange data with PLC. When programming, users only need to program the D register mapped in PLC, without writing instructions; when connecting with PLC, registers after D6000 will be used temporarily.

Product using

DIP switch

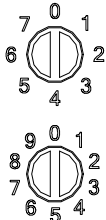


DIP switch is used to set baud rate and master/slave station; DIP switch 4 is used to set master/slave station, on is master station and off is slave station; DIP switch 1 ~ 3 is used to set baud rate, as shown in the following table:

DIP1	DIP2	DIP3	Baud rate/bps	Max distance
ON	ON	ON	10K	5000m
OFF	ON	ON	20K	2500m
ON	OFF	ON	50K	1000m
OFF	OFF	ON	100K	500m
ON	ON	OFF	125K	500m
OFF	ON	OFF	250K	250m
ON	OFF	OFF	500K	100m
OFF	OFF	OFF	1000K	25m

Note: the DIP switch is only valid when the module is powered off. After setting, power on the module.

Rotary switch 1, 2



- The rotary switches 1 and 2 are used to set the node address (i.e. station number) of XL-COBX-ED module in CANopen network.
- Setting range: 1 ~ 64 (0, 65 ~ 79 are not available).
- Rotary switch 1: range 0 ~ 7, representing the high position of station number (decimal).
- Rotary switch 2: range 0 ~ 9, representing the low position of station number (decimal).

For example, if you want to set the communication station number of XL-COBX-ED module to 37, just turn the rotary switch 1 to 3, and then turn the rotary switch 2 to 7.

Note: the address setting rotary switch is only valid when the module is powered off. After setting, power on the module.

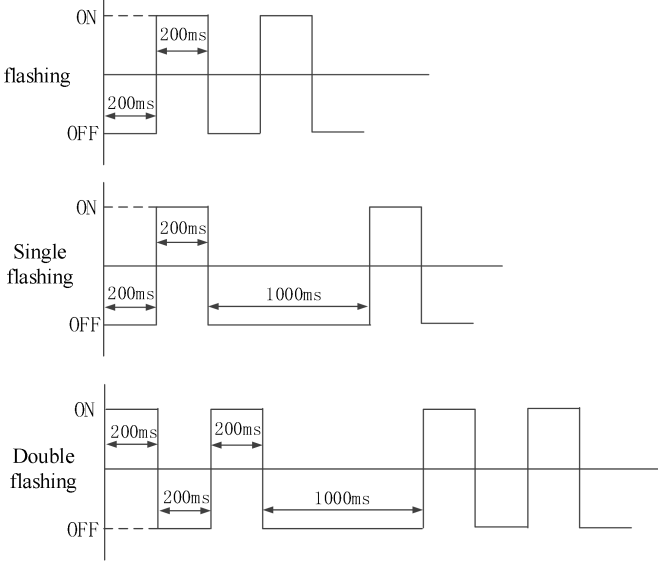
Indicator light

XL-COBX-ED module has four indicator lights, and its main functions are shown in the following table:

Indicator light	Status	Description	Solution
PWR	ON	Power supply is normal	-
	OFF	Power supply is abnormal	Check the power supply
RUN	ON	The module is running	-
	Flashing	Module is in pre-operation state	Enter the pre-operation state automatically when power on.

	Flash once	Module is in stop mode	The host computer is downloading the network configuration, waiting for the download to complete. Automatic operation after completion.
	OFF	Error	1. Check whether the bus cable wiring in CANopen network is correct. 2. Check whether the baud rate of master station and other slave stations are the same. 3. Check whether the slave station of network configuration is actually connected to CANopen network.
ERR	OFF	The device is in normal working condition	-
	Flash once	At least one CAN controller error count reaches or exceeds the alert value (too many error frames)	1. Check that CANopen bus connection cable is standard cable 2. Check whether there is terminal resistance at both ends of CANopen bus 3. Check whether there is too much interference around CANopen bus cable
	Flash twice	A slave station is offline and triggering a heartbeat event	Check whether the slave station is offline
	ON	CAN bus shut down	1. Check whether the bus cable wiring in CANopen network is correct 2. Check whether the baud rate of master station and other slave stations are the same
COM	Flashing	Communication with PLC is normal	-
	OFF	Communication with PLC is abnormal	1. Check whether the parameters of COM3 communication port on the left side of PLC are configured 2. Check whether the connecting cable is loose

Note: the difference between flashing, single flashing and double flashing is shown in the figure below:



Module configuration

XL-COBX-ED needs to be used in conjunction with Xinje X-NET config tool, which is generally built into XDPPro software compression package. After decompressing the software, follow the prompt steps to install and use.