

DISTRIBUIDOR AUTORIZADO  
ventas1@imservo.com – ventas2@imservo.com  
0992679083 0963733108   
QUITO – GUAYAQUIL  
ECUADOR



# XINJE

## XC series PLC hardware

User manual

WUXI XINJE ELECTRIC CO., LTD.

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# Catalog

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# 1 Summary of XC Series PLC

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XC series PLC include diverse CPU units and expansions with powerful functions. This chapter will mainly tell the main specifications, the whole products range, each part's description and name template composing the four items.

1-1. Products Specifications

1-2. Model Composing and Model List

1-3. Each Part's Description

## 1-1. Products Specifications

### 1-1-1. CPU Units

#### 1 Diverse Models

XC series PLC's CPU units has many subsidiary products line, the combination can be make freely.

- I/O Points: 10、14、16、24、32、42、48、60 points
- Output Type: Transistor、Relay、R/T mixed type
- Input Type: PNP、NPN
- Power Supply Type: AC220V、DC24V
- Subsidiary<sup>※1</sup> XC1、XC2、XC3、XC5、XCM

| Series | Type                           | Description                                                                                                                                                                                                                         |
|--------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XC1    | Economic Type                  | Include 10I/O、16I/O、24I/O、32I/O<br>Suitable for common simple applications which has less I/O requirement, Do not support free communication, expansion, BD cards.                                                                  |
| XC2    | Basic Type                     | Include 14I/O、16I/O、24I/O、32I/O、48I/O、60I/O<br>Equipped XC series PLC's basic functions, the CPU unit can't work with expansions, but can work with BD card. Equipped with high speed operation ability.                            |
| XC3    | Standard Type                  | Include 14I/O、24I/O、32I/O、42I/O、48I/O、60I/O<br>XC series standard models, equipped with full functions, fulfill the user's diverse requirements                                                                                     |
| XC5    | Strength Type                  | Include 24I/O、32I/O、48I/O、60I/O<br>Besides XC3 series functions, XC5 series PLC added following functions:<br>24I/O、32I/O models have 4CH pulse output;<br>48I/O、60I/O support CAN-bus, users can realize CAN bus network functions |
| XCM    | Motion Control Type            | Include 24I/O、32I/O<br>Besides XC series basic functions, XCM models support powerful pulse output functions and rich motion control instruction. The models are designed especially for motion control.                            |
| XCC    | High speed motion control type | Include 32 I/O.<br>Besides XC series basic function, XCC models support motion control instruction, more pulse output channels and high speed counters.                                                                             |

- Special Type XC3-19AR-E (Combine analogue I/O with digital I/O in one body)

---

※1: For each subsidiary serie's model list and functions, please refer to Appendix 4;

※2: XC3-19AR is not included in this manual. For the using method, please refer to 《XC3-19AR-E manual》。

---

|   |                         |
|---|-------------------------|
| 2 | <b>Strong Functions</b> |
|---|-------------------------|

XC series PLC have abundant basic functions and diverse special functions. Each subsidiary series faces to different application field.

#### **Abundant Basic Functions**

- **High Speed Operation**  
Basic operation instruction 0.2~0.5us, the scan time is 10,000 steps per 5ms, the program space reaches to 160K.
- **Abundant expansions**  
The CPU units usually support 7 different expansions and 1 BD card.
- **Multiple Communication Ports**  
The CPU units have 1~4 communication ports, support RS232、RS485、CAN bus; it can work with many peripheral devices like inverters, instruments, printers etc.
- **Rich soft device space**  
The five subsidiary series of XC series PLC are equipped with different internal resource to apply different requirements.  
The resource space reaches: 1024 points flow S、8768 points middle relay M、544 points input relay、544 points output relay、640 points Timer T、640 points counter C、9024 points data register D、2048 points FD、36864 points expansion register ED。
- **2 types of program form**  
XC series PLC support 2 types of program form, I.e. instruction list and ladder chart. The two types can switch to each other;
- **Abundant instructions**  
Abundant instructions, besides the basic order control, data transfer and compare, arithmetic, data loop and shift, the PLC also support pulse output, high speed counter, interruption, PID etc.
- **Real time clock**  
XC series PLC are equipped with real time clock, for time control;
- **Compact size, convenient to install**  
XC series PLC has compact size, convenient to install. User can choose DIN or screw installation style.

#### **Strength Special Functions**

- **High Speed Pulse Counter can reach 80KHz**  
The CPU units of XC2/XC3/XC5 are equipped with 3 channels, 2 phases high speed counter and high speed counter comparator; can realize single phase, pulse + direction,

- AB phase count, the frequency can reach 80KHz.
- Powerful communication & network ability  
With multiple communication port and diverse communication protocol like Modbus protocol、 free communication protocol etc, it's easy to build the different network; In Modbus network, PLC can be master or slave; XC5 series can build CAN bus; via T-BOX module can build Ether net; via G-BOX can work with GPRS network;
  - High Speed Pulse Output can reach 400Hz  
XC series PLC<sup>※1</sup> are generally equipped 2 pulse output terminals, can output 200 KHz pulse; the special model<sup>※2</sup> has 4 channels pulse output functions
  - Interruption Function  
XC series PLC have interruption function, including external interruption, time interruption and high-speed counter interruption; they can meet different requirements.
  - Switch I/O points freely  
XC series PLC can switch I/O in case of terminals broken; there is no need to change the program;
  - C language function block  
Write the function block with C language. C is good at calculation operations that improve the efficiency;
  - PID function on CPU units  
The CPU units of XC series PLC<sup>※1</sup> has PID control and auto tune function.
  - Sequential Function Block (BLOCK)  
In sequential function Block, users can realize the sequential action of instructions. This function is suitable to apply on pulse output, communication, motion control; inverter read/write etc. This function simplifies the program editing greatly.
  - 24 segments high speed counter interruption  
There are 24 segments 32 bits initial value in high speed counter of XC series PLC<sup>※1</sup> Each segment can generate interruption with perfect real time ability, realize electric cam function;
  - PWM pulse width modulation  
XC series PLC<sup>※1</sup> have PWM pulse width modulation; this function can apply to DC motor control;
  - Frequency testing  
XC series PLC<sup>※1</sup> can realize frequency testing
  - Precise Time  
XC series PLC<sup>※1</sup> can realize precise time; the precise timer is a 32 bits timer of 1ms
  - Motion Control  
XCM series PLC<sup>※1</sup> are motion control models, can realize circular interpolation, position control etc.

---

※1: Here XC series PLC refer to the PLC that can realize the mentioned functions. That is to say, not all XC series PLC can realize the mentioned function. For details, please refer to Appendix 4.

※2: Here the special model refers to XC5-32T-E.

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When programming the PLC via XCPPro, users can feel it Humanism and easy to get familiar.

- Switch ladder and instruction list freely
- Offer soft device comment, ladder comment, instruction hint functions etc.
- Offer many types of program interface for special instructions, convenient to write the instructions.
- Perfect monitor mode: ladder monitor, free monitor, soft devices monitor
- Many windows in one interface, convenient to manage.

---

※1: For the detailed XCP Pro software application, please refer to XC series PLC user manual 【software】 .

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## 1-1-2. Expansions

### 1

#### Expansion Modules

To fulfill the field control requirements better, XC series PLC can work with expansions, each CPU units can link seven expansions.

- Diverse Types  
Digital I/O expansions, analogue I/O modules, temperature control modules and mixed function modules etc.
- Compact Size
- DC24V power supply (32I/O modules are AC220V power supply).
- Analogue、temperature modules all include PID tune function.

| Digital I/O Modules                                                                                            | Analogue I/O Modules                                                                      | Temperature Control Modules                                                                                | Function Mixed Modules                                              |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Power Supply: DC24V<br>AC220V<br>Input points: 8-32<br>Output points: 8-32<br>Output Type: Relay<br>Transistor | Power Supply: DC24V<br>Type: DA、AD<br>AD/DA<br>DA channel Nr.: 2、4<br>AD channel Nr.: 4、8 | Power Supply: DC24V<br>Temperature: PT100<br>Thermocouple<br>Temp. Channel Nr.: 6<br>PID Control: Included | Power Supply: DC24V<br>AD: 3CH<br>Temperature: 4CH PT100<br>DA: 2CH |

|          |                |
|----------|----------------|
| <b>2</b> | <b>BD Card</b> |
|----------|----------------|

Besides the expansion modules, XC series PLC can also expand by the BD cards. The BD cards are small PCB cards that can insert into PLC from the BD port (on CPU unit), so this kind of expansion does not take extra space.

- Analog temperature: XC-2AD2PT-BD
- Analog: XC-2AD2DA-BD
- Communication: XC-COM-BD
- SD card: XC-SD-BD
- Ethernet: XC-TBOX-BD

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※1: User should install and configure before using the BD cards. For details, please refer to: 《XC series BD cards user manual》.

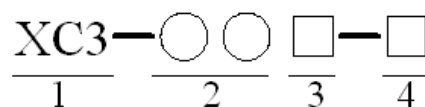
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|  |                                            |
|--|--------------------------------------------|
|  | <b>1-2. Model Composing and Model List</b> |
|--|--------------------------------------------|

|  |                                                          |  |
|--|----------------------------------------------------------|--|
|  | <b>1-2-1. Name Principle and Model list of CPU units</b> |  |
|--|----------------------------------------------------------|--|

|          |                                    |
|----------|------------------------------------|
| <b>1</b> | <b>Name Principle of CPU units</b> |
|----------|------------------------------------|

Name principle of XC series PLC CPU units:



- |                       |                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------|
| 1: Series Name        | XC1、XC2、XC3、XC5、XCM                                                                               |
| 2: Input/output Point | 10、14、16、24、32、42、48、60                                                                           |
| 3: If Input is NPN    | R: Relay output<br>T: Transistor output<br>RT: Relay/Transistor mix output (Y0、Y1 are Transistor) |
| If Input is PNP       | PR: Relay output<br>PT: Transistor output<br>PRT : Relay/Transistor mix output (Y0 、 Y1 are       |

Transistor)

4: Power Supply

E: AC Power Supply (220V)

C: DC Power Supply (24V)

※1: Generally, clock and RS485 are standard configuration on communication port. But some models are not included. Please refer to Appendix 4.

2

## CPU Units List

### ● XC1 Series Model List

| Model           |            |                      |                 |                      | Input points<br>(DC24V) | Output<br>points<br>(R, T) |
|-----------------|------------|----------------------|-----------------|----------------------|-------------------------|----------------------------|
| AC Power Supply |            |                      | DC Power Supply |                      |                         |                            |
| Relay output    |            | Transistor<br>output | Relay output    | Transistor<br>output |                         |                            |
| N<br>P<br>N     | XC1-10R-E  | XC1-10T-E            | XC1-10R-C       | XC1-10T-C            | 5                       | 5                          |
|                 | XC1-16R-E  | XC1-16T-E            | XC1-16R-C       | XC1-16T-C            | 8                       | 8                          |
|                 | XC1-24R-E  | XC1-24T-E            | XC1-24R-C       | XC1-24T-C            | 12                      | 12                         |
|                 | XC1-32R-E  | XC1-32T-E            | XC1-32R-C       | XC1-32T-C            | 16                      | 16                         |
| P<br>N<br>P     | XC1-10PR-E | XC1-10PT-E           | XC1-10PR-C      | XC1-10PT-C           | 5                       | 5                          |
|                 | XC1-16PR-E | XC1-16PT-E           | XC1-16PR-C      | XC1-16PT-C           | 8                       | 8                          |
|                 | XC1-24PR-E | XC1-24PT-E           | XC1-24PR-C      | XC1-24PT-C           | 12                      | 12                         |
|                 | XC1-32PR-E | XC1-32PT-E           | XC1-32PR-C      | XC1-32PT-C           | 16                      | 16                         |

### ● XC2 Series Model List

| Model           |            |            |             |                 |                      |             | Input<br>points<br>(DC24V) | Output<br>points<br>(R, T) |
|-----------------|------------|------------|-------------|-----------------|----------------------|-------------|----------------------------|----------------------------|
| AC Power Supply |            |            |             | DC Power Supply |                      |             |                            |                            |
| Relay output    |            |            |             | Relay<br>output | Transistor<br>output | R/T Type    |                            |                            |
| N<br>P<br>N     | XC2-14R-E  | XC2-14T-E  | XC2-14RT-E  | XC2-14R-C       | XC2-14T-C            | XC2-14RT-C  | 8                          | 6                          |
|                 | XC2-16R-E  | XC2-16T-E  | XC2-16RT-E  | XC2-16R-C       | XC2-16T-C            | XC2-16RT-C  | 8                          | 8                          |
|                 | XC2-24R-E  | XC2-24T-E  | XC2-24RT-E  | XC2-24R-C       | XC2-24T-C            | XC2-24RT-C  | 14                         | 10                         |
|                 | XC2-32R-E  | XC2-32T-E  | XC2-32RT-E  | XC2-32R-C       | XC2-32T-C            | XC2-32RT-C  | 18                         | 14                         |
|                 | XC2-48R-E  | XC2-48T-E  | XC2-48RT-E  | XC2-48R-C       | XC2-48T-C            | XC2-48RT-C  | 28                         | 20                         |
|                 | XC2-60R-E  | XC2-60T-E  | XC2-60RT-E  | XC2-60R-C       | XC2-60T-C            | XC2-60RT-C  | 36                         | 24                         |
| P               | XC2-14PR-E | XC2-14PT-E | XC2-14PRT-E | XC2-14PR-C      | XC2-14PT-C           | XC2-14PRT-C | 8                          | 6                          |

|        |            |            |             |            |            |             |    |    |
|--------|------------|------------|-------------|------------|------------|-------------|----|----|
| N<br>P | XC2-16PR-E | XC2-16PT-E | XC2-16PRT-E | XC2-16PR-C | XC2-16PT-C | XC2-16PRT-C | 8  | 8  |
|        | XC2-24PR-E | XC2-24PT-E | XC2-24PRT-E | XC2-24PR-C | XC2-24PT-C | XC2-24PRT-C | 14 | 10 |
|        | XC2-32PR-E | XC2-32PT-E | XC2-32PRT-E | XC2-32PR-C | XC2-32PT-C | XC2-32PRT-C | 18 | 14 |
|        | XC2-48PR-E | XC2-48PT-E | XC2-48PRT-E | XC2-48PR-C | XC2-48PT-C | XC2-48PRT-C | 28 | 20 |
|        | XC2-60PR-E | XC2-60PT-E | XC2-60PRT-E | XC2-60PR-C | XC2-60PT-C | XC2-60PRT-C | 36 | 24 |

● **XC3 Series Model List**

| Model           |            |            |             |                 |                      |             | Input<br>points<br>(DC24V) | Output<br>points<br>(R, T) |
|-----------------|------------|------------|-------------|-----------------|----------------------|-------------|----------------------------|----------------------------|
| AC Power Supply |            |            |             | DC Power Supply |                      |             |                            |                            |
| Relay output    |            |            |             | Relay<br>output | Transistor<br>output | R/T Type    |                            |                            |
| N               | XC3-14R-E  | XC3-14T-E  | XC3-14RT-E  | XC3-14R-C       | XC3-14T-C            | XC3-14RT-C  | 8                          | 6                          |
|                 | XC3-24R-E  | XC3-24T-E  | XC3-24RT-E  | XC3-24R-C       | XC3-24T-C            | XC3-24RT-C  | 14                         | 10                         |
|                 | XC3-32R-E  | XC3-32T-E  | XC3-32RT-E  | XC3-32R-C       | XC3-32T-C            | XC3-32RT-C  | 18                         | 14                         |
| N               | XC3-48R-E  | XC3-48T-E  | XC3-48RT-E  | XC3-48R-C       | XC3-48T-C            | XC3-48RT-C  | 28                         | 20                         |
|                 | XC3-42R-E  | XC3-42T-E  | XC3-42RT-E  | XC3-42R-C       | XC3-42T-C            | XC3-42RT-C  | 24                         | 18                         |
|                 | XC3-60R-E  | XC3-60T-E  | XC3-60RT-E  | XC3-60R-C       | XC3-60T-C            | XC3-60RT-C  | 36                         | 24                         |
| P               | XC3-14PR-E | XC3-14PT-E | XC3-14PRT-E | XC3-14PR-C      | XC3-14PT-C           | XC3-14PRT-C | 8                          | 6                          |
|                 | XC3-24PR-E | XC3-24PT-E | XC3-24PRT-E | XC3-24PR-C      | XC3-24PT-C           | XC3-24PRT-C | 14                         | 10                         |
|                 | XC3-32PR-E | XC3-32PT-E | XC3-32PRT-E | XC3-32PR-C      | XC3-32PT-C           | XC3-32PRT-C | 18                         | 14                         |
| N               | XC3-48PR-E | XC3-48PT-E | XC3-48PRT-E | XC3-48PR-C      | XC3-48PT-C           | XC3-48PRT-C | 28                         | 20                         |
| P               | XC3-42PR-E | XC3-42PT-E | XC3-42PRT-E | XC3-42PR-C      | XC3-42PT-C           | XC3-42PRT-C | 24                         | 18                         |
|                 | XC3-60PR-E | XC3-60PT-E | XC3-60PRT-E | XC3-60PR-C      | XC3-60PT-C           | XC3-60PRT-C | 36                         | 24                         |

● **XC5 Series Model List**

| Model           |            |            |             |                 |                      |             | Input<br>points<br>(DC24V) | Output<br>points<br>(R, T) |
|-----------------|------------|------------|-------------|-----------------|----------------------|-------------|----------------------------|----------------------------|
| AC Power Supply |            |            |             | DC Power Supply |                      |             |                            |                            |
| Relay output    |            |            |             | Relay<br>output | Transistor<br>output | R/T Type    |                            |                            |
| N<br>P<br>N     | -          | XC5-24T-E  | -           | -               | XC5-24T-C            | -           | 14                         | 10                         |
|                 | -          | XC5-32T-E  | -           | -               | XC5-32T-C            | -           | 18                         | 14                         |
|                 | XC5-48R-E  | XC5-48T-E  | XC5-48RT-E  | XC5-48R-C       | XC5-48T-C            | XC5-48RT-C  | 28                         | 20                         |
|                 | XC5-60R-E  | XC5-60T-E  | XC5-60RT-E  | XC5-60R-C       | XC5-60T-C            | XC5-60RT-C  | 36                         | 24                         |
| P<br>N<br>P     | -          | XC5-24PT-E | -           | -               | XC5-24PT-C           | -           | 14                         | 10                         |
|                 | -          | XC5-32PT-E | -           | -               | XC5-32PT-C           | -           | 18                         | 14                         |
|                 | XC5-48PR-E | XC5-48PT-E | XC5-48PRT-E | XC5-48PR-C      | XC5-48PT-C           | XC5-48PRT-C | 28                         | 20                         |
|                 | XC5-60PR-E | XC5-60PT-E | XC5-60PRT-E | XC5-60PR-C      | XC5-60PT-C           | XC5-60PRT-C | 36                         | 24                         |

● **XCM Series Model List**

| Model           |   |            |   |                 |                      |          | Input<br>points<br>(DC24V) | Output<br>points<br>(R, T) |
|-----------------|---|------------|---|-----------------|----------------------|----------|----------------------------|----------------------------|
| AC Power Supply |   |            |   | DC Power Supply |                      |          |                            |                            |
| Relay output    |   |            |   | Relay<br>output | Transistor<br>output | R/T Type |                            |                            |
| N<br>P<br>N     | - | XCM-24T-E  | - | -               | XCM-24T-C            | -        | 14                         | 10                         |
|                 | - | XCM-32T-E  | - | -               | XCM-32T-C            | -        | 18                         | 14                         |
|                 | - | XCM-48T-E  | - | -               | XCM-48T-C            | -        | 28                         | 20                         |
| P<br>N<br>P     | - | XCM-24PT-E | - | -               | XCM-24PT-C           | -        | 14                         | 10                         |
|                 | - | XCM-32PT-E | - | -               | XCM-32PT-C           | -        | 18                         | 14                         |
|                 | - | XCM-48PT-E | - | -               | XCM-48PT-C           | -        | 28                         | 20                         |

● **XCC series model list**

| Model           |              |                      |               |                 |                      |               | Input points<br>(DC24V) | Output<br>points<br>(R, T) |
|-----------------|--------------|----------------------|---------------|-----------------|----------------------|---------------|-------------------------|----------------------------|
| AC power supply |              |                      |               | DC power supply |                      |               |                         |                            |
|                 | Relay output | Transistor<br>output | R/T<br>output | Relay output    | Transistor<br>output | R/T<br>output |                         |                            |
| NPN             | -            | XCC-32T-E            | -             | -               | XCC-32T-C            | -             | 18                      | 14                         |
| PNP             | -            | XCC-32PT-E           | -             | -               | XCC-32PT-C           | -             | 18                      | 14                         |

※1: XC1 can also have special 20 I/O model

**1-2-2. Expansion's name principle and module list**

|   |           |
|---|-----------|
| 1 | I/O       |
|   | Expansion |

The I/O expansions' name principle:

$\text{XC} - \text{E} \begin{array}{c} \bigcirc \square \bigcirc \square \\ \hline 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \end{array}$

- |                  |                                           |
|------------------|-------------------------------------------|
| 1: Series name   | XC                                        |
| 2: For Expansion | E                                         |
| 3: Input points  | 8、16、32                                   |
| 4: For Input     | NPN Type: X<br>PNP Type: PX               |
| 5: Output points | 8、16、32                                   |
| 6: For output    | YR: relay output<br>YT: transistor output |

- I/O expansions list:

| Model       |          |              |                   | I/O<br>Points | Input<br>points<br>(DC24V) | Output<br>points<br>(R, T) |
|-------------|----------|--------------|-------------------|---------------|----------------------------|----------------------------|
|             | Input    | Output       |                   |               |                            |                            |
|             |          | relay output | transistor output |               |                            |                            |
| N<br>P<br>N | XC-E8X   | -            | -                 | 8             | 8                          | -                          |
|             | -        | XC-E8YR      | XC-E8YT           | 8             | -                          | 8                          |
|             | -        | XC-E8X8YR    | XC-E8X8YT         | 16            | 8                          | 8                          |
|             | XC-E16X  | -            | -                 | 16            | 16                         | -                          |
|             | -        | XC-E16YR     | XC-E16YT          | 16            | -                          | 16                         |
|             | -        | XC-E16X16YR  | XC-E16X16YT       | 32            | 16                         | 16                         |
|             | XC-E32X  | -            | -                 | 32            | 32                         | -                          |
|             | -        | XC-E32YR     | -                 | 32            | -                          | 32                         |
| P<br>N<br>P | XC-E8PX  | -            | -                 | 8             | 8                          | -                          |
|             | -        | XC-E8YR      | XC-E8YT           | 8             | -                          | 8                          |
|             | -        | XC-E8PX8YR   | XC-E8PX8YT        | 16            | 8                          | 8                          |
|             | XC-E16PX | -            | -                 | 16            | 16                         | -                          |
|             | -        | XC-E16YR     | XC-E16YT          | 16            | -                          | 16                         |
|             | -        | XC-E16PX16YR | XC-E16PX16YT      | 32            | 16                         | 16                         |
|             | XC-E32PX | -            | -                 | 32            | 32                         | -                          |
|             | -        | XC-E32YR     | -                 | 32            | -                          | 32                         |

|   |                                             |
|---|---------------------------------------------|
| 2 | <b>Analogue &amp; Temperature Expansion</b> |
|---|---------------------------------------------|

Analogue、Temperature model name Principle:

XC — E 4AD 4DA 6PT 6TCA — P  
 ① ② ③ ④ ⑤ ⑥

- |                       |                                                      |
|-----------------------|------------------------------------------------------|
| ① For Expansion       | E                                                    |
| ② Analogue Input      | 4AD: 4CH analogue input<br>8AD: 8CH analogue input   |
| ③ Analogue Output     | 2DA: 2CH analogue output<br>4DA: 4CH analogue output |
| ④ PT100 Temperature   | 6PT: 6CH PT100                                       |
| ⑤ K type thermocouple | 6TCA: 6CH thermocouple input (V3.1or above)          |
| ⑥ P、I、D tune          | P: with PID tune<br>Blank: without PID tune          |

- Analogue、temperature modules list:

| Model               |               | Description                                                         |
|---------------------|---------------|---------------------------------------------------------------------|
| Analogue Input      | XC-E8AD       | 8CH analogue input                                                  |
|                     | XC-E4AD       | 4CH analogue input                                                  |
|                     | XC-E4AD2DA    | 4CH analogue input, 2CH analogue output                             |
| Analogue Output     | XC-E2DA       | 2CH analogue output                                                 |
|                     | XC-E4DA       | 4CH analogue output                                                 |
| Temperature Testing | XC-E6PT-P     | 6CH PT100 testing with PID tune                                     |
|                     | XC-E6TCA-P    | 6CH K type thermocouple testing, each channel's PID tune separately |
|                     | XC-E3AD4PT2DA | 3CH analogue input, 4CH PT100 testing, 2CH analogue output          |
|                     | XC-E2AD2PT2DA | 2CH analogue input, 2CH PT100 testing, 2CH analogue output          |

|   |         |
|---|---------|
| 3 | BD Card |
|---|---------|

The BD card name principle:

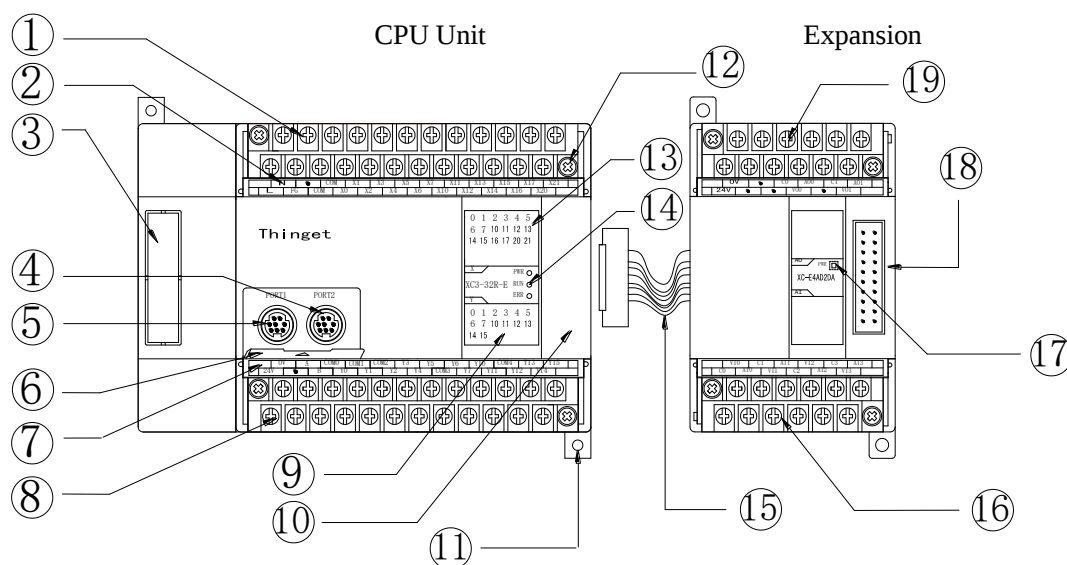
**XC — 4AD 6PT 6TC — P — BD**  
                     ①       ②       ③       ④       ⑤

- ① Analogue Input                      4AD: 4CH analogue input  
                                                 8AD: 8CH analogue input
- ② PT100 Temperature                6PT: 6CH PT100 temperature Testing
- ③ K Type thermocouple            6TC: 6CH thermocouple testing
- ④ P、I、D Tune                      P: with PID tune  
                                                 Blank: without PID tune
- ⑤ For BD card                        BD

● BD card list

| Model         |              | Description                                       |
|---------------|--------------|---------------------------------------------------|
| Temperature   | XC-2AD2PT-BD | 2CH analogue input, 2CH PT100 temperature testing |
| Analog        | XC-2AD2DA-BD | 2 CH analog input, 2 CH analog output             |
| Communication | XC-COM-BD    | RS-485/232 communication                          |
| SD card       | XC-SD-BD     | Install SD card and store the data in it          |
| Ethernet      | XC-TBOX-BD   | To connect the Ethernet                           |

### 1-3. Each Part's Description



Each part's name is listed below:

| Number | Name                           | Number | Name                                            |
|--------|--------------------------------|--------|-------------------------------------------------|
| 1      | Input & power supply terminals | 11     | Installation holes (2)                          |
| 2      | Input terminal label           | 12     | Screws to install/remove the terminals          |
| 3      | Port to install BD card        | 13     | Input LED                                       |
| 4      | COM2                           | 14     | Action LED: PWR (power); RUN (RUN); ERR (Error) |
| 5      | COM1                           | 15     | Expansion cable                                 |
| 6      | Cover plate for COM port       | 16     | Output terminals                                |
| 7      | Output terminal label          | 17     | Action LED: PWR (power);                        |
| 8      | Output& 24V power terminals    | 18     | Port to connect with expansion                  |
| 9      | Output LED                     | 19     | Input & power supply terminals                  |
| 10     | Port to connect with expansion |        |                                                 |

## 2 The Specifications and Parameters of CPU

---

This chapter mainly tells the general specifications, performance, external dimension, terminals arrangement and communication interface of the CPU units. For the expansions, please refer to chapter 8.

|                                    |
|------------------------------------|
| 2-1. Specifications and Parameters |
|------------------------------------|

|                         |
|-------------------------|
| 2-2. External Dimension |
|-------------------------|

|                            |
|----------------------------|
| 2-3. Terminals Arrangement |
|----------------------------|

|                              |
|------------------------------|
| 2-4. Communication Interface |
|------------------------------|

## 2-1. Specifications and Parameters

### 2-1-1. General Specifications

| Items               | Specifications                                                                         |
|---------------------|----------------------------------------------------------------------------------------|
| Isolate Voltage     | Above DC 500V 2M ohm                                                                   |
| Anti-noise          | Noise voltage 1000Vp-p 1uS pulse per minute                                            |
| Atmosphere          | No erosive, flammable gas                                                              |
| Ambient Temperature | 0°C~60°C                                                                               |
| Ambient Humidity    | 5%~95% (no dew)                                                                        |
| COM1 <sup>※1</sup>  | RS-232, connect with the host machine, HMI to program or debug                         |
| COM2 <sup>※2</sup>  | RS-232/RS-485, connect with net or intelligent instruments, inverters etc.             |
| COM3 <sup>※3</sup>  | RS-232C/RS-485 expanded by BD card                                                     |
| COM4 <sup>※4</sup>  | CANBUS COM port                                                                        |
| Installation        | Use M3 screws or DIN to fix <sup>※5</sup>                                              |
| Grounding           | The third type grounding (do not grounding with the strong power system) <sup>※6</sup> |

※1: All the CPU units have COM1, for program and communication;

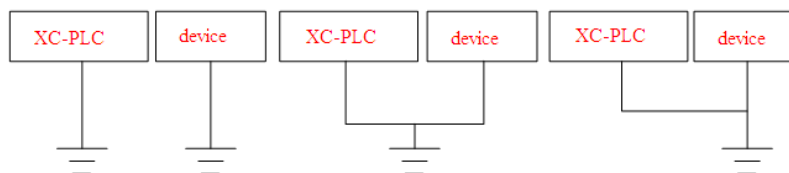
※2: 10I/O、14I/O、16I/O CPU units don't have COM2;

※3: COM3 is the COM port from BD card (XC-COM-BD).

※4: COM4 is only equipped on XC series.

※5: The rail is DIN46277, width is 35mm.

※6: The grounding should be like type 1 and 2, not 3.



Type 1

Type 2

Type 3

## 2-1-2. Performance and Specifications

## XC1 series

| Items                              |           | Specifications                                                                                                       |                                               |              |              |
|------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------|--------------|
| Program Executing Form             |           | Loop scan form                                                                                                       |                                               |              |              |
| Program Form                       |           | Instruction、Ladder                                                                                                   |                                               |              |              |
| Dispose Speed                      |           | 0.5 us                                                                                                               |                                               |              |              |
| Power Off Retentive                |           | Use Flash ROM                                                                                                        |                                               |              |              |
| User's program space <sup>※1</sup> |           | 32KB                                                                                                                 |                                               |              |              |
| I/O points <sup>※2</sup>           | Total I/O | 10                                                                                                                   | 16                                            | 24           | 32           |
|                                    | Input     | 5<br>X0~X4                                                                                                           | 8<br>X0~X7                                    | 12<br>X0~X13 | 16<br>X0~X17 |
|                                    | Output    | 5<br>Y0~Y4                                                                                                           | 8<br>Y0~Y7                                    | 12<br>Y0~Y13 | 16<br>Y0~Y17 |
| Internal Coils (X) <sup>※3</sup>   |           | X0~X77 (64)                                                                                                          |                                               |              |              |
| Internal Coils (Y) <sup>※4</sup>   |           | Y0~Y77 (64)                                                                                                          |                                               |              |              |
| Internal Coils (M)                 |           | 448                                                                                                                  | M0~M199<br>【M200~M319】 <sup>※5</sup>          |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8000~M8079     |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8120~M8139     |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8170~M8172     |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8238~M8242     |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8350~M8370     |              |              |
| Flow (S)                           |           | 32                                                                                                                   | S0~S31                                        |              |              |
| Timer (T)                          | Points    | 80                                                                                                                   | T0~T23: 100ms not accumulate                  |              |              |
|                                    |           |                                                                                                                      | T100~T115: 100ms accumulate                   |              |              |
|                                    |           |                                                                                                                      | T200~T223: 10ms not accumulate                |              |              |
|                                    |           |                                                                                                                      | T300~T307: 10ms accumulate                    |              |              |
|                                    |           |                                                                                                                      | T400~T403: 1ms not accumulate                 |              |              |
|                                    |           |                                                                                                                      | T500~T503: 1ms accumulate                     |              |              |
|                                    | Spec.     | 100ms timer: set time 0.1~3276.7sec.<br>10ms timer: set time 0.01~327.67sec.<br>1ms timer: set time 0.001~32.767sec. |                                               |              |              |
| Counter (C)                        | Points    | 48                                                                                                                   | C0~C23: 16 bits sequential counter            |              |              |
|                                    |           |                                                                                                                      | C300~C315: 32 bits sequential/inverse counter |              |              |
|                                    |           |                                                                                                                      | C600~C603: single phase high speed counter    |              |              |
|                                    |           |                                                                                                                      | C620~C621                                     |              |              |
|                                    |           |                                                                                                                      | C630~C631                                     |              |              |
|                                    | Spec.     | 16 bits counter: set value K0~32,767<br>32 bits counter: set value -2147483648~+2147483647                           |                                               |              |              |

|                            |                                                  |                                |
|----------------------------|--------------------------------------------------|--------------------------------|
| Data Register (D)          | 288 words                                        | D0~D99<br>【D100~D149】※5        |
|                            |                                                  | For Special Use※6D8000~D8029   |
|                            |                                                  | For Special Use※6D8060~D8079   |
|                            |                                                  | For Special Use※6D8120~D8179   |
|                            |                                                  | For Special Use※6D8240~D8249   |
|                            |                                                  | For Special Use※6D8306~D8313   |
|                            |                                                  | For Special Use※6D8460~D8469   |
| Flash ROM Register (FD)    | 510 words                                        | FD0~FD411                      |
|                            |                                                  | For Special Use※6FD8000~FD8011 |
|                            |                                                  | For Special Use※6FD8202~FD8229 |
|                            |                                                  | For Special Use※6FD8306~FD8315 |
|                            |                                                  | For Special Use※6FD8323~FD8335 |
|                            |                                                  | For Special Use※6FD8350~FD8384 |
| High Speed Dispose Ability | No                                               |                                |
| Password Protection        | 6 bits ASCII                                     |                                |
| Self-diagnose Function     | Power on self-check、monitor timing、grammar check |                                |

## XC2 Series

| Items                              |           | Specifications                                                                                                       |                                               |              |              |              |              |
|------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------|--------------|--------------|--------------|
| Program Executing Form             |           | Loop scan form                                                                                                       |                                               |              |              |              |              |
| Program Form                       |           | Instruction、Ladder                                                                                                   |                                               |              |              |              |              |
| Dispose Speed                      |           | 0.5 us                                                                                                               |                                               |              |              |              |              |
| Power Off Retentive                |           | Use Flash ROM                                                                                                        |                                               |              |              |              |              |
| User's program space <sup>※1</sup> |           | 128K                                                                                                                 |                                               |              |              |              |              |
| I/O points <sup>※2</sup>           | Total I/O | 14                                                                                                                   | 16                                            | 24           | 32           | 48           | 60           |
|                                    | Input     | 8<br>X0~X7                                                                                                           | 8<br>X0~X7                                    | 14<br>X0~X15 | 18<br>X0~X21 | 28<br>X0~X33 | 36<br>X0~X43 |
|                                    | Output    | 6<br>Y0~Y5                                                                                                           | 8<br>Y0~Y7                                    | 10<br>Y0~Y11 | 14<br>Y0~Y15 | 20<br>Y0~Y23 | 24<br>Y0~Y27 |
| Internal Coils (X) <sup>※3</sup>   |           | X0~X1037 (544)                                                                                                       |                                               |              |              |              |              |
| Internal Coils (Y) <sup>※4</sup>   |           | Y0~Y1037 (544)                                                                                                       |                                               |              |              |              |              |
| Internal Coils (M)                 |           | 8768<br>points                                                                                                       | M0~M2999<br>【M3000~M7999】 <sup>※5</sup>       |              |              |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8000~M8767     |              |              |              |              |
| Flow (S)                           |           | 1024<br>points                                                                                                       | S0~S511<br>【S512~S1023】                       |              |              |              |              |
| Timer                              | points    | 640<br>points                                                                                                        | T0~T99: 100ms not accumulate                  |              |              |              |              |
|                                    |           |                                                                                                                      | T100~T199: 100ms accumulate                   |              |              |              |              |
|                                    |           |                                                                                                                      | T200~T299: 10ms not accumulate                |              |              |              |              |
|                                    |           |                                                                                                                      | T300~T399: 10ms accumulate                    |              |              |              |              |
|                                    |           |                                                                                                                      | T400~T499: 1ms not accumulate                 |              |              |              |              |
|                                    |           |                                                                                                                      | T500~T599: 1ms accumulate                     |              |              |              |              |
|                                    |           |                                                                                                                      | T600~T639: 1ms precise time                   |              |              |              |              |
|                                    | Spec.     | 100mS timer: set time 0.1~3276.7sec.<br>10mS timer: set time 0.01~327.67sec.<br>1mS timer: set time 0.001~32.767sec. |                                               |              |              |              |              |
| Counter (C)                        | points    | 640<br>points                                                                                                        | C0~C299: 16 bits sequential counter           |              |              |              |              |
|                                    |           |                                                                                                                      | C300~C598: 32 bits sequential/inverse counter |              |              |              |              |
|                                    |           |                                                                                                                      | C600~C619: single phase high speed counter    |              |              |              |              |
|                                    |           |                                                                                                                      | C620~C629: dual-phase high speed counter      |              |              |              |              |
|                                    |           |                                                                                                                      | C630~C639: AB phase high speed counter        |              |              |              |              |
|                                    | Spec.     | 16 bits counter: set value K0~32,767<br>32 bits counter: set value -2147483648~+2147483647                           |                                               |              |              |              |              |
| Data Register (D)                  |           | 2612<br>Words                                                                                                        | D0~D999<br>【D4000~D4999】 <sup>※5</sup>        |              |              |              |              |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> D8000~D8511     |              |              |              |              |

|                            |                                                         |                                             |
|----------------------------|---------------------------------------------------------|---------------------------------------------|
|                            |                                                         | For Special Use <sup>*6</sup> D8630~D8729   |
| Flash ROM Register (FD)    | 512 words                                               | FD0~FD127                                   |
|                            |                                                         | For Special Use <sup>*6</sup> FD8000~FD8383 |
| High Speed Dispose Ability | High speed counter, pulse output, external interruption |                                             |
| Password Protection        | 6 bits ASCII                                            |                                             |
| Self-diagnose Function     | Power on self-check、monitor the timer、grammar check     |                                             |

### XC3 Series

| Items                              |            | Specifications               |                                                                                                                      |              |              |              |              |
|------------------------------------|------------|------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|--------------|
| Program Executing Form             |            | Loop scan form               |                                                                                                                      |              |              |              |              |
| Program Form                       |            | Instruction、Ladder           |                                                                                                                      |              |              |              |              |
| Dispose Speed                      |            | 0.5 us                       |                                                                                                                      |              |              |              |              |
| Power Off Retentive                |            | Use Flash ROM and Li battery |                                                                                                                      |              |              |              |              |
| User's program space <sup>*1</sup> |            | 128K                         |                                                                                                                      |              |              |              |              |
| I/O points <sup>※2</sup>           | Total I/O  | 14                           | 24                                                                                                                   | 32           | 42           | 48           | 60           |
|                                    | Input      | 8<br>X0~X7                   | 14<br>X0~X15                                                                                                         | 18<br>X0~X21 | 24<br>X0~X27 | 28<br>X0~X33 | 36<br>X0~X43 |
|                                    | Output     | 6<br>Y0~Y5                   | 10<br>Y0~Y11                                                                                                         | 14<br>Y0~Y15 | 18<br>Y0~Y21 | 20<br>Y0~Y23 | 24<br>Y0~Y27 |
| Internal Coils (X) <sup>※3</sup>   |            | X0~X1037 (544)               |                                                                                                                      |              |              |              |              |
| Internal Coils (Y) <sup>※4</sup>   |            | Y0~Y1037 (544)               |                                                                                                                      |              |              |              |              |
| Internal Coils (M)                 |            | 8768 points                  | M0~M2999<br>【M3000~M7999】 <sup>※5</sup>                                                                              |              |              |              |              |
|                                    |            |                              | For Special Use <sup>※6</sup> M8000~M8767                                                                            |              |              |              |              |
| Flow (S)                           |            | 1024 points                  | S0~S511<br>【S512~S1023】                                                                                              |              |              |              |              |
| Timer                              | points     | 640 points                   | T0~T99: 100ms not accumulate                                                                                         |              |              |              |              |
|                                    |            |                              | T100~T199: 100ms accumulate                                                                                          |              |              |              |              |
| T200~T299: 10ms not accumulate     |            |                              |                                                                                                                      |              |              |              |              |
| T300~T399: 10ms accumulate         |            |                              |                                                                                                                      |              |              |              |              |
| T400~T499: 1ms not accumulate      |            |                              |                                                                                                                      |              |              |              |              |
| T500~T599: 1ms accumulate          |            |                              |                                                                                                                      |              |              |              |              |
| Flow (S)                           |            | Spec.                        | 100ms timer: set time 0.1~3276.7sec.<br>10ms timer: set time 0.01~327.67sec.<br>1ms timer: set time 0.001~32.767sec. |              |              |              |              |
|                                    | 640 points |                              | C0~C299: 16 bits sequential counter                                                                                  |              |              |              |              |
| Counter (C)                        |            | points                       | C300~C598: 32 bits sequential/inverse counter                                                                        |              |              |              |              |

|                                            |       |                                                                                            |                                             |
|--------------------------------------------|-------|--------------------------------------------------------------------------------------------|---------------------------------------------|
|                                            |       |                                                                                            | C600~C619: single phase high speed counter  |
|                                            |       |                                                                                            | C620~C629: dual-phase high speed counter    |
|                                            |       |                                                                                            | C630~C639: AB phase high speed counter      |
|                                            | Spec. | 16 bits counter: set value K0~32,767<br>32 bits counter: set value -2147483648~+2147483647 |                                             |
| Data Register (D)                          |       | 9024 words                                                                                 | D0~D3999<br>【D4000~D7999】 <sup>※5</sup>     |
|                                            |       |                                                                                            | For Special Use <sup>※6</sup> D8000~D9023   |
| Flash ROM Register (FD)                    |       | 4096 words                                                                                 | FD0~FD3071                                  |
|                                            |       |                                                                                            | For Special Use <sup>※6</sup> FD8000~FD9023 |
| Expansion's Register (ED)<br><sup>※7</sup> |       | 16384 words                                                                                | ED0~ED16383                                 |
| High Speed Dispose Ability                 |       | High speed counter, pulse output, external interruption                                    |                                             |
| Password Protection                        |       | 6 bits ASCII                                                                               |                                             |
| Self-diagnose Function                     |       | Power on self-check、monitor the timer、grammar check                                        |                                             |

## XC5 Series

| Items                              |           | Specifications       |                                           |              |              |
|------------------------------------|-----------|----------------------|-------------------------------------------|--------------|--------------|
| Program Executing Form             |           | Loop scan form       |                                           |              |              |
| Program Form                       |           | Instruction、Ladder   |                                           |              |              |
| Dispose Speed                      |           | 0.5 us               |                                           |              |              |
| Power Off Retentive                |           | Use Flash ROM        |                                           |              |              |
| User's program space <sup>※1</sup> |           | 96K                  |                                           |              |              |
| I/O points<br><sup>※2</sup>        | Total I/O | 24                   | 32                                        | 48           | 60           |
|                                    | Input     | 14<br>X0~X15         | 18<br>X0~X21                              | 28<br>X0~X33 | 36<br>X0~X43 |
|                                    | Output    | 10<br>Y0~Y11         | 14<br>Y0~Y15                              | 20<br>Y0~Y23 | 24<br>Y0~Y27 |
| Internal Coils (X) <sup>※3</sup>   |           | 544 points: X0~X1037 |                                           |              |              |
| Internal Coils (Y) <sup>※4</sup>   |           | 544 points: Y0~Y1037 |                                           |              |              |
| Internal Coils (M)                 |           | 8768 points          | M0~M3999<br>【M4000~M7999】 <sup>※5</sup>   |              |              |
|                                    |           |                      | For Special Use <sup>※6</sup> M8000~M8767 |              |              |
| Flow (S)                           |           | 1024 points          | S0~S511<br>【S512~S1023】                   |              |              |

|                                                  |        |                                                                                                                      |                                               |
|--------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Timer                                            | points | 640 points                                                                                                           | T0~T99: 100ms not accumulate                  |
|                                                  |        |                                                                                                                      | T100~T199: 100ms accumulate                   |
|                                                  |        |                                                                                                                      | T200~T299: 10ms not accumulate                |
|                                                  |        |                                                                                                                      | T300~T399: 10ms accumulate                    |
|                                                  |        |                                                                                                                      | T400~T499: 1ms not accumulate                 |
|                                                  |        |                                                                                                                      | T500~T599: 1ms accumulate                     |
|                                                  |        |                                                                                                                      | T600~T639: 1ms precise time                   |
|                                                  | Spec.  | 100ms timer: set time 0.1~3276.7sec.<br>10ms timer: set time 0.01~327.67sec.<br>1ms timer: set time 0.001~32.767sec. |                                               |
| Counter (C)                                      | points | 640 points                                                                                                           | C0~C299: 16 bits sequential counter           |
|                                                  |        |                                                                                                                      | C300~C598: 32 bits sequential/inverse counter |
|                                                  |        |                                                                                                                      | C600~C619: single phase high speed counter    |
|                                                  |        |                                                                                                                      | C620~C629: dual-phase high speed counter      |
|                                                  |        |                                                                                                                      | C630~C639: AB phase high speed counter        |
|                                                  | Spec.  | 16 bits counter: set value K0~32,767<br>32 bits counter: set value -2147483648~+2147483647                           |                                               |
| Data Register (D)                                |        | 9024 words                                                                                                           | D0~D3999                                      |
|                                                  |        |                                                                                                                      | 【D4000~D4999】 <sup>*5</sup>                   |
|                                                  |        |                                                                                                                      | For Special Use <sup>*6</sup> D8000~D9023     |
| Flash ROM Register (FD)                          |        | 8192 words                                                                                                           | FD0~FD7167                                    |
|                                                  |        |                                                                                                                      | For Special Use <sup>*6</sup> FD8000~FD9023   |
| Expand the internal registers (ED) <sup>*7</sup> |        | 36864 words                                                                                                          | ED0~ED36863                                   |
| High Speed Dispose Ability                       |        | High speed counter, pulse output, external interruption                                                              |                                               |
| Password Protection                              |        | 6 bits ASCII                                                                                                         |                                               |
| Self-diagnose Function                           |        | Power on self-check、monitor the timer、grammar check                                                                  |                                               |

### XCM Series

| Items                              |           | Specifications               |    |    |
|------------------------------------|-----------|------------------------------|----|----|
| Program Executing Form             |           | Loop scan form               |    |    |
| Program Form                       |           | Instruction, Ladder          |    |    |
| Dispose Speed                      |           | 0.5 us                       |    |    |
| Power Off Retentive                |           | Use Flash ROM and Li battery |    |    |
| User's program space <sup>*1</sup> |           | 160KB                        |    |    |
| I/O points                         | Total I/O | 24                           | 32 | 60 |

|                                      |        |                                                                                                                      |                                               |              |
|--------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------|
| ※2                                   | Input  | 14<br>X0~X015                                                                                                        | 18<br>X0~X021                                 | 36<br>X0~X43 |
|                                      | Output | 10<br>Y0~Y011                                                                                                        | 14<br>Y0~Y015                                 | 20<br>Y0~Y27 |
| Internal Coils (X)※3                 |        | X0~X1037 (Total 544)                                                                                                 |                                               |              |
| Internal Coils (Y)※4                 |        | Y0~Y1037 (Total 544)                                                                                                 |                                               |              |
| Internal Coils (M)                   |        | 8768 points                                                                                                          | M0~M2999<br>【M3000~M7999】※5                   |              |
|                                      |        |                                                                                                                      | For Special Use※6M8000~M8767                  |              |
| Flow (S)                             |        | 1024 points                                                                                                          | S0~S511<br>【S512~S1023】                       |              |
| Timer                                | points | 640 points                                                                                                           | T0~T99: 100ms not accumulate                  |              |
|                                      |        |                                                                                                                      | T100~T199: 100ms accumulate                   |              |
|                                      |        |                                                                                                                      | T200~T299: 10ms not accumulate                |              |
|                                      |        |                                                                                                                      | T300~T399: 10ms accumulate                    |              |
|                                      |        |                                                                                                                      | T400~T499: 1ms not accumulate                 |              |
|                                      |        |                                                                                                                      | T500~T599: 1ms accumulate                     |              |
|                                      |        |                                                                                                                      | T600~T639: 1ms precise time                   |              |
|                                      | Spec.  | 100ms timer: set time 0.1~3276.7sec.<br>10ms timer: set time 0.01~327.67sec.<br>1ms timer: set time 0.001~32.767sec. |                                               |              |
| Counter (C)                          | points | 640 points                                                                                                           | C0~C299: 16 bits sequential counter           |              |
|                                      |        |                                                                                                                      | C300~C598: 32 bits sequential/inverse counter |              |
|                                      |        |                                                                                                                      | C600~C619: single phase high speed counter    |              |
|                                      |        |                                                                                                                      | C620~C629: dual-phase high speed counter      |              |
|                                      |        |                                                                                                                      | C630~C639: AB phase high speed counter        |              |
|                                      | Spec.  | 16 bits counter: set value K0~32,767<br>32 bits counter: set value -2147483648~+2147483647                           |                                               |              |
| Data Register (D)                    |        | 5024 words                                                                                                           | D0~D2999<br>【D4000~D4999】※5                   |              |
|                                      |        |                                                                                                                      | For Special Use※6D8000~D9023                  |              |
| FlashROM register (FD)               |        | 1996 words                                                                                                           | FD0~FD1535                                    |              |
|                                      |        |                                                                                                                      | For Special Use※6FD8000~FD8349                |              |
|                                      |        |                                                                                                                      | For Special Use※6FD8890~FD8999                |              |
| Expand the internal registers (ED)※7 |        | 36864 words                                                                                                          | ED0~ED36863                                   |              |
| High Speed Dispose Ability           |        | High speed counter, pulse output, external interruption                                                              |                                               |              |
| Password Protection                  |        | 6 bits ASCII                                                                                                         |                                               |              |
| Self-diagnose Function               |        | Power on self-check、monitor the timer、grammar check                                                                  |                                               |              |

## XCC series

| Items                              |           | Specifications                                                                                                       |                                               |
|------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Program Executing Form             |           | Loop scan form                                                                                                       |                                               |
| Program Form                       |           | Instruction、Ladder                                                                                                   |                                               |
| Dispose Speed                      |           | 0.5 us                                                                                                               |                                               |
| Power Off Retentive                |           | Use Flash ROM and Li battery                                                                                         |                                               |
| User's program space <sup>※1</sup> |           | 256KB                                                                                                                |                                               |
| I/O points <sup>※2</sup>           | Total I/O | 32                                                                                                                   |                                               |
|                                    | Input     | 18                                                                                                                   |                                               |
|                                    | Output    | 14                                                                                                                   |                                               |
| Internal Coils (X) <sup>※3</sup>   |           | X0~X1037 (Total 544)                                                                                                 |                                               |
| Internal Coils (Y) <sup>※4</sup>   |           | Y0~Y1037 (Total 544)                                                                                                 |                                               |
| Internal Coils (M)                 |           | 8768 points                                                                                                          | M0~M2999<br>【M3000~M7999】 <sup>※5</sup>       |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> M8000~M8767     |
| Flow (S)                           |           | 1024 points                                                                                                          | S0~S511<br>【S512~S1023】                       |
| Timer                              | points    | 640 points                                                                                                           | T0~T99: 100ms not accumulate                  |
|                                    |           |                                                                                                                      | T100~T199: 100ms accumulate                   |
|                                    |           |                                                                                                                      | T200~T299: 10ms not accumulate                |
|                                    |           |                                                                                                                      | T300~T399: 10ms accumulate                    |
|                                    |           |                                                                                                                      | T400~T499: 1ms not accumulate                 |
|                                    |           |                                                                                                                      | T500~T599: 1ms accumulate                     |
|                                    |           |                                                                                                                      | T600~T639: 1ms precise time                   |
|                                    | Spec.     | 100ms timer: set time 0.1~3276.7sec.<br>10ms timer: set time 0.01~327.67sec.<br>1ms timer: set time 0.001~32.767sec. |                                               |
| Counter (C)                        | points    | 640 points                                                                                                           | C0~C299: 16 bits sequential counter           |
|                                    |           |                                                                                                                      | C300~C598: 32 bits sequential/inverse counter |
|                                    |           |                                                                                                                      | C600~C619: single phase high speed counter    |
|                                    |           |                                                                                                                      | C620~C629: dual-phase high speed counter      |
|                                    |           |                                                                                                                      | C630~C639: AB phase high speed counter        |
|                                    | Spec.     | 16 bits counter: set value K0~32,767<br>32 bits counter: set value -2147483648~+2147483647                           |                                               |
| Data Register (D)                  |           | 9024 words                                                                                                           | D0~D3999<br>【D4000~D7999】 <sup>※5</sup>       |
|                                    |           |                                                                                                                      | For Special Use <sup>※6</sup> D8000~D9023     |
| FlashROM register (FD)             |           | 2048 words                                                                                                           | FD0~FD1023                                    |

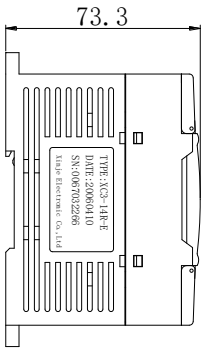
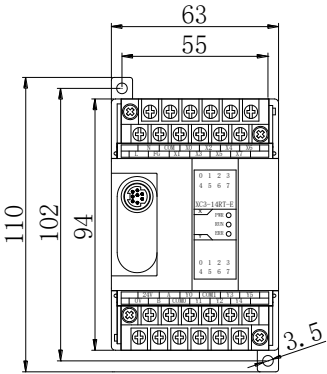
|                                                  |                                                         |                                             |
|--------------------------------------------------|---------------------------------------------------------|---------------------------------------------|
|                                                  |                                                         | For Special Use <sup>※6</sup> FD8000~FD9023 |
| Expand the internal registers (ED) <sup>※7</sup> | 36864 words                                             | ED0~ED36863                                 |
| High Speed Dispose Ability                       | High speed counter, pulse output, external interruption |                                             |
| Password Protection                              | 6 bits ASCII                                            |                                             |
| Self-diagnose Function                           | Power on self-check、monitor the timer、grammar check     |                                             |

- ※1: The user's program space: refer to the maximum program space when download secretly.
- ※2: I/O points: refer to the terminal number that users can connect from outside
- ※3: X: refer to the internal input relays, users can use middle relay when exceed the Input points
- ※4: Y: refer to the internal output relays, users can use middle relay when the Output points exceed
- ※5: 【】 Sign: The default power off retentive area, this area can be changed
- ※6: For special use: refer to the special usage registers that are occupied by the system, can't be applied for other usage. For details, please refer to Appendix 1;
- ※7: Only the hardware with 3.0 or above version of the CPU units has internal expansion register ED;
- ※8: XC3-14 hardware version 3.2: the ED is 0.
- ※9: Input and output coil no. is octal, other coil and register are decimal.
- ※10: The I/O which is not connected to other device can be used to internal coil.
- ※11: Flash ROM register doesn't have to set power loss retentive, the data will not lose when power is off.

## 2-2. External Dimension

Graph 1

(Unit: mm)

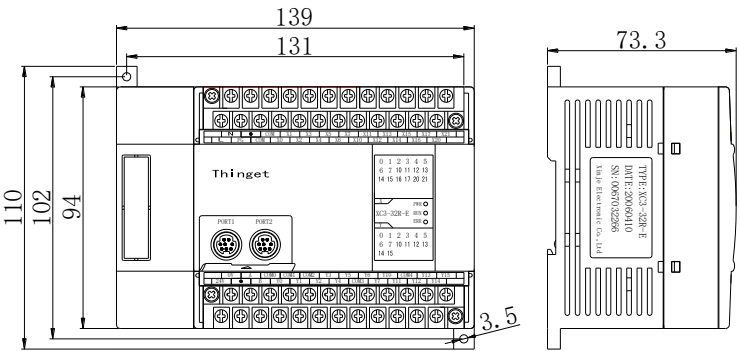


Suitable Model

| Series | I/O       |
|--------|-----------|
| XC1    | 10 and 16 |
| XC2    | 14 and 16 |
| XC3    | 14        |

Graph 2

(Unit: mm)

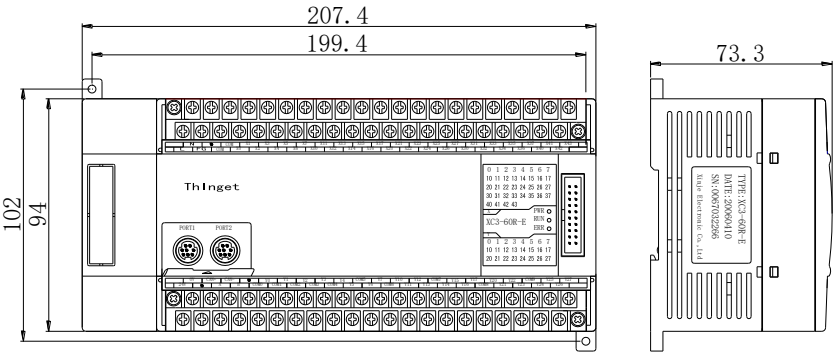


Suitable Model

| Series | I/O       |
|--------|-----------|
| XC1    | 24 and 32 |
| XC2    | 24 and 32 |
| XC3    | 24 and 32 |
| XC5    | 24 and 32 |
| XCM    | 24 and 32 |
| XCC    | 32        |

Graph 3

(Unit: mm)

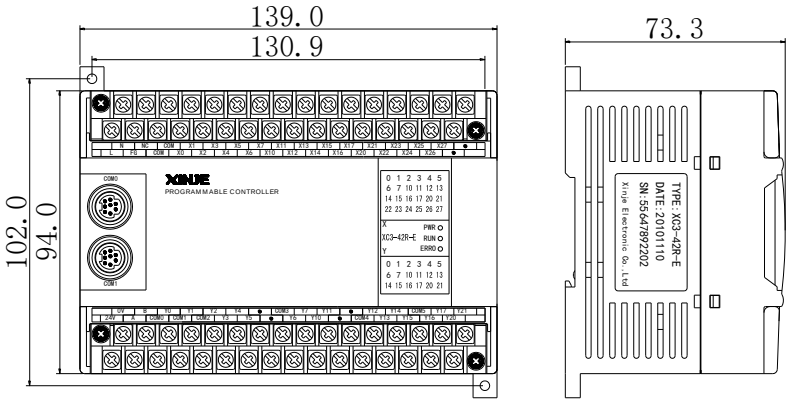


Suitable Model

| Series | I/O       |
|--------|-----------|
| XC2    | 48 and 60 |
| XC3    | 48 and 60 |
| XC5    | 48 and 60 |
| XCM    | 60        |

Graph 4

Unit: mm



Suitable model

| Series | I/O |
|--------|-----|
| XC3    | 42  |

### 2-3. Terminals Arrangement

#### ● Graph A

|  |     |      |      |    |      |      |      |      |      |      |     |      |     |      |     |     |      |     |      |     |     |
|--|-----|------|------|----|------|------|------|------|------|------|-----|------|-----|------|-----|-----|------|-----|------|-----|-----|
|  | N   | •    | COM  | X1 | X3   | X5   | X7   | X11  | X13  | X15  | X17 | X21  | X23 | X25  | X27 | X31 | X33  | X35 | X37  | X41 | X43 |
|  | L   | FG   | COM  | X0 | X2   | X4   | X6   | X10  | X12  | X14  | X16 | X20  | X22 | X24  | X26 | X30 | X32  | X34 | X36  | X40 | X42 |
|  | OV  | CAN+ | CAN- | •  | Y0   | Y1   | Y2   | Y3   | Y4   | COM5 | Y7  | Y10  | Y12 | COM7 | Y15 | Y17 | Y20  | Y22 | COM9 | Y25 | Y27 |
|  | 24V | •    | A    | B  | COM0 | COM1 | COM2 | COM3 | COM4 | Y5   | Y6  | COM6 | Y11 | Y13  | Y14 | Y16 | COM8 | Y21 | Y23  | Y24 | Y26 |

#### ● Graph B

|  |     |      |      |    |      |      |      |      |      |      |     |      |     |      |     |     |      |     |      |     |     |
|--|-----|------|------|----|------|------|------|------|------|------|-----|------|-----|------|-----|-----|------|-----|------|-----|-----|
|  | N   | •    | COM  | X1 | X3   | X5   | X7   | X11  | X13  | X15  | X17 | X21  | X23 | X25  | X27 | X31 | X33  | •   | •    | •   | •   |
|  | L   | FG   | COM  | X0 | X2   | X4   | X6   | X10  | X12  | X14  | X16 | X20  | X22 | X24  | X26 | X30 | X32  | •   | •    | •   | •   |
|  | OV  | CAN+ | CAN- | •  | Y0   | Y1   | Y2   | Y3   | Y4   | COM5 | Y7  | Y10  | Y12 | COM7 | Y15 | Y17 | Y20  | Y22 | COM9 | Y25 | Y27 |
|  | 24V | •    | A    | B  | COM0 | COM1 | COM2 | COM3 | COM4 | Y5   | Y6  | COM6 | Y11 | Y13  | Y14 | Y16 | COM8 | Y21 | Y23  | •   | •   |

#### ● Graph C

|  |     |    |      |      |      |    |    |      |     |      |     |     |  |
|--|-----|----|------|------|------|----|----|------|-----|------|-----|-----|--|
|  | N   | •  | COM  | X1   | X3   | X5 | X7 | X11  | X13 | X15  | X17 | X21 |  |
|  | L   | FG | COM  | X0   | X2   | X4 | X6 | X10  | X12 | X14  | X16 | X20 |  |
|  | OV  | A  | COM0 | COM1 | COM2 | Y3 | Y5 | Y6   | Y10 | COM4 | Y13 | Y15 |  |
|  | 24V | •  | B    | Y0   | Y1   | Y2 | Y4 | COM3 | Y7  | Y11  | Y12 | Y14 |  |

#### ● Graph D

|  |     |    |      |      |      |    |    |      |     |     |   |   |   |
|--|-----|----|------|------|------|----|----|------|-----|-----|---|---|---|
|  | N   | •  | COM  | X1   | X3   | X5 | X7 | X11  | X13 | X15 | • | • | • |
|  | L   | FG | COM  | X0   | X2   | X4 | X6 | X10  | X12 | X14 | • | • | • |
|  | OV  | A  | COM0 | COM1 | COM2 | Y3 | Y5 | Y6   | Y10 | •   | • | • |   |
|  | 24V | •  | B    | Y0   | Y1   | Y2 | Y4 | COM3 | Y7  | Y11 | • | • |   |

#### ● Graph E

|  |     |     |      |      |    |    |  |
|--|-----|-----|------|------|----|----|--|
|  | N   | COM | X1   | X3   | X5 | X7 |  |
|  | L   | FG  | X0   | X2   | X4 | X6 |  |
|  | 24V | A   | Y0   | COM1 | Y3 | Y5 |  |
|  | OV  | B   | COM0 | Y1   | Y2 | Y4 |  |

#### ● Graph F

|  |     |      |    |      |    |    |  |
|--|-----|------|----|------|----|----|--|
|  | N   | COM  | X1 | X3   | X5 | X7 |  |
|  | L   | FG   | X0 | X2   | X4 | X6 |  |
|  | 24V | Y0   | Y2 | COM1 | Y5 | Y7 |  |
|  | OV  | COM0 | Y1 | Y3   | Y4 | Y6 |  |

#### ● Graph G

|  |     |    |      |    |      |      |    |      |     |     |   |   |  |
|--|-----|----|------|----|------|------|----|------|-----|-----|---|---|--|
|  | N   | •  | COM  | X1 | X3   | X5   | X7 | X11  | X13 | X15 | • | • |  |
|  | L   | FG | COM  | X0 | X2   | X4   | X6 | X10  | X12 | X14 | • | • |  |
|  | OV  | A  | COM0 | Y1 | Y2   | COM2 | Y5 | Y6   | Y10 | •   | • | • |  |
|  | 24V | •  | B    | Y0 | COM1 | Y3   | Y4 | COM3 | Y7  | Y11 | • | • |  |

#### ● Graph H

|  |     |    |      |    |      |    |    |      |     |      |     |     |  |
|--|-----|----|------|----|------|----|----|------|-----|------|-----|-----|--|
|  | N   | •  | COM  | X1 | X3   | X5 | X7 | X11  | X13 | X15  | X17 | •   |  |
|  | L   | FG | COM  | X0 | X2   | X4 | X6 | X10  | X12 | X14  | X16 | •   |  |
|  | OV  | A  | Y0   | Y2 | COM1 | Y5 | Y7 | Y10  | Y12 | COM3 | Y15 | Y17 |  |
|  | 24V | B  | COM0 | Y1 | Y3   | Y4 | Y6 | COM2 | Y11 | Y13  | Y14 | Y16 |  |

#### ● Graph I

|  |     |    |      |    |      |    |    |      |     |     |   |   |  |
|--|-----|----|------|----|------|----|----|------|-----|-----|---|---|--|
|  | N   | •  | COM  | X1 | X3   | X5 | X7 | X11  | X13 | •   | • | • |  |
|  | L   | FG | COM  | X0 | X2   | X4 | X6 | X10  | X12 | •   | • | • |  |
|  | OV  | A  | Y0   | Y2 | COM1 | Y5 | Y7 | Y10  | Y12 | •   | • | • |  |
|  | 24V | B  | COM0 | Y1 | Y3   | Y4 | Y6 | COM2 | Y11 | Y13 | • | • |  |

#### ● Graph J

|  |     |      |    |      |    |   |  |
|--|-----|------|----|------|----|---|--|
|  | N   | COM  | X1 | X3   | •  | • |  |
|  | L   | FG   | X0 | X2   | X4 | • |  |
|  | 24V | Y0   | Y2 | COM1 | •  | • |  |
|  | OV  | COM0 | Y1 | Y3   | Y4 | • |  |

#### ● Graph K

|  |     |    |     |    |      |      |      |      |     |      |      |     |      |      |     |     |      |     |      |     |     |
|--|-----|----|-----|----|------|------|------|------|-----|------|------|-----|------|------|-----|-----|------|-----|------|-----|-----|
|  | N   | ●  | COM | X1 | X3   | X5   | X7   | X11  | X13 | X15  | X17  | X21 | X23  | X25  | X27 | X31 | X33  | X35 | X37  | X41 | X43 |
|  | L   | FG | COM | X0 | X2   | X4   | X6   | X10  | X12 | X14  | X16  | X20 | X22  | X24  | X26 | X30 | X32  | X34 | X36  | X40 | X42 |
|  | OV  | ●  | ●   | ●  | COM0 | Y1   | Y2   | COM3 | Y5  | Y6   | COM5 | Y11 | Y12  | COM7 | Y15 | Y17 | Y20  | Y22 | COM9 | Y25 | Y27 |
|  | 24V | ●  | A   | B  | R    | COM1 | COM2 | Y3   | Y4  | COM4 | Y7   | Y10 | COM6 | Y13  | Y14 | Y16 | COM8 | Y21 | Y23  | Y24 | Y26 |

## ● Graph L

|  |   |    |     |    |    |    |    |     |     |     |     |     |     |     |     |   |  |
|--|---|----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|---|--|
|  | N | NC | COM | X1 | X3 | X5 | X7 | X11 | X13 | X15 | X17 | X21 | X23 | X25 | X27 | ● |  |
|  | L | FG | COM | X0 | X2 | X4 | X6 | X10 | X12 | X14 | X16 | X20 | X22 | X24 | X26 | ● |  |

|  |     |   |      |      |      |    |    |      |     |     |      |     |     |      |     |     |  |
|--|-----|---|------|------|------|----|----|------|-----|-----|------|-----|-----|------|-----|-----|--|
|  | 0V  | A | COM0 | COM1 | COM2 | Y3 | Y5 | Y6   | Y10 | ●   | COM4 | Y13 | Y15 | COM5 | Y17 | Y21 |  |
|  | 24V | ● | B    | Y0   | Y1   | Y2 | Y4 | COM3 | Y7  | Y11 | ●    | Y12 | Y14 | ●    | Y16 | Y20 |  |

## ● Graph M

|  |   |    |     |    |    |    |    |     |     |     |     |     |  |
|--|---|----|-----|----|----|----|----|-----|-----|-----|-----|-----|--|
|  | N | ●  | COM | X1 | X3 | X5 | X7 | X11 | X13 | X15 | X17 | X21 |  |
|  | L | FG | COM | X0 | X2 | X4 | X6 | X10 | X12 | X14 | X16 | X20 |  |

|  |     |   |      |    |      |      |    |      |     |      |     |     |  |
|--|-----|---|------|----|------|------|----|------|-----|------|-----|-----|--|
|  | 0V  | A | COM0 | Y1 | Y2   | COM2 | Y5 | Y6   | Y10 | COM4 | Y13 | Y15 |  |
|  | 24V | ● | B    | Y0 | COM1 | Y3   | Y4 | COM3 | Y7  | Y11  | Y12 | Y14 |  |

## ● Graph N

|     |    |     |      |      |      |    |      |     |     |     |   |   |  |
|-----|----|-----|------|------|------|----|------|-----|-----|-----|---|---|--|
|     | N  | ●   | COM  | X1   | X3   | X5 | X7   | X11 | X13 | X15 | ● | ● |  |
| L   | FG | COM | X0   | X2   | X4   | X6 | X10  | X12 | X14 | ●   | ● | ● |  |
|     | 0V | A   | COM0 | COM1 | Y2   | Y3 | Y5   | Y6  | Y10 | ●   | ● | ● |  |
| 24V | ●  | B   | Y0   | Y1   | COM2 | Y4 | COM3 | Y7  | Y11 | ●   | ● | ● |  |

## ● Graph O

|  |     |    |      |      |    |      |    |      |     |      |     |     |  |
|--|-----|----|------|------|----|------|----|------|-----|------|-----|-----|--|
|  | N   | ●  | COM  | X1   | X3 | X5   | X7 | X11  | X13 | X15  | X17 | X21 |  |
|  | L   | FG | COM  | X0   | X2 | X4   | X6 | X10  | X12 | X14  | X16 | X20 |  |
|  | OV  | A  | COM0 | COM1 | Y2 | Y3   | Y5 | Y6   | Y10 | COM4 | Y13 | Y15 |  |
|  | 24V | ●  | B    | Y0   | Y1 | COM2 | Y4 | COM3 | Y7  | Y11  | Y12 | Y14 |  |

## ● Graph P

|   |    |     |     |    |    |    |     |     |     |     |     |     |  |
|---|----|-----|-----|----|----|----|-----|-----|-----|-----|-----|-----|--|
|   | N  | ●   | COM | X1 | X3 | X5 | X7  | X11 | X13 | X15 | X17 | X21 |  |
| L | FG | COM | X0  | X2 | X4 | X6 | X10 | X12 | X14 | X16 | X20 |     |  |

|     |    |      |      |    |    |      |    |      |     |      |     |     |  |
|-----|----|------|------|----|----|------|----|------|-----|------|-----|-----|--|
|     | 0V | B    | CAN- | Y0 | Y2 | Y4   | Y5 | Y7   | Y10 | Y12  | Y13 | Y15 |  |
| 24V | A  | CAN+ | COM0 | Y1 | Y3 | COM1 | Y6 | COM2 | Y11 | COM3 | Y14 |     |  |

The Graph to the model:

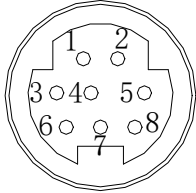
| Graph | Suitable model         | I/O   |
|-------|------------------------|-------|
| A     | XC2-60、XC3- 60、XC5- 60 | 36/24 |
| B     | XC2-48、XC3- 48、XC5- 48 | 28/20 |
| C     | XC2-32、XC3- 32、XC5- 32 | 18/14 |
| D     | XC2-24、XC3- 24         | 14/10 |
| E     | XC2-14、XC3- 14         | 8/6   |
| F     | XC1- 16、XC2-16         | 8/8   |
| G     | XC5- 24、XCM-24T4       | 14/10 |
| H     | XC1- 32                | 16/16 |
| I     | XC1- 24                | 12/12 |
| J     | XC1-10                 | 5/5   |
| K     | XCM-60                 | 36/24 |
| L     | XC3-42                 | 24/18 |
| M     | XCM-32T4               | 18/14 |
| N     | XCM-24T3               | 14/10 |
| O     | XCM-32T3               | 18/14 |
| P     | XCC-32                 | 18/14 |

Note: for XC5-32, the com terminal of Y2, Y3 is COM1.

2-4. Communication Ports

1 COM1

Pins of COM1:

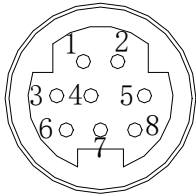


- 2: PRG
- 4: RxD
- 5: TxD
- 6: VCC
- 8: GND

Mini Din 8 female

2 COM2

Pins of COM2<sup>※1</sup>:



- 4: RxD
- 5: TxD
- 8: GND

Mini Din 8 female

3 Program Cable



Mini Din 8 male

DB9 female

※1: in the graph we show only RS232 of COM2, we extend RS485 (A、B) to the terminals), so we here don't list them out.

## 3 System Structure

---

As the controller, XC series PLC can connect with many types of peripheral equipments, expansions etc. In this chapter, it introduces 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 |
|-------------------------|

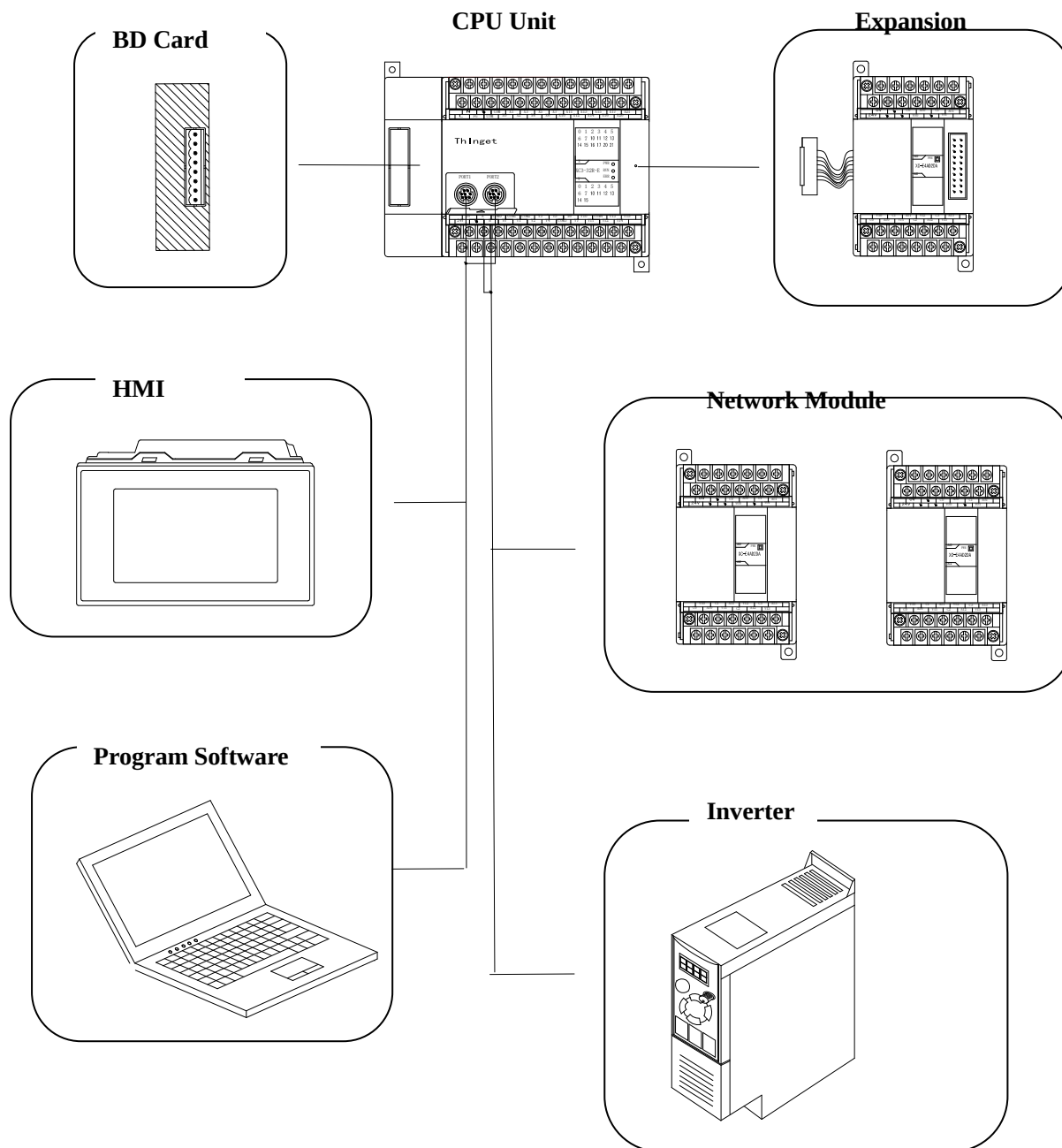
|                            |
|----------------------------|
| 3-3. Combination Principle |
|----------------------------|

|                                |
|--------------------------------|
| 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.



※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.

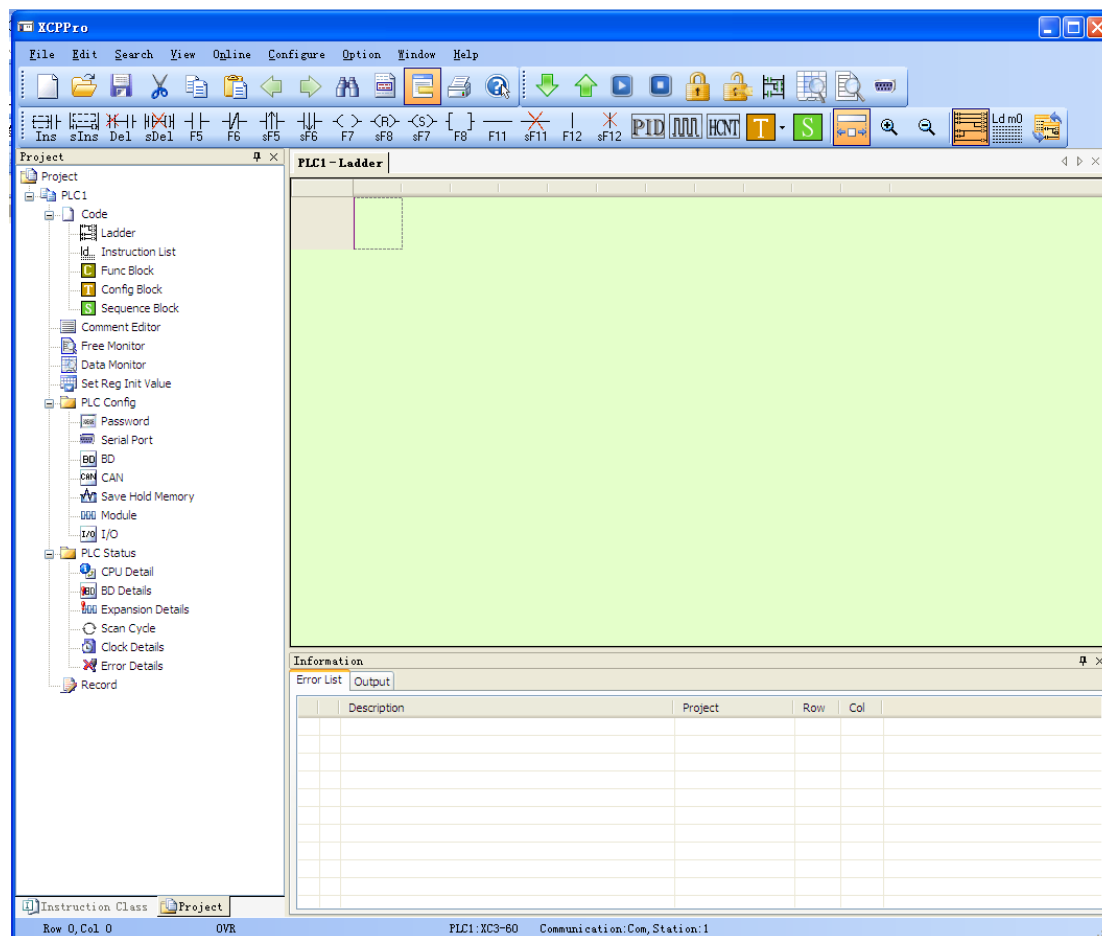
## 3-2. Peripheral Equipments

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 the cable made 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, and then PLC executes 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 TG, TH, TP, OP, MP series.

#### TH, TP Series HMI

- Size: 4.3"、4.7"、5.7"、7"、8"、10.1"、10.4"
- Display: 65536, 256 true color TFT, blue LCD
- Operation: Touch Screen
- Interface: RS232、RS422、RS485, USB, RJ45
- 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: real time clock

### MP Series Operation Panels with Touch Function

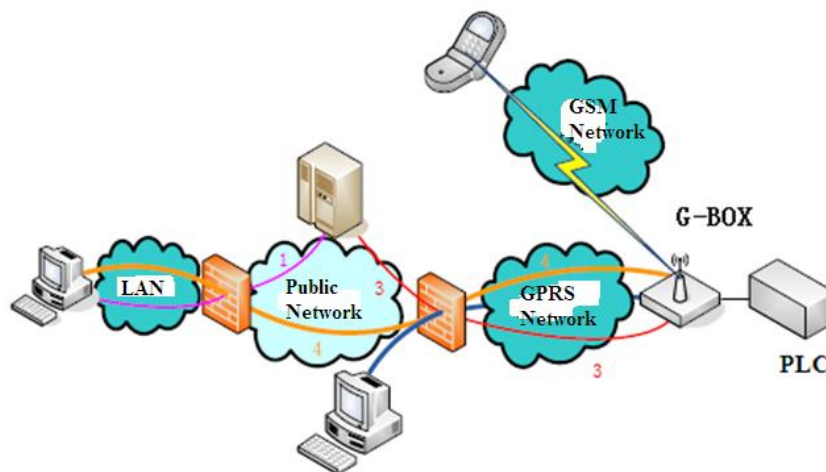
- Size 3.7"、7"
- Display 256 true color、blue LCD
- Buttons Nr.: 26、42, the LCD is touch screen
- Interface: RS232、RS485
- Communication: work with many PLC brands.  
Communicate with Xinje Inverters
- RTC: Real Time Clock

### 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.

#### 1 G-BOX



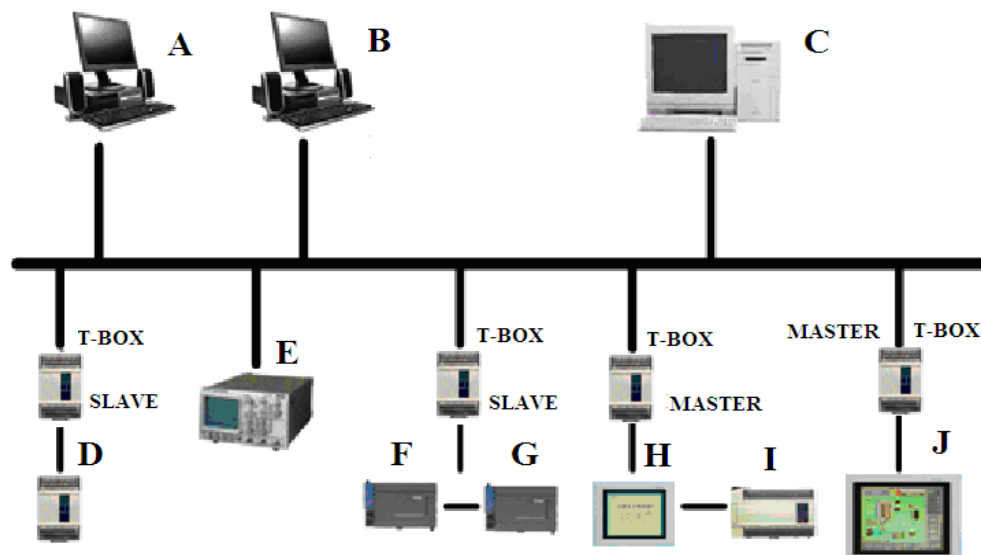
- Transfer data wirelessly, open and transparent;
- Remote program and debug PLC, realize upload/download PLC;
- Integral data transfer terminal of TCP/IP protocol pallet, support TCP, UDP, DNS, PPP etc.
- Standard industrial interface (RS-232 or RS-485)
- Support long time online mode, equipped re-dial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

- Suitable for distributed system and remote control applications.

|   |              |
|---|--------------|
| 2 | <b>T-BOX</b> |
|---|--------------|

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.

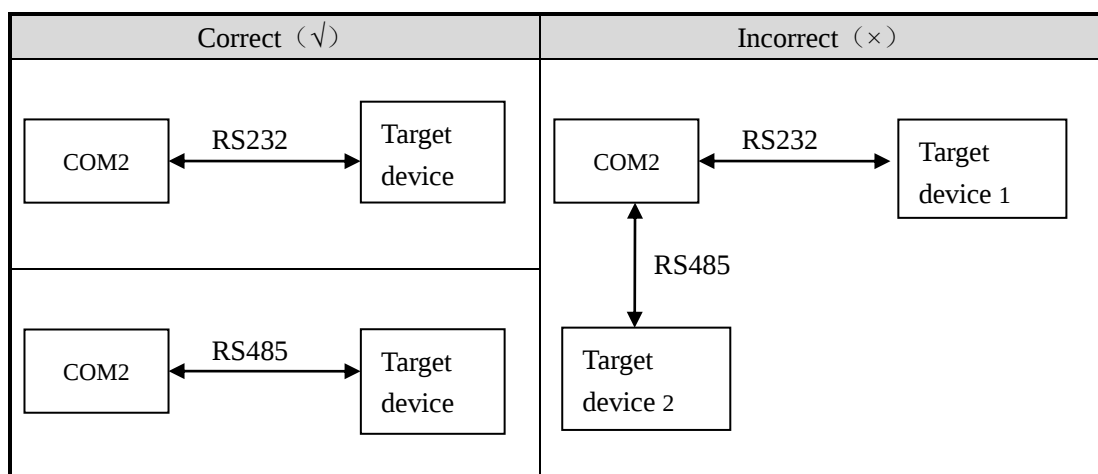


- Realize flexible distributing automation structure, simplify the system management
- Realize Ether net visit via RJ45 interface, the communication is based on standard TCP/IP protocol
- Realize remote program, monitor, diagnose via industrial Ether net, save great time and cost;
- Store and operate 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

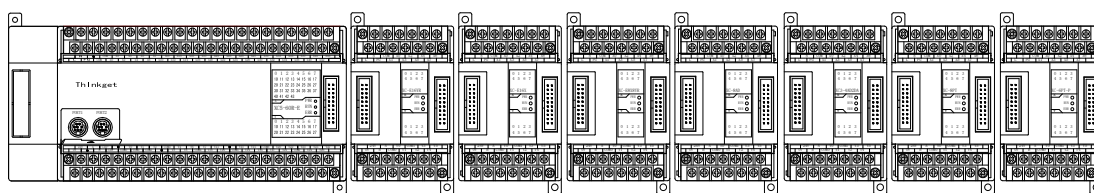
#### About COM port

- 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 anymore;
- 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;



#### 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) connects with five 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 =  $42+54=96$

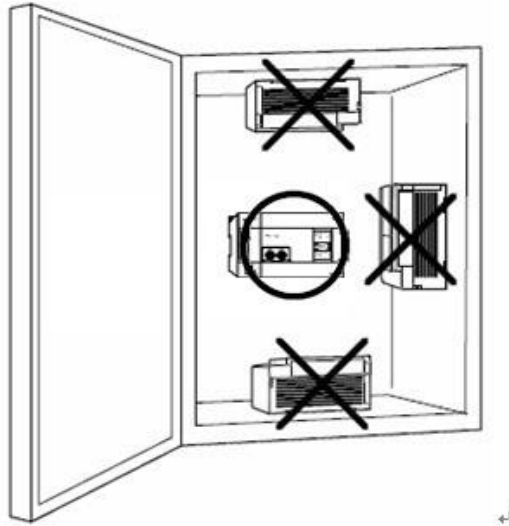
### 3-4. ID Assignment of Expansions

| 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

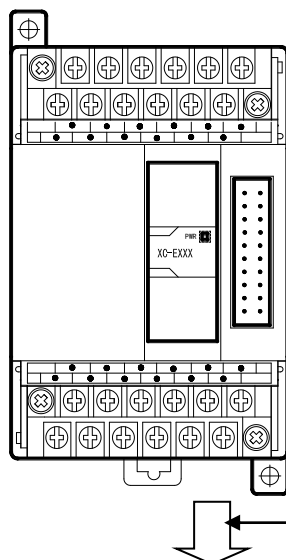
#### 1 Installation Position



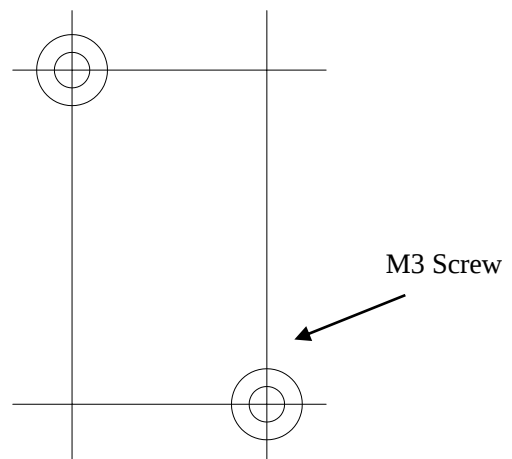
#### 2 Installation Method

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

Use DIN46277



- Directly install by screws



|          |                                 |
|----------|---------------------------------|
| <b>3</b> | <b>Installation Environment</b> |
|----------|---------------------------------|

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

# 4

## Power Supply Specification and Wiring Method

---

In this chapter, we tell the structure, specification and external wiring of XC series PLC. The wiring method differs according to different models. The mainly difference is the wiring terminals. For each model's terminal arrangement, please refer to chapter 2-3.

|                                 |
|---------------------------------|
| 4-1. Power Supply Specification |
|---------------------------------|

|                              |
|------------------------------|
| 4-2. AC Power, DC Input Type |
|------------------------------|

## 4-1. Power Supply Specifications

The power supply specifications of XC series PLC are listed below:

### 1 AC Power Supply

| Items                          | Content                                                      |
|--------------------------------|--------------------------------------------------------------|
| Rated Voltage                  | AC100V~240V                                                  |
| Allow Voltage Range            | AC90V~265V                                                   |
| Rated Frequency                | 50/60Hz                                                      |
| Allow momentary power off time | Interruption Time $\leq 0.5$ AC cycle, interval $\geq 1$ sec |
| Impulse Current                | Below 40A 5mS/AC100V   below 60A 5mS/AC200V                  |
| Maximum Power Consumption      | 12W                                                          |
| Power Supply for Sensor        | 24VDC $\pm 10\%$ maximum 400mA                               |

※1: Please use the wire cable thicker than 2mm<sup>2</sup>, to avoid the decrease of voltage;

※2: Even happens the 10ms power off, the PLC can keep working. But when power off for long time or voltage abnormal decrease, the PLC will stop working, output will be OFF. When power supply recover, the PLC will RUN automatically.

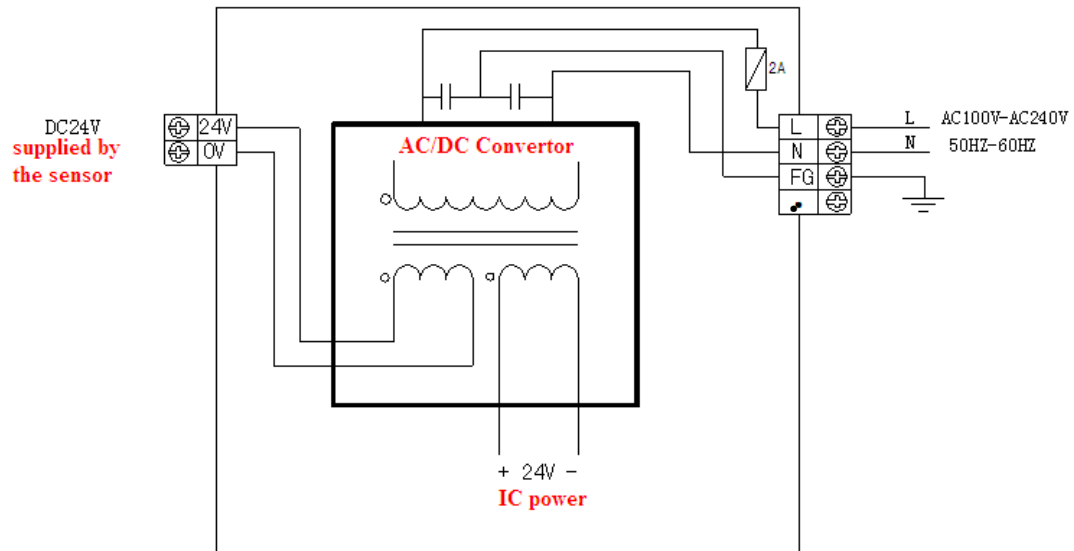
※3: The grounding terminals on basic units and expansions connect together and use the third type grounding.

### 2 DC Power Supply Type

| Items                               | Content                        |
|-------------------------------------|--------------------------------|
| Rated Voltage                       | DC24V                          |
| Allow Voltage Range                 | DC21.6V~26.4V                  |
| Input Current (Only for basic unit) | 120mA   DC24V                  |
| Allow momentary power off time      | 10mS   DC24V                   |
| Impulse Current                     | 10A   DC26.4V                  |
| Maximum Power Consumption           | 12W                            |
| Power Supply for Sensor             | 24VDC $\pm 10\%$ maximum 400mA |

## 4-2. AC Power DC Input Type

### 1 Connection



※1: Connect the power supply to L, N terminals

※2: 24V、COM can supply 400mA/DC24V power supply. Do not give these two terminals power supply

※3: . terminals are blank terminals, please do not wire them or use them as middle relays

※4: Please connect the COM terminals on basic units and expansions together

## 5 Input Specifications and Wiring Methods

---

In this chapter, we tell the input specification and external wiring methods of XC series PLC. The connection method differs according to different model; the main reason is the terminal's position. For each model's terminal arrangement, please refer to chapter 2-3.

|                          |
|--------------------------|
| 5-1. Input Specification |
|--------------------------|

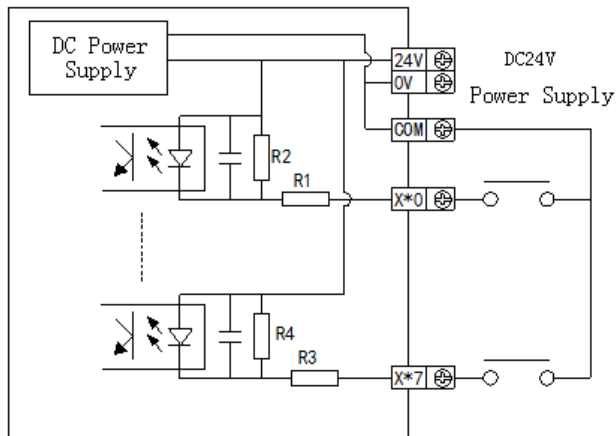
|                                             |
|---------------------------------------------|
| 5-2. DC Input Signal (AC power supply type) |
|---------------------------------------------|

|                               |
|-------------------------------|
| 5-3. High Speed counter input |
|-------------------------------|

## 5-1. Input Specification

### 1 Basic Units

|                        |                                                |
|------------------------|------------------------------------------------|
| Input signal's voltage | DC24V±10%                                      |
| Input signal's current | 7mA/DC24V                                      |
| Input ON current       | Up to 4.5mA                                    |
| Input OFF current      | Low than 1.5mA                                 |
| Input response time    | About 10ms                                     |
| Input signal's format  | Contact input or NPN open collector transistor |
| Circuit insulation     | Photo-electricity coupling insulation          |
| Input action's display | LED light when input ON                        |



### 2 Expansion Modules

|                        |                                                |
|------------------------|------------------------------------------------|
| Input signal's voltage | DC24V±10%                                      |
| Input signal's current | 7mA/DC24V                                      |
| Input ON current       | Up to 4.5mA                                    |
| Input OFF current      | Low than 1.5mA                                 |
| Input response time    | About 10ms                                     |
| Input signal's format  | Contact input or NPN open collector transistor |
| Circuit insulation     | Photo-electricity coupling insulation          |
| Input action's display | LED light when input ON                        |

## 5-2. DC Input Signal (AC Power Supply Type)

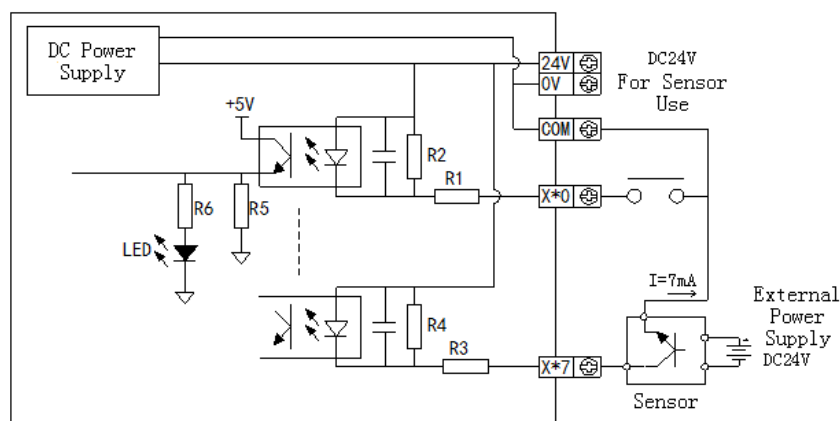
DC  
Input Signal

- **Input terminal**  
When connect input terminal and **COM** terminal with contacts without voltage or NPN open collector transistor, if input is ON, LED lamp lights, which indicates input. There are many **COM** terminals to connect in PLC.
- **Input circuit**  
Use optical coupling instrument to insulate the input once circuit and twice circuit, There's a C-R filter in the twice circuit. It is set to avoid wrong operation caused by vibration of input contacts or noise along with input signal. As the preceding reason, for the changing of input ON→OFF, OFF→ON, in PLC, the response time delays about 10ms. There's a digital filter inside X000~X015. This kind of filter can vary from 0~15ms according to the special register (FD8000).
- **Input sensitive**  
The PLC's input current is DC24V 7mA, but to be safe, it needs current up to 3.5mA when it's ON, lower than 1.5mA when it's OFF.

2

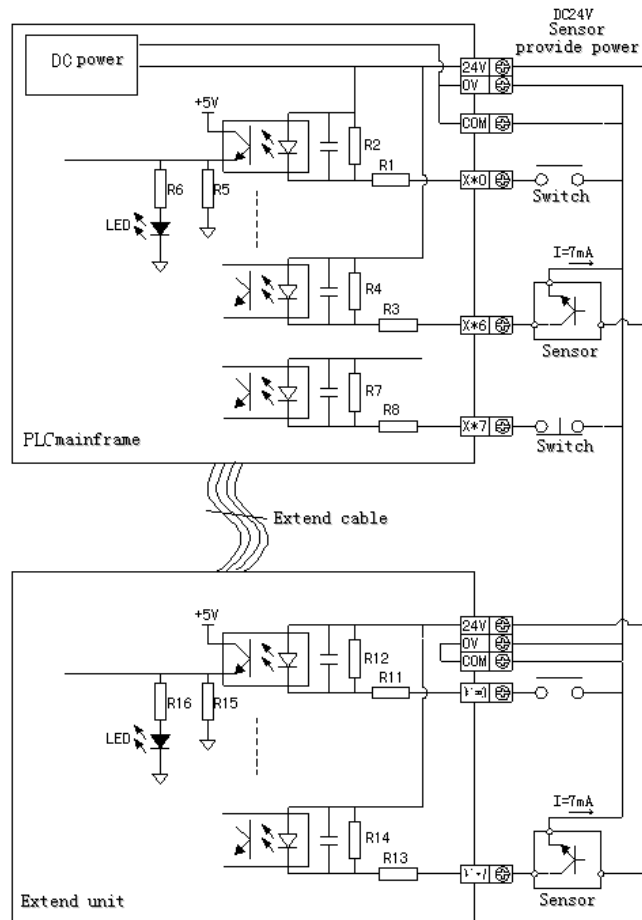
### External circuit used by sensors

XC series PLC input power is from its interior 24V power, if the exterior power drives photo-electricity sensor etc., this exterior power should be DC24V±4V. Please use NPN open collector type for sensor output transistor



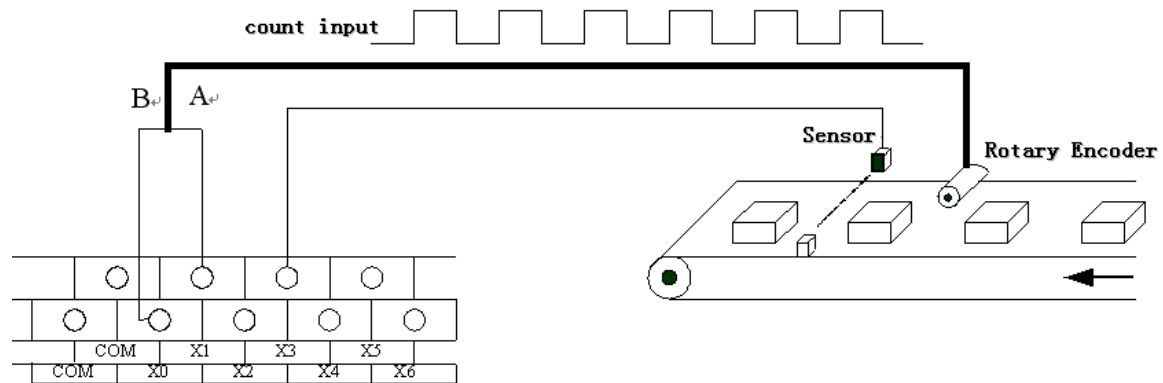
3

### Input Wiring



### 5-3. High Speed Counter Input

XC series PLC support high speed count function which is independent with the scan cycle. Via choosing different counter, testing the high speed input signal comes from sensor and rotary encoder. The highest testing frequency can reach 80 KHz.

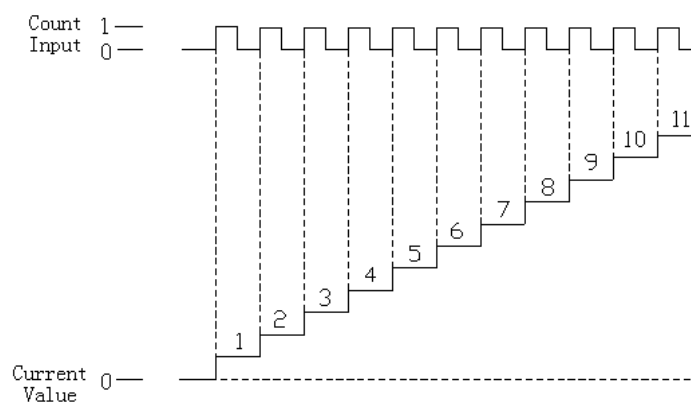


#### 5-3-1. Count Mode

XC series HSC function has three count modes: Increment mode, Pulse+Direction mode, AB-phase mode;

##### 1 Increment Mode

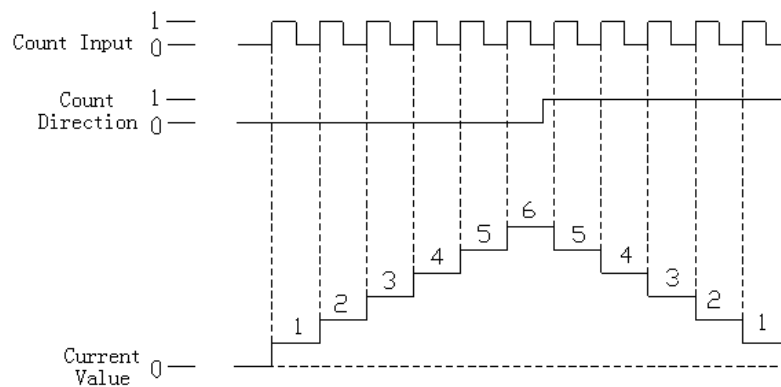
Under this mode, input the pulse signal, the count value increase with every rising edge of pulse signal;



##### 2 Pulse+Direction Mode

Under this mode, input the pulse signal and direction signal together. The count value increase or

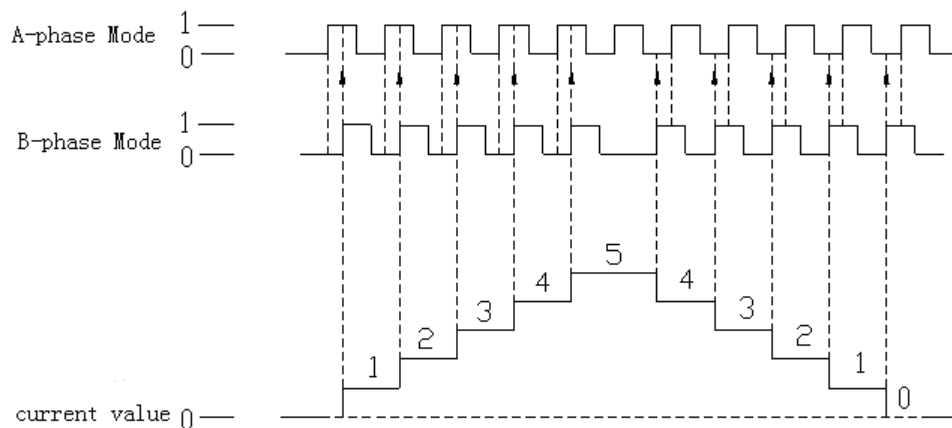
decrease according to the direction status. If the count direction is OFF, do increment count with the input's rising edge; if the count direction is ON, do decrement count with the input's rising edge;

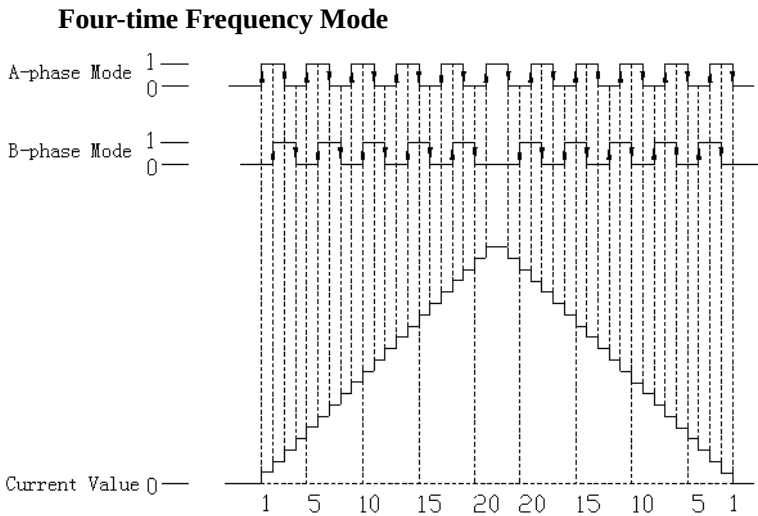


### 3 AB Phase Mode

Under this mode, the HSC value increase or decrease according to the two difference signal (A phase or B phase). According to the times number, we have also one-time frequency mode and four-time frequency mode. The default mode is four-time frequency mode.

#### One-time Frequency Mode





**5-3-2. High Speed Count Range**

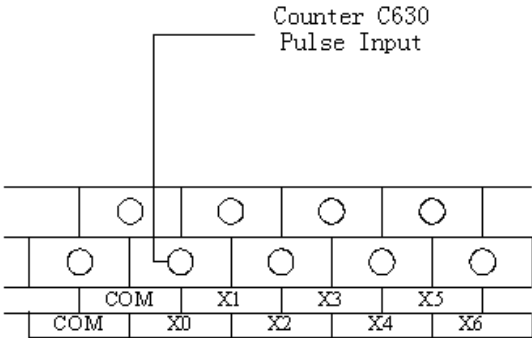
The HSC's count range is: K-2,147,483,648 ~ K+2,147,483,647. If the count value exceeds this range, up-flow or down-flow appears;

The up-flow means: the count value jumps from K+2,147,483,647 to be K-2,147,483,648 then continue to count; the up-flow means: the count value jumps from K-2,147,483,648 to be K+2,147,483,647, then continue to count;

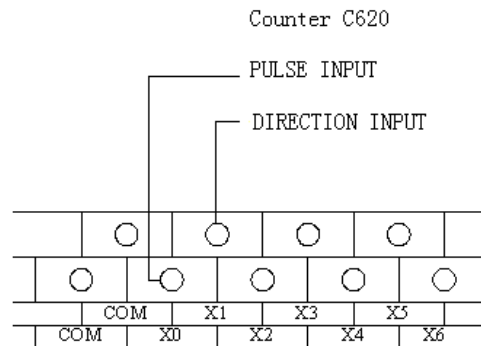
**5-3-3. The Input Wiring Of HSC**

For the input wiring of pulse, it differs according to PLC's model and counter's model. Below, we show several typical wiring methods (take XC3-48 PLC as the example):

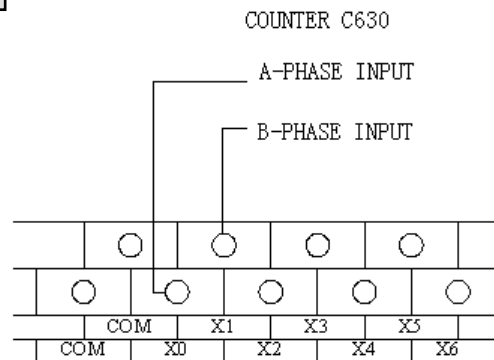
**1 Increment Mode**



2

**Pulse+Direction  
Mode**

3

**AB Phase Mode****5-3-3. Input Terminals Assignment**

## 1、High Speed counters Assignment of XC series PLC:

| PLC model  |          | High speed counter channels |                      |               |
|------------|----------|-----------------------------|----------------------|---------------|
|            |          | Incremental mode            | Pulse+direction mode | AB phase mode |
| XC2 series |          | 5                           | 2                    | 2             |
| XC3 series | 14       | 4                           | 2                    | 2             |
|            | 24/32/42 | 6                           | 3                    | 3             |
|            | 48/60    | 4                           | 2                    | 2             |
| XC5 series | 24/32    | 2                           | 1                    | 1             |
|            | 48/60    | 6                           | 3                    | 3             |
| XCM series | 24/32 T4 | 2                           | 1                    | 1             |
|            | 32 T3    | 4                           | 2                    | 2             |
|            | 60       | 4                           | 0                    | 3             |

|            |    |   |   |   |
|------------|----|---|---|---|
| XCC series | 32 | 5 | 0 | 5 |
|------------|----|---|---|---|

## 2、Input Terminals of HSC:

Each letter's description:

| U                     | Dir                                                                             | A             | B             |
|-----------------------|---------------------------------------------------------------------------------|---------------|---------------|
| Counter's pulse input | Counter's direction judgment<br>(OFF: increment counter, ON: decrement counter) | A phase input | B phase input |

Normally, X0, X1 terminals' input frequency can reach 80KHz under single-phase and AB phase mode; the other terminal's input frequency can reach 10KHz under single-phase mode and 5KHz under AB phase mode. If X input terminals are not used as high speed input port, they can be used as common input terminals. The detailed port assignment is shown below:

| XC2 series PLC       |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
|----------------------|----------------|------|------|------|------|------|------|------|------|------|------------------------|------|------|------|------|---------------|------|------|
|                      | Increment Mode |      |      |      |      |      |      |      |      |      | Pulse + direction mode |      |      |      |      | AB phase mode |      |      |
|                      | C600           | C602 | C604 | C606 | C608 | C610 | C612 | C614 | C616 | C618 | C620                   | C622 | C624 | C626 | C628 | C630          | C632 | C634 |
| Highest frequency    | 80K            | 80K  | 10K  | 10K  | 10K  |      |      |      |      |      | 80K                    | 10K  |      |      |      | 80K           | 5K   |      |
| 4 times frequency    |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      | √             |      |      |
| Counter interruption | √              | √    | √    | √    | √    |      |      |      |      |      | √                      |      |      |      |      | √             |      |      |
| X000                 | U              |      |      |      |      |      |      |      |      |      | U                      |      |      |      |      | A             |      |      |
| X001                 |                | U    |      |      |      |      |      |      |      |      | Dir                    |      |      |      |      | B             |      |      |
| X002                 |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X003                 |                |      | U    |      |      |      |      |      |      |      |                        | U    |      |      |      |               | A    |      |
| X004                 |                |      |      |      |      |      |      |      |      |      |                        | Dir  |      |      |      |               | B    |      |
| X005                 |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X006                 |                |      |      | U    |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X007                 |                |      |      |      | U    |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X010                 |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X011                 |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X012                 |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |

Note:

- XC2-16: C600, C602, C620, C630 max frequency is 10KHz;
- XC2-14: max frequency is 10 KHz.



| XC3-48、 60 PLC  |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
|-----------------|----------------|------|------|------|------|------|------|------|------|------|------------------------|------|------|------|------|---------------|------|------|
|                 | Increment Mode |      |      |      |      |      |      |      |      |      | Pulse + direction mode |      |      |      |      | AB phase mode |      |      |
|                 | C600           | C602 | C604 | C606 | C608 | C610 | C612 | C614 | C616 | C618 | C620                   | C622 | C624 | C626 | C628 | C630          | C632 | C634 |
| Max. Freq.      | 80K            | 80K  | 10K  | 10K  |      |      |      |      |      |      | 80K                    | 80K  |      |      |      | 80K           | 80K  |      |
| 4-time Freq.    |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               | √    |      |
| Count Interrupt | √              | √    | √    | √    |      |      |      |      |      |      |                        | √    |      |      |      |               | √    |      |
| X000            | U              |      |      |      |      |      |      |      |      |      | U                      |      |      |      |      | A             |      |      |
| X001            |                |      |      |      |      |      |      |      |      |      | Dir                    |      |      |      |      | B             |      |      |
| X002            |                | U    |      |      |      |      |      |      |      |      |                        | U    |      |      |      |               | A    |      |
| X003            |                |      |      |      |      |      |      |      |      |      |                        | Dir  |      |      |      |               | B    |      |
| X004            |                |      | U    |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X005            |                |      |      | U    |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |

| XC3-24/32/42 PLC and XC5-48/60 PLC |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |      |               |      |      |
|------------------------------------|----------------|------|------|------|------|------|------|------|------|------|----------------------|------|------|------|------|---------------|------|------|
|                                    | Increment Mode |      |      |      |      |      |      |      |      |      | Pulse+Direction Mode |      |      |      |      | AB phase Mode |      |      |
|                                    | C600           | C602 | C604 | C606 | C608 | C610 | C612 | C614 | C616 | C618 | C620                 | C622 | C624 | C626 | C628 | C630          | C632 | C634 |
| Max. Freq.                         | 80K            | 80K  | 10K  | 10K  | 10K  | 10K  |      |      |      |      | 80K                  | 10K  | 10K  |      |      | 80K           | 5K   | 5K   |
| 4-time Freq.                       |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |      | √             |      | √    |
| Count Interrupt                    | √              | √    | √    | √    | √    | √    |      |      |      |      | √                    |      |      |      |      | √             |      |      |
| X000                               | U              |      |      |      |      |      |      |      |      |      | U                    |      |      |      |      | A             |      |      |
| X001                               |                | U    |      |      |      |      |      |      |      |      | Dir                  |      |      |      |      | B             |      |      |
| X002                               |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |      |               |      |      |
| X003                               |                |      | U    |      |      |      |      |      |      |      |                      | U    |      |      |      |               | A    |      |
| X004                               |                |      |      |      |      |      |      |      |      |      |                      | Dir  |      |      |      |               | B    |      |
| X005                               |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |      |               |      |      |
| X006                               |                |      |      | U    |      |      |      |      |      |      |                      |      | U    |      |      |               |      | A    |
| X007                               |                |      |      |      |      |      |      |      |      |      |                      |      | Dir  |      |      |               |      | B    |
| X010                               |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |      |               |      |      |
| X011                               |                |      |      |      | U    |      |      |      |      |      |                      |      |      |      |      |               |      |      |
| X012                               |                |      |      |      |      | U    |      |      |      |      |                      |      |      |      |      |               |      |      |

Note: XC5-48/60: C622 and C632 max frequency is 80 KHz.

| XC5-24/32 PLC、XCM-24/32 T4 PLC |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
|--------------------------------|----------------|------|------|------|------|------|------|------|------|------|------------------------|------|------|------|------|---------------|------|------|
|                                | Increment Mode |      |      |      |      |      |      |      |      |      | Pulse + direction mode |      |      |      |      | AB phase mode |      |      |
|                                | C600           | C602 | C604 | C606 | C608 | C610 | C612 | C614 | C616 | C618 | C620                   | C622 | C624 | C626 | C628 | C630          | C632 | C634 |
| Max. Freq.                     | 80K            | 10K  |      |      |      |      |      |      |      |      | 80K                    |      |      |      |      | 80K           |      |      |
| 4-time Freq.                   |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      | √             |      |      |
| Count Interrupt                | √              | √    |      |      |      |      |      |      |      |      | √                      |      |      |      |      | √             |      |      |
| X000                           | U              |      |      |      |      |      |      |      |      |      | U                      |      |      |      |      | A             |      |      |
| X001                           |                |      |      |      |      |      |      |      |      |      | Dir                    |      |      |      |      | B             |      |      |
| X002                           |                |      |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |
| X003                           |                | U    |      |      |      |      |      |      |      |      |                        |      |      |      |      |               |      |      |

| XCC-32 PLC      |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |      |  |  |  |
|-----------------|----------------|------|------|------|------|------|------|------|------|------|----------------------|------|------|------|------|--|--|--|
|                 | Increment Mode |      |      |      |      |      |      |      |      |      | Pulse+Direction Mode |      |      |      |      |  |  |  |
|                 | C600           | C602 | C604 | C606 | C608 | C610 | C612 | C614 | C616 | C618 | C630                 | C632 | C634 | C636 | C638 |  |  |  |
| Max. Freq.      | 80K            | 80K  | 80K  | 10K  | 10K  |      |      |      |      |      | 80K                  | 80K  | 80K  | 10K  | 10K  |  |  |  |
| 4-time Freq.    |                |      |      |      |      |      |      |      |      |      | √                    | √    | √    | √    | √    |  |  |  |
| Count Interrupt | √              | √    | √    | √    | √    |      |      |      |      |      | √                    | √    | √    | √    | √    |  |  |  |
| X000            | U              |      |      |      |      |      |      |      |      |      | A                    |      |      |      |      |  |  |  |
| X001            |                |      |      |      |      |      |      |      |      |      | B                    |      |      |      |      |  |  |  |
| X002            |                | U    |      |      |      |      |      |      |      |      |                      | A    |      |      |      |  |  |  |
| X003            |                |      |      |      |      |      |      |      |      |      |                      | B    |      |      |      |  |  |  |
| X004            |                |      | U    |      |      |      |      |      |      |      |                      |      | A    |      |      |  |  |  |
| X005            |                |      |      |      |      |      |      |      |      |      |                      |      | B    |      |      |  |  |  |
| X006            |                |      |      | U    |      |      |      |      |      |      |                      |      |      | A    |      |  |  |  |
| X007            |                |      |      |      |      |      |      |      |      |      |                      |      |      | B    |      |  |  |  |
| X010            |                |      |      |      | U    |      |      |      |      |      |                      |      |      |      | A    |  |  |  |
| X011            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      | B    |  |  |  |

Note: X7 cannot used with Y0 at the same time.

| XCM-60T         |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      |      |      |
|-----------------|----------------|------|------|------|------|------|------|------|------|------|----------------------|------|------|------|---------------|------|------|------|
|                 | Increment Mode |      |      |      |      |      |      |      |      |      | Pulse+Direction Mode |      |      |      | AB phase Mode |      |      |      |
|                 | C600           | C602 | C604 | C606 | C608 | C610 | C612 | C614 | C616 | C618 | C620                 | C622 | C624 | C626 | C628          | C630 | C632 | C634 |
| Max. Freq.      | 80K            | 10K  | 10K  | 10K  |      |      |      |      |      |      |                      |      |      |      |               | 80K  | 10K  | 10K  |
| 4-time Freq.    |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               | √    | √    | √    |
| Count Interrupt | √              | √    |      |      |      |      |      |      |      |      |                      |      |      |      |               | √    |      |      |
| X000            | U              |      |      |      |      |      |      |      |      |      |                      |      |      |      |               | A    |      |      |
| X001            |                | U    |      |      |      |      |      |      |      |      |                      |      |      |      |               | B    |      |      |
| X002            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      |      |      |
| X003            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      |      |      |
| X004            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      |      |      |
| X005            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      |      |      |
| X006            |                |      | U    |      |      |      |      |      |      |      |                      |      |      |      |               |      | A    |      |
| X007            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      | B    |      |
| X010            |                |      |      | U    |      |      |      |      |      |      |                      |      |      |      |               |      |      | A    |
| X011            |                |      |      |      |      |      |      |      |      |      |                      |      |      |      |               |      |      | B    |

**5-3-4. AB Phase Counter's Frequency Multiplication Setting**

To AB phase counter, user can modify the value in FLASH data registers FD8241, FD8242, FD8243 to set the frequency multiplication value. When the value is one, it is one time frequency; when the value is four, it is 4 times frequency.

| Register | Function                         | Setting Value | Content          |
|----------|----------------------------------|---------------|------------------|
| FD8241   | Frequency Multiplication of C630 | 1             | 1 time frequency |
|          |                                  | 4             | 4 time frequency |
| FD8242   | Frequency Multiplication of C632 | 1             | 1 time frequency |
|          |                                  | 4             | 4 time frequency |
| FD8243   | Frequency Multiplication of C634 | 1             | 1 time frequency |
|          |                                  | 4             | 4 time frequency |

※1: For more information about high speed counter, please refer to XC series PLC instruction manual

※2: To some special model, only one axis can be set as one time frequency or 4 times frequency, the left two axes are separately one time frequency and 4 times frequency.

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## 6 Output Specification and Wiring Methods

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In this chapter, we tell the output specification and external wiring methods of XC series PLC. The connection method differs according to different model; the main reason is the terminal's position. For each model's terminal arrangement, please refer to chapter 2-3;

|                            |
|----------------------------|
| 6-1. Output Specifications |
|----------------------------|

|                        |
|------------------------|
| 6-2. Relay Output Type |
|------------------------|

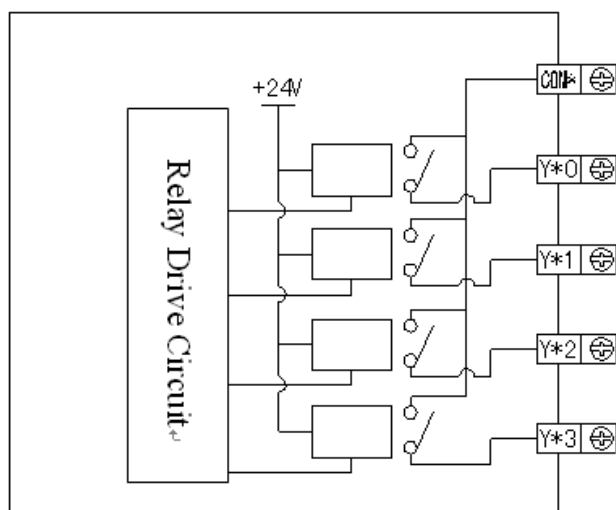
|                             |
|-----------------------------|
| 6-3. Transistor Output Type |
|-----------------------------|

## 6-1. Output Specification

1

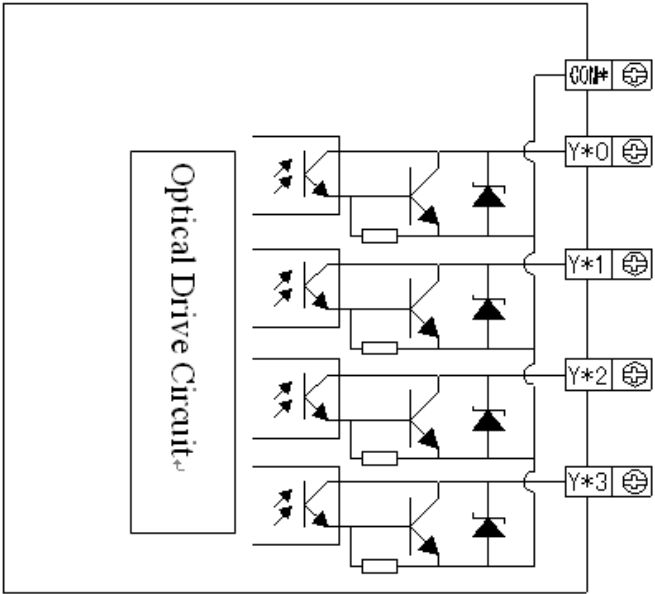
### Relay Output

|                             |                |                      |
|-----------------------------|----------------|----------------------|
| Interior power              |                | Below AC250V、DC30V   |
| Circuit insulation          |                | Mechanism insulation |
| Action denote               |                | LED indicate lamp    |
| Max load                    | Resistant load | 3A                   |
|                             | Induce load    | 80VA                 |
|                             | Lamp load      | 100W                 |
| Open circuit's leak current |                | -                    |
| Mini load                   |                | DC5V 2mA             |
| Response time               | OFF→ON         | 10ms                 |
|                             | ON→OFF         | 10ms                 |



|   |                                     |
|---|-------------------------------------|
| 2 | <b>Normal Transistor<br/>Output</b> |
|---|-------------------------------------|

|                             |                 |                             |
|-----------------------------|-----------------|-----------------------------|
| Interior power              |                 | Below DC5~30V               |
| Circuit insulation          |                 | Optical coupling insulation |
| Action denote               |                 | Indicate lamp LED           |
| Max load                    | Resistance load | 0.5A                        |
|                             | Induce load     | 12W/DC24V                   |
|                             | Lamp load       | 1.5W/DC24V                  |
| Open circuit's leak current |                 | -                           |
| Mini load                   |                 | DC5V 2mA                    |
| Response time               | OFF→ON          | Below 0.2ms                 |
|                             | ON→OFF          | Below 0.2ms                 |



|   |                                |
|---|--------------------------------|
| 3 | <b>High Speed Pulse Output</b> |
|---|--------------------------------|

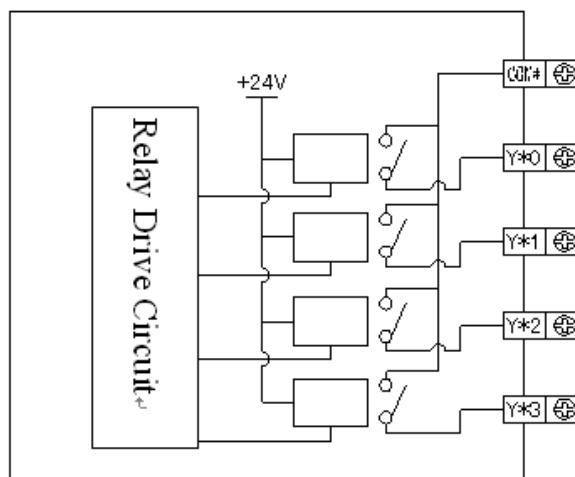
|                                  |                                                   |
|----------------------------------|---------------------------------------------------|
| Model                            | RT or T Type                                      |
| High Speed Pulse Output Terminal | Common models are Y0、Y1； XC5-24/32 model is Y0~Y3 |
| External Power Supply            | Below DC5~30V                                     |
| Action Indication                | LED Lamp                                          |
| Maximum Current                  | 50mA                                              |
| Max output frequency of pulse    | 200KHZ                                            |

Note: 1. XCM-24/32T4、XCM-24/32T3、XCM-60T、XCC-32: the high speed pulse output terminals are Y0~Y3、Y0~Y2、Y0~Y11、Y0~Y4.

2. High speed pulse output terminal Y1 cannot use together with expansion BD.

|  |                               |
|--|-------------------------------|
|  | <b>6-2. Relay Output Type</b> |
|--|-------------------------------|

|   |                             |
|---|-----------------------------|
| 1 | <b>Relay Output Circuit</b> |
|---|-----------------------------|



- **Output terminals**  
Relay output type includes 2~4 public terminals. So each public-end unit can drive different power-voltage system's (E.g.: AC200V, AC100V, DC24V etc.) load.
- **Circuit's insulation**  
Between the relay output coils and contacts, PLC's interior circuits and exterior circuits, load circuits are electric insulation. Besides, each public-end blocks are separate.

- **Action display**

LED lamp lights when output relay's coils galvanize, output contacts are ON.

- **Response time**

From the output relay galvanize (or cut) to the output contacts be ON (or OFF), the response time is about 10ms

- **Output current**

The current-voltage below AC250V can drive the load of pure resistance 2A/1 point、inductance load below 80VA (AC100V or AC200V) and lamp load below 100W (AC100V or AC200V) .

- **Open circuit's leak current**

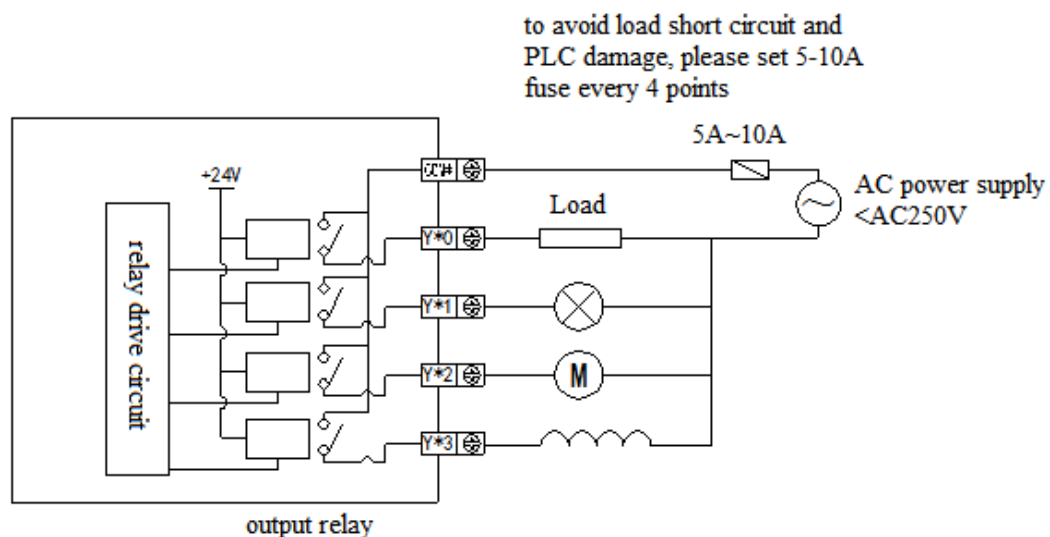
When the output contact be OFF and there's no leak current, can directly drive Ne lamp etc.

- **The life of relay output contacts**

Standard life of induce AC load such as contactor、electromagnetism valve: 5 million times for 20VA load. Cut power device's life according to the company's test: for 80VA load, the action life is up to 2 million times. But if the load parallel connection with surge absorber, the life will be greatly improved.

2

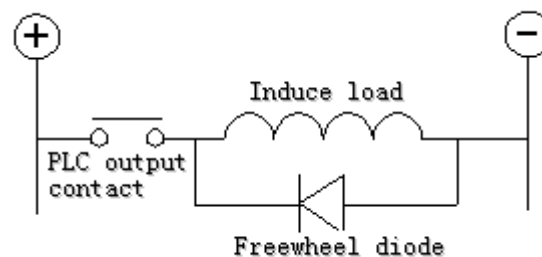
## Output Connection Example



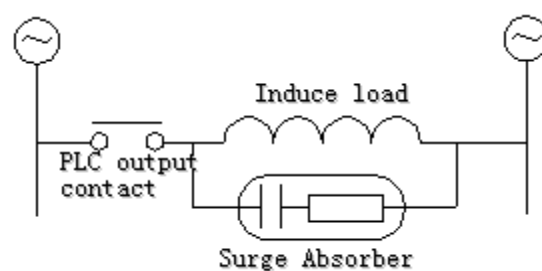
|   |                                       |
|---|---------------------------------------|
| 3 | <b>Constitution of output circuit</b> |
|---|---------------------------------------|

- For DC induce load, please parallel connect with commutate diode. If not connect with the commutate diode, the contact's life will be decreased greatly. Please choose the commutate diode which allow inverse voltage endurance up to 5~10 times of the load's voltage, ordinal current exceeds load current.
- Parallel connect AC induce load with surge absorber can reduce noise.

|   |                |
|---|----------------|
| 4 | <b>DC Load</b> |
|---|----------------|



|   |                |
|---|----------------|
| 5 | <b>AC Load</b> |
|---|----------------|



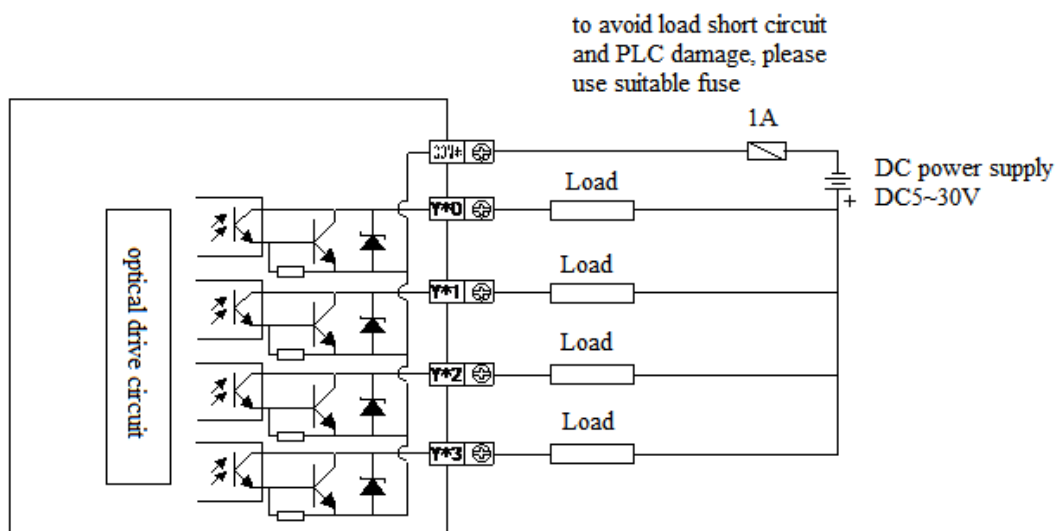
### 6-3. Transistor Output Type

Transistor output models support high speed pulse output and normal transistor these two types;

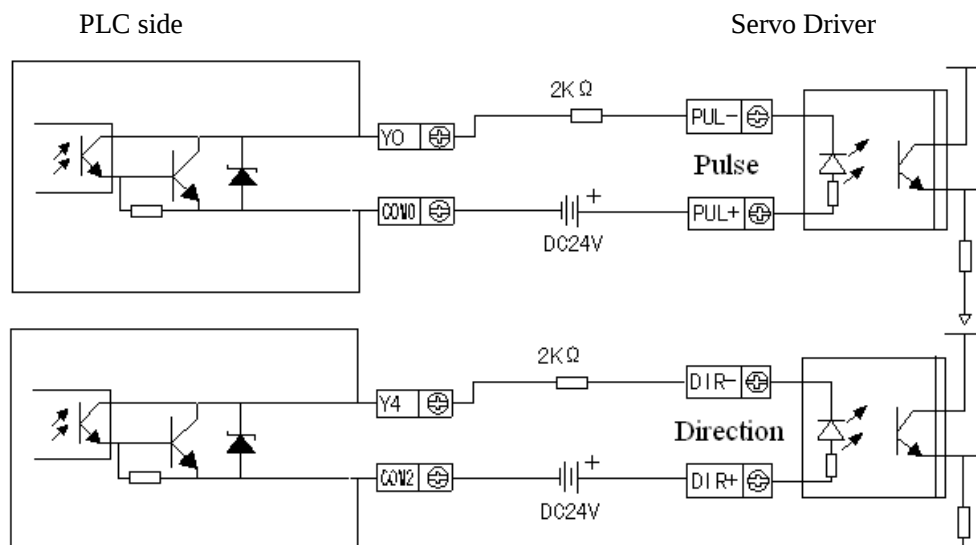
1

#### Normal Transistor Output

- Output Terminals  
There are 1~4 COM outputs on transistor output type CPU units
- External Power Supply  
Please use DC5~30V power supply to drive the load drive.
- Circuit Isolation  
Inside PLC, we use optical couples to isolate the internal circuit with the output transistors; besides, public blocks isolate to each other.
- Action Indication  
When driving optical couples, LED will be ON, the output transistors will be ON;
- Response Time  
From optical couple being ON (or OFF) to transistor being ON (or OFF), PLC needs time below 0.2ms.
- Output current  
Each output's current is 0.3A. But limited by the temperature rising, every 4 points' total current should be below 0.8A.
- Open circuit current  
Below 0.1mA



E.g.: Below is the connection diagram of RT/T type PLC with servo driver:



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

## 7 Run, Debug, Maintenance

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In this chapter, we tell the whole using process of PLV, from programming till using. It includes running, debug and maintenance of PLC.

|                    |
|--------------------|
| 7-1. Run and Debug |
|--------------------|

|                        |
|------------------------|
| 7-2. Daily Maintenance |
|------------------------|

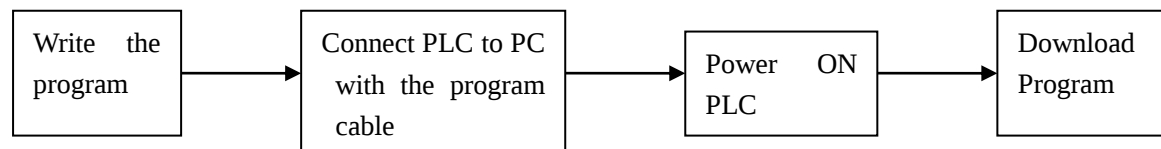
## 7-1. Run and Debug

### 1 Check the Products

When get the products, please check if the input/output terminals are correct, if there is any component missed. Generally, you can power on the PLC directly at this time. Check if PWR and RUN LED are ON.

### 2 Write and Download the Program

After confirming the products, please write the program for PLC. You can write the program via computer. Then download the program to your PLC. The general operation steps are listed below:



※1: Please link the download cable before you power on the PLC. Or else the COM port will be easily damaged! The method to connect BD card and expansion is same.

### 3 Debug the Products

In Ideal condition, PLC is in running mode. But if you find some mistakes in the program and you need to modify the program, you should write the new program to the running PLC;

- Connect PLC to PC with the program cable
- Upload the program in PLC
- Modify the uploaded program; we suggest you to save the modified program;
- Pause the running of PLC, download the modified program to PLC;
- Use ladder monitor, free monitor to monitor PLC
- If the program still cannot fulfill your requirement, you can go on modify it and download to PLC.

### 4 LED on PLC

- When PLC is running correctly, the **PWR** and **RUN** LED should keeps be ON;

- If **ERR** LED keeps be ON, it indicates that PLC running is in error, please correct the program in time
- If **PWR** LED is OFF, it indicates that the power supply is in error, please check your wiring;

## 7-2. Daily Maintenance

### 1 Regular Check on Products

Even the PLC has certain anti-interfere ability and strong stability, you should check the PLC regularly.

The check items include:

- Check if the input/output terminals, power supply terminals are loosen
- Check if the COM ports are correct
- Check if the PWR LED, I/O LED can be ON
- Clear the dusts on PLC, to avoid the dusts fall into PLC
- Manage to make PLC running, the storage environment fits the standard told in chapter 2-1-1

### 2 About the battery

There is no any component in PLC to shorten the life of the battery, so the battery can work all the time. However, if your PLC supports clock function, you should change the battery regularly.

- The battery's life is usually 3~5 years;
- If you need the replay output PLC type, and the relay needs to open/close frequently, or drive large capacity load, the battery's life may be decreased
- If you find battery's power decreased, please change it at your earliest
- After changing the battery, please power it on at your earliest, or else the battery will run out of power automatically.

### 3 Abandon

If you make sure to abandon the products, please treat the products as the industrial waste.

## 8 Expansion Devices

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XC series PLC expansions include expansion modules and expansion BD cards. The expansion modules include input/output expansion module, analogue, temperature expansion modules; BD cards include analogue temperature, communication applications etc. Via the expansion devices, XC series PLC is applied widely to temperature, flow, liquid, pressure fields etc.

|                       |
|-----------------------|
| 8-1. Module's Summary |
|-----------------------|

|                           |
|---------------------------|
| 8-2. Input/output modules |
|---------------------------|

|                                   |
|-----------------------------------|
| 8-3. Analogue Temperature Modules |
|-----------------------------------|

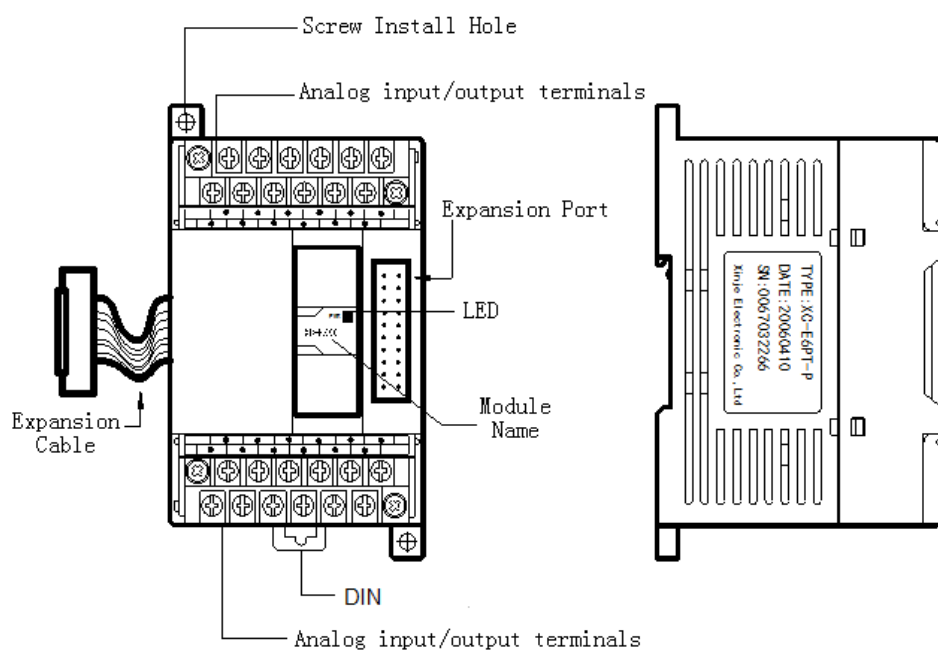
|                         |
|-------------------------|
| 8-4. Expansion BD cards |
|-------------------------|

## 8-1. MODULES SUMMARY

### 1 General Specifications

| Item                      | Content                                                      |
|---------------------------|--------------------------------------------------------------|
| Using environment         | No corrosive gas                                             |
| Environmental Temperature | 0°C~60°C                                                     |
| Stock temperature         | -20~70°C                                                     |
| Environmental Humidity    | 5~95%                                                        |
| Stock Humidity            | 5~95%                                                        |
| Installation              | Use M3 screws to fix or install on DIN46277 (width 35mm) DIN |

### 2 Module's Structure

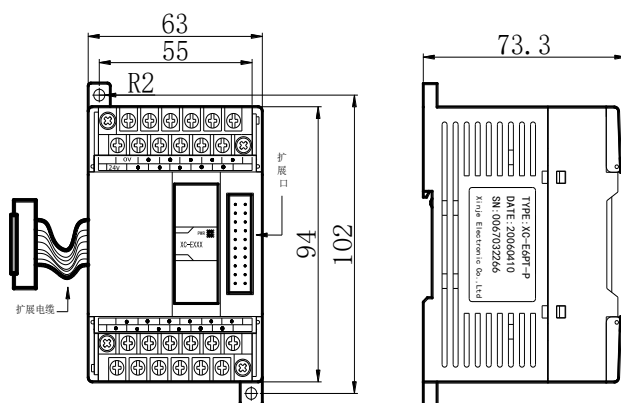


| Name                    | Function                                                  |
|-------------------------|-----------------------------------------------------------|
| Power Supply Indication | The LED is ON when power on the module                    |
| Module Name             | The model name of this special module                     |
| Expansion Port          | Link with other expansion module                          |
| Analogue input/output   | Used to connect with analogue input/output and peripheral |

|                     |                                                                        |
|---------------------|------------------------------------------------------------------------|
| terminal            | equipments, can be removed                                             |
| DIN guild rail      | Used to install the module directly                                    |
| Screws install hole | Put M3 screw in the hole to finish installation                        |
| Expansion Cable     | Realize data transfer by linking this cable to with PLC extension port |

### 3 External Dimension

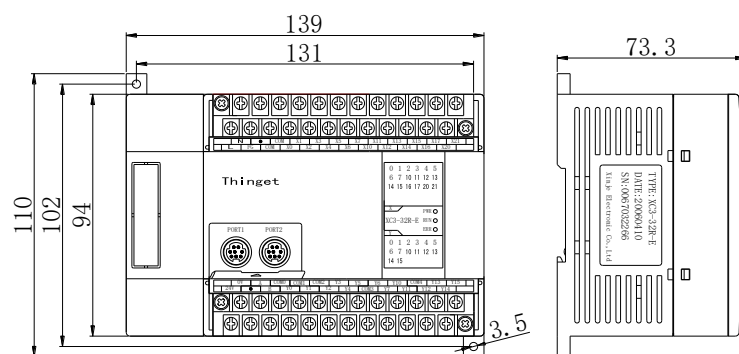
#### ● Graph 1 (Unit: mm)



#### Suitable Models

| Module Type          | Model      |
|----------------------|------------|
| Digital Input/output | 8I/O、16I/O |
| Analogue             | All        |
| Temperature          | All        |
| Mixture              | All        |

#### ● Graph 2 (Unit: mm)

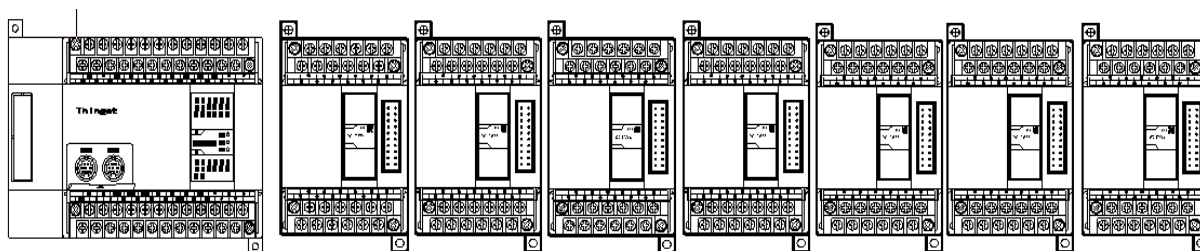


#### Suitable Models

| Module Type          | Model |
|----------------------|-------|
| Digital Input/output | 32I/O |
| Analogue             | None  |
| Temperature          | None  |
| Mixture              | None  |

### 4 Module Configuration

XC series modules can connect on the right side of XC-PLC main units:



- Digital input/output quantity is in octal form;
- Input/output analog is in decimal form
- PLC main units can work with seven expansions and one extra BD card. The expansion module can be any type (analog or digital, temperature);

## 8-2. Digital Input/output Modules

Input/output expansions, I/O ranges 8~32, Input type, output type, input/output type, transistor output, relay output etc.

### 1 Model List

The detailed models are listed below:

| Model       |          |              |                      | I/O Nr. | Input Nr.<br>(DC24V) | Output<br>Nr.<br>(R,T) |
|-------------|----------|--------------|----------------------|---------|----------------------|------------------------|
|             | Input    | Output       |                      |         |                      |                        |
|             |          | Relay Output | Transistor<br>Output |         |                      |                        |
| N<br>P<br>N | XC-E8X   | -            | -                    | 8       | 8                    | -                      |
|             | -        | XC-E8YR      | XC-E8YT              | 8       | -                    | 8                      |
|             | -        | XC-E8X8YR    | XC-E8X8YT            | 16      | 8                    | 8                      |
|             | XC-E16X  | -            | -                    | 16      | 16                   | -                      |
|             | -        | XC-E16YR     | XC-E16YT             | 16      | -                    | 16                     |
|             | -        | XC-E16X16YR  | XC-E16X16YT          | 32      | 16                   | 16                     |
|             | XC-E32X  | -            | -                    | 32      | 32                   | -                      |
|             | -        | XC-E32YR     | -                    | 32      | -                    | 32                     |
| P<br>N<br>P | XC-E8PX  | -            | -                    | 8       | 8                    | -                      |
|             | -        | XC-E8YR      | XC-E8YT              | 8       | -                    | 8                      |
|             | -        | XC-E8PX8YR   | XC-E8PX8YT           | 16      | 8                    | 8                      |
|             | XC-E16PX | -            | -                    | 16      | 16                   | -                      |
|             | -        | XC-E16YR     | XC-E16YT             | 16      | -                    | 16                     |
|             | -        | XC-E16PX16YR | XC-E16PX16YT         | 32      | 16                   | 16                     |
|             | XC-E32PX | -            | -                    | 32      | 32                   | -                      |
|             | -        | XC-E32YR     | -                    | 32      | -                    | 32                     |

|   |                             |
|---|-----------------------------|
| 2 | <b>Module Specification</b> |
|---|-----------------------------|

## Power Supply Specification

DC24V (32 I/O expansions is AC220V)

## ● Input Specification

| Input Items            | Content                                        |
|------------------------|------------------------------------------------|
| Input signal's voltage | DC24V±10%                                      |
| Input signal's current | 7mA/DC24V                                      |
| Input ON current       | Up to 4.5mA                                    |
| Input OFF current      | Low than 1.5mA                                 |
| Input response time    | About 10ms                                     |
| Input signal's format  | Contact input or NPN open collector transistor |
| Circuit insulation     | Photo-electricity coupling insulation          |
| Input action's display | LED light when input ON                        |

## ● Relay output

| Input Items        |          | Content              |
|--------------------|----------|----------------------|
| Internal power     |          | Below AC250V, DC30V  |
| Circuit insulation |          | Mechanism insulation |
| Action denote      |          | LED indicate lamp    |
| Max load           | 3A       | 3A                   |
|                    | 80VA     | 80VA                 |
|                    | 100W     | 100W                 |
| Min load           |          | DC5V 2mA             |
| Response time      | OFF → ON | 10ms                 |
|                    | ON → OFF | 10ms                 |

## ● Transistor Output

| Input Items        |            | Content                     |
|--------------------|------------|-----------------------------|
| Internal power     |            | Below DC5~30V               |
| Circuit insulation |            | Optical coupling insulation |
| Action denote      |            | Indicate lamp LED           |
| Max load           | 0.8A       | 0.8A                        |
|                    | 12W/DC24V  | 12W/DC24V                   |
|                    | 1.5W/DC24V | 1.5W/DC24V                  |

|               |          |             |
|---------------|----------|-------------|
| Min load      |          | DC5V 2mA    |
| Response time | OFF → ON | Below 0.2ms |
|               | ON → OFF | Below 0.2ms |

### 3 Terminal Arrangement

#### ● XC-E8X

|    |     |     |    |    |    |    |  |
|----|-----|-----|----|----|----|----|--|
|    | 24V | COM | X1 | X3 | X5 | X7 |  |
| OV | COM | X0  | X2 | X4 | X6 |    |  |
|    | ●   | ●   | ●  | ●  | ●  | ●  |  |
| ●  | ●   | ●   | ●  | ●  | ●  | ●  |  |

#### ● XC-E8YR, XC-E8YT

|      |      |      |    |      |    |    |  |
|------|------|------|----|------|----|----|--|
|      | ●    | ●    | ●  | ●    | ●  | ●  |  |
| ●    | ●    | ●    | ●  | ●    | ●  | ●  |  |
|      | Y0   | Y1   | Y2 | COM3 | Y5 | Y7 |  |
| COM0 | COM1 | COM2 | Y3 | Y4   | Y6 |    |  |

#### ● XC-E8X8YR, XC-E8X8YT

|      |      |      |    |      |    |    |  |
|------|------|------|----|------|----|----|--|
|      | 24V  | COM  | X1 | X3   | X5 | X7 |  |
| OV   | COM  | X0   | X2 | X4   | X6 |    |  |
|      | Y0   | Y1   | Y2 | COM3 | Y5 | Y7 |  |
| COM0 | COM1 | COM2 | Y3 | Y4   | Y6 |    |  |

#### ● XC-E16X

|     |     |     |     |     |     |    |  |
|-----|-----|-----|-----|-----|-----|----|--|
|     | 24V | COM | X1  | X3  | X5  | X7 |  |
| OV  | COM | X0  | X2  | X4  | X6  |    |  |
|     | COM | X11 | X13 | X15 | X17 | ●  |  |
| COM | X10 | X12 | X14 | X16 | ●   |    |  |

#### ● XC-E16YR, XC-E16YT

|      |      |      |     |      |     |     |  |
|------|------|------|-----|------|-----|-----|--|
|      | Y0   | Y1   | Y2  | COM3 | Y5  | Y7  |  |
| COM0 | COM1 | COM2 | Y3  | Y4   | Y6  |     |  |
|      | Y10  | Y11  | Y12 | COM7 | Y15 | Y17 |  |
| COM4 | COM5 | COM6 | Y13 | Y14  | Y16 |     |  |

#### ● XC-E32X

|     |    |     |     |     |     |     |     |     |     |     |     |   |  |
|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|--|
|     | N  | ●   | COM | X1  | X3  | X5  | X7  | X11 | X13 | X15 | X17 | ● |  |
| L   | FG | COM | X0  | X2  | X4  | X6  | X10 | X12 | X14 | X16 | ●   |   |  |
|     | OV | ●   | COM | X21 | X23 | X25 | X27 | X31 | X33 | X35 | X37 | ● |  |
| 24V | ●  | COM | X20 | X22 | X24 | X26 | X30 | X32 | X34 | X36 | ●   |   |  |

#### ● XC-E32YR, XC-E32YT

|   |    |      |    |    |      |    |      |     |     |      |     |     |  |
|---|----|------|----|----|------|----|------|-----|-----|------|-----|-----|--|
|   | N  | ●    | Y0 | Y2 | COM1 | Y5 | Y7   | Y20 | Y22 | COM3 | Y25 | Y27 |  |
| L | FG | COM0 | Y1 | Y3 | Y4   | Y6 | COM2 | Y21 | Y23 | Y24  | Y26 |     |  |

|     |    |      |     |     |      |     |      |     |     |      |     |     |  |
|-----|----|------|-----|-----|------|-----|------|-----|-----|------|-----|-----|--|
|     | 0V | ●    | Y20 | Y23 | COM5 | Y25 | Y27  | Y30 | Y32 | COM7 | Y35 | Y37 |  |
| 24V | ●  | COM4 | Y22 | Y23 | Y24  | Y25 | COM6 | Y31 | Y33 | Y34  | Y36 |     |  |

● XC-E16X16YR

|   |    |     |     |    |    |    |     |     |     |     |     |   |  |
|---|----|-----|-----|----|----|----|-----|-----|-----|-----|-----|---|--|
|   | N  | ●   | COM | X1 | X3 | X5 | X7  | X11 | X13 | X15 | X17 | ● |  |
| L | FG | COM | X0  | X2 | X4 | X6 | X10 | X12 | X14 | X16 | ●   |   |  |

|     |    |      |    |    |      |    |      |     |     |      |     |     |  |
|-----|----|------|----|----|------|----|------|-----|-----|------|-----|-----|--|
|     | 0V | ●    | Y0 | Y2 | COM1 | Y5 | Y7   | Y10 | Y12 | COM3 | Y15 | Y17 |  |
| 24V | ●  | COM0 | Y1 | Y3 | Y4   | Y6 | COM2 | Y11 | Y13 | Y14  | Y16 |     |  |

### 8-3. Analogue, Temperature Modules

As the special modules of XC series PLC, analogue and temperature modules can work with XC series PLC, apply in process controls like temperature, pressure, flow etc.

For details, please refer to 《XC series analogue/temperature expansions manual》

The detailed modules are listed below:

| Model         | Function                                                                                                               |
|---------------|------------------------------------------------------------------------------------------------------------------------|
| XC-E8AD       | 8 channels analog input (14bit); 4 channels current input, 4 channels voltage input                                    |
| XC-E4AD2DA    | 4 channels analog input (14bit); 2 channels analog output (12bit); current, voltage selectable                         |
| XC-E4AD       | 4 channels analog input (14bit); current, voltage selectable                                                           |
| XC-E4DA       | 4 channels analog output (12bit); current, voltage selectable                                                          |
| XC-E2DA       | 2 channels analog output (12bit); current, voltage selectable                                                          |
| XC-E6PT-P     | -100°C ~ 350°C, 6 channels Pt100 temperature sampling, 0.1 degree precision, include PID operation                     |
| XC-E6TCA-P    | 0°C ~ 1000°C, 6 channels K type thermocouple temperature sampling module, 0.1 degree precision, include PID operation  |
| XC-E3AD4PT2DA | 3 channels current input (14bit), 4 channels Pt100 temperature sampling and 2 channels 10 bits voltage output          |
| XC-E2AD2PT2DA | 2 channels current input (14bit), 2 channels Pt100 temperature sampling (16bit), and 2 channels 10 bits voltage output |

### 8-3-1. XC-E8AD

#### 1 Brief Introduction

- 14 bits high precision analog input
- 8 channels analog input: The first four channels voltage input (0~5V、0~10V two kinds); The left 4 channels current input (0~20mA、4~20 mA two kinds)
- As special function module of XC, 7 models could be connected at most.
- Support PID auto tune function

#### 2 Specification

| Items                | Voltage input (0CH-3CH) | Current input (4CH-7CH) |
|----------------------|-------------------------|-------------------------|
| Analog input bound   | DC0~5V, 0~10V           | DC0~20mA, 4~20mA        |
| Max input bound      | ±18V                    | 0~40mA                  |
| Digital output bound | 14 bits binary data     |                         |
| PID control value    | 0~K4095                 |                         |
| Distinguish Ratio    | 1/16383 (14Bit)         |                         |
| Integrate Precision  | 0.8%                    |                         |
| Convert speed        | 20ms/channel            |                         |
| Power used by analog | DC24V±10%, 100mA        |                         |

#### 3 Terminal Arrangement

|     |    |      |     |     |     |    |  |
|-----|----|------|-----|-----|-----|----|--|
|     | 0V | ●    | C0  | C1  | C2  | C3 |  |
| 24V | ●  | .VI0 | VI1 | VI2 | VI3 |    |  |

|   |    |     |     |     |     |   |  |
|---|----|-----|-----|-----|-----|---|--|
|   | ●  | AI0 | AI1 | AI2 | AI3 | ● |  |
| ● | C0 | C1  | C2  | C3  | ●   |   |  |

| CH  | NAME | SIGNAL             | CH  | NAME | SIGNAL             |
|-----|------|--------------------|-----|------|--------------------|
| CH0 | AI0  | VI0+ voltage input | CH1 | AI1  | VI1+ voltage input |
|     | C0   | VI0- voltage input |     | C1   | VI1- voltage input |
| CH2 | AI2  | VI2+ voltage input | CH3 | AI3  | VI3+ voltage input |
|     | C2   | VI2- voltage input |     | C3   | VI3- voltage input |

|     |     |                     |     |     |                    |
|-----|-----|---------------------|-----|-----|--------------------|
| CH4 | VI0 | AI0+ current input  | CH5 | VI1 | AI1+ current input |
|     | C0  | AI0- current input  |     | C1  | AI1- current input |
| CH6 | VI2 | AI2+ current input  | CH7 | VI3 | AI3+ current input |
|     | C2  | AI2- current input  |     | C3  | AI3- current input |
| -   | 24V | +24V power supply   |     |     |                    |
|     | 0V  | COM of power supply |     |     |                    |

### 8-3-2. XC-E4AD2DA

#### 1 Brief Introduction

- 4CH analogue input: voltage and current input selectable; Voltage input range is 0~5V, 0~10V selectable, current input range is 0~20mA, 4~20mA selectable;
- 2CH analogue output: voltage and current input selectable; Voltage input range is 0~5V, 0~10V selectable, current input range is 0~20mA, 4~20mA selectable;
- 14 bits high precision analogue input;
- As the special module, 7pcs XC-E4AD2DA can be connected to one XC series PLC main unit;
- XC-E4AD2DA module four A/D channels have PID function.

#### 2 Specification

| Items                 | Analogue Input           |               | Analogue Output                                    |                                                   |
|-----------------------|--------------------------|---------------|----------------------------------------------------|---------------------------------------------------|
|                       | Voltage Input            | Current Input | Voltage output                                     | Current Output                                    |
| Analogue Input Range  | 0~5V,0~10V               | 0~20mA,4~20mA | -                                                  |                                                   |
| Max Input Range       | DC±18V                   | 0~40mA        | -                                                  |                                                   |
| Analogue Output Range | -                        |               | 0~5V、0~10V,<br>(external load resistor<br>2KΩ~1MΩ) | 0~20mA,4~20mA<br>(external load resistor<br>500Ω) |
| Digital Input Range   | -                        |               | 12bits binary (0~4095)                             |                                                   |
| Digital Output Range  | 14 bits binary (0~16383) |               | -                                                  |                                                   |

|                    |                                                                           |                                                                          |
|--------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Distinguish Ratio  | 1/16383(14Bit); the convert data is stored in PLC in form of Hex. (14Bit) | 1/4095(12Bit); the convert data is stored in PLC in form of Hex. (14Bit) |
| PID Output Value   | 0~K4095                                                                   |                                                                          |
| Integral precision | 0.8%                                                                      |                                                                          |
| Convert Speed      | 20ms/CH                                                                   | 3ms/CH                                                                   |
| Power Supply       | DC24V±10%, 100mA                                                          |                                                                          |

### 3 Terminal Arrangement

|  |     |   |   |     |     |     |     |  |
|--|-----|---|---|-----|-----|-----|-----|--|
|  | OV  | ● |   | CO  | A00 | C1  | A01 |  |
|  | 24V | ● | ● | V00 | ●   | V01 |     |  |

|  |     |     |     |     |     |     |  |  |
|--|-----|-----|-----|-----|-----|-----|--|--|
|  | VI0 | C1  | A11 | VI2 | C3  | AI3 |  |  |
|  | C0  | AI0 | VI1 | C2  | AI2 | VI3 |  |  |

| CH  | NAME | SIGNAL                  | CH  | NAME | SIGNAL                  |
|-----|------|-------------------------|-----|------|-------------------------|
| CH0 | AI0  | Current analogue input  | CH1 | AI1  | Current analogue input  |
|     | VI0  | Voltage analogue input  |     | VI1  | Voltage analogue input  |
|     | C0   | COM of CH0              |     | C1   | COM of CH1              |
| CH2 | AI2  | Current analogue input  | CH3 | AI3  | Current analogue input  |
|     | VI2  | Voltage analogue input  |     | VI3  | Voltage analogue input  |
|     | C2   | COM of CH2              |     | C3   | COM of CH3              |
| CH0 | AO0  | Current analogue output | CH1 | AO1  | Current analogue output |
|     | VO0  | Voltage analogue output |     | VO1  | Voltage analogue output |
|     | C0   | COM of CH0              |     | C1   | COM of CH1              |
| -   | 24V  | +24V power supply       |     |      |                         |
|     | 0V   | COM of power supply     |     |      |                         |

#### 8-3-3. XC-E4AD

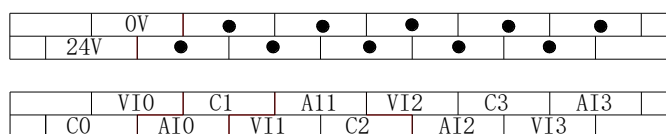
### 1 Brief Introduction

- 4CH analogue input: voltage and current input selectable; Voltage input range is 0~5V, 0~10V selectable, current input range is 0~20mA、4~20mA selectable;
- 14 bits high precision analogue input;
- As the special module, 7pcs XC-E4AD can be connected to one XC series PLC main unit;
- XC-E4AD module support PID auto tune function;

|   |                      |
|---|----------------------|
| 2 | <b>Specification</b> |
|---|----------------------|

| Items                | Analogue Input (AD)                                                       |                  |
|----------------------|---------------------------------------------------------------------------|------------------|
|                      | Voltage Input                                                             | Current Input    |
| Analogue Input Range | DC0~5V, 0~10V                                                             | DC0~20mA, 4~20mA |
| Max Input Range      | DC±18V                                                                    | DC0~40mA         |
| Analogue Output      | -                                                                         |                  |
| Digital Input Range  | -                                                                         |                  |
| Digital Output Range | 14 bits binary (0~16383)                                                  |                  |
| Distinguish Ratio    | 1/16383(14Bit); the convert data is stored in PLC in form of Hex. (14Bit) |                  |
| PID Output Value     | 0~K4095                                                                   |                  |
| Integral precision   | 0.8%                                                                      |                  |
| Convert Speed        | 20ms/CH                                                                   |                  |
| Power Supply         | DC24V±10%, 100mA                                                          |                  |

|   |                             |
|---|-----------------------------|
| 3 | <b>Terminal Arrangement</b> |
|---|-----------------------------|



| CH  | NAME | SIGNAL                 | CH  | NAME | SIGNAL                 |
|-----|------|------------------------|-----|------|------------------------|
| CH0 | AI0  | Current analogue input | CH1 | AI1  | Current analogue input |
|     | VI0  | Voltage analogue input |     | VI1  | Voltage analogue input |
|     | C0   | COM of CH0             |     | C1   | COM of CH1             |
| CH2 | AI2  | Current analogue input | CH3 | AI3  | Current analogue input |
|     | VI2  | Voltage analogue input |     | VI3  | Voltage analogue input |
|     | C2   | COM of CH2             |     | C3   | COM of CH3             |
| -   | 24V  | +24V power supply      |     |      |                        |
|     | 0V   | COM of power supply    |     |      |                        |

### 8-3-4. XC-E4DA

#### 1 Brief Introduction

- 4CH analogue output: voltage and current input selectable; Voltage input range is 0~5V, 0~10V selectable, current input range is 0~20mA, 4~20mA selectable;
- 10 bits high precision analogue output;
- As the special module, 7pcs XC-E4DA can be connected to one XC series PLC main unit;

#### 2 Specification

| Items                 | Voltage Output                                                           | Current Output                                                       |
|-----------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------|
| Analogue Output Range | DC0~5V, 0~10V<br>(external load resistor<br>2K $\Omega$ ~1M $\Omega$ )   | DC0~20mA, 4~20mA<br>(external load resistor less than 500 $\Omega$ ) |
| Digital Input Range   | 12 bits binary                                                           |                                                                      |
| Distinguish Ratio     | 1/4095(12Bit); the convert data is stored in PLC in form of Hex. (12Bit) |                                                                      |
| Integral Precision    | 0.8%                                                                     |                                                                      |
| Convert Speed         | 3ms/CH                                                                   |                                                                      |
| Power Supply          | DC24V $\pm$ 10%, 100mA                                                   |                                                                      |

#### 3 Terminal

|  |     |  |  |     |     |     |     |  |
|--|-----|--|--|-----|-----|-----|-----|--|
|  | 0V  |  |  | C0  | A00 | C1  | A01 |  |
|  | 24V |  |  | V00 |     | V01 |     |  |

|  |  |  |  |     |     |     |     |  |
|--|--|--|--|-----|-----|-----|-----|--|
|  |  |  |  | C2  | A02 | C3  | A03 |  |
|  |  |  |  | V02 |     | V03 |     |  |

| CH  | NAME | SIGNAL                  | CH  | NAME | SIGNAL                  |
|-----|------|-------------------------|-----|------|-------------------------|
| CH0 | AO0  | Current analogue output | CH1 | AO1  | Current analogue output |
|     | VO0  | Voltage analogue output |     | VO1  | Voltage analogue output |
|     | C0   | COM of CH0              |     | C1   | COM of CH1              |

|     |     |                         |     |     |                         |
|-----|-----|-------------------------|-----|-----|-------------------------|
| CH2 | AO2 | Current analogue output | CH3 | AO3 | Current analogue output |
|     | VO2 | Voltage analogue output |     | VO3 | Voltage analogue output |
|     | C2  | COM of CH2              |     | C3  | COM of CH3              |
| -   | 24V | +24V power supply       |     |     |                         |
|     | 0V  | COM of power supply     |     |     |                         |

### 8-3-5. XC-E2DA

#### 1 Brief Introduction

- 2CH analogue output: voltage and current input selectable; Voltage input range is 0~5V、0~10V selectable, current input range is 0~20mA、4~20mA selectable;
- 12 bits high precision analogue input;
- As the special module, 7pcs XC-E2DA can be connected to one XC series PLC main unit;

#### 2 Specification

| Items                 | Voltage Output                                                           | Current Output                        |
|-----------------------|--------------------------------------------------------------------------|---------------------------------------|
| Analogue Output Range | DC0~5V、0~10V                                                             | DC0~20mA、4~20mA                       |
|                       | External Load Resistor (2KΩ~1MΩ)                                         | External Load Resistor less than 500Ω |
| Digital Input Range   | 12 bits binary                                                           |                                       |
| Distinguish Ratio     | 1/4096(12Bit); the convert data is stored in PLC in form of Hex. (12Bit) |                                       |
| Integral Precision    | 0.8%                                                                     |                                       |
| Convert Speed         | 3ms/CH                                                                   |                                       |
| Power Supply          | DC24V±10%, 100mA                                                         |                                       |

#### 3 Terminal Arrangement

|     |    |  |  |     |     |     |     |  |
|-----|----|--|--|-----|-----|-----|-----|--|
|     | 0V |  |  | CO  | A00 | C1  | A01 |  |
| 24V |    |  |  | V00 |     | V01 |     |  |

|  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

| CH  | NAME | SIGNAL                  |
|-----|------|-------------------------|
| CH0 | AO0  | Current analogue output |
|     | VO0  | Voltage analogue output |
|     | C0   | COM of CH0              |
| CH1 | AO1  | Current analogue output |
|     | VO1  | Voltage analogue output |
|     | C1   | COM of CH1              |
| -   | 24V  | +24V power supply       |
|     | 0V   | COM of power supply     |

### 8-3-6. XC-E6PT-P

#### 1 Brief Introduction

- Pt resistor input, the scale is Pt100
- 6CH input, 6CH output, 2 groups PID parameters (3CH/group)
- 1mA constant output, doesn't effected by the environment;
- The distinguish precision is 0.1℃
- As the special module, 7pcs XC-E6PT-P can be connected to one XC series PLC main unit;

#### 2 Specification

| Items                     | Content                              |
|---------------------------|--------------------------------------|
| Analogue Input Signal     | Pt100 resistor                       |
| Temperature testing range | -100℃～350℃                           |
| Digital Output range      | -1000～3500, 16bits with sign, binary |
| Control precision         | ±0.5℃                                |
| Distinguish Ratio         | 0.1℃                                 |
| Integral Precision        | 0.8% (Relate to the max value)       |
| Convert Speed             | 20ms/CH                              |
| Power Supply              | DC24V±10%, 50mA                      |

※1: If no signal input, the value is 3500;

※2: According to the actual requirements, connect with Pt100 resistors

### 3 Terminal Arrangement

|  |     |      |      |      |    |    |  |
|--|-----|------|------|------|----|----|--|
|  | 0V  | COM0 | COM1 | COM2 | Y3 | Y5 |  |
|  | 24V | ●    | Y0   | Y1   | Y2 | Y4 |  |

|  |    |    |    |    |    |    |  |
|--|----|----|----|----|----|----|--|
|  | A0 | A1 | A2 | A3 | A4 | A5 |  |
|  | C0 | C1 | C2 | C3 | C4 | C5 |  |

| CH                                | NAME | SIGNAL                             | CH  | NAME | SIGNAL                             |
|-----------------------------------|------|------------------------------------|-----|------|------------------------------------|
| CH0                               | A0   | 0CH thermo-resistor input terminal | CH1 | A1   | 1CH thermo-resistor input terminal |
|                                   | C0   | 0CH COM of thermo-resistor input   |     | C1   | 1CH COM of thermo-resistor input   |
| CH2                               | A2   | 2CH thermo-resistor input terminal | CH3 | A3   | 3CH thermo-resistor input terminal |
|                                   | C2   | 2CH COM of thermo-resistor input   |     | C3   | 3CH COM of thermo-resistor input   |
| CH4                               | A4   | 4CH thermo-resistor input terminal | CH5 | A5   | 5CH thermo-resistor input terminal |
|                                   | C4   | 4CH COM of thermo-resistor input   |     | C5   | 5CH COM of thermo-resistor input   |
|                                   | Y0   | Output of CH0                      |     | Y1   | Output of CH1                      |
|                                   | Y2   | Output of CH2                      |     | Y3   | Output of CH3                      |
|                                   | Y4   | Output of CH4                      |     | Y5   | Output of CH5                      |
| -                                 | 24V  | +24V power supply                  |     |      |                                    |
|                                   | 0V   | COM for power supply               |     |      |                                    |
| COM0, COM1, COM2: COM for outputs |      |                                    |     |      |                                    |

### 8-3-7. XC-E6TCA-P

#### 1 Brief Introduction

- Support many thermocouple types (K, S, E, N, J, T, R types)
- Adopt DC-DC power supply isolate design, enhance the anti-interfere ability;
- The temperature precision is 0.1℃。
- Set each channel's PID parameters independently, equipped with separate register space;
- Support real time PID auto tune function; enable the device to PID auto tune under every status (cold status, heating status, transition status etc), get the best PID values;
- Realize data exchange with FROM and TO instructions, enhance the flexibility, reduce the data exchange quantity, expand the data memory space;

|   |                      |
|---|----------------------|
| 2 | <b>Specification</b> |
|---|----------------------|

| Items                     | Specifications                        |
|---------------------------|---------------------------------------|
| Analogue Input Signal     | K、S、E、N、J、T、R type thermocouples      |
| Temperature testing range | 0℃～1000℃                              |
| Digital Output range      | 0～4095, without sign 12 bits, decimal |
| Control precision         | 0.1℃                                  |
| Distinguish Ratio         | 0.1℃                                  |
| Integral Precision        | 0.1℃                                  |
| Convert Speed             | 20ms/CH                               |
| Power Supply              | DC24V±10%, 50mA                       |

※1: When no signal input, the channel's data is 4095;

※2: According to the actual requirements, connect with the thermo-resistors;

|   |                             |
|---|-----------------------------|
| 3 | <b>Terminal Arrangement</b> |
|---|-----------------------------|

|     |    |      |      |      |    |    |  |
|-----|----|------|------|------|----|----|--|
|     | 0V | COM0 | COM1 | COM2 | Y3 | Y5 |  |
| 24V | ●  | Y0   | Y1   | Y2   | Y4 |    |  |

|  |      |      |      |      |      |      |  |
|--|------|------|------|------|------|------|--|
|  | TC0+ | TC1+ | TC2+ | TC3+ | TC4+ | TC5+ |  |
|  | TC0- | TC1- | TC2- | TC3- | TC4- | TC5- |  |

| CH    | NAME | SIGNAL                                                                                                                                                                  | CH  | NAME | SIGNAL                  |
|-------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------------------------|
| CH0   | TC0+ | CH0 temperature input +                                                                                                                                                 | CH1 | TC1+ | CH1 temperature input + |
|       | TC0- | CH0 temperature input -                                                                                                                                                 |     | TC1- | CH1 temperature input - |
| CH2   | TC2+ | CH2 temperature input +                                                                                                                                                 | CH3 | TC3+ | CH3 temperature input + |
|       | TC2- | CH2 temperature input -                                                                                                                                                 |     | TC3- | CH3 temperature input - |
| CH4   | TC4+ | CH4 temperature input +                                                                                                                                                 | CH5 | TC5+ | CH5 temperature input + |
|       | TC4- | CH4 temperature input -                                                                                                                                                 |     | TC5- | CH5 temperature input - |
| Y0~Y5 |      | Output Channel Y0~Y5<br>Analogue Output: in the form of digital type, the range is 0~4095<br>Digital Output: in the form of occupy ratio, Y output in the activate time |     |      |                         |
| —     | 24V  | +24V power supply                                                                                                                                                       |     |      |                         |
|       | 0V   | COM of power supply                                                                                                                                                     |     |      |                         |

### 8-3-8. XC-E3AD4PT2DA

#### 1 Brief Introduction

- 3CH 14bits current input、4CH PT100 temperature input and 2CH 10bits voltage output
- 3CH AD is current (0~20mA、4~20mA) selectable; 2Ch DA is voltage (0~5V、0~10V) selectable, choose via the software;
- Pt resistor input, the scale is PT100
- 3CH A/D and 4CH PT input are equipped with PID auto tune function;
- As the special module, 7pcs XC-E3AD4PT2DA can be connected to one XC series PLC main unit;

#### 2 Specification

| Items                     | Analogue Current Input (AD)                                         | Temperature Input (PT) | Analogue Voltage Output (DA)                                       |
|---------------------------|---------------------------------------------------------------------|------------------------|--------------------------------------------------------------------|
| Analogue input            | DC0~20mA, 4~20mA                                                    | PT100                  | -                                                                  |
| Temperature testing range | -                                                                   | -100~350°C             | -                                                                  |
| Max input range           | DC0~40mA                                                            | -                      | -                                                                  |
| Analogue output range     | -                                                                   | -                      | DC0~5V, 0~10V(external load resistor 2K $\Omega$ ~1M $\Omega$ )    |
| Digital input range       | -                                                                   | -                      | 10 bits Binary (0~1023)                                            |
| Digital Output Range      | 14 bits Binary (0~16383)                                            | -1000~3500             | -                                                                  |
| Distinguish Ratio         | 1/16383(14Bit): The converted data is stored in PLC in Hex. (14Bit) | 0.1°C                  | 1/1023(10Bit): The converted data is stored in PLC in Hex. (10Bit) |
| PID Output Value          | 0~K4095                                                             |                        | -                                                                  |
| Integral Precision        | 0.8%                                                                | ±0.5°C                 | 0.8%                                                               |
| Convert Speed             | 20ms/CH                                                             |                        | 3ms/CH                                                             |
| Power Supply              | DC24V±10%, 100mA                                                    |                        |                                                                    |

### 3 Terminal Arrangement

|     |    |     |     |     |     |     |  |
|-----|----|-----|-----|-----|-----|-----|--|
|     | 0V | AI0 | AI1 | AI2 | V00 | V01 |  |
| 24V | C0 | C1  | C2  | C3  | C4  |     |  |

|    |    |    |    |    |    |    |  |
|----|----|----|----|----|----|----|--|
|    | B0 | A1 | C1 | B2 | A3 | C3 |  |
| A0 | C0 | B1 | A2 | C2 | B3 |    |  |

| CH  | NAME | SIGNAL                 | CH  | NAME | SIGNAL                 |
|-----|------|------------------------|-----|------|------------------------|
| 0CH | AI0  | 0CH current Input      | 1CH | AI1  | 1CH current Input      |
|     | C0   | 0CH current Input COM  |     | C1   | 1CH current Input COM  |
| 2CH | AI2  | 2CH current Input      |     |      |                        |
|     | C2   | 2CH current Input COM  |     |      |                        |
| 0CH | A0   | 0CH temperature input  | 1CH | A1   | 1CH temperature input  |
|     | B0   | -                      |     | B1   | -                      |
|     | C0   | 0CH input COM          |     | C1   | 1CH input COM          |
| 2CH | A2   | 2CH temperature input  | 3CH | A3   | 3CH temperature input  |
|     | B2   | -                      |     | B3   | -                      |
|     | C2   | 2CH input COM          |     | C3   | 3CH input COM          |
| 0CH | VO0  | 0CH voltage output     | 1CH | VO1  | 1CH voltage output     |
|     | C3   | 0CH voltage output COM |     | C4   | 1CH voltage output COM |
| -   | 24V  | +24V power supply      |     |      |                        |
|     | 0V   | power supply COM       |     |      |                        |

#### 8-3-9. XC-E2AD2PT2DA

### 1 Brief Introduction

- 2CH 16bits analogue input, 2CH PT100 temperature input and 2CH 10bits analogue output
- 2CH input/output is current, voltage selectable (current: 0~20mA, 4~20mA; voltage: 0~5V, 0~10V), select via XCPPro;
- 2CH A/D and 2CH PT input has PID auto tune function;
- Adopt DC-DC power supply isolation design, enhance the anti-interfere ability;
- The display precision is 0.01℃
- Set each channel's PID value separately, equipped separate register space;
- Support real time PID auto tune function; enable the device to PID auto tune under every status (cold status, heating status, transition status etc), get the best PID values;
- Realize data exchange with FROM and TO instructions, enhance the flexibility, reduce

the data exchange quantity, expand the data memory space;

|   |                      |
|---|----------------------|
| 2 | <b>Specification</b> |
|---|----------------------|

| Items                 | Analogue Input (AD)      |                  | Temp. input (PT) | Analogue output (DA)    |                  |
|-----------------------|--------------------------|------------------|------------------|-------------------------|------------------|
| Analogue Input        | Current                  | 0~20mA<br>4~20mA | PT100            | -                       |                  |
|                       | Voltage                  | 0~5V<br>0~10V    |                  |                         |                  |
| Temperature Range     | -                        |                  | -100~327℃        | -                       |                  |
| Max input range       | DC0~40mA                 |                  | -                | -                       |                  |
| Analogue output range | -                        |                  | -                | Current                 | 0~10V<br>0~5V    |
|                       |                          |                  |                  | Voltage                 | 0~20mA<br>4~20mA |
| Digital input range   | -                        |                  | -                | 10 bits binary (0~1023) |                  |
| Digital Output range  | 16 bits binary (0~65535) |                  | -1000~3500       | -                       |                  |
| Distinguish Ratio     | 1/16383(16Bit)           |                  | 0.01℃            | 1/1023(10Bit)           |                  |
| PID Output value      | 0~K4095                  |                  |                  | -                       |                  |
| Integral precision    | 0.8%                     | ±0.01℃           |                  | 0.8%                    |                  |
| Convert speed         | 20ms/CH                  |                  |                  | 3ms/CH                  |                  |
| Power supply          | DC24V±10%, 100mA         |                  |                  |                         |                  |

|   |                             |
|---|-----------------------------|
| 3 | <b>Terminal Arrangement</b> |
|---|-----------------------------|

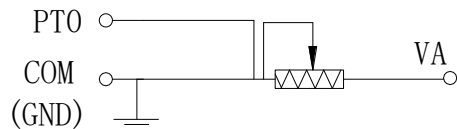
|  |     |   |   |     |     |     |  |
|--|-----|---|---|-----|-----|-----|--|
|  | 0V  | • | • | V00 | V01 | C01 |  |
|  | 24V | • | • | I00 | C00 | I01 |  |

|  |     |     |     |     |     |     |  |
|--|-----|-----|-----|-----|-----|-----|--|
|  | PT0 | VB  | COM | AIO | VI1 | C11 |  |
|  | VA  | COM | PT1 | VI0 | CIO | AI1 |  |

| Name            | Terminals | Comments          |                                                         |               |
|-----------------|-----------|-------------------|---------------------------------------------------------|---------------|
| Input terminals | PT0, PT1  | Temperature Input | Analogue input, PT100 temperature sensor (-100°C~350°C) |               |
|                 | VI0, VI1  | Analogue Input    | Voltage Input                                           | 0~10V or 0~5V |

|                  |          |                 |               |                                |
|------------------|----------|-----------------|---------------|--------------------------------|
|                  | AI0, AI1 |                 | Current input | 0~20mA or 4~20mA               |
| Output terminals | VO0, VO1 | Analogue Output | Voltage Input | in digital form, range: 0~1023 |
|                  | IO0, IO1 |                 | Current input | in digital form, range: 0~1023 |

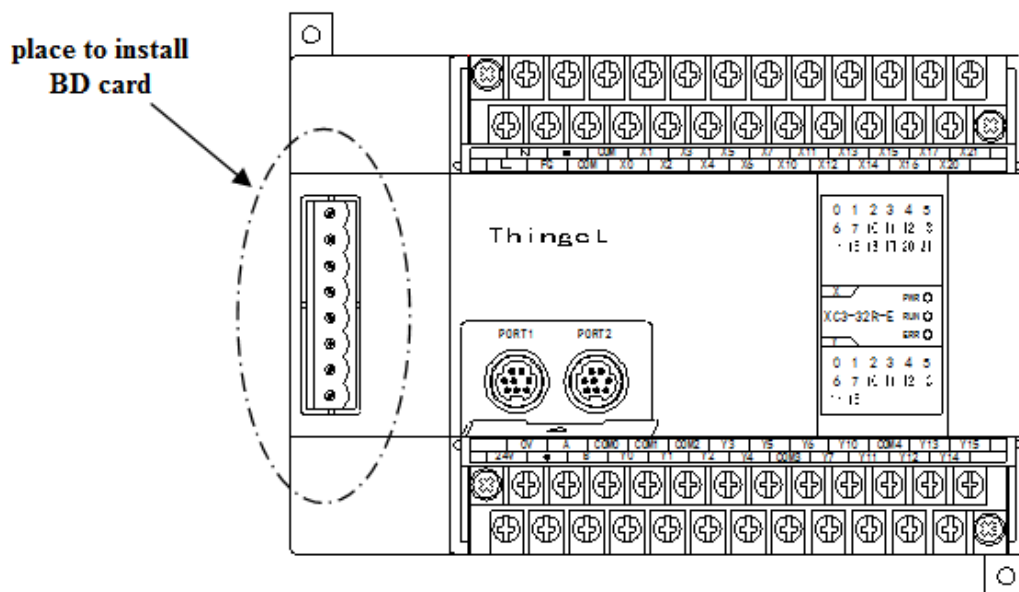
Three-line PT100 resistor's input wiring is shown below:



To normal PT100 resistors, wire according to the terminal's color; the terminal with same color can connect to PT1 and COM randomly, the other terminals connect to VA side;

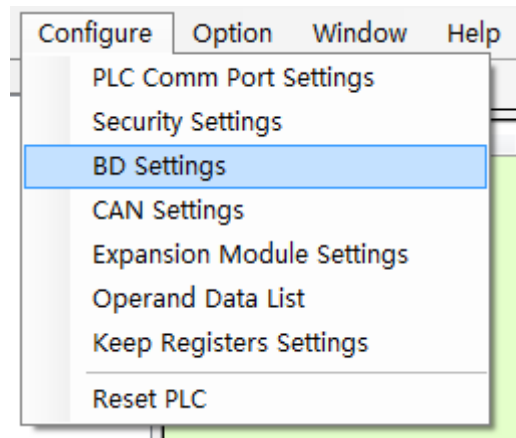
#### 8-4. Expansion BD cards

##### 1 Installation

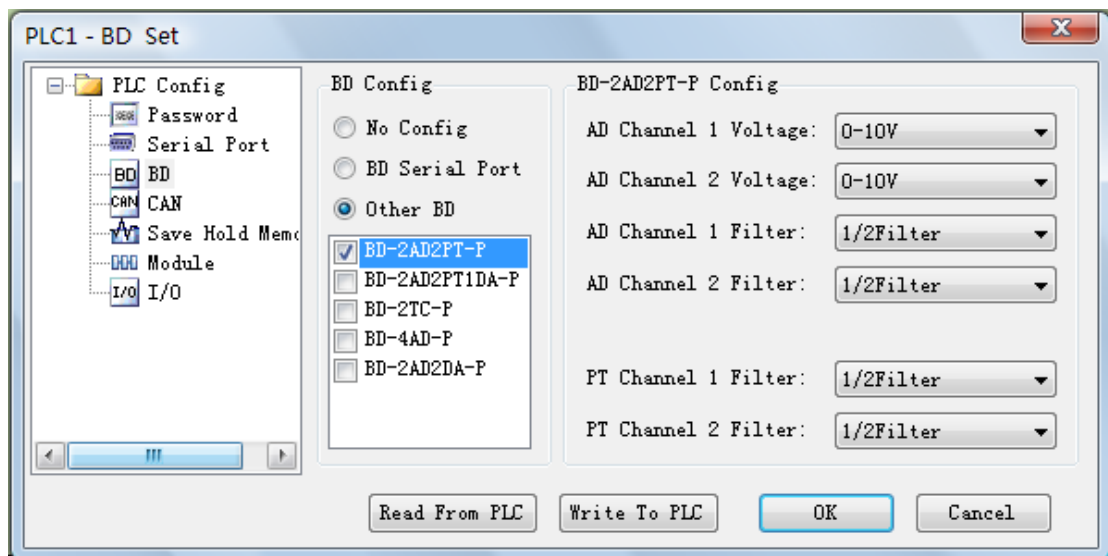


##### 2 Configuration

- 1) Install the BD card on PLC correctly
- 2) Link PLC via XCPPro, in "Configure" menu, choose "BD settings" (See graph below)



- 3) In “BD settings”, choose “Other BD”, then set BD from the right options; finally download the user program;




---

※1: If configure XC-COM-BD, then ‘BD config’ option should choose “BD Serial Port”

---

## 8-4-1. XC-2AD2PT-BD

## 1 Specifications

- 14 bits high precision analogue input
- 2CH voltage 0~10V、0~5V selectable; 2CH temperature input;
- Pt temperature resistor sensor input (Pt100 2-line form)

## 2 Specification

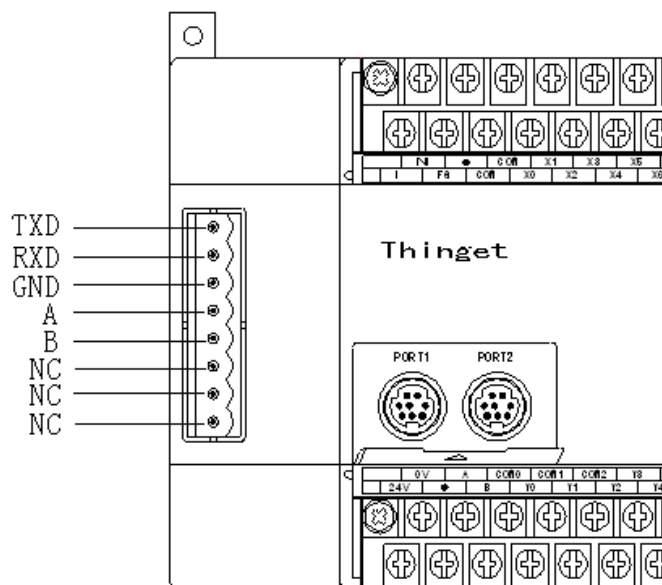
| Items                     | Voltage Input                                                                                  | Temperature Input          |
|---------------------------|------------------------------------------------------------------------------------------------|----------------------------|
| Analogue input signal     | DC0~5V, 0~10V (the input resistor is 300k $\Omega$ )                                           | Pt resistor Pt100 (2-line) |
| Temperature testing range | -                                                                                              | -100~350°C                 |
| Distinguish               | 0.15mV (10/16383)                                                                              | 0.1°C                      |
| Digital output range      | 0~16383                                                                                        | -1000~3500                 |
| Integral precision        | $\pm 0.8\%$ of the full scale                                                                  |                            |
| Convert time              | 15ms $\times$ 4CH                                                                              |                            |
| PID output value          | 0~K4095                                                                                        |                            |
| Default value             | 0                                                                                              | 3500                       |
| Input Specialty           |                                                                                                |                            |
| Isolation                 | No isolation among PLC's each channel                                                          |                            |
| I/O occupation            | 0 I/O (as operate via data register, so I/O is not limited by PLC's standard I/O limitation) ( |                            |

## 8-4-2. XC-COM-BD

### 1 Specifications

- For RS-485 communication
- For RS-232 communication
- RS-232 and RS-485 can't be used at the same time

### 2 Pins



※1: TXD、RXD、GND are RS-232 pins

※2: A、B are RS-485 pins

※3: RS-232 and RS-485 can't be used at the same time

## 9 change the Soft Components

---

This chapter focuses on a special function of XC serials PLC, mapping relationship of terminals and soft components. With this special function, users reduce the maintenance job greatly. To the local operation, they will not bother with the damaged terminals any more.

|                       |
|-----------------------|
| 9-1. Function Summary |
|-----------------------|

|                       |
|-----------------------|
| 9-2. Operation Method |
|-----------------------|

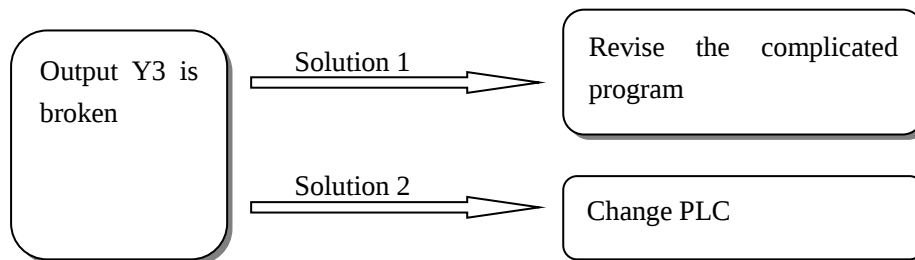
|                       |
|-----------------------|
| 9-3. Operated via HMI |
|-----------------------|

## 9-1. Function Summary

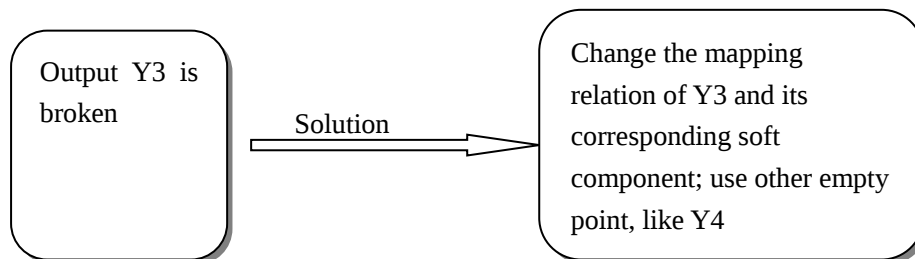
For general PLC, when the internal optical couples, relays or transistors are damaged, the corresponding input/output terminals will be faulty. The only solution is to revise the program. This is troublesome for the user and affects the production greatly;

XC series PLC breaks the one-to-one correspondence. The users only need to change the soft component's value by HMI, then the corresponding terminal will activate. Take advantage of this improvement, the user need not replace the PLC or modify the original program in the condition of PLC terminals damaged.

### Before (Complicate and not effective)



### Now (Simple, fast and effective)



## 9-2. Operation Method

To the damaged input/output, we can change their mapping relation; replace the damaged input/output points with other. This need not change the user program. In PLC special register, we specify certain address section for user to change the mapping relation. User just finds the mapping relation of the damaged input/output; replace the value in this special register with the value of changed input/output.

Below is the table to modify the input/output point's mapping ID:

Table1 mapping relationship of the Input and soft component

| ID.    | FUNCTION               | DESCRIPTION                                       |
|--------|------------------------|---------------------------------------------------|
| FD8010 | X00 corresponds to I** | X0 corresponds to the number of input mapping I** |
| FD8011 | X01 corresponds to I** |                                                   |
| FD8012 | X02 corresponds to I** |                                                   |
| .....  | .....                  |                                                   |
| FD8073 | X77 corresponds to I** |                                                   |

Table2 mapping relationship of the output and soft component

| NO     | FUNCTION               | INSTRUCTION                                        |
|--------|------------------------|----------------------------------------------------|
| FD8074 | Y00 corresponds to O** | Y0 corresponds to the number of output mapping O** |
| FD8075 | Y01 corresponds to O** |                                                    |
| FD8076 | Y02 corresponds to O** |                                                    |
| .....  | .....                  |                                                    |
| FD8137 | Y77 corresponds to O** |                                                    |

As shown in the table above, the original value is FD8010 is 0, if replace it by value “7”, then X7 will represent X0 in the program. Meantime you should change the value in FD8170 to be 0, to realize exchange. In this way, X0 will correspond with external input X7; X7 will correspond with external input X0.

※1: After changing the mapping relation, please restart the PLC.

※2: When change the mapping relation, please notice, input/output is in octal, but the address ID is in decimal.

※3: When change, should exchange the mapping relation. I.e. if modify X0 ID to be 5, make sure to change X5 ID to be 0;

※4: Mapping relation, must one terminal corresponds to one soft component.

※5: Users can modify the FD value online, but this method is not recommended. Method in chapter 9-3 is recommended to use;

### 9-3. Operated by HMI

User can change the mapping relation by XCP Pro, but PLC must be online with PC. We suggest users to change the mapping relation by HMI. Below is the sample:

There are two screens based on ID60004 and ID60005 in XINJE TP series HMI, they are used to changing the mapping relation of input and output. We just need to put the “Screen Jump” Button in the program interface, touch the Button, jump to the specified screen, and change the mapping relation there.

Modify the input point mapping diagram (HMI screen No.60004), see below:

|                            |     |     |     |             |     |     |     |
|----------------------------|-----|-----|-----|-------------|-----|-----|-----|
| 0                          | 1   | 2   | 3   | 4           | 5   | 6   | 7   |
| X 0                        | X 0 | X 0 | X 0 | X 0         | X 0 | X 0 | X 0 |
| 10                         | 11  | 12  | 13  | 14          | 15  | 16  | 17  |
| X 0                        | X 0 | X 0 | X 0 | X 0         | X 0 | X 0 | X 0 |
| 20                         | 21  | 22  | 23  | 24          | 25  | 26  | 27  |
| X 0                        | X 0 | X 0 | X 0 | X 0         | X 0 | X 0 | X 0 |
| 30                         | 31  | 32  | 33  | 34          | 35  | 36  | 37  |
| X 0                        | X 0 | X 0 | X 0 | X 0         | X 0 | X 0 | X 0 |
| 40                         | 41  | 42  | 43  | Output Port |     |     |     |
| X 0                        | X 0 | X 0 | X 0 |             |     |     |     |
| X port banned, With X port |     |     |     |             |     |     |     |
| Replace                    |     |     |     |             |     |     |     |

Modify the output point mapping diagram (HMI screen No.60005), see below:

|            |     |     |     |     |     |     |     |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 0          | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| Y 0        | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 |
| 10         | 11  | 12  | 13  | 14  | 15  | 16  | 17  |
| Y 0        | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 |
| 20         | 21  | 22  | 23  | 24  | 25  | 26  | 27  |
| Y 0        | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 | Y 0 |
| Input Port |     |     |     |     |     |     |     |
| OK         |     |     |     |     |     |     |     |

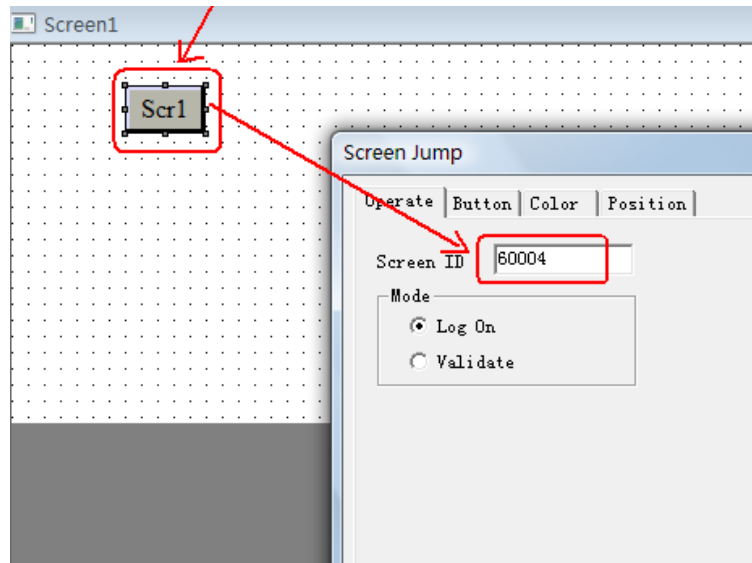
  

|                            |         |
|----------------------------|---------|
| Y port banned, With y port | Replace |
|----------------------------|---------|

From the above graph, we can see that in the screen we list all the input/output terminals, and it's simple to modify. Below we tell the steps:

## Step1

Put the screen jump icon, jump to screen ID60004



## Step2

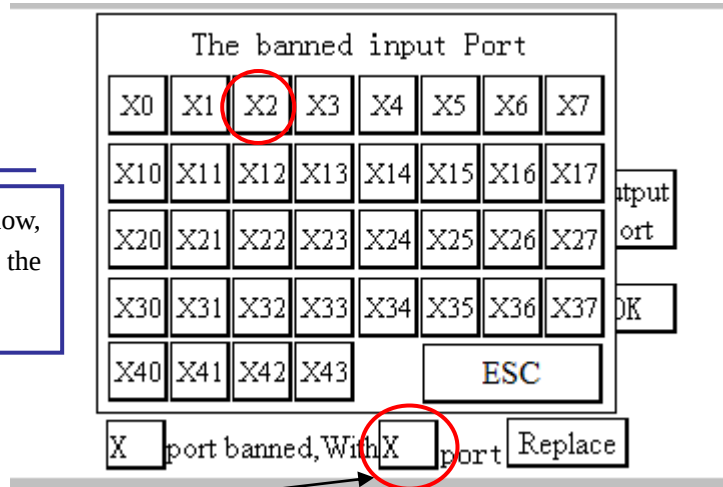
Click into "Scr1", enter the modify table



Click it; you will see the pop-up window:

## Step3

In the pop-up window, click X2, disable the faulty terminal X2



Continue to click it; the replacement window will pop up:

Step4

In the pop-up window, click X4, replace the faulty terminal X2 with X4

|     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 0   | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 20  | 21  | 22  | 23  | 24  | 25  | 26  | 27  |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 30  | 31  | 32  | 33  | 34  | 35  | 36  | 37  |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 40  | 41  | 42  | 43  |     |     |     |     |
| X 0 | X 0 | X 0 | X 0 |     |     |     |     |

X 2 port banned, With X port Replace

Output Port

OK

Step5

Click “Replace”, the status table will change, the original X2 changes to be  , which means X2 has disabled.

|     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 0   | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| X 0 | X 0 | X X | X 0 | X 0 | X 0 | X 0 | X 0 |
| 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 20  | 21  | 22  | 23  | 24  | 25  | 26  | 27  |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 30  | 31  | 32  | 33  | 34  | 35  | 36  | 37  |
| X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 | X 0 |
| 40  | 41  | 42  | 43  |     |     |     |     |
| X 0 | X 0 | X 0 | X 0 |     |     |     |     |

X port banned, With X port Replace

Output Port

OK

As in the above graphs, we need only 5 minutes replace I/O terminals. This method avoids us to modify the program, change PLC etc.

※1: After modification, make sure to restart PLC

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## Appendix Special soft device list

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Here we mainly introduce the functions of special soft device, data register and FlashROM, and introduce the address of expansion. Users can scan fast.

Appendix 1-1. Special Auxiliary Relay List

Appendix 1-2. Special Data Register List

Appendix 1-3. Special Module Address List

Appendix 1-4. Special Flash Register List

## Appendix 1-1. Special Auxiliary Relay List

### PC Status (M8000-M8003)

| ID    | Function                       | Description |                                                  |
|-------|--------------------------------|-------------|--------------------------------------------------|
| M8000 | Normally ON coil when running  |             | M8000 keeps being ON status when PLC is running  |
| M8001 | Normally OFF coil when running |             | M8001 keeps being OFF status when PLC is running |
| M8002 | Initial positive pulse coil    |             | M8002 be ON in first scan cycle                  |
| M8003 | Initial negative pulse coil    |             | M8003 be OFF in first scan cycle                 |

### Clock (M8011-M8014)

| ID    | Function                      | Description |
|-------|-------------------------------|-------------|
| M8011 | Shake with the cycle of 10ms  |             |
| M8012 | Shake with the cycle of 100ms |             |
| M8013 | Shake with the cycle of 10sec |             |
| M8014 | Shake with the cycle of 1min  |             |

**Flag (M8020-M8029)**

| ID    | Function  | Description                                                                   |
|-------|-----------|-------------------------------------------------------------------------------|
| M8020 | Zero      | The plus/minus operation result is 0                                          |
| M8021 | Borrow    | “borrow” occurs in minus operation                                            |
| M8022 | Carry     | When carry occurs in plus operation or overflow occurs in bit shift operation |
| M8023 |           |                                                                               |
| M8026 | RAMP Mode |                                                                               |
| M8029 |           |                                                                               |

**PC Mode (M8030-M8038)**

| ID    | Function                     | Description                                                                                                       |
|-------|------------------------------|-------------------------------------------------------------------------------------------------------------------|
| M8030 | PLC initializing             |                                                                                                                   |
| M8031 | Non-retentive register reset | When driving this M, ON/OFF mapping memory of Y, M, S, TC and the current values of T, C, D are all reset to be 0 |
| M8032 | Retentive register reset     |                                                                                                                   |
| M8033 | Registers keep stopping      | When PLC changes from RUN to STOP, leave all content in mapping registers and data registers                      |
| M8034 | All output forbidden         | Set PC's all external contacts to be OFF status                                                                   |
| M8038 | Parameter setting            | Set communication parameters flag                                                                                 |

**Stepping Ladder (M8041-M8046)**

| ID    | Function                   | Description                                                          |
|-------|----------------------------|----------------------------------------------------------------------|
| M8041 |                            |                                                                      |
| M8045 | All output reset forbidden | When shifting the mode, all outputs reset functions are forbidden    |
| M8046 | STL status activate        | When M8047 activating, act when any device of S0~S999 turns to be ON |

### Interruption (M8050-M8059)

| ID             | Function                        | Description                                                                                                                                                                                                     |
|----------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M8050<br>I000□ | Forbid the input interruption 0 | After executing EI instruction, even the interruption is allowed, but if M acts at this time, the correspond input interruption couldn't act separately<br>E.g.: when M8050 is ON, interrupt I000□ is forbidden |
| M8051<br>I010□ | Forbid the input interruption 1 |                                                                                                                                                                                                                 |
| M8052<br>I020□ | Forbid the input interruption 2 |                                                                                                                                                                                                                 |
| M8053<br>I030□ | Forbid the input interruption 3 |                                                                                                                                                                                                                 |
| M8054<br>I040□ | Forbid the input interruption 4 |                                                                                                                                                                                                                 |
| M8055<br>I050□ | Forbid the input interruption 5 |                                                                                                                                                                                                                 |
| M8056<br>I40□□ | Forbid the time interruption 0  | After executing EI instruction, even the interruption is allowed, but if M acts at this time, the correspond time interruption couldn't act separately                                                          |
| M8057<br>I41□□ | Forbid the time interruption 1  |                                                                                                                                                                                                                 |
| M8058<br>I42□□ | Forbid the time interruption 2  |                                                                                                                                                                                                                 |
| M8059          | Forbid the interruption         | Forbid all interruption                                                                                                                                                                                         |

### Error Testing (M8067-M8072)

| ID    | Function           | Description                                     |
|-------|--------------------|-------------------------------------------------|
| M8067 | Operation error    | happen when calculating                         |
| M8070 | Scan time out      |                                                 |
| M8071 | No user program    | Internal codes parity error                     |
| M8072 | User program error | execution codes or configure table parity error |

**Communication (M8120-M8148)**

|      | ID    | Function                      | Description                                                                             |
|------|-------|-------------------------------|-----------------------------------------------------------------------------------------|
| COM1 | M8120 |                               |                                                                                         |
|      | M8121 | Waiting to send via RS232     |                                                                                         |
|      | M8122 | “sending by RS232” flag       |                                                                                         |
|      | M8123 | “RS232 receiving finish” flag |                                                                                         |
|      | M8124 | RS232 receiving flag          |                                                                                         |
|      | M8125 | “Receive incomplete” flag     | acceptance ends normally, but the accepted data number is less than the required number |
|      | M8126 | Global signal                 |                                                                                         |
|      | M8127 | “Accept error” flag           |                                                                                         |
|      | M8128 | “ Accept correct” flag        |                                                                                         |
|      | M8129 |                               |                                                                                         |
| COM2 | M8130 |                               |                                                                                         |
|      | M8131 | Waiting to send via RS232     |                                                                                         |
|      | M8132 | “sending by RS232” flag       |                                                                                         |
|      | M8133 | “RS232 receiving finish” flag |                                                                                         |
|      | M8134 | RS232 receiving flag          |                                                                                         |
|      | M8135 | “Receive incomplete” flag     | acceptance ends normally, but the accepted data number is less than the required number |
|      | M8136 | Global signal                 |                                                                                         |
|      | M8137 | “Accept error” flag           |                                                                                         |
|      | M8138 | “ Accept correct” flag        |                                                                                         |
|      | M8139 |                               |                                                                                         |
| COM3 | M8140 |                               |                                                                                         |
|      | M8141 | Waiting to send via RS232     |                                                                                         |
|      | M8142 | “sending by RS232” flag       |                                                                                         |
|      | M8143 | “RS232 receiving finish” flag |                                                                                         |
|      | M8144 | RS232 receiving flag          |                                                                                         |
|      | M8145 | “Receive incomplete” flag     | acceptance ends normally, but the accepted data number is less than the required number |
|      | M8146 | Global signal                 |                                                                                         |
|      | M8147 | “Accept error” flag           |                                                                                         |
|      | M8148 | “ Accept correct” flag        |                                                                                         |
|      | M8149 |                               |                                                                                         |

**“High Speed Counter Interruption Finished” Flag (M8150-M 8169)**

| ID    | Counter ID | Function                           | Description                                |
|-------|------------|------------------------------------|--------------------------------------------|
| M8150 | C600       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8151 | C602       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8152 | C604       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8153 | C606       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8154 | C608       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8155 | C610       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8156 | C612       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8157 | C614       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8158 | C616       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8159 | C618       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8160 | C620       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8161 | C622       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8162 | C624       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8163 | C626       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8164 | C628       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8165 | C630       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8166 | C632       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8167 | C634       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8168 | C636       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |
| M8169 | C638       | “Count Interruption Finished” Flag | Set flag ON when count interruption finish |

**Pulse output (M8170~M8238)**

| ID    | Pulse ID | Function                                 | specification                                                |
|-------|----------|------------------------------------------|--------------------------------------------------------------|
| M8170 | PULSE_1  | “sending pulse” flag                     | Being ON when sending the pulse,                             |
| M8171 |          | overflow flag of “32 bits pulse sending” | When overflow, Flag is on                                    |
| M8172 |          | Direction flag                           | 1 is positive direction, the correspond direction port is on |
| M8173 | PULSE_2  | “sending pulse” flag                     | Being ON when sending the pulse,                             |
| M8174 |          | overflow flag of “32 bits pulse sending” | When overflow, Flag is on                                    |
| M8175 |          | Direction flag                           | 1 is positive direction, the correspond direction port is on |
| M8176 | PULSE_3  | “sending pulse” flag                     | Being ON when sending the pulse,                             |
| M8177 |          | overflow flag of “32 bits pulse          | When overflow, Flag is on                                    |

|       |         |                                          |                                                              |
|-------|---------|------------------------------------------|--------------------------------------------------------------|
|       |         | sending”                                 |                                                              |
| M8178 |         | Direction flag                           | 1 is positive direction, the correspond direction port is on |
| M8179 | PULSE_4 | “sending pulse” flag                     | Being ON when sending the pulse,                             |
| M8180 |         | overflow flag of “32 bits pulse sending” | When overflow, Flag is on                                    |
| M8181 |         | Direction flag                           | 1 is positive direction, the correspond direction port is on |

**Absolute, relative bit:**

| ID    | function                                     | specification                              |         |
|-------|----------------------------------------------|--------------------------------------------|---------|
| M8190 | C600 (24 segments)                           | <b>1</b> is absolute, <b>0</b> is relative |         |
| M8191 | C602 (24 segments)                           | <b>1</b> is absolute, <b>0</b> is relative |         |
| M8192 | C604 (24 segments)                           | <b>1</b> is absolute, <b>0</b> is relative |         |
| M8193 | C606 (24 segments)                           | <b>1</b> is absolute, <b>0</b> is relative |         |
| M8194 | C608 (24 segments)                           | <b>1</b> is absolute, <b>0</b> is relative |         |
| M8195 | C610 (24 segments)                           | .....                                      |         |
| M8196 | C612 (24 segments)                           |                                            |         |
| M8197 | C614 (24 segments)                           |                                            |         |
| M8198 | C616 (24 segments)                           |                                            |         |
| M8199 | C618 (24 segments)                           |                                            |         |
| M8200 | C620 (24 segments)                           |                                            |         |
| M8201 | C622 (24 segments)                           |                                            |         |
| M8202 | C624 (24 segments)                           |                                            |         |
| M8203 | C626 (24 segments)                           |                                            |         |
| M8204 | C628 (24 segments)                           |                                            |         |
| M8205 | C630 (24 segments)                           |                                            |         |
| M8206 | C632 (24 segments)                           |                                            |         |
| M8207 | C634 (24 segments)                           |                                            |         |
| M8208 | C636 (24 segments)                           |                                            |         |
| M8209 | C638 (24 segments)                           |                                            |         |
| M8210 | Pulse alarm flag (frequency change suddenly) | <b>1</b> is alarm, <b>0</b> is correct     | PULSE_1 |
| M8211 | Neglect the alarm or not                     | When flag is 1, stop sending alarm         | PULSE_1 |
| M8212 | Pulse alarm flag (frequency change suddenly) | <b>1</b> is alarm, <b>0</b> is correct     | PULSE_2 |
| M8213 | Neglect the alarm or not                     | When flag is 1, stop sending alarm         | PULSE_2 |
| M8214 | Pulse alarm flag (frequency change suddenly) | <b>1</b> is alarm, <b>0</b> is correct     | PULSE_3 |
| M8215 | Neglect the alarm or not                     | When flag is 1, stop sending alarm         | PULSE_3 |
| M8216 | Pulse alarm flag (frequency change suddenly) | <b>1</b> is alarm, <b>0</b> is correct     | PULSE_4 |

|       |                                              |                                        |         |
|-------|----------------------------------------------|----------------------------------------|---------|
| M8217 | Neglect the alarm or not                     | When flag is 1, stop sending alarm     | PULSE_4 |
| M8218 | Pulse alarm flag (frequency change suddenly) | <b>1</b> is alarm, <b>0</b> is correct | PULSE_5 |
| M8219 | Neglect the alarm or not                     | When flag is 1, stop sending alarm     | PULSE_5 |

**Positive/negative count**

| ID    | Counter Nr. | Function                          | Specification                                                              |
|-------|-------------|-----------------------------------|----------------------------------------------------------------------------|
| M8238 | C300~C498   | Positive/negative counter control | <b>0</b> is increment counter, <b>1</b> is decrement counter, default is 0 |

**24 segments HSC interruption loop (M8270~M8289)**

| ID    | Counter ID                               | Specification                                                                                        |  |
|-------|------------------------------------------|------------------------------------------------------------------------------------------------------|--|
| M8270 | 24 segments HSC interruption loop (C600) | if set it to be 1, then loop executing the interruption; or else execute only one time interruption; |  |
| M8271 | 24 segments HSC interruption loop (C602) |                                                                                                      |  |
| M8272 | 24 segments HSC interruption loop (C604) |                                                                                                      |  |
| M8273 | 24 segments HSC interruption loop (C606) |                                                                                                      |  |
| M8274 | 24 segments HSC interruption loop (C608) |                                                                                                      |  |
| M8275 | 24 segments HSC interruption loop (C610) |                                                                                                      |  |
| M8276 | 24 segments HSC interruption loop (C612) |                                                                                                      |  |
| M8277 | 24 segments HSC interruption loop (C614) |                                                                                                      |  |
| ..... | .....                                    |                                                                                                      |  |
| M8279 | 24 segments HSC interruption loop (C618) |                                                                                                      |  |
| M8280 | 24 segments HSC interruption loop (C620) | if set it to be 1, then loop executing the interruption; or else execute only one time interruption; |  |
| M8281 | 24 segments HSC interruption loop (C622) |                                                                                                      |  |
| ..... | .....                                    |                                                                                                      |  |
| M8284 | 24 segments HSC interruption loop (C628) |                                                                                                      |  |
| M8285 | 24 segments HSC interruption loop (C630) | if set it to be 1, then loop executing the interruption; or else execute only one time interruption; |  |
| ..... | .....                                    |                                                                                                      |  |
| M8289 | 24 segments HSC interruption loop (C638) |                                                                                                      |  |

**Read & Write the Expansions (M8340~M8341)**

| ID    | Function                                                   | Specification |
|-------|------------------------------------------------------------|---------------|
| M8340 | Read the expansion error flag ( <b>read</b> instruction)   |               |
| M8341 | Write the expansion error flag ( <b>write</b> instruction) |               |

**BLOCK Execution (M8630~M8730)**

| ID    | Function                 | Specification |
|-------|--------------------------|---------------|
| M8630 |                          |               |
| M8631 | BLOCK1 is running flag   |               |
| M8632 | BLOCK2 is running flag   |               |
| ..... | .....                    | .....         |
| ..... | .....                    | .....         |
| ..... | .....                    | .....         |
| M8730 | BLOCK100 is running flag |               |

**Appendix 1-2. List of special memory and special data register****Clock (D8010-D8019)**

| ID    | Function               | Specification        |
|-------|------------------------|----------------------|
| D8010 | The current scan cycle | Unit:0.1ms           |
| D8011 | The min. scan time     | Unit:0.1ms           |
| D8012 | The max. scan time     | Unit:0.1ms           |
| D8013 | Second (clock)         | 0~59 (BCD code)      |
| D8014 | minute (clock)         | 0~59 (BCD code)      |
| D8015 | hour (clock)           | 0~23 (BCD code)      |
| D8016 | day (clock)            | 0~31 (BCD code)      |
| D8017 | month (clock)          | 0~12 (BCD code)      |
| D8018 | year (clock)           | 2000~2099 (BCD code) |

|       |              |                                    |
|-------|--------------|------------------------------------|
| D8019 | week (clock) | 0 (Sunday)~6 (Saturday) (BCD code) |
|-------|--------------|------------------------------------|

### Flag (D8021-D8029)

| ID    | Function                           | Specification          |
|-------|------------------------------------|------------------------|
| D8021 | Model                              | Low byte               |
|       | Series number                      | High byte              |
| D8022 | Compatible system’s version number | Low byte               |
|       | System’s version number            | High byte              |
| D8023 | Compatible model’s version number  | Low byte               |
|       | Model’s version number             | High byte              |
| D8024 | Model’s information                | Max 5 characters +“\0” |
| D8025 |                                    |                        |
| D8026 |                                    |                        |
| D8027 | Suitable program software version  |                        |
| D8028 |                                    |                        |
| D8029 |                                    |                        |

### Error check (D8067-D8098)

| ID    | Function                   | Specification            |
|-------|----------------------------|--------------------------|
| D8067 | Operation error code's Nr. | The error of divide zero |
| D8068 | lock the Nr. of error code |                          |
| D8069 |                            |                          |
| D8070 | exceeded scan time         | Unit 1ms                 |
| D8074 | Nr. of offset registers D  |                          |
| D8097 |                            |                          |
| D8098 |                            |                          |

### Communication (D8120-D8149)

| Com 1 | ID    | Function                        | specification |
|-------|-------|---------------------------------|---------------|
|       | D8120 |                                 |               |
|       | D8121 |                                 |               |
|       | D8122 | the left data RS232 should send |               |

|       |       |                                                                                                |                                                                                                                                                                  |
|-------|-------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | D8123 | Data number RS232 received                                                                     |                                                                                                                                                                  |
|       | D8126 |                                                                                                |                                                                                                                                                                  |
|       | D8127 | Communication error code                                                                       | 7: hardware error<br>8: CRC Parity error<br>9: station number error<br>10: no start code<br>11: no end code<br>12: communication time out                        |
|       | D8128 | Modbus communication error<br>(the replied message from slaves<br>when the master send errors) | 0: correct<br>1: don't support function ID<br>2: address error (overrun address)<br>3: Data error (the number of data)<br>8: saving data error (rewrite Flash)   |
|       | D8129 |                                                                                                |                                                                                                                                                                  |
| Com2  | D8130 |                                                                                                |                                                                                                                                                                  |
|       | D8131 |                                                                                                |                                                                                                                                                                  |
|       | D8132 | the left data RS232 should send                                                                |                                                                                                                                                                  |
|       | D8133 | Data number RS232 received                                                                     |                                                                                                                                                                  |
|       | D8136 |                                                                                                |                                                                                                                                                                  |
|       | D8137 | Communication error code                                                                       | 7: hardware error<br>8: CRC check error<br>9: station number error<br>10: no start sign<br>11: no end sign<br>12: communication time out                         |
|       | D8138 | Modbus communication error<br>(the replied message from slaves<br>when the master send errors) | 0: correct<br>1: don't support function ID<br>2: address error(overrun address)<br>3: Data error ( the number of data)<br>8: saving data error ( rewrite Flash ) |
| Com 3 | D8139 |                                                                                                |                                                                                                                                                                  |
|       | D8140 |                                                                                                |                                                                                                                                                                  |
|       | D8141 |                                                                                                |                                                                                                                                                                  |
|       | D8142 | the left data RS232 should send                                                                |                                                                                                                                                                  |
|       | D8143 | Data number RS232 received                                                                     |                                                                                                                                                                  |
|       | D8146 |                                                                                                |                                                                                                                                                                  |
|       | D8147 | Communication error code                                                                       | 7: hardware error<br>8: CRC check error<br>9: station number error<br>10: no start sign<br>11: no end sign<br>12: communication time out                         |

|  |       |                                                                                                |                                                                                                                                                                   |
|--|-------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | D8148 | Modbus communication error<br>(the replied message from slaves<br>when the master send errors) | 0: correct<br>1: don't support function ID<br>2: address error(overflow address)<br>3: Data error ( the number of data)<br>8: saving data error ( rewrite Flash ) |
|  | D8149 |                                                                                                |                                                                                                                                                                   |

### HSC Interruption Station (D8150-D8169)

| ID    | Counter ID | function                                   | specification |
|-------|------------|--------------------------------------------|---------------|
| D8150 | C600       | The current segment ( <b>No.n</b> segment) |               |
| D8151 | C602       | The current segment                        |               |
| D8152 | C604       | The current segment                        |               |
| D8153 | C606       | The current segment                        |               |
| D8154 | C608       | The current segment                        |               |
| D8155 | C610       | The current segment                        |               |
| D8156 | C612       | The current segment                        |               |
| D8157 | C614       | The current segment                        |               |
| D8158 | C616       | The current segment                        |               |
| D8159 | C618       | The current segment                        |               |
| D8160 | C620       | The current segment                        |               |
| D8161 | C622       | The current segment                        |               |
| D8162 | C624       | The current segment                        |               |
| D8163 | C626       | The current segment                        |               |
| D8164 | C628       | The current segment                        |               |
| D8165 | C630       | The current segment                        |               |
| D8166 | C632       | The current segment                        |               |
| D8167 | C634       | The current segment                        |               |
| D8168 | C636       | The current segment                        |               |
| D8169 | C638       | The current segment                        |               |

### Pulse output (D8170-D8220)

| ID    | Pulse ID | function                                     | specification |
|-------|----------|----------------------------------------------|---------------|
| D8170 | PULSE_1  | The low 16 bits of accumulated pulse number  |               |
| D8171 |          | The high 16 bits of accumulated pulse number |               |

|       |         |                                                                  |                                     |
|-------|---------|------------------------------------------------------------------|-------------------------------------|
| D8172 |         | The current segment (means Nr.n segment)                         |                                     |
| D8173 | PULSE_2 | The low 16 bits of accumulated pulse number                      |                                     |
| D8174 |         | The high 16 bits of accumulated pulse number                     |                                     |
| D8175 |         | The current segment (means Nr.n segment)                         |                                     |
| D8176 | PULSE_3 | The low 16 bits of accumulated pulse number                      | Only XC5-32RT-E<br>(4PLS) model has |
| D8177 |         | The high 16 bits of accumulated pulse number                     |                                     |
| D8178 |         | The current segment (means Nr.n segment)                         |                                     |
| D8179 | PULSE_4 | The low 16 bits of accumulated pulse number                      |                                     |
| D8180 |         | The high 16 bits of accumulated pulse number                     |                                     |
| D8181 |         | The current segment (means Nr.n segment)                         |                                     |
| D8190 | PULSE_1 | The low 16 bits of the current accumulated current pulse number  |                                     |
| D8191 |         | The high 16 bits of the current accumulated current pulse number |                                     |
| D8192 | PULSE_2 | The low 16 bits of the current accumulated current pulse number  |                                     |
| D8193 |         | The high 16 bits of the current accumulated current pulse number |                                     |
| D8194 | PULSE_3 | The low 16 bits of the current accumulated current pulse number  | Only XC5-32RT-E<br>(4PLS) model has |
| D8195 |         | The high 16 bits of the current accumulated current pulse number |                                     |
| D8196 | PULSE_4 | The low 16 bits of the current accumulated current pulse number  |                                     |
| D8197 |         | The high 16 bits of the current accumulated current pulse number |                                     |

| ID    | Pulse ID  | Function                    | Description |
|-------|-----------|-----------------------------|-------------|
| D8210 | PULSE_1   | Error segment number        | PULSE_1     |
|       |           |                             |             |
| D8212 | PULSE_2   | Error segment number        | PULSE_2     |
|       |           |                             |             |
| D8214 | PULSE_3   | Error segment number        | PULSE_3     |
|       |           |                             |             |
| D8216 | PULSE_4   | Error segment number        | PULSE_4     |
|       |           |                             |             |
| D8218 | PULSE_5   | Error segment number        | PULSE_5     |
| D8220 | Frequency | indicate the bit Nr. Behind |             |

|  |                   |                                            |  |
|--|-------------------|--------------------------------------------|--|
|  | Testing Precision | the decimal dot, 1 means *10, 2 means *100 |  |
|--|-------------------|--------------------------------------------|--|

### Absolute Positioning/Relative Positioning/the Origin Return (D8230-D8239)

| ID    | Pulse   | Function                                                       | Description |
|-------|---------|----------------------------------------------------------------|-------------|
| D8230 | PULSE_1 | Rising time of the absolute/relation position instruction (Y0) |             |
| D8231 |         | Falling time of the origin return instruction (Y0)             |             |
| D8232 | PULSE_2 | Rising time of the absolute/relation position instruction (Y1) |             |
| D8233 |         | Falling time of the origin return instruction (Y1)             |             |
| D8234 | PULSE_3 | Rising time of the absolute/relation position instruction (Y2) |             |
| D8235 |         | Falling time of the origin return instruction (Y2)             |             |
| D8236 | PULSE_4 | Rising time of the absolute/relation position instruction (Y3) |             |
| D8237 |         | Falling time of the origin return instruction (Y3)             |             |
| D8238 | PULSE_5 | Rising time of the absolute/relation position instruction      |             |
| D8239 |         | Falling time of the origin return instruction                  |             |

### Read/Write the Expansion (D8315-D8316)

| ID    | Function                         | Description |
|-------|----------------------------------|-------------|
| D8315 | Read the expansion's error type  |             |
| D8316 | Write the expansion's error type |             |

### Sequential Function Block (D8630-D8730)

| ID    | Function                                           | Description                                       |
|-------|----------------------------------------------------|---------------------------------------------------|
| D8630 |                                                    |                                                   |
| D8631 | The current executing instruction of <b>BLOCK1</b> | The value is used when <b>BLOCK</b> is monitoring |
| D8632 | The current executing instruction of <b>BLOCK2</b> | The value is used when <b>BLOCK</b> is monitoring |
| ..... | .....                                              | .....                                             |
| ..... | .....                                              | .....                                             |
| ..... | .....                                              | .....                                             |
| D8730 | The current executing instruction of               | The value is used when <b>BLOCK</b> is monitoring |

|  |                 |  |
|--|-----------------|--|
|  | <b>BLOCK100</b> |  |
|--|-----------------|--|

**Error information of the Expansions (D8600-D8627)**

| ID    | Function                          | specification                                                                                                                                                                                                                                                    | Expansion ID |
|-------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| D8600 | Read the expansion's error times  |                                                                                                                                                                                                                                                                  | Expansion 1  |
| D8601 | Read the expansion's error        | 1. expansion's CRC parity error<br>2. expansion's address error<br>3. expansion's accepted data length error<br>4. expansion's accept buffer zone overflow<br>5. expansion's timeout error<br>6. CRC parity error when PLC is accepting data<br>7. unknown error |              |
| D8602 | write the expansion's error times |                                                                                                                                                                                                                                                                  |              |
| D8603 | write the expansion's error       | .....                                                                                                                                                                                                                                                            |              |
| D8604 | Read the expansion's times        |                                                                                                                                                                                                                                                                  | Expansion 2  |
| D8605 | Read the expansion's error        | .....                                                                                                                                                                                                                                                            |              |
| D8606 | write the expansion's error times |                                                                                                                                                                                                                                                                  |              |
| D8607 | write the expansion's error       | .....                                                                                                                                                                                                                                                            | Expansion 3  |
| D8608 | Read the expansion's times        |                                                                                                                                                                                                                                                                  |              |
| D8609 | Read the expansion's error        | .....                                                                                                                                                                                                                                                            |              |
| D8610 | write the expansion's error times |                                                                                                                                                                                                                                                                  | Expansion 4  |
| D8611 | write the expansion's error       | .....                                                                                                                                                                                                                                                            |              |
| D8612 | Read the expansion's times        |                                                                                                                                                                                                                                                                  |              |
| D8613 | Read the expansion's error        | .....                                                                                                                                                                                                                                                            | Expansion 7  |
| D8614 | write the expansion's error times |                                                                                                                                                                                                                                                                  |              |
| D8615 | write the expansion's error       | .....                                                                                                                                                                                                                                                            |              |
| ..... | .....                             | .....                                                                                                                                                                                                                                                            | .....        |
| ..... | .....                             | .....                                                                                                                                                                                                                                                            | .....        |
| D8624 | Read the expansion's times        |                                                                                                                                                                                                                                                                  | Expansion 7  |
| D8625 | Read the expansion's error        | .....                                                                                                                                                                                                                                                            |              |
| D8626 | write the expansion's error times |                                                                                                                                                                                                                                                                  |              |
| D8627 | write the expansion's error       | .....                                                                                                                                                                                                                                                            |              |

### Appendix 1-3. ID List of the Expansions

Take the first expansion module as the example:

| Channel    | AD signal | DA signal | PID Output value | PID run/stop bit | Set value | PID parameter: Kp, Ki, Kd, control range Diff, Death range death              |
|------------|-----------|-----------|------------------|------------------|-----------|-------------------------------------------------------------------------------|
| XC-E8AD    |           |           |                  |                  |           |                                                                               |
| 0CH        | ID100     | -         | ID108            | Y100             | QD100     | Kp-----QD108<br>Ki-----QD109<br>Kd-----QD110<br>Diff----QD111<br>Death--QD112 |
| 1CH        | ID101     | -         | ID109            | Y101             | QD101     |                                                                               |
| 2CH        | ID102     | -         | ID110            | Y102             | QD102     |                                                                               |
| 3CH        | ID103     | -         | ID111            | Y103             | QD103     |                                                                               |
| 4CH        | ID104     | -         | ID112            | Y104             | QD104     |                                                                               |
| 5CH        | ID105     | -         | ID113            | Y105             | QD105     |                                                                               |
| 6CH        | ID106     | -         | ID114            | Y106             | QD106     |                                                                               |
| 7CH        | ID107     | -         | ID115            | Y107             | QD107     |                                                                               |
| XC-E4AD2DA |           |           |                  |                  |           |                                                                               |
| 0CH        | ID100     | -         | ID104            | Y100             | QD102     | Kp-----QD106<br>Ki-----QD107<br>Kd-----QD108<br>Diff----QD109<br>Death--QD110 |
| 1CH        | ID101     | -         | ID105            | Y101             | QD103     |                                                                               |
| 2CH        | ID102     | -         | ID106            | Y102             | QD104     |                                                                               |
| 3CH        | ID103     | -         | ID107            | Y103             | QD105     |                                                                               |
| 0CH        | -         | QD100     | -                | -                | -         |                                                                               |
| 1CH        | -         | QD101     | -                | -                | -         |                                                                               |
| XC-E4AD    |           |           |                  |                  |           |                                                                               |
| 0CH        | ID100     | -         | ID104            | Y100             | QD100     | Kp-----QD104<br>Ki-----QD105<br>Kd-----QD106<br>Diff---QD107<br>Death--QD108  |
| 1CH        | ID101     | -         | ID105            | Y101             | QD101     |                                                                               |
| 2CH        | ID102     | -         | ID106            | Y102             | QD102     |                                                                               |
| 3CH        | ID103     | -         | ID107            | Y103             | QD103     |                                                                               |
|            |           |           |                  |                  |           |                                                                               |

#### XC-E4DA

| CH Nr. | Exp. 1 | Exp. 2 | Exp. 3 | Exp. 4 | Exp. 5 | Exp. 6 | Exp. 7 |
|--------|--------|--------|--------|--------|--------|--------|--------|
| 0CH    | QD100  | QD200  | QD300  | QD400  | QD500  | QD600  | QD700  |
| 1CH    | QD101  | QD201  | QD301  | QD401  | QD501  | QD601  | QD701  |
| 2CH    | QD102  | QD202  | QD302  | QD402  | QD502  | QD602  | QD702  |
| 3CH    | QD103  | QD203  | QD303  | QD403  | QD503  | QD603  | QD703  |

#### XC-E2DA

| CH Nr. | Exp. 1 | Exp. 2 | Exp. 3 | Exp. 4 | Exp. 5 | Exp. 6 | Exp. 7 |
|--------|--------|--------|--------|--------|--------|--------|--------|
| 0CH    | QD100  | QD200  | QD300  | QD400  | QD500  | QD600  | QD700  |
| 1CH    | QD101  | QD201  | QD301  | QD401  | QD501  | QD601  | QD701  |

**XC-E6PT-P/ XC-E6TC-P**

| CH Nr. | Current temp. | Set temp. | PID run/stop bit | The first 3CH PID value                            | The last 3CH PID value                             |
|--------|---------------|-----------|------------------|----------------------------------------------------|----------------------------------------------------|
| 0CH    | ID100         | QD100     | Y100             | Kp: QD106<br>Ki: QD107<br>Kd: QD108<br>Diff: QD109 | Kp: QD110<br>Ki: QD111<br>Kd: QD112<br>Diff: QD113 |
| 1CH    | ID101         | QD101     | Y101             |                                                    |                                                    |
| 2CH    | ID102         | QD102     | Y102             |                                                    |                                                    |
| 3CH    | ID103         | QD103     | Y103             |                                                    |                                                    |
| 4CH    | ID104         | QD104     | Y104             |                                                    |                                                    |
| 5CH    | ID105         | QD105     | Y105             |                                                    |                                                    |

**XC-E6TCA-P**

| RELATIVE PARAMETERS                                                 | COMMENTS AND DESCRIPTIONS                                                                                                                                                                                                                                                                                              |       |       |       |       |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
|                                                                     | CH                                                                                                                                                                                                                                                                                                                     | Ch0   | Ch1   | ..... | Ch5   |
| Display temperature<br>(unit: 0.1°C)                                | module 1                                                                                                                                                                                                                                                                                                               | ID100 | ID101 | ID10× | ID105 |
| PID output<br>(X input which returns to main unit)                  | module 1                                                                                                                                                                                                                                                                                                               | X100  | X101  | X10×  | X105  |
| Thermocouple's connecting status<br>(0 is connect, 1 is disconnect) | module 1                                                                                                                                                                                                                                                                                                               | X110  | X111  | X11×  | X115  |
| PID auto tune error bit (0 is normal, 1 is parameters error)        | module 1                                                                                                                                                                                                                                                                                                               | X120  | X121  | X12×  | X125  |
| Enable channel's signal                                             | module 1                                                                                                                                                                                                                                                                                                               | Y100  | Y101  | Y10×  | Y105  |
| Auto tune PID control bit                                           | Auto tune activate signal, enter auto tune stage if being set to be 1;<br>When auto turn finish, PID parameters and temperature control cycle value are refreshed, reset this bit automatically.<br>Users can also read its status; 1 represents auto tune processing; 0 represents no auto tune or auto tune finished |       |       |       |       |
| PID output value (operation value)                                  | Digital output value range: 0~4095<br>If PID output is analogue control (like steam valve open scale or thyistor ON angle), transfer this value to the analogue output module to realize the control requirements                                                                                                      |       |       |       |       |
| PID parameters<br>(P、I、D)                                           | Via PID auto tune to get the best parameters;<br>If the current PID control can't fulfill the control requirements, users can also write the PID parameters according to experience. Modules carry on PID control according to the set PID parameters.                                                                 |       |       |       |       |
| PID operation range<br>(Diff)<br>(unit: 0.1°C)                      | PID operation activates between $\pm \text{Diff}$ ranges. In real temperature control environments, if the temperature is lower than $T_{\text{set temp.}} - T_{\text{Diff}}$ , PID output the max                                                                                                                     |       |       |       |       |

|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                       | value; if the temperature is higher than $T_{\text{set temp.}} + T_{\text{Diff}}$ , PID output the mini value;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Temperature difference $\delta$<br>(unit: 0.1°C)      | (sample temperature+ Temperature difference $\delta$ )/10=display temperature value. Then temperature display value can equal or close to the real temperature value. This parameter has sign (negative or positive). Unit is 0.1°C, the default value is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| The set temperature value(unit: 0.1°C)                | Control system's target temperature value. The range is 0~1000°C, the precision is 0.1°C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Temperature control cycle<br>(unit: 0.1s)             | Control cycle's range is 0.5s~200s, the minimum precision is 0.1s. The write value is the real temperature control cycle multiplies 10. i.e. 0.5s control cycle should write 5, 200s control cycle should write 2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Adjust environment temperature value<br>(unit: 0.1°C) | <p>If users think the environment temperature is different with the display temperature, he can write in the known temperature value. At the moment of value written in, calculate the temperature difference <math>\delta</math> and save.</p> <p>Calculate the temperature difference value <math>\delta</math>=adjust environment temperature value—sample temperature value. Unit: 0.1°C.</p> <p>E.g.: under heat balance status, user test the environmental temperature as 60.0°C with mercurial thermometer, the display temperature is 55.0°C (correspond sample temperature is 550), temperature difference <math>\delta</math>=0. at this time, users write this parameters with 600, temperature difference <math>\delta</math> is re-calculated to be 50 (5°C), then the display temperature = (sample temperature + temperature difference <math>\delta</math>) / 10 = 60°C.</p> <p><b>**Note:</b> when users write the adjust temperature value, make sure that the temperature is same with the environment temperature value. This value is very important, once it's wrong, temperature difference <math>\delta</math> will be wrong, then effect the display temperature</p> |
| Auto tune output value                                | The output when auto tune, use % as the unit, 100 represents 100% of full scale output. 80 represent 80% of full scale output.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**XC-E3AD4PT2DA**

| CH Nr. | AD signal | PID output value | PID run/stop bit | Set value | PID parameters: <b>Kp</b> 、 <b>Ki</b> 、 <b>Kd</b> 、 control range <b>Diff</b> 、 death range <b>Death</b>                      |
|--------|-----------|------------------|------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------|
| 0CH    | ID100     | ID107            | Y100             | QD102     | <b>Kp</b> ----- QD109<br><b>Ki</b> ----- QD110<br><b>Kd</b> ----- QD111<br><b>Diff</b> ----- QD112<br><b>Death</b> ---- QD113 |
| 1CH    | ID101     | ID108            | Y101             | QD103     |                                                                                                                               |
| 2CH    | ID102     | ID109            | Y102             | QD104     |                                                                                                                               |
| CH Nr. | PT signal | PID output value | PID run/stop bit | Set value |                                                                                                                               |
| 3CH    | ID103     | ID110            | Y103             | QD105     |                                                                                                                               |
| 4CH    | ID104     | ID111            | Y104             | QD106     |                                                                                                                               |
| 5CH    | ID105     | ID112            | Y105             | QD107     |                                                                                                                               |
| 6CH    | ID106     | ID113            | Y106             | QD108     |                                                                                                                               |

| CH Nr. | DA signal | - | - | - | - |
|--------|-----------|---|---|---|---|
| 0CH    | QD100     | - | - | - |   |
| 1CH    | QD101     | - | - | - |   |

**XC-E2AD2PT2DA**

| RELATIVE PARAMETERS                                             | COMMENTS AND DESCRIPTIONS                                                                                                                                                                                                                                                                                                    |             |             |       |       |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------|-------|
|                                                                 | CH                                                                                                                                                                                                                                                                                                                           | PT0 (0.01℃) | PT1 (0.01℃) | AD0   | AD1   |
| Display temperature<br>(unit: 0.1℃)                             | module 1                                                                                                                                                                                                                                                                                                                     | ID100       | ID101       | ID102 | ID103 |
| PID output<br>(X input which returns to main unit)              | module 1                                                                                                                                                                                                                                                                                                                     | X100        | X101        | X102  | X103  |
| Connecting status<br>(0 is connect, 1 is disconnect)            | module 1                                                                                                                                                                                                                                                                                                                     | X110        | X111        | X112  | X113  |
| PID auto tune error bit<br>(0 is normal, 1 is parameters error) | module 1                                                                                                                                                                                                                                                                                                                     | X120        | X121        | X122  | X123a |
| Enable channel's signal                                         | module 1                                                                                                                                                                                                                                                                                                                     | Y100        | Y101        | Y102  | Y103  |
| Auto tune PID control bit                                       | Auto tune activate signal, enter auto tune stage if being set to be 1;<br>when auto turn finish, PID parameters and temperature control cycle value are refreshed,<br>reset this bit automatically.<br>Users can also read its status; 1 represents auto tune processing; 0 represents no atto tune or<br>auto tune finished |             |             |       |       |
| PID output value<br>(operation value)                           | Digital output value range: 0~4095<br>If PID output is analogue control (like steam valve open scale or thyistor ON angle),<br>transfer this value to the analogue output module to realize the control requirements                                                                                                         |             |             |       |       |
| PID parameters<br>(P、I、D)                                       | Via PID auto tune to get the best parameters;<br>If the current PID control can't fulfill the control requirements, users can also write the PID<br>parameters according to experience. Modules carry on PID control according to the set PID<br>parameters.                                                                 |             |             |       |       |
| PID operation range<br>(Diff)<br>(unit: 0.1℃)                   | PID operation activates between $\pm \text{Diff}$ ranges. In real temperature control environments, if<br>the temperature is lower than $T_{\text{set temp.}} - T_{\text{Diff}}$ , PID output the max value; if the temperature<br>is higher than $T_{\text{set temp.}} + T_{\text{Diff}}$ , PID output the mini value;      |             |             |       |       |
| Temperature difference<br>$\delta$                              | (sample temperature+ Temperature difference $\delta$ )/10=display temperature value. Then<br>temperature display value can equal or close to the real temperature value. This parameter                                                                                                                                      |             |             |       |       |

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (unit: 0.1°C)                          | has sign (negative or positive). Unit is 0.1°C, the default value is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| The set temperature value(unit: 0.1°C) | Control system's target temperature value. The range is 0~1000°C, the precision is 0.1°C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Temperature control cycle (unit: 0.1s) | Control cycle's range is 0.5s~200s, the minimum precision is 0.1s. The write value is the real temperature control cycle multiplies 10. i.e. 0.5s control cycle should write 5, 200s control cycle should write 2000.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Real value (unit: 0.1°C)               | <p>If users think the environment temperature is different with the display temperature, he can write in the known temperature value. At the moment of value written in, calculate the temperature difference <math>\delta</math> and save.</p> <p>Calculate the temperature difference value <math>\delta = \text{adjust environment temperature value} - \text{sample temperature value}</math>. Unit: 0.1°C.</p> <p>E.g.: under heat balance status, user test the environmental temperature as 60.0°C with mercurial thermometer, the display temperature is 55.0°C (correspond sample temperature is 550), temperature difference <math>\delta = 0</math>. at this time, users write this parameters with 600, temperature difference <math>\delta</math> is re-calculated to be 50 (5°C), then the display temperature = (sample temperature + temperature difference <math>\delta</math>) / 10 = 60°C.</p> <p><b>**Note:</b> when users write the adjust temperature value, make sure that the temperature is same with the environment temperature value. This value is very important, once it's wrong, temperature difference <math>\delta</math> will be wrong, then effect the display temperature</p> |
| Auto tune output value                 | The output when auto tune, use % as the unit, 100 represents 100% of full scale output. 80 represent 80% of full scale output.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

#### Appendix 1-4. Special Flash Register List

##### 1、I filter

| ID     | Function                    | Initial Value | Description |
|--------|-----------------------------|---------------|-------------|
| FD8000 | input filter time of X port | 10            | Unit: ms    |
| FD8002 |                             | 0             |             |
| FD8003 |                             | 0             |             |
| .....  |                             | 0             |             |
| FD8009 |                             | 0             |             |

##### 2、I mapping

| ID     | Function                 | Initial value | Description                                   |
|--------|--------------------------|---------------|-----------------------------------------------|
| FD8010 | X00 corresponds with I** | 0             | X0 corresponds with number of input image I** |
| FD8011 | X01 corresponds with I** | 1             | Initial values are all decimal                |
| FD8012 | X02 corresponds with I** | 2             |                                               |
| .....  | .....                    |               |                                               |
| FD8073 | X77 corresponds with I** | 63            |                                               |

**3、O mapping**

| ID     | Function                               | Initial value | Description                                        |
|--------|----------------------------------------|---------------|----------------------------------------------------|
| FD8074 | <b>Y00</b> corresponds with <b>I**</b> | 0             | Y0 corresponds with the number of output image O** |
| FD8075 | <b>Y01</b> corresponds with <b>I**</b> | 1             | Initial value are all decimal                      |
| FD8076 | <b>Y02</b> corresponds with <b>I**</b> | 2             |                                                    |
| .....  | .....                                  |               |                                                    |
| FD8137 | <b>Y77</b> corresponds with <b>I**</b> | 63            |                                                    |

**4、I property**

| ID     | function     | Initial value | Description                                  |
|--------|--------------|---------------|----------------------------------------------|
| FD8138 | X00 property | all be 0      | 0: positive logic;<br>others: negative logic |
| FD8139 | X01 property |               |                                              |
| FD8140 | X02 property |               |                                              |
| .....  | .....        |               |                                              |
| FD8201 | X77 property |               |                                              |

**5、 power-off retentive area of soft components**

|                   | Soft component | FD REGISTER | FUNCTION                                | Default value | Power-off retentive range |
|-------------------|----------------|-------------|-----------------------------------------|---------------|---------------------------|
| <b>XC1 series</b> | D              | FD8202      | Start tag of D power off retentive area | 100           | D100~D149                 |
|                   | M              | FD8203      | Start tag of M power off retentive area | 200           | M200~M319                 |
|                   | T              | FD8204      | Start tag of T power off retentive area | 640           | -                         |
|                   | C              | FD8205      | Start tag of C power off retentive area | 320           | C320~C631                 |
|                   | S              | FD8206      | Start tag of S power off retentive area | 512           | -                         |
| <b>XC2 series</b> | D              | FD8202      | Start tag of D power off retentive area | 4000          | D4000~D4999               |
|                   | M              | FD8203      | Start tag of M power off retentive area | 3000          | M3000~M7999               |
|                   | T              | FD8204      | Start tag of T power off retentive area | 640           | -                         |
|                   | C              | FD8205      | Start tag of C power off retentive area | 320           | C320~C639                 |
|                   | S              | FD8206      | Start tag of S power off retentive area | 512           | S512~S1023                |

|                   |    |        |                                          |      |             |
|-------------------|----|--------|------------------------------------------|------|-------------|
| <b>XC3 series</b> | D  | FD8202 | Start tag of D power off retentive area  | 4000 | D4000~D7999 |
|                   | M  | FD8203 | Start tag of M power off retentive area  | 3000 | M3000~M7999 |
|                   | T  | FD8204 | Start tag of T power off retentive area  | 640  | -           |
|                   | C  | FD8205 | Start tag of C power off retentive area  | 320  | C320~C639   |
|                   | S  | FD8206 | Start tag of S power off retentive area  | 512  | S512~S1023  |
|                   | ED | FD8207 | Start tag of ED power off retentive area | 0    | ED0~ED16383 |
| <b>XC5 series</b> | D  | FD8202 | Start tag of D power off retentive area  | 4000 | D4000~D7999 |
|                   | M  | FD8203 | Start tag of M power off retentive area  | 4000 | M4000~M7999 |
|                   | T  | FD8204 | Start tag of T power off retentive area  | 640  | -           |
|                   | C  | FD8205 | Start tag of C power off retentive area  | 320  | C320~C639   |
|                   | S  | FD8206 | Start tag of S power off retentive area  | 512  | S512~S1023  |
|                   | ED | FD8207 | Start tag of ED power off retentive area | 0    | ED0~ED36863 |
| <b>XCM series</b> | D  | FD8202 | Start tag of D power off retentive area  | 4000 | D4000~D4999 |
|                   | M  | FD8203 | Start tag of M power off retentive area  | 3000 | M3000~M7999 |
|                   | T  | FD8204 | Start tag of T power off retentive area  | 640  | -           |
|                   | C  | FD8205 | Start tag of C power off retentive area  | 320  | C320~C639   |
|                   | S  | FD8206 | Start tag of S power off retentive area  | 512  | S512~S1023  |
|                   | ED | FD8207 | Start tag of ED power off retentive area | 0    | ED0~ED36863 |

## 6、Communication

|      | ID     | Function                             | Initial | Description                                                           |
|------|--------|--------------------------------------|---------|-----------------------------------------------------------------------|
|      |        |                                      |         |                                                                       |
| COM1 | FD8210 | Communicate Mode<br>(station number) | 1       | 255 (FF) is free mode,<br>1~254 is modbus station number              |
|      | FD8211 | Communicate format                   | 8710    | Baud rate, Data bit, stop bit,<br>parity                              |
|      | FD8212 | Judgment time of ASC<br>timeout      | 3       | Unit ms, if set to be 0, it means no<br>timeout waiting               |
|      | FD8213 | Judgment time of reply<br>timeout    | 300     | Unit ms, if set to be 0, it means no<br>timeout waiting               |
|      | FD8214 | Start ASC                            | 0       | High 8 bits invalid                                                   |
|      | FD8215 | End ASC                              | 0       | High 8 bits invalid                                                   |
|      | FD8216 | Free format setting                  | 0       | 8/16 bits buffer;<br>With/without start bit,<br>With/without stop bit |
| COM2 | FD8220 | Communicate Mode<br>(station number) | 8710    | 255 (FF) is free mode,<br>1~254 is modbus station number              |
|      | FD8221 | Communicate format                   | 3       | Baud rate, Data bit, stop bit,<br>parity                              |
|      | FD8222 | Judgment time of ASC<br>timeout      | 300     | Unit ms, if set to be 0, it means no<br>timeout waiting               |
|      | FD8223 | Judgment time of reply<br>timeout    | 0       | Unit ms, if set to be 0, it means no<br>timeout waiting               |
|      | FD8224 | Start ASC                            | 0       | High 8 bits invalid                                                   |
|      | FD8225 | End ASC                              | 0       | High 8 bits invalid                                                   |
|      | FD8226 | Free format setting                  | 8710    | 8/16 bits buffer;<br>With/without start bit,<br>With/without stop bit |
| COM3 | FD8230 | Communicate Mode<br>(station number) | 8710    | 255 (FF) is free mode,<br>1~254 is modbus station number              |
|      | FD8231 | Communicate format                   | 3       | Baud rate, Data bit, stop bit,<br>parity                              |
|      | FD8232 | Judgment time of ASC<br>timeout      | 300     | Unit ms, if set to be 0, it means no<br>timeout waiting               |
|      | FD8233 | Judgment time of reply<br>timeout    | 0       | Unit ms, if set to be 0, it means no<br>timeout waiting               |
|      | FD8234 | Start ASC                            | 0       | High 8 bits invalid                                                   |
|      | FD8235 | End ASC                              | 0       | High 8 bits invalid                                                   |
|      | FD8236 | Free format setting                  | 8710    | 8/16 bits buffer;<br>With/without start bit,<br>With/without stop bit |

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※1: If you change special FLASH memory, it will take into effect after restart the PLC

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## Appendix 2 Instructions List

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In this chapter, we will list all the instructions XC series PLC support. These instructions include: basic instructions, application instructions, special function instructions and motion control instructions. Also, we declare each instruction's application range.

This part enables the users to check the instruction's functions much faster. For the detailed application, please refer to XC Series Programmable Controller **【Instruction Part】**.

|                                       |
|---------------------------------------|
| Appendix 2-1. Basic Instructions List |
|---------------------------------------|

|                                             |
|---------------------------------------------|
| Appendix 2-2. Application Instructions List |
|---------------------------------------------|

|                                                  |
|--------------------------------------------------|
| Appendix 2-3. Special Function Instructions List |
|--------------------------------------------------|

|                                                |
|------------------------------------------------|
| Appendix 2-4. Motion Control Instructions List |
|------------------------------------------------|

## Appendix 2-1. Basic Instructions List

| Mnemonic | Function                                                    |
|----------|-------------------------------------------------------------|
| LD       | Initial logical operation contact type NO (normally open)   |
| LDI      | Initial logical operation contact type NC (normally closed) |
| OUT      | Final logic operation type coil drive                       |
| AND      | Serial connection of NO                                     |
| ANI      | Serial connection of NC                                     |
| OR       | Parallel connection of NO                                   |
| ORI      | Parallel connection of NC                                   |
| LDP      | Rising edge pulse                                           |
| LDF      | Falling edge pulse                                          |
| ANDP     | Serial connection of rising edge pulse                      |
| ANDF     | Serial connection of falling edge pulse                     |
| ORP      | Parallel connection of rising edge pulse                    |
| ORF      | Parallel connection of falling edge pulse                   |
| LDD      | Read the point                                              |
| LDDI     | Read NC                                                     |
| ANDD     | Read the point and serial connection                        |
| ANDDI    | Read NC and serial connection                               |
| ORD      | Read the point and parallel connection                      |
| ORDI     | Read NC and parallel connection                             |
| OUTD     | Output the point                                            |
| ORB      | Parallel connection of parallel multiply parallel circuit   |
| ANB      | Serial connection of parallel multiply parallel circuit     |
| MCS      | New bus line start                                          |
| MCR      | Bus line return                                             |
| ALT      | Alternate state                                             |
| PLS      | Rising edge pulse                                           |
| PLF      | Falling edge pulse                                          |
| SET      | Set a bit device permanently on                             |
| RST      | Reset a bit device permanently off                          |
| OUT      | Output counter coil                                         |
| RST      | Output reset, and current data reset to zero                |
| END      | I/O process and return to step0                             |
| GROUP    | Instruction block fold start                                |
| GROUPE   | Instruction block fold end                                  |
| TMR      | Time                                                        |

## Appendix 2-2. Applied instruction list

| Sort         | Mnemonic            | Function                                           | Suit Model |     |     |     |     |
|--------------|---------------------|----------------------------------------------------|------------|-----|-----|-----|-----|
|              |                     |                                                    | XC1        | XC2 | XC3 | XC5 | XCM |
| Program flow | CJ                  | Condition Jump                                     | √          | √   | √   | √   | √   |
|              | CALL                | Call subroutine                                    | √          | √   | √   | √   | √   |
|              | SRET                | Subroutine return                                  | √          | √   | √   | √   | √   |
|              | STL                 | Flow start                                         | √          | √   | √   | √   | √   |
|              | STLE                | Flow end                                           | √          | √   | √   | √   | √   |
|              | SET                 | Open the assigned flow, close the current flow     | √          | √   | √   | √   | √   |
|              | ST                  | Open the assigned flow, not close the current flow | √          | √   | √   | √   | √   |
|              | FOR                 | Start of a FOR-NEXT loop                           | √          | √   | √   | √   | √   |
|              | NEXT                | END of a FOR-NEXT loop                             | √          | √   | √   | √   | √   |
|              | FEND                | End of main program                                | √          | √   | √   | √   | √   |
|              | LD=* <sup>1</sup>   | LD activate if (S1)= (S2)                          | √          | √   | √   | √   | √   |
| Data compare | LD>* <sup>1</sup>   | LD activate if (S1)> (S2)                          | √          | √   | √   | √   | √   |
|              | LD<* <sup>1</sup>   | LD activate if (S1)< (S2)                          | √          | √   | √   | √   | √   |
|              | LD<>* <sup>1</sup>  | LD activate if(S1)≠(S2)                            | √          | √   | √   | √   | √   |
|              | LD>=* <sup>1</sup>  | LD activate if(S1) >= (S2)                         | √          | √   | √   | √   | √   |
|              | LD<=* <sup>1</sup>  | LD activate if(S1) <= (S2)                         | √          | √   | √   | √   | √   |
|              | AND=* <sup>1</sup>  | AND activate if (S1)= (S2)                         | √          | √   | √   | √   | √   |
|              | AND>* <sup>1</sup>  | AND activate if (S1)> (S2)                         | √          | √   | √   | √   | √   |
|              | AND<* <sup>1</sup>  | AND activate if (S1)< (S2)                         | √          | √   | √   | √   | √   |
|              | AND<>* <sup>1</sup> | AND activate if(S1)≠(S2)                           | √          | √   | √   | √   | √   |
|              | AND>=* <sup>1</sup> | AND activate if(S1) >= (S2)                        | √          | √   | √   | √   | √   |
|              | AND<=* <sup>1</sup> | AND activate if(S1) <= (S2)                        | √          | √   | √   | √   | √   |
|              | OR=* <sup>1</sup>   | OR activate if (S1)= (S2)                          | √          | √   | √   | √   | √   |
|              | OR>* <sup>1</sup>   | OR activate if (S1)> (S2)                          | √          | √   | √   | √   | √   |
|              | OR<* <sup>1</sup>   | OR activate if (S1)< (S2)                          | √          | √   | √   | √   | √   |
|              | OR<>* <sup>1</sup>  | OR activate if(S1)≠(S2)                            | √          | √   | √   | √   | √   |
|              | OR>=* <sup>1</sup>  | OR activate if(S1) >= (S2)                         | √          | √   | √   | √   | √   |
|              | OR<=* <sup>1</sup>  | OR activate if(S1) <= (S2)                         | √          | √   | √   | √   | √   |
| Data move    | CMP* <sup>1</sup>   | Data compare                                       | √          | √   | √   | √   | √   |
|              | ZCP* <sup>1</sup>   | Data zone compare                                  | √          | √   | √   | √   | √   |
|              | MOV* <sup>1</sup>   | Move                                               | √          | √   | √   | √   | √   |
|              | BMOV                | Block move                                         | √          | √   | √   | √   | √   |
|              | FMOV* <sup>1</sup>  | Fill move                                          | √          | √   | √   | √   | √   |
|              | FWRT* <sup>1</sup>  | FlashROM Written                                   | √          | √   | √   | √   | √   |
|              | MSET                | Zone set                                           | √          | √   | √   | √   | √   |
|              | ZRST                | Zone reset                                         | √          | √   | √   | √   | √   |
|              | SWAP                | The high bytes and low bytes exchange              | √          | √   | √   | √   | √   |
|              | XCH* <sup>1</sup>   | Data exchange                                      | √          | √   | √   | √   | √   |

| Sort           | Mnemonic           | function                                           | Suit model |     |     |     |     |
|----------------|--------------------|----------------------------------------------------|------------|-----|-----|-----|-----|
|                |                    |                                                    | XC1        | XC2 | XC3 | XC5 | XCM |
| Data Operation | ADD <sup>*1</sup>  | addition                                           | √          | √   | √   | √   | √   |
|                | SUB <sup>*1</sup>  | subtraction                                        | √          | √   | √   | √   | √   |
|                | MUL <sup>*1</sup>  | multiplication                                     | √          | √   | √   | √   | √   |
|                | DIV <sup>*1</sup>  | division                                           | √          | √   | √   | √   | √   |
|                | INC <sup>*1</sup>  | Increment                                          | √          | √   | √   | √   | √   |
|                | DEC <sup>*1</sup>  | decrement                                          | √          | √   | √   | √   | √   |
|                | MEAN <sup>*1</sup> | mean                                               | √          | √   | √   | √   | √   |
|                | WAND <sup>*1</sup> | Word and                                           | √          | √   | √   | √   | √   |
|                | WOR <sup>*1</sup>  | Word or                                            | √          | √   | √   | √   | √   |
|                | WXOR <sup>*1</sup> | Word exclusive or                                  | √          | √   | √   | √   | √   |
|                | CML <sup>*1</sup>  | <b>Complement</b>                                  | √          | √   | √   | √   | √   |
|                | NEG <sup>*1</sup>  | Negative                                           | √          | √   | √   | √   | √   |
| Data shift     | SHL <sup>*1</sup>  | Arithmetic shift left                              |            | √   | √   | √   | √   |
|                | SHR <sup>*1</sup>  | Arithmetic shift right                             |            | √   | √   | √   | √   |
|                | LSL <sup>*1</sup>  | Logic shift left                                   |            | √   | √   | √   | √   |
|                | LSR <sup>*1</sup>  | Logic shift right                                  |            | √   | √   | √   | √   |
|                | ROL <sup>*1</sup>  | Rotation shift left                                |            | √   | √   | √   | √   |
|                | ROR <sup>*1</sup>  | Rotation shift right                               |            | √   | √   | √   | √   |
|                | SFTL <sup>*1</sup> | Bit shift left                                     |            | √   | √   | √   | √   |
|                | SFTR <sup>*1</sup> | Bit shift right                                    |            | √   | √   | √   | √   |
|                | WSFL               | Word shift left                                    |            | √   | √   | √   | √   |
|                | WSFR               | Word shift right                                   |            | √   | √   | √   | √   |
| Data convert   | WTD                | Single word integer convert to double word integer |            | √   | √   | √   | √   |
|                | FLT <sup>*1</sup>  | 16 bits integer convert to float                   |            | √   | √   | √   | √   |
|                | FLTD <sup>*1</sup> | 64 bits integer convert to float                   |            | √   | √   | √   | √   |
|                | INT <sup>*1</sup>  | Float convert to integer                           |            | √   | √   | √   | √   |
|                | BIN                | BCD convert to binary                              |            | √   | √   | √   | √   |
|                | BCD                | Binary convert to BCD                              |            | √   | √   | √   | √   |
|                | ASCI               | Hex convert to ASC II                              |            | √   | √   | √   | √   |
|                | HEX                | ASC II convert to Hex                              |            | √   | √   | √   | √   |
|                | DECO               | Coding                                             |            | √   | √   | √   | √   |
|                | ENCO               | High bit coding                                    |            | √   | √   | √   | √   |
|                | ENCOL              | Low bit coding                                     |            | √   | √   | √   | √   |

| Sort            | Mnemonic           | function             | Suit Model |     |     |     |     |
|-----------------|--------------------|----------------------|------------|-----|-----|-----|-----|
|                 |                    |                      | XC1        | XC2 | XC3 | XC5 | XCM |
| Float Operation | ECMP <sup>※2</sup> | Float compare        |            | √   | √   | √   | √   |
|                 | EZCP <sup>※2</sup> | Float zone compare   |            | √   | √   | √   | √   |
|                 | EADD <sup>※2</sup> | Float addition       |            | √   | √   | √   | √   |
|                 | ESUB <sup>※2</sup> | Float subtraction    |            | √   | √   | √   | √   |
|                 | EMUL <sup>※2</sup> | Float multiplication |            | √   | √   | √   | √   |
|                 | EDIV <sup>※2</sup> | Float division       |            | √   | √   | √   | √   |
|                 | ESQR <sup>※2</sup> | Float square root    |            | √   | √   | √   | √   |
|                 | SIN <sup>※2</sup>  | Sine                 |            | √   | √   | √   | √   |
|                 | COS <sup>※2</sup>  | Cosine               |            | √   | √   | √   | √   |
|                 | TAN <sup>※2</sup>  | tangent              |            | √   | √   | √   | √   |
|                 | ASIN <sup>※2</sup> | Float arcsin         |            | √   | √   | √   | √   |
|                 | ACOS <sup>※2</sup> | Float arccos         |            | √   | √   | √   | √   |
|                 | ATAN <sup>※2</sup> | Float arctan         |            | √   | √   | √   | √   |
| Clock           | TRD                | Read RTC data        |            | √   | √   | √   | √   |
|                 | TWR                | Set RTC data         |            | √   | √   | √   | √   |

※1: All the instructions are 16bits except the instructions with ※1 which has 32bits. 32bits instructions are added D in front of its 16bits instruction. Such as ADD (16bits) / DADD (32bits).

※2: These instructions are 32bits, and have no 16bits format.

※3: √ means this series support the instruction.

### Appendix 2-3. Special Instructions List

| Sort                     | Mnemonic              | Function                                             | Suitable type |     |     |     |     |
|--------------------------|-----------------------|------------------------------------------------------|---------------|-----|-----|-----|-----|
|                          |                       |                                                      | XC1           | XC2 | XC3 | XC5 | XCM |
| pulse                    | PLSY <sup>※1</sup>    | Single segment no accelerate/decelerate pulse output |               | √   | √   | √   | √   |
|                          | PLSR <sup>※1</sup>    | Relative position multi-segment pulse control        |               | √   | √   | √   | √   |
|                          | PLSF <sup>※1</sup>    | Changeable frequency pulse output                    |               | √   | √   | √   | √   |
|                          | PLSA <sup>※1</sup>    | Absolute position multi-segment pulse control        |               | √   | √   | √   | √   |
|                          | PLSNE<br>XT/PLS<br>NT | change the pulse segment                             |               | √   | √   | √   | √   |
|                          | PLSMV <sup>※2</sup>   | Save the pulse number in the register                |               | √   | √   | √   | √   |
|                          | STOP                  | Pulse stop                                           |               | √   | √   | √   | √   |
| High Speed Counter (HSC) | HSCR <sup>※2</sup>    | Read high speed counter value                        |               | √   | √   | √   | √   |
|                          | HSCW <sup>※2</sup>    | Write high speed counter value                       |               | √   | √   | √   | √   |

|                                  |       |                              |  |   |   |   |   |
|----------------------------------|-------|------------------------------|--|---|---|---|---|
| <b>MODBUS communication</b>      | COLR  | MODBUS coil read             |  | √ | √ | √ | √ |
|                                  | INPR  | MODBUS input coil read       |  | √ | √ | √ | √ |
|                                  | COLW  | MODBUS single coil write     |  | √ | √ | √ | √ |
|                                  | MCLW  | MODBUS multi coil write      |  | √ | √ | √ | √ |
|                                  | REGR  | MODBUS register read         |  | √ | √ | √ | √ |
|                                  | INRR  | MODBUS input register write  |  | √ | √ | √ | √ |
|                                  | REGW  | MODBUS single register write |  | √ | √ | √ | √ |
|                                  | MRGW  | MODBUS multi register write  |  | √ | √ | √ | √ |
| <b>Free format communication</b> | SEND  | Free format data send        |  | √ | √ | √ | √ |
|                                  | RCV   | Free format data receive     |  | √ | √ | √ | √ |
| <b>CANBUS communication</b>      | CCOLR | CANBUS coil read             |  |   |   | √ |   |
|                                  | CCOLW | CANBUS coil write            |  |   |   | √ |   |
|                                  | CREGR | CANBUS register read         |  |   |   | √ |   |
|                                  | CREGW | CANBUS register write        |  |   |   | √ |   |
| <b>Precision time</b>            | STR   | Precision time               |  | √ | √ | √ | √ |
|                                  | STRR  | Read precision time register |  | √ | √ | √ | √ |
|                                  | STRS  | Stop precision time          |  | √ | √ | √ | √ |
| <b>interrupt</b>                 | EI    | Enable interruption          |  | √ | √ | √ | √ |
|                                  | DI    | Disable interruption         |  | √ | √ | √ | √ |
|                                  | IRET  | Interruption return          |  | √ | √ | √ | √ |
| <b>BLOCK</b>                     | BSTOP | Stop the block               |  | √ | √ | √ | √ |
|                                  | BGOON | Continue running the block   |  | √ | √ | √ | √ |
|                                  | WAIT  | Wait                         |  | √ | √ | √ | √ |
| <b>Read/write expansion</b>      | FROM  | Read the module              |  | √ | √ | √ | √ |
|                                  | TO    | Write the module             |  | √ | √ | √ | √ |
| <b>others</b>                    | FRQM  | Frequency measurement        |  | √ | √ | √ | √ |
|                                  | PWM   | Pulse width modulation       |  | √ | √ | √ | √ |
|                                  | PID   | PID control                  |  | √ | √ | √ | √ |

※1: All the instructions are 16bits except the instructions with ※1 which has 32bits. 32bits instructions are added D in front of its 16bits instruction. Such as ADD (16bits) / DADD (32bits).

※2: These instructions are 32bits, and have no 16bits format.

※3: √ means this series support the instruction.

#### Appendix 2-4. MOTION CONTROL INSTRUCTIONS LIST

| Mnemonic           | FUNCTION                             | SUITABLE MODELS |     |     |     |     |
|--------------------|--------------------------------------|-----------------|-----|-----|-----|-----|
|                    |                                      | XC1             | XC2 | XC3 | XC5 | XCM |
| ZRN <sup>※1</sup>  | Origin return                        |                 |     |     |     | √   |
| DRVA <sup>※1</sup> | Absolute position                    |                 |     |     |     | √   |
| DRVI <sup>※1</sup> | Relative position                    |                 |     |     |     | √   |
| ABS                | Absolute address                     |                 |     |     |     | √   |
| CCW <sup>※2</sup>  | Circular anticlockwise interpolation |                 |     |     |     | √   |

|                      |                                  |  |  |  |  |   |
|----------------------|----------------------------------|--|--|--|--|---|
| CHK                  | Servo end check                  |  |  |  |  | √ |
| CW <sup>※2</sup>     | Circular interpolation clockwise |  |  |  |  | √ |
| DRV <sup>※2</sup>    | High speed                       |  |  |  |  | √ |
| DRVR                 | Electrical zero return           |  |  |  |  | √ |
| DRVZ                 | Machine zero return              |  |  |  |  | √ |
| FOLLOW <sup>※2</sup> | Follow movement instruction      |  |  |  |  | √ |
| INC                  | Incremental address              |  |  |  |  | √ |
| LIN <sup>※2</sup>    | Linear interpolation positioning |  |  |  |  | √ |
| PLAN <sup>※2</sup>   | Plane selection                  |  |  |  |  | √ |
| TIM <sup>※2</sup>    | Delayed time                     |  |  |  |  | √ |
| SETR                 | Set electrical zero              |  |  |  |  | √ |
| SETP <sup>※2</sup>   | Set reference frame              |  |  |  |  | √ |

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※1: The instructions with ※1 sign have 32 bits form; generally 32 bits instructions are represented as adding D before 16 bits instructions, like this 32 bits ADD instructions is DADD;

※2: The instructions with ※2 sign are 32 bits form; they don't have 16 bits form;

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## Appendix 3 Version for special function

Generally, the functions and instructions described in this manual don't have software and hardware requirements. But for some special functions, we have software and hardware versions requirement. Below, we list these requirements for the special functions;

| function                                            | Hardware version | Software version |
|-----------------------------------------------------|------------------|------------------|
| Fill move 32 bits instruction DFMOV                 | V3.0 and above   | V3.0 and above   |
| Float number move instruction EMOV                  | V3.0 and above   | V3.0 and above   |
| Gray code switch to binary instruction GRY, GBIN    | V3.3 and above   | V3.3 and above   |
| Anti-trigonometric Operation                        | V3.0 and above   | V3.0 and above   |
| Read/write clock                                    | V2.51 and above  | V3.0 and above   |
| Read/write high speed counter                       | V3.1c and above  | V3.0 and above   |
| Interrupt high speed counter                        | V3.1c and above  | V3.0 and above   |
| Pulse output PTO, PTOA, PSTOP, PTF                  | V3.3 and above   | V3.3 and above   |
| Free format instruction RCVST                       | V3.1e and above  | V3.1f and above  |
| Read precise time                                   | V3.0e and above  | V3.0 and above   |
| Stop precise time                                   | V3.0e and above  | V3.0 and above   |
| C program block function                            | V3.0c and above  | V3.0 and above   |
| PID function                                        | V3.0 and above   | V3.0 and above   |
| Block                                               | V3.1i and above  | V3.1h and above  |
| Connect T-BOX                                       | V3.0g and above  | V3.0 and above   |
| Connect G-BOX                                       | V3.0i and above  | V3.0 and above   |
| Connect XC-SD-BD                                    | V3.2 and above   | V3.2 and above   |
| Read/write XC-E6TCA-P, XC-E2AD2PT3DA, XC-E2AD2PT2DA | V3.1f and above  | V3.1b and above  |
| Expand register ED                                  | V3.0 and above   | V3.0 and above   |

## Appendix 4 PLC Configuration List

This part is used to check each model's configurations. Via this table, we can judge the model easily;

○ selectable    ×Not support    √support

| Models          | clock | communication |        |      | expansion | BD<br>board | NO. of high speed counter |                            |             | No. of<br>Pulse<br>(T<br>model/<br>RT<br>model<br>) | External<br>interrupt |
|-----------------|-------|---------------|--------|------|-----------|-------------|---------------------------|----------------------------|-------------|-----------------------------------------------------|-----------------------|
|                 |       | CAN           | Modbus | Free |           |             | Increase                  | Pulse<br>+<br>directo<br>r | AB<br>phase |                                                     |                       |
| XC1 Series      |       |               |        |      |           |             |                           |                            |             |                                                     |                       |
| XC1-10          | ×     | ×             | ×      | ×    | ×         | ×           | ×                         | ×                          | ×           | ×                                                   | ×                     |
| XC1-16          | ×     | ×             | ×      | ×    | ×         | ×           | ×                         | ×                          | ×           | ×                                                   | ×                     |
| XC1-24          | ×     | ×             | √※2    | ×    | ×         | ×           | ×                         | ×                          | ×           | ×                                                   | ×                     |
| XC1-32          | ×     | ×             | √※2    | ×    | ×         | ×           | ×                         | ×                          | ×           | ×                                                   | ×                     |
| XC2 Series      |       |               |        |      |           |             |                           |                            |             |                                                     |                       |
| XC2-14          | ○     | ×             | ○      | ○    | ×         | ×           | 5                         | 2                          | 2           | 2                                                   | 3                     |
| XC2-16          | ○     | ×             | ×      | ×    | ×         | ×           | 5                         | 2                          | 2           | 2                                                   | 3                     |
| XC2-24          | ○     | ×             | √      | √    | ×         | √           | 5                         | 2                          | 2           | 2※1                                                 | 3                     |
| XC2-32          | ○     | ×             | √      | √    | ×         | √           | 5                         | 2                          | 2           | 2※1                                                 | 3                     |
| XC2-48          | ○     | ×             | √      | √    | ×         | √           | 5                         | 2                          | 2           | 2※1                                                 | 3                     |
| XC2-60          | ○     | ×             | √      | √    | ×         | √           | 5                         | 2                          | 2           | 2※1                                                 | 3                     |
| XC3 Series      |       |               |        |      |           |             |                           |                            |             |                                                     |                       |
| XC3-14          | ×     | ×             | ○      | ○    | ×         | ×           | 4                         | 2                          | 2           | 2                                                   | 1                     |
| XC3-24          | ○     | ×             | √      | √    | √         | √           | 6                         | 3                          | 3           | 2※1                                                 | 3                     |
| XC3-32          | ○     | ×             | √      | √    | √         | √           | 6                         | 3                          | 3           | 2※1                                                 | 3                     |
| XC3-42          | ○     | ×             | √      | √    | √         | ×           | 6                         | 3                          | 3           | 2※1                                                 | 3                     |
| XC3-48          | ○     | ×             | √      | √    | √         | √           | 4                         | 2                          | 2           | 2                                                   | 3                     |
| XC3-60          | ○     | ×             | √      | √    | √         | √           | 4                         | 2                          | 2           | 2                                                   | 3                     |
| XC3-19A<br>R-E  | ○     | ×             | √      | √    | ×         | ×           | 4                         | 2                          | 2           | 2                                                   | 3                     |
| XC5 Series      |       |               |        |      |           |             |                           |                            |             |                                                     |                       |
| XC5-24          | ○     | ×             | √      | √    | √         | √           | 2                         | 1                          | 1           | 4※1                                                 | 5                     |
| XC5-32          | ○     | ×             | √      | √    | √         | √           | 2                         | 1                          | 1           | 4※1                                                 | 5                     |
| XC5-48          | ○     | √             | √      | √    | √         | √           | 6                         | 3                          | 3           | 2※1                                                 | 3                     |
| XC5-60          | ○     | √             | √      | √    | √         | √           | 6                         | 3                          | 3           | 2※1                                                 | 3                     |
| XCM Series      |       |               |        |      |           |             |                           |                            |             |                                                     |                       |
| XCM-24/<br>32T4 | ○     | ×             | √      | √    | √         | √           | 2                         | 1                          | 1           | 4※1                                                 | 5                     |

|                 |   |   |   |   |   |   |   |   |   |                             |   |
|-----------------|---|---|---|---|---|---|---|---|---|-----------------------------|---|
| XCM-24/<br>32T3 | ○ | × | √ | √ | √ | √ | 4 | 2 | 2 | 3 <sup>※</sup> <sub>1</sub> | 3 |
| XCM-60          | ○ | × | √ | √ | × | √ | 4 | 0 | 3 | 10 <sup>※1</sup>            | 4 |
| XCC Series      |   |   |   |   |   |   |   |   |   |                             |   |
| XCC-32          | ○ | √ | √ | √ | √ | √ | 5 | 0 | 5 | 5                           | 5 |

※1: If use BD board, Y1 can't be used for pulse

※2: it just can be used for Modbus slave.

## Appendix 5 common question A&Q

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The following are the common questions may happen when using the PLC.

**Q1: why the coil is not set when the condition is satisfied?**

**A1: the probable reasons:**

- (1) use one coil for many times, double coils output, the later coil has priority.
- (2) some conditions reset the coil, please use monitor function to find the reset point and modify the program.

**Q2: set on the pulse output instruction, the pulse doesn't output?**

**A2:** there are many pulse output instructions in the program.

**Q3: why connect the high speed counter but no counter value?**

**A3: the probable reasons:**

- (1) make sure the PLC has high speed counter photo-couplers.
- (2) when the PLC hardware version is 2.5 and software version is 3.0, it is not available to use HSC, please update the hardware version to 3.0.

**Q4: What's the difference between com1 and com2?**

**A4:** the communication parameters of com1 and com2 can set by users. The difference is com1 can return to default parameters by stop PLC after power on.

**Q5: Why free format communication is failure?**

**A5:** check the communication parameters, if use com2, please set the FD8220 to HFF, FD8221 set to corresponding parameters.

**Q6: Why the real time clock (RTC) cannot work**

**A6:** XC3-14 and XP1 do not have RTC function.

**Q7: Why PLC cannot communicate with other device**

**A7: the probable reasons:**

- (1) Communication parameters: PLC com port and device parameters must be the same.
- (2) Communication cable: Make sure connection is correct and good.
- (3) Communication serial port: check the serial port, download the PLC program, if download successful the serial port is no problem.
- (4) Ask manufacturer for help.

**Q8: How long can the PLC battery are used?**

**A8:** for 3-5 years.

**Q9: why the temperature fluctuates serious under normal temperature when connecting the thermocouple with the temperature module?**

**A9: the probable reasons:**

- (1) Check if the thermocouple cold point is short with the outside cover. If short, please change another thermocouple.
- (2) the weak electricity such as outside interference, thermocouple, temperature module should separate from the strong electricity, make sure there is certain distance between them. If the device has motor, inverter, make sure to connect the ground correctly.



**WUXI XINJE ELECTRIC CO., LTD.**

4th Floor, Building 7th, No.100 Dicui Rd,  
Wuxi, China

Tel: 86-0510-85134139

Fax: 86-0510-85111290

Web: [www.xinje.com](http://www.xinje.com)

Email: [cheerfiona@gmail.com](mailto:cheerfiona@gmail.com)