3

System Structure

As the controller, XC series PLC can connect with many types of peripheral equipments, expansions etc. In this chapter, we mainly tells the peripheral devices, the connection principle of CPU with expansions, installation, calculate the I/O points, input/output ID etc.

For the introduction of expansions, please refer to chapter 8;

3-1．System Structure

3-2．Peripheral Devices

3-3．Combination Principle

3-4．Expansion's ID assignment

3-5．Install the Products

3-1. System Structure

In the below Graph, we show the common system structure according to XC series PLC basic configuration. Via this graph, we could know the basic connection among PLC and peripheral equipments; also classic applications of PLC's each COM port, connection and expansion etc.

BD Card

CPU Unit

Expansion

Thinget

HMI

Network Module

Program Software

Inverter
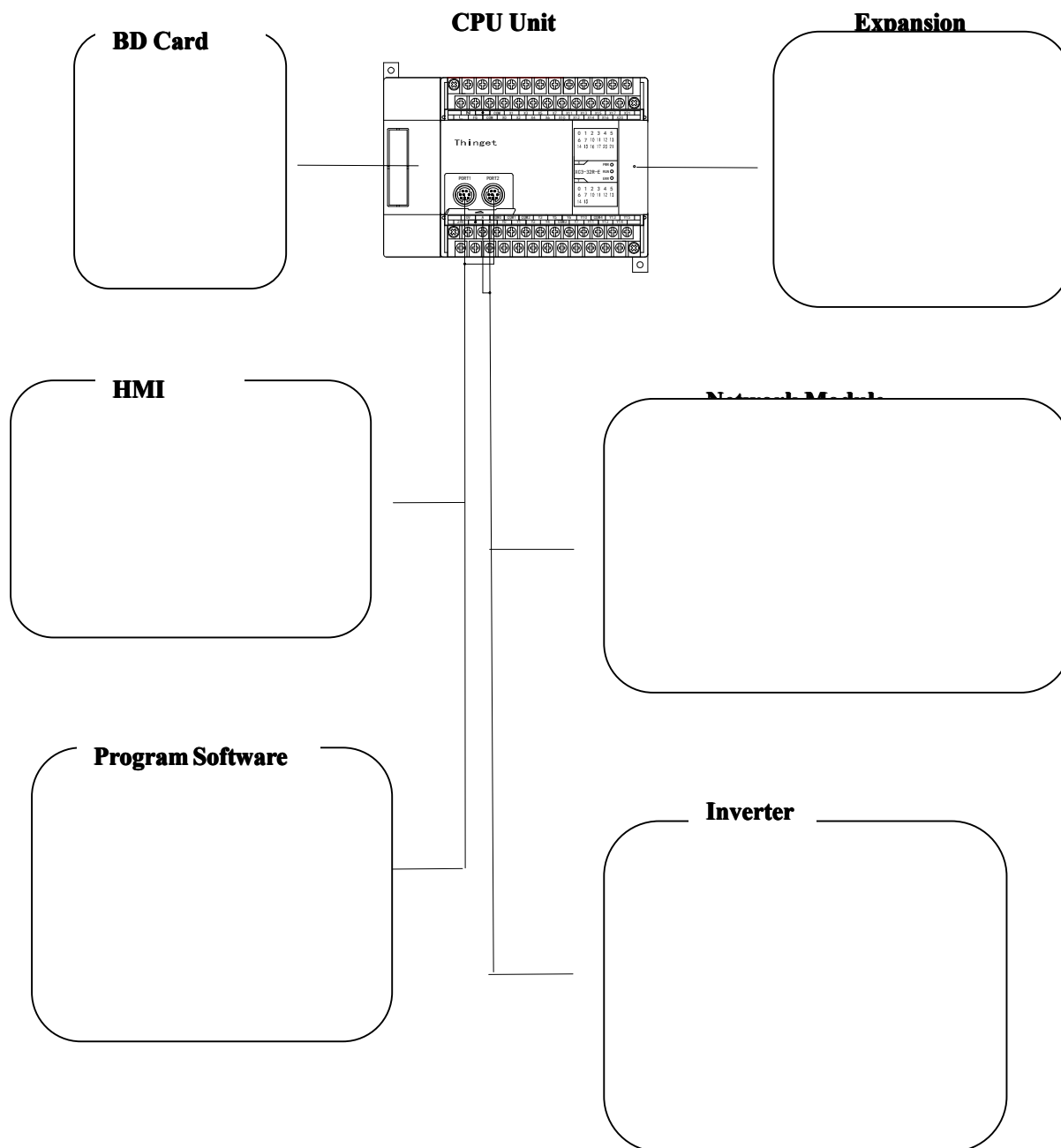
※1：In the above graph, the communication devices connected to the COM port are only samples for your reference. Each COM port can connect with many devices in real applications.
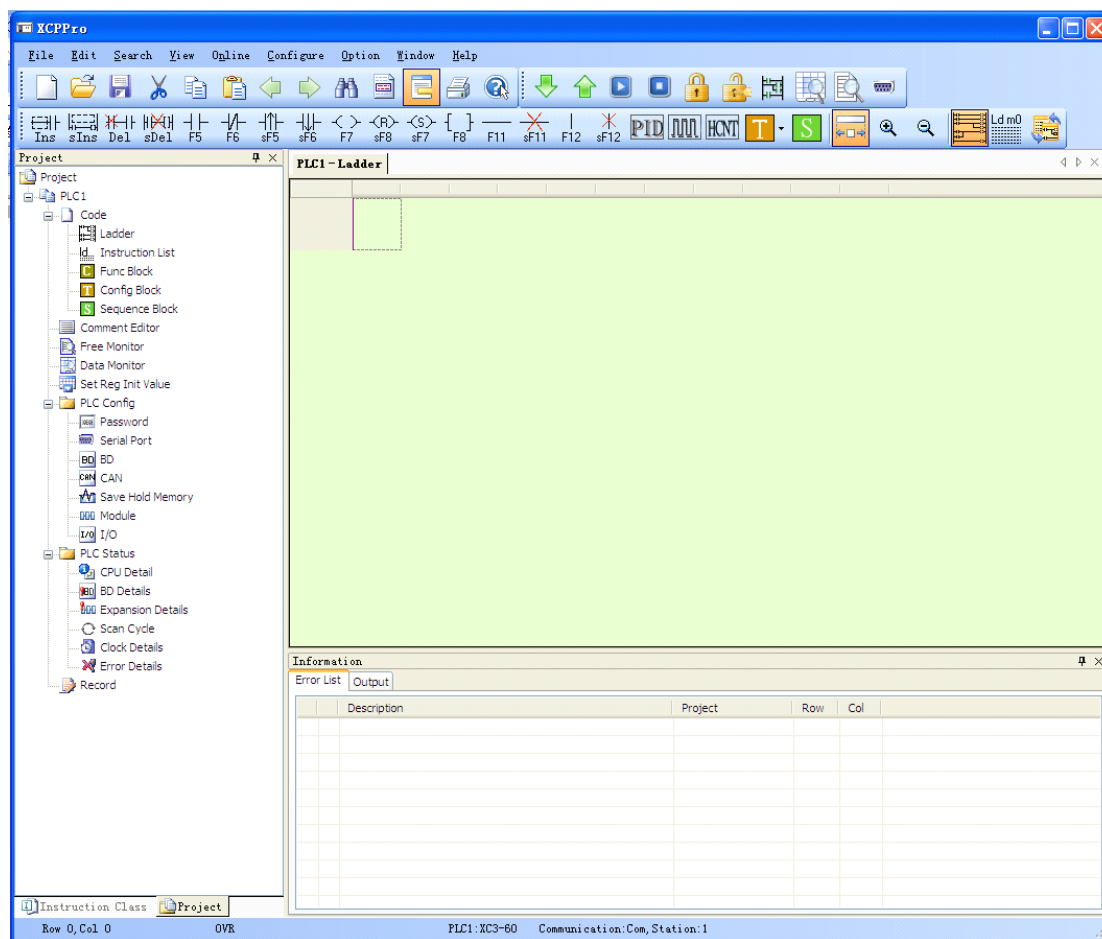
3-2．Peripheral Equipments

XC series PLC basic units can work with many kinds of peripheral equipments.

3-2-1．Program Software

Via program software, users can write to or upload program from PLC. Real time monitor PLC, configure PLC etc; After installing XCPPro on your PC, use the program cable, via COM1 or COM2 on PLC (CPU Units) to link PLC with XCPPro;

- Program Interface

※1：Please use the program cable offered by Xinje Electronic, or make the cable by yourself; the making method is showing in Chapter 2-4

3-2-2．Human Machine Interface (HMI)

The HMI link PLC to the operators. The HMI can send the commands from operators to PLC, then PLC execute the commands.

XC series PLC support diverse brands of HMI; the connection is based on the communication protocol. Generally communicate via Modbus protocol, the detailed parameters setting depends on the HMI.

The Xinje HMI can work with PLC directly (the communication parameters are set in accordance already). Presently Xinje HMI has TP, OP, MP three series.

TP Series Touch Panel Monitors

- Size: 4.7"、5.7"、7"、10.4"
- Display: 256 true color TFT
- Operation: Touch Screen
- Interface: RS232、RS422、RS485
- Communication   work with many PLC brands, inverters, instruments etc.
      Communicate with Xinje Inverters
      Driver panel printer directly
      Dual COM ports, work with two different devices separately
      Support free format protocol, the user can write the driver program freely
- Recipe
- Advanced Function
- RTC: Real Time Clock
- Password: nine-level setting

OP Series Operation Panels

- Size   3.7"、5.7"
- Display   Blue LCD、256 true color
- Buttons Nr.   7、20、42
- Interface   RS232、RS485
- Communication   work with many PLC brands.
   Communicate with Xinje Inverters
- RTC

MP Series Operation Panels with Touch Function

- Size   3.7"、7"
- Display   256 true color、blue LCD
- Buttons Nr.:   26、42, the LCD is a touch screen
- Interface: RS232、RS485
- Communication   work with many PLC brands.
                    Communicate with Xinje Inverters
- RTC: Real Time Clock

3-2-3．Network Module

PLC can build Modbus network, the special models can build CANBUS network.

If the basic units configure with the special network module, they can connect to GPRS network, Ether net etc.

G-BOX
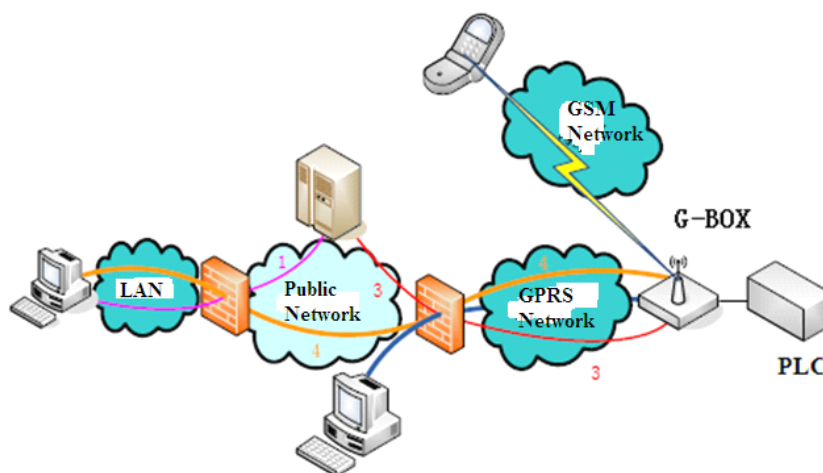
- Transfer data wirelessly, open and transparent;
- Remote program and debug PLC, realize upload/download PLC;
- Integral data transfer terminal of TCP/IP protocol pallet, support TCP, UDP, DNS, PPP etc.
- Standard industrial interface (RS-232 or RS-485)
- Support long time online mode, equipped re-dial and heart-beat functions;
- Support SMS to control PLC
- Support local configuration
- Support GPRS network and GSM network
- Suitable for distribution system and remote control applications.

T-BOX

As industrial Ether Net module, T-BOX supports Modbus-RTU devices, the design is applied to industrial Ether net control system.

- Remote integral maintenance and diagnose of PLC program on IP devices;
- Remote integral monitor of PLC program on IP devices;
- The traditional Modbus communication is one master, multi-slave form. The communication speed is slow. Via the connection by T-Box, users can realize the data exchange among master PLC and each subsidiary PLCs.
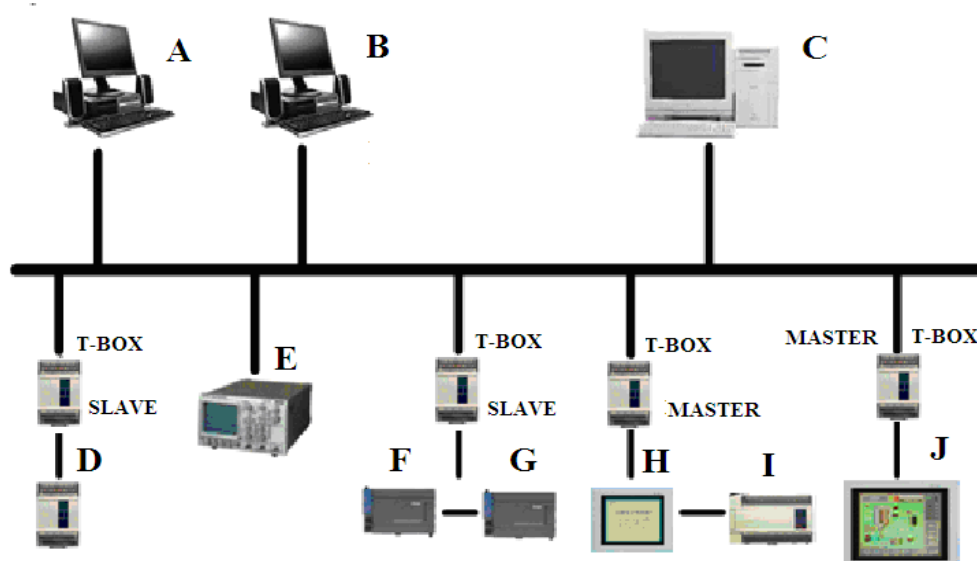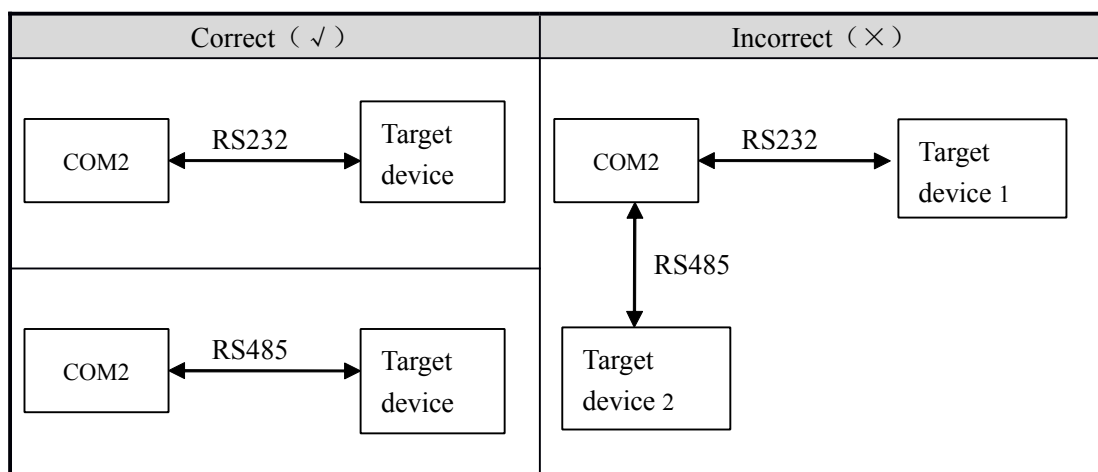

- Realize flexible distributing automation structure, simplify the system management
- Realize Ether net visit via RJ45 interface, the communication is based on standard TCP/IP protocol
- Realize remote program, monitor, diagnose via industrial Ether net, save great time and cost;
- Store and operate data information via Ether net, build base to simplify the data disposal and file
- Enable the communication between Ether net and automation equipments, enable these devices to be used in complicated systems;
- High performance-price ratio, link the ether net to all the automation devices and levels in a simple form.
- Easy to maintenance, support simple diagnose function

3-3．Configuration Principle

About COM port

- XC series PLC (CPU units) are usually equipped with COM1 and COM2.
- Normally, both COM ports can be used to program, download, communication; but please make sure not change the parameters on two COM ports at one time, or the COM ports can't be used to program and download any more;
- COM2 is equipped with RS232 and RS485. But COM2 can't use these two modes at one time; that's to say, COM2 can only be applied to one interface mode;

Correct（√）	Incorrect（×）
COM2 ←RS232→ Target device COM2 ←RS485→ Target device	COM2 ←RS232→ Target device 1 ↕ RS485 Target device 2

About Expansion Devices

- Generally, one CPU unit can work with different types of expansions, can expand digital I/O, analog I/O, temperature control etc.
- One CPU unit can work with 7 expansions and an extra BD card.
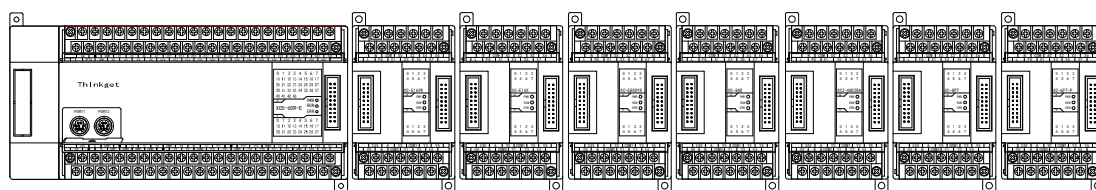
- After connect the CPU unit with the expansion, if the "PWR" LED on expansion ON, then the expansion can work properly; after installing the BD card to CPU unit, users need to configure it before using;

How to calculate the I/O

- After connect with the expansions, the total I/O points=I/O on basic unit+I/O on expansions.
- Digital I/O is octal
- Analog I/O is Decimal
- After expansion, the total I/O can reach 284 points

How To Calculate the I/O Points

Basic Unit XC3-32R-E (18I/14O) connect with 5 expansions: XC-E8X8Y、XC-E16X、XC-E32Y、XC-E2AD、XC-E4DA. Then the total I/O points should be:

Input Points: 18 + 8 + 16 = 42

Output points: 14 + 8 +32 = 54

Total points: Input+ Output = 42+54=96

3-4．ID Assignment of Expansions

Expansion Position	Type	ID (As Register)	Maximum points/channels
Position 1#	Digital Input X	X100~X137	32 points
	Digital Output Y	Y100~Y137	32 points
	Analog Input ID	ID100~ID131	16 channels
	Analog Output QD	QD100~QD131	16 channels
	Module's Value D	D8250~D8259	-
Position 2#	Digital Input X	X200~X237	32 points
	Digital Output Y	Y200~Y237	32 points
	Analog Input ID	ID200~ID231	16 channels
	Analog Output QD	QD200~QD231	16 channels
	Module's Value D	D8260~D8269	-
Position 3#	Digital Input X	X300~X337	32 points
	Digital Output Y	Y300~Y337	32 points
	Analog Input ID	ID300~ID331	16 channels
	Analog Output QD	QD300~QD331	16 channels
	Module's Value D	D8270~D8279	-
Position 4#	Digital Input X	X400~X437	32 points
	Digital Output Y	Y400~Y437	32 points
	Analog Input ID	ID400~ID431	16 channels
	Analog Output QD	QD400~QD431	16 channels
	Module's Value D	D8280~D8289	-
Position 5#	Digital Input X	X500~X537	32 points
	Digital Output Y	Y500~Y537	32 points
	Analog Input ID	ID500~ID531	16 channels

|			
	Analog Output QD	QD500~QD531	16 channels
	Module's Value D	D8290~D8299	-
Position 6#	Digital Input X	X600~X637	32 points
	Digital Output Y	Y600~Y637	32 points
	Analog Input ID	ID600~ID631	16 channels
	Analog Output QD	QD600~QD631	16 channels
	Module's Value D	D8300~D8309	-
Position 7#	Digital Input X	X700~X737	32 points
	Digital Output Y	Y700~Y737	32 points
	Analog Input ID	ID700~ID731	16 channels
	Analog Output QD	QD700~QD731	16 channels
	Module's Value D	D8310~D8319	-
BD Card	Digital Input X	X1000~X1037	32 points
	Digital Output Y	Y1000~Y1037	32 points
	Analog Input ID	ID1000~ID1031	16 channels
	Analog Output QD	QD1000~QD1031	16 channels
	Module's Value D	D8320~D8329	-

3-5．Install The Products

Installation Position
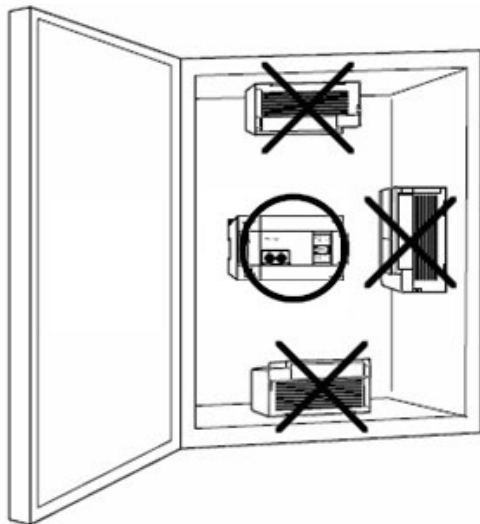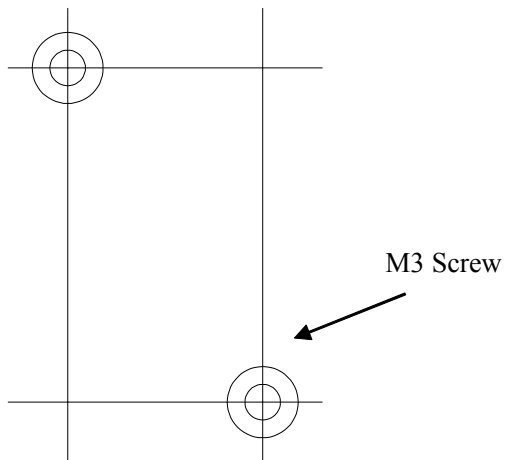

Installation Method

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

Use DIN46277
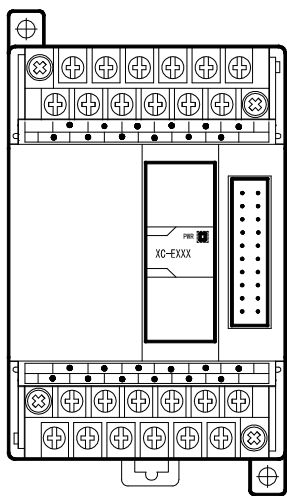
DIN installation

● Directly install by screws

M3 Screw

Installation Environment

Please install the products according to chapter 2-1-1