
XINJE

XP/XMP-18 series

Integral industrial controller

Operating manual

Xinje Electronic Co.,Ltd

Data No. PHC01 20080730 3.0



Xinje

| | | |
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V1.0

This manual includes some basic precautions which you should follow to keep you safe and protect the products. These precautions are underlined with warning triangles in the manual. About other manuals that we do not mention, please follow basic electric operating rules.

Precautions



Please follow the precautions. If not, it may lead the controlsystem incorrect or abnormal, even cause fortune lose.

**Correct
Application**



The models could only be used according to the manual, and an only be used along with the peripheral equipments recognized or recommended by Xinje Electronic. They could only work normally in the condition of be transported, kept and installed correctly, also please operate and maintain them according to the recommendation.

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Without exact paper file allowance, copy, translate or using the manual is not allowed. Disobey this, people should take the responsibility of loss. We reserve all the right of expansions and their design patent.

Duty Declare

We have checked the manual, its content fits the hardware and software of the products. As mistakes are unavoidable, we couldn't promise all correct. However, we would check the data in the manual frequently, and in the next edition, we will correct the necessary information. Your recommendation would be highly appreciated

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Preface

Thank you for purchasing Xinje XP/XMP series integral industrial controller, please read the manual before operating.

Manual purpose

- This manual provides user with the guide of using and operating our product, it includes the product characteristics, spec explanation, using method, etc.
- This manual contains product summarization, exterior layout, PLC program, and exterior extension.
- ∅ Summarization: introduce the product characteristics, specs, dimension, installation.
- ∅ Exterior layout: introduce the product power spec, in-out layout.
- ∅ PLC program: introduce how to program in PLC.
- ∅ HMI picture: introduce how to edit picture in OP.
- ∅ Exterior extension: introduce extension ability of the product.

Suitable people

This manual aims to below users:

- Terminal user
- Debugging person
- Technology support person

Make sure you have read the safety notice before operating.

Scope

This manual applies to the XP/XMP series integral industrial controller.

Tele-document

Xinje provides user with press document and tele-document:

- User CD
Contained software, manual and application examples
- Xinje website
Welcome to www.xinje.com download center to find electronic document.

Contact us

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Safety notice

Read the manual carefully before operating. Be aware of the safety and correct operation. The content below is focus on XP/XMP series products only.

Please safekeeping the manual, put in somewhere easy to get and read and give the manual to final user.

Notice items



ATTENTION

Do not put the wire close to cable, keep 10cm distance at least.

Do not change the inside module of product or it may cause fault, error action, loss, fire.

When it smelly or noisy, cut the power immediately (short tweet after power on is normal).

Do not press the screen with pen, screwdriver or other sharp tools, it may cause screen break or error.

For installing the product, tighten the screws to avoid loosing.

Transport, install, store, assemble and maintain the product accurately to avoid breaking.



DANGEROUSNESS

Confirm the power voltage and wire connection before turn on the power in order to avoid breaking

Do not touch the connection point to avoid getting an electric shock

Do not open the back cover board

Cut all the power before installation and take-down to avoid error and fault

Please use in the surrounding the manual stated to avoid accident

Do not use the product under the condition of high frequency radiation, strong magnetic field to avoid interference

1. Summarization

1-1. Product summarization

XP/XMP-18 series integral industrial controller integrated human machine interface (HMI) and PLC (XC1, XC2, XC3 series). It can instead of HMI and PLC to fulfill the control function. It can save space with slim outline and improve the convenience of maintenance.

Product characteristics

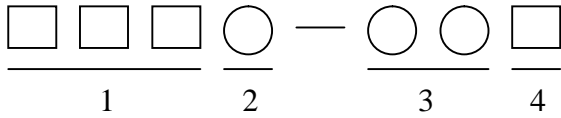
- U Integrate logical control, analog quantity in-out and HMI into the product
 - On-off quantity input: 10 points, optical coupling insulation
 - On-off quantity output: 8 points, relay output/transistor output/R&T mixture output
 - Analog quantity: XP/XMP can extend BD board to realize analog quantity in-out control
 - Easy edit of the HMI picture, rich function
- U LCD display: 192×64 pixel (3.7 inch), LCD useful life can reach 0.5 million hours
- U 26 function keys can be redefined by user
- U Sensitive and accurate key-press
- U Multifunctional download port: HMI and PLC use one download cable
- U Waterproof level is IP20
- U Small structure, space saving
- U Simple and modern outline

Type List

| XMP series | | |
|--------------|-------------------|-------------------------|
| Relay output | Transistor output | Relay&Transistor output |
| XMP1-18R | XMP1-18T | XMP1-18RT |
| XMP2-18R | XMP2-18T | XMP2-18RT |
| XMP3-18R | XMP3-18T | XMP3-18RT |

| XP series | | |
|--------------|-------------------|-------------------------|
| Relay output | Transistor output | Relay&Transistor output |
| XP1-18R | XP1-18T | XP1-18RT |
| XP2-18R | XP2-18T | XP2-18RT |
| XP3-18R | XP3-18T | XP3-18RT |

Type Name



- | | |
|------------------|--|
| 1: Name | XP, XMP series |
| 2: PLC Type | 1: XC1 series 2: XC2 series 3: XC3 series |
| 3: In-out points | 18: Input 10 points, output 8 points |
| 4: Output Type | R: Relay output T: Transistor output RT: Relay&Transistor output |

Notice: XMP series exclude XMP2-32 series products in this manual. About these products, please refer to Integral Controller Manual XMP2-32.

1-2. Specs

General Specs

| Item | | Specs |
|---------------|-------------------------------|--|
| Electric | Power supply voltage | DC12V ~ DC24V |
| | Power | Less than 10W (TYP2.0W) |
| | Power cut moment permit | Less than 20ms |
| | Endurable voltage | AC1000V/10MA for 1minute (between signal and ground) |
| | Insulated impedance | About 10M , DC500V (between signal and ground) |
| Surrounding | Operating temperature | 0 ~ 50 |
| | Storage temperature | -10 ~ 60 |
| | Environment temperature | 20~85% (No dew) |
| | Endurable quiver | 10~25Hz (X, Y, Z direction for 30 minutes) |
| | Anti-jamming | Voltage Noise: 1000Vp-p |
| | Air | No causticity gas |
| | Protection | According to IP20 |
| Configuration | Cooling mode | Natural wind |
| | Dimension | 172.0*121.0*56.5 |
| | Panel open aperture dimension | 164.0*113.0 |
| Port | Download port | RS-232 |
| | Com port | RS-485 |

HMI Specs

| Item | | Specs | |
|----------------|-------------------|--|---------------------------------|
| | | XP series | XMP series |
| Characteristic | Type | Kelly/Blue LCD | |
| | Screen dimension | 3.7 inch | |
| | Useful life | Over 20000 hours, 25 , 24hours operating | |
| | Display area | 192*64 | |
| | Contrast | Regulation resistance available | |
| | Character setting | Chinese, English | |
| | Character size | Lattice font, vector font | |
| | Touch mode | Touch unable | Matrix or resistance touch mode |
| Register | Picture | 64KB Flash ROM | |
| | Data | 4KB SRAM | |

PLC Specs

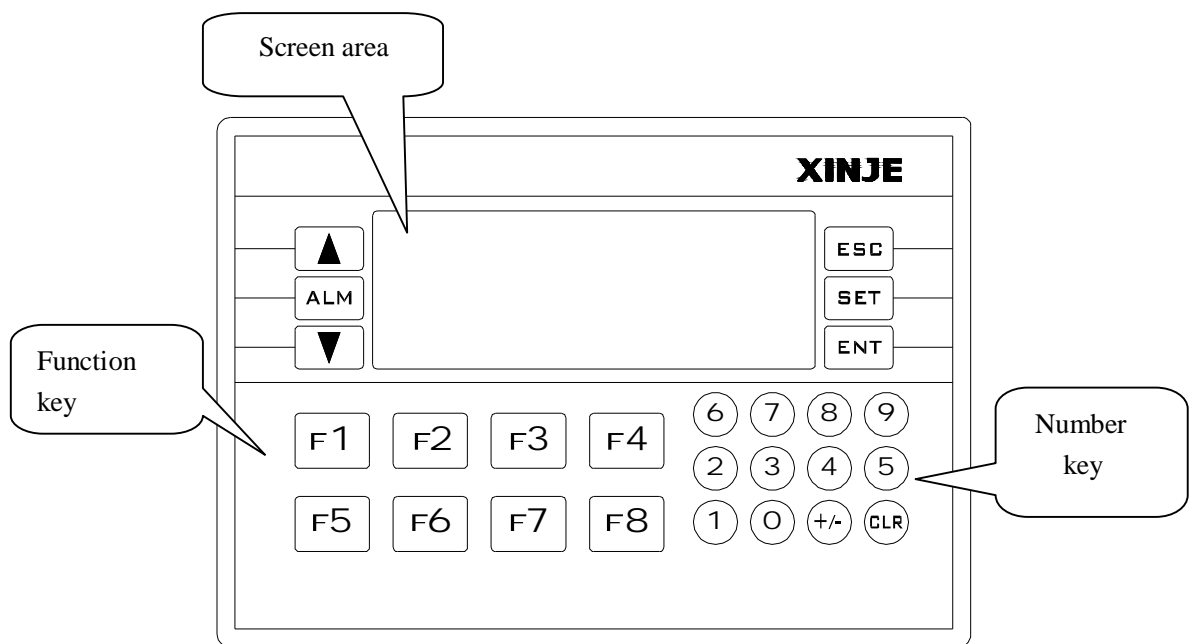
| Item | | Specs | | |
|----------------------------|--------|---|------------|------------|
| | | XP1/XMP1 | XP2/XMP2 | XP3/XMP3 |
| Program executing format | | Loop scan format, time scan format | | |
| Program format | | Instruction, C language and ladder chart | | |
| Processing speed | | 0.5us | | |
| Power cut retaining | | Use Flash ROM and Li battery | | |
| User program's capacity | | 32KB | 128KB | 128KB |
| I/O points | | Input 10 points, output 8 points | | |
| Interior coil's points (M) | | 448 | 8768 | 8768 |
| Timer (T) | Points | 80 | 640 | 640 |
| | Specs | 100mS timer : Set time 0.1~3276.7 seconds 10mS timer : Set time 0.01~327.67 seconds 1mS timer : Set time 0.001~32.767 seconds | | |
| Counter (C) | Points | 48 | 640 | 640 |
| | Specs | 16 bits counter : set value K0~32767 32 bits counter : set value -2147483648~2147483647 | | |
| Data Register (D) | | 288 words | 2612 words | 9024 words |

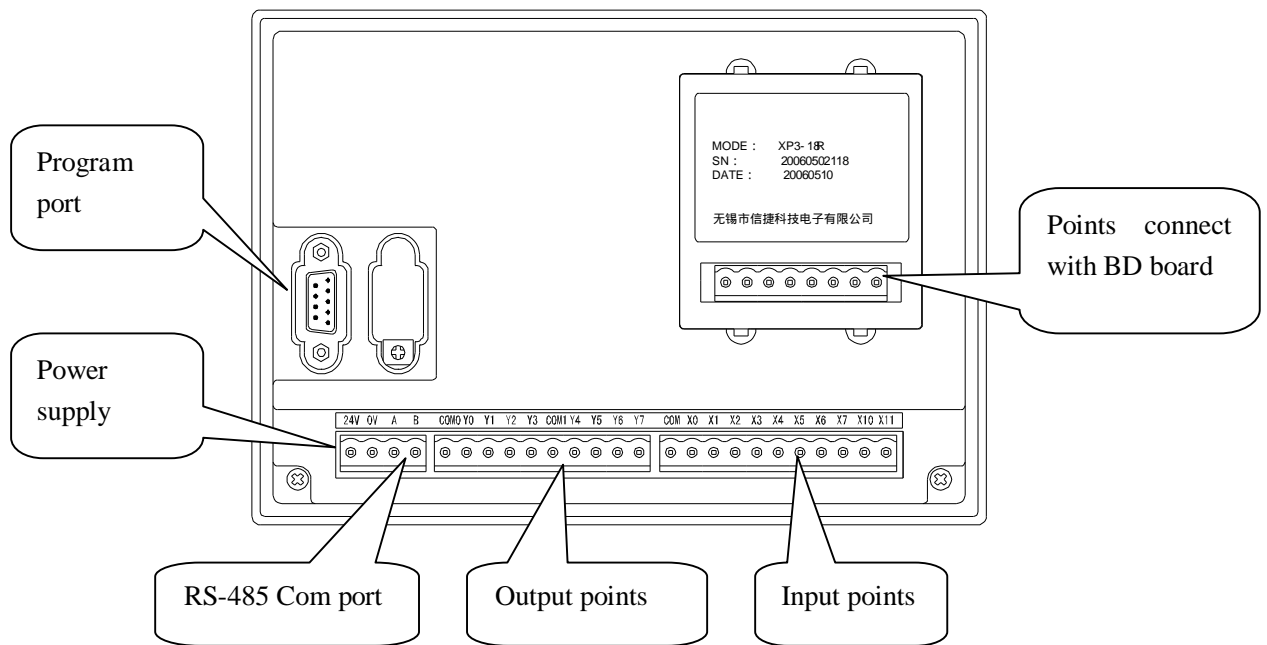
| | | | |
|--------------------------------|--|--|------------|
| Flash ROM Register (FD) | 510 words | 512 words | 2048 words |
| Extension D register (ED) | - | - | 16383 |
| High speed processing function | - | High speed count, pulse output, external interrupt | |
| Setting of time scan space | 0~99mS | | |
| Password protection | 6 bits ASCII | | |
| Self diagnose function | Power on self-diagnose, Monitor timer, grammar check | | |

Note: The user program capacity is referred to the capacity under “secret downloading mode”.

1-3. Parts explanation

Configuration





In-out points arrangement

24V 0V A B COM0 Y0 Y1 Y2 Y3 COM1 Y4 Y5 Y6 Y7 COM X0 X1 X2 X3 X4 X5 X6 X7 X10 X11

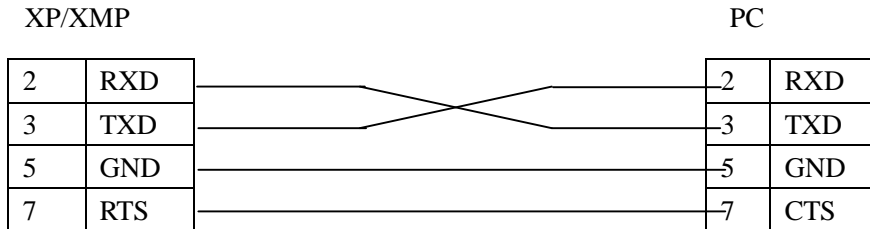
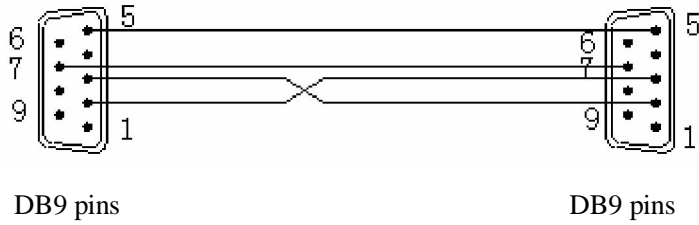
- 24V, 0V: power supply input
- A, B: RS-485 com port
- COM: common ground
- X: Input
- Y: Output

Program port

Program port is a RS-232 com port which has double functions of downloading PLC program and HMI pictures. The pins function of the port is as below:

| Pin | Function |
|------|----------|
| Pin2 | RXD |
| Pin3 | TXD |
| Pin5 | GND |
| Pin7 | RTS |

Xinje provides special program cable to download the PLC program or HMI program. You also can make the cable by yourself. Please see the pin connection between PC and the port.



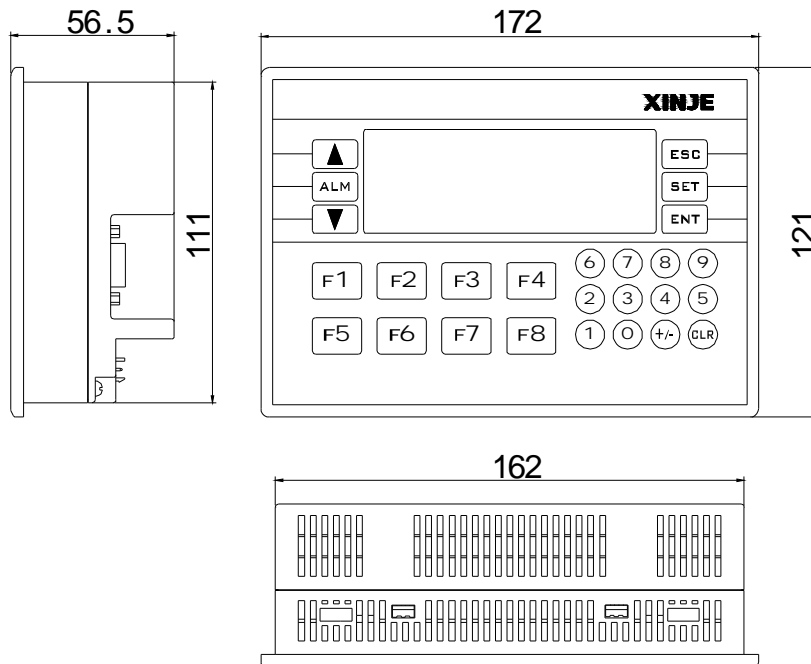
Communication port

Communication port (A and B) is a RS-485 com port. This port is used to connect other devices. Please refer to paragraph 3-4 for details.

1-4. Outline dimension

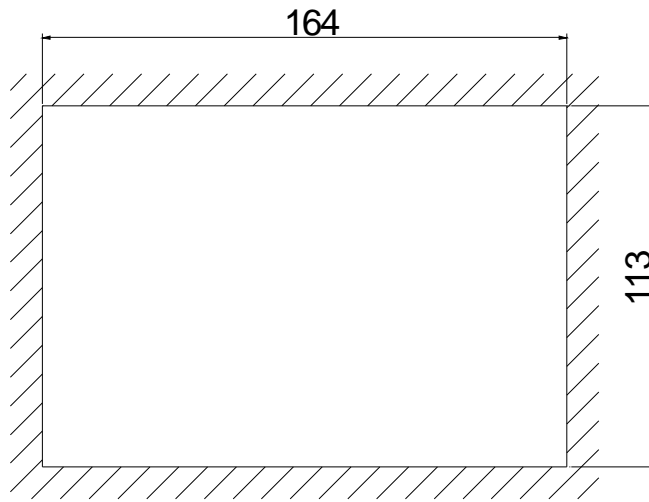
Outline dimension

Unit: mm



Installation dimension

Unit: mm

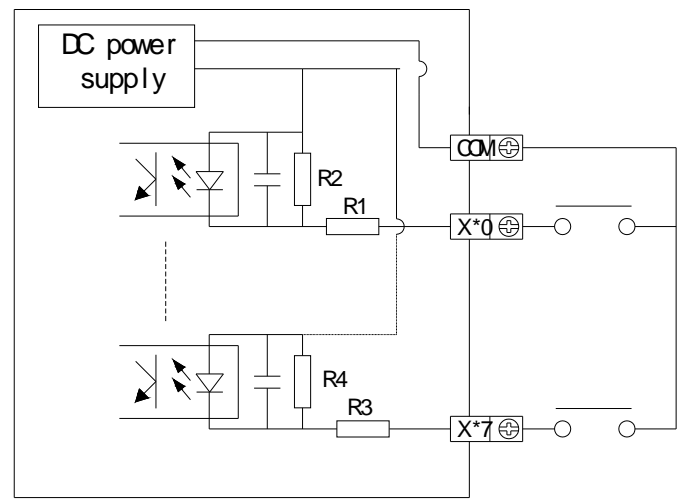


2. In-out specs and exterior layout

2-1. Input specs

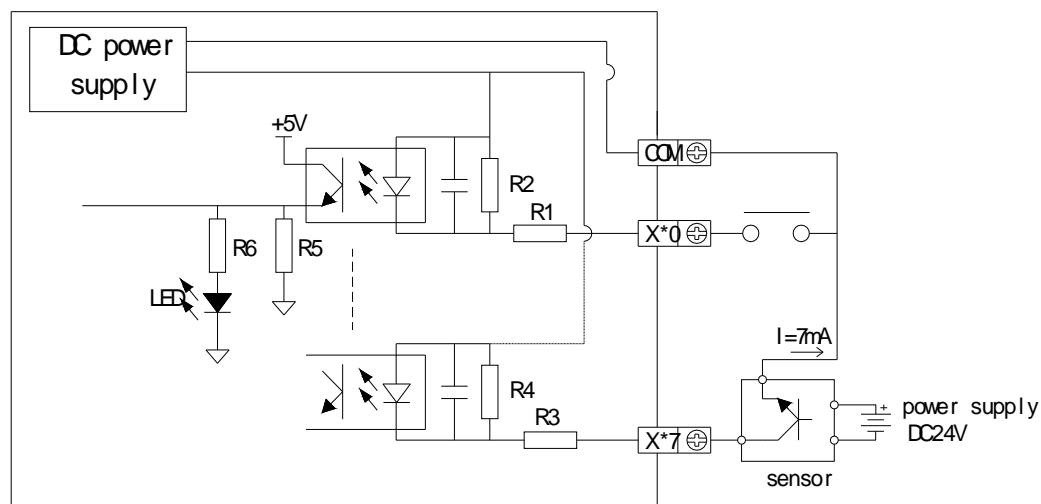
Basic unit

| | |
|------------------------|--|
| Input signal's voltage | DC24V \pm 10% |
| Input signal's current | 7mA/DC24V |
| Input ON current | Above 4.5mA |
| Input OFF current | Below 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 |



Input connection

Because there is no 24V power supply inside XP/XMP, it needs an outside supplier to drive the photo-electricity switch sensor. The supplier should be DC 24V \pm 4V. The output transistor of sensor should be NPN open collector.



2-2. Relay output specs and circuit

Relay output specs

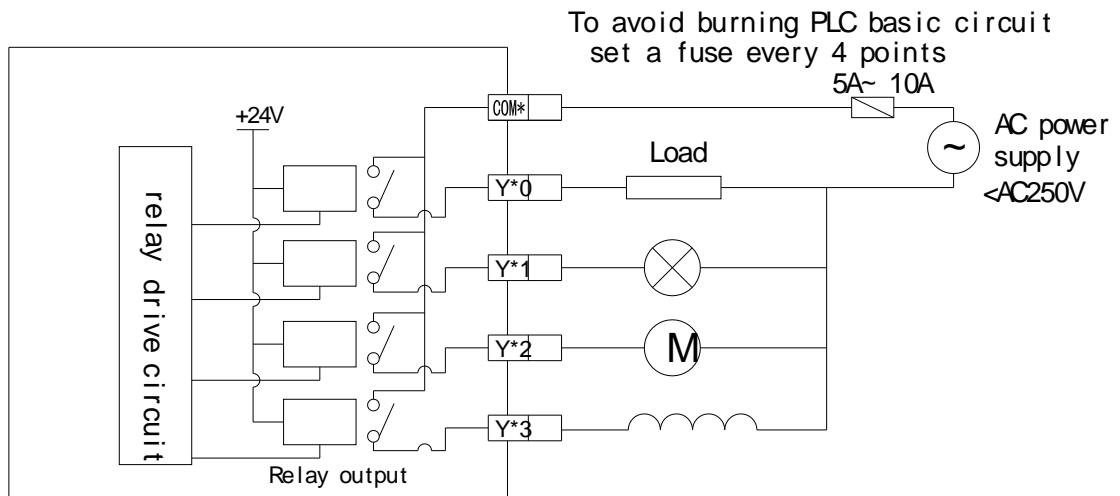
| Type | | R /RT output | T output |
|--------------------|-----------------|-------------------------|----------|
| Relay output | | R : Y0~Y7 RT : Y4~Y7 | NO |
| Power supply | | Below AC250V、 DC30V | |
| Circuit insulation | | Machinery insulation | |
| Action indication | | Produce close sound | |
| Maximum load | Resistor load | 3A | |
| | Inductance load | 80VA | |
| | LED load | 100W | |
| Minimum load | | DC5V 2mA | |
| Response time | OFF ON | 10ms | |
| | ON OFF | 10ms | |

Relay output circuit

- | Output points
Relay output has two common points. Different units can drive the loader of different power-voltage systems.
- | Loop insulation
It is electric insulated between relay output point and outside load circuit.
- | Action indication
Relay output coil produces close sound when it is on.
- | Response time
The response time is about 10ms transferring the ON or OFF signal from relay output coil to the output connection.
- | Output current
Output current is 3A per point to drive resistor load for voltage below AC250V.
Inductor load is below 80VA (AC100V or AC200V) and light load is below 100W (AC100V or AC200V).
- | Open leakage current
There is no leakage current when output point is OFF, it can drive neon light.
- | Use life of relay output point
The standard life of inductor load such as contactor, solenoid valve: according to our experiment results, 20VA load is about 3 million times, 35VA load is about 1 million times, 80VA load is about 0.2 million times. However, the life will extend if parallel connect surge

absorber with the load.

Output connection example

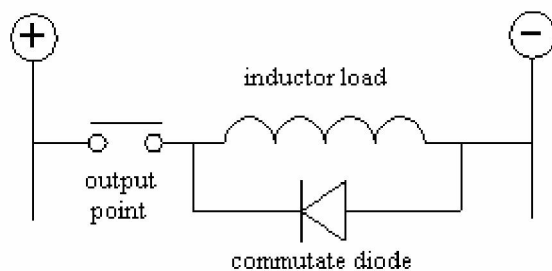


Note: T type has no relay output, do not connect AC220V, or the product will be broken.

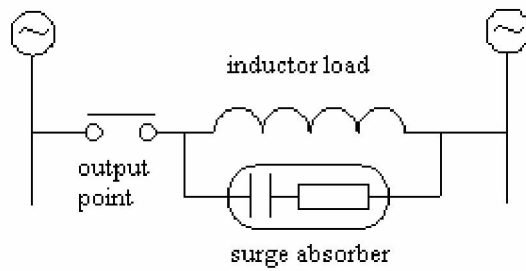
Constitution of output circuit

- I For DC inductor load, please parallel connect with commutate diode. If not connect with the commutate diode, the point'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.
- I Parallel connect AC inductor load with surge absorber can reduce noise and extend useful life of the points.

DC load



AC load



2-3. Transistor output specs and circuit

Transistor output can divide into two types: high speed pulse output and normal transistor output.

High speed pulse output

| Type | RT output | T output |
|-------------------------------|---------------|----------|
| High speed pulse output point | Y0 ~ Y1 | Y0~Y1 |
| Power supply | Below DC5~30V | |
| Maximum current | 50mA | |
| Maximum pulse frequency | 200KHZ | |

Normal transistor output

| Type | RT output | T output |
|-------------------------|-----------------------------|-------------|
| Transistor output point | Y2 ~ Y3 | Y2~Y7 |
| Power supply | Below DC5~30V | |
| Circuit insulation | Optical coupling insulation | |
| Maximum load | Resistor load | 0.4A |
| | Inductor load | 12W/DC24V |
| | Light load | 1.5W/DC24V |
| Minimum load | DC5V 2mA | |
| Repose time | OFF ON | Below 0.2ms |
| | ON OFF | Below 0.2ms |

Normal transistor output circuit

| Output point

There is one common point for basic unit transistor output

I Power supply

The load circuit power supply should be steady voltage of DC5~30V.

I Circuit insulation

The inside circuit of XP/XMP is insulated with output transistor by optical coupler.

I Action indication

When driving optical coupling , LED lights , output transistor is ON.

I Response time

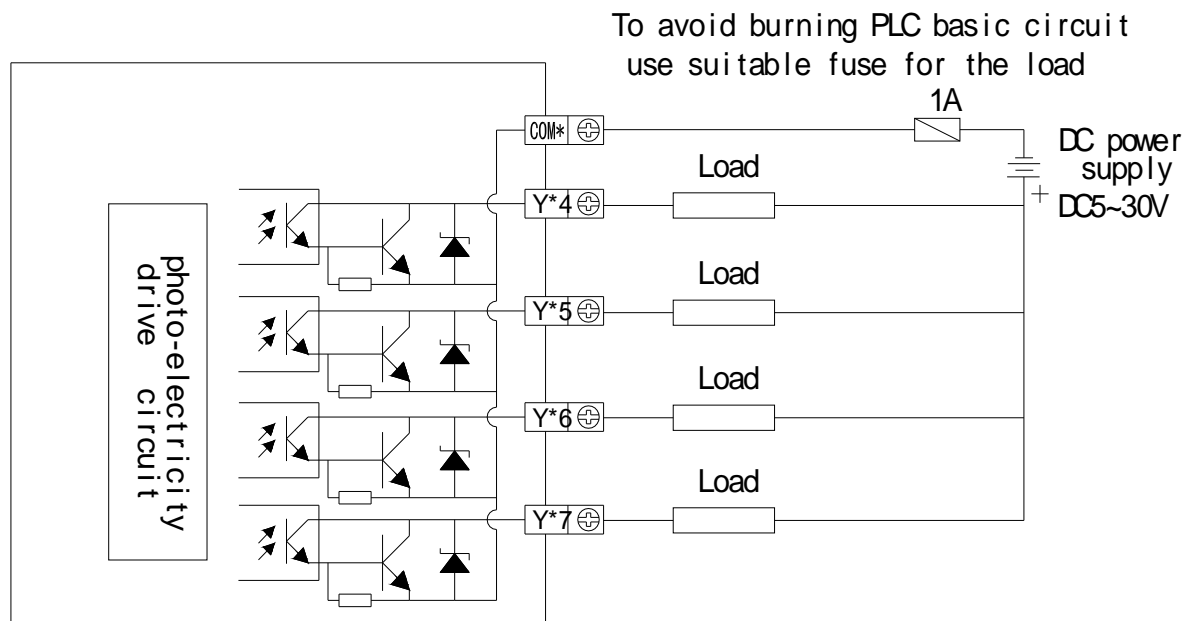
From optical coupler driving (or cut) to transistor ON (or OFF), the time is below 0.2ms.

I Output current

The current is 0.4A per point. But due to restriction of temperature going up, the total current is 0.8A every four points.

I Open current

Less than 0.1mA.



3. PLC function and application

3-1. PLC instruction

The XP/XMP integrated with XC series PLC. The function of PLC is the same as XC series.

| | |
|-----------------|---------------------|
| XP/XMP Type | Integrated PLC type |
| XP1/XMP1 series | XC1 series |
| XP2/XMP2 series | XC2 series |
| XP3/XMP3 series | XC3 series |

Instruction

1. XP1/XMP1 series include SFC instructions and applied instructions, exclude special function instructions.
2. XP2/XMP2 series and XP3/XMP3 series have the same instructions. They include SFC instructions, applied instructions and special function instructions.

Please refer to XC Series PLC Manual: paragraph 4, 5, 6.

Special function instructions

XP2/XMP2 and XP3/XMP3 have special function instructions, please refer to XC Series PLC Operating Manual: paragraph 6. Here we only give the port definition and distribution.

1. High speed count

| XP2/XMP2/XP3/XMP3 series | | | | | | | | | | | | | | | | | | |
|--------------------------|---------------|------|------|------|------|------|------|------|------|------|----------------------|------|------|------|---------------|------|------|------|
| | Increase 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 | 10K | | | 80K | 5K | 5K |
| 4 times frequency | | | | | | | | | | | | | | | | | | |
| Count interruption | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | |

2. High speed pulse output

- ⊔ T type: Y0, Y1 available, the highest frequency is 200KHz
- ⊔ RT type: Y0, Y1 available, the highest frequency is 200KHz
- ⊔ R type: unavailable

3. Interrupt function

| Channel | Input | Pointer tag | | Disable interruption instruction |
|---------|-------|---------------------|----------------------|----------------------------------|
| | | Rising interruption | Falling interruption | |
| CHL1 | X2 | I0000 | I0001 | M8050 |
| CHL2 | X5 | I0100 | I0101 | M8051 |
| CHL3 | X10 | I0200 | I0201 | M8052 |

4. Frequency measurement

The point is X1, X11, X12.

5. Pulse width modulation

The point is Y0, Y1.

- ⊔ T type: Y0, Y1 available
- ⊔ RT type: Y0, Y1 available
- ⊔ R type: unavailable

6. Precise timer

32 bit precise timer, the timer range is T600 to T618, match with 10 interruption tag.

3-2. soft component range

XP/XMP series soft component ID distribution list is as below:

If extending BD board, the in-out point definition, please refer to XP Series Extended BD Board Manual.

XP1/XMP1 series:

| Soft component | Name | Range | Points |
|----------------|--------------------|---------------------------------------|--------|
| X | Input points | X000~X011(octal) | 10 |
| Y | Output points | Y000~Y007(octal) | 8 |
| M | Auxiliary relay | M0~ M199 【M200~M319】 | 320 |
| | | For special using M8000~M8079 | 128 |
| | | For special using M8120~M8139 | |
| | | For special using M8170~M8172 | |
| | | For special using M8238~M8242 | |
| | | For special using M8350~ M8370 | |
| S | Process | S0~S31 | 32 |
| T | Timer | T0~T23 : 100ms not accumulation | 80 |
| | | T100~T115 : 100ms accumulation | |
| | | T200~T223 : 10ms not accumulation | |
| | | T300~T307 : 10ms accumulation | |
| | | T400~T403 : 1ms not accumulation | |
| | | T500~T503 : 1ms accumulation | |
| C | Counter | C0~C23 : 16 bits plus counter | 48 |
| | | C300~C315 : 32bits plus/minus counter | |
| | | 【C600~C603】 : vacant | |
| | | 【C620~C621】 : vacant | |
| | | 【C630~C631】 : vacant | |
| D | Data register | D0 ~D99 【D100~D149】 | 150 |
| | | For special using D8000~D8029 | 138 |
| | | For special using D8060~D8079 | |
| | | For special using D8120~D8179 | |
| | | For special using D8240~D8249 | |
| | | For special using D8306~D8313 | |
| | | For special using D8460~D8469 | |
| FD | Flash ROM register | FD0~FD411 | 412 |
| | | For special using FD8000~FD8011 | 98 |
| | | For special using FD8202~FD8229 | |
| | | For special using FD8306~FD8315 | |
| | | For special using FD8323~FD8335 | |
| | | For special using FD8350~ FD 8384 | |

XP2/XMP2 and XP3/XMP3 series:

| Soft component | Name | Range | | Point | |
|----------------|----------------------|--|------------------------------------|----------|----------|
| | | XP2/XMP2 | XP3/XMP3 | XP2/XMP2 | XP3/XMP3 |
| X | Input point | X000~X011(octal) | | 10 | |
| Y | Output point | Y000~Y007(octal) | | 8 | |
| M | Auxiliary relay | M0~ M2999 【M3000~M7999】 | | 8000 | |
| | | M8000~M8767 | | 768 | |
| S | Status | S0~ S511 【S512~M1023】 | | 1024 | |
| T | Timer | T0~T99 : 100ms not accumulation | | 640 | |
| | | T100~T199 : 100ms accumulation | | | |
| | | T200~T299 : 10ms not accumulation | | | |
| | | T300~T399 : 10ms accumulation | | | |
| | | T400~T499 : 1ms not accumulation | | | |
| | | T500~T599 : 1ms accumulation | | | |
| | | T600~T618 : 1ms with interruption precise time | | | |
| | | T620~T639 : vacant | | | |
| C | Counter | C0~C299 : 16 bits forth counter | | 640 | |
| | | C300~C318 : 32 bits forth/back counter 【C320~C598】 : 32 bits forth/back counter | | | |
| | | 【C600~C619】 : one phase high speed counter | | | |
| | | 【C620~C629】 : Pulse + direction high speed counter | | | |
| | | 【C630~C639】 : AB phase high speed counter | | | |
| D | Data register | D0~D999 【D4000~D4999】 | D0~ D3999 【D4000~D7999】 | 2000 | 8000 |
| | | For special using D8000~D8511 D8630~D8729 | For special using D8000~D9023 | 612 | 1024 |
| FD | FlashROM register | FD0~FD127 | FD0~FD1535 | 128 | 1536 |
| | | For special using FD8000~FD8383 | For special using FD8000~FD8511 | 384 | 512 |
| ED | Extend data register | - | 【ED0~ED16383】 | - | 16384 |

NOTE:

1. The memorizer area in 【 】 is the defaulted power failure retentive area, the power failure retentive area of soft components D, M, S, T, C can be set via FD register. For the details, please see the following table.
2. Flash ROM register needn't set power failure retentive area, its data won't lose when

power is cut (No battery).

3. The serial number of input coil and output relay are octal data, other memorizers' number are all decimal data.
4. There is no I/O point connected with exterior device can be used as interior relay.

Soft component power failure area setting:

XP1/XMP1:

| Soft component | Area | Function | Default value | Power failure memory area |
|----------------|--------|---|---------------|---------------------------|
| D | FD8202 | First address of the power failure memory area of D | 100 | D100~D149 |
| M | FD8203 | First address of the power failure memory area of M | 200 | M200~M319 |
| T | FD8204 | First address of the power failure memory area of T | 640 | No set |
| C | FD8205 | First address of the power failure memory area of C | 320 | C320~C631 |
| S | FD8206 | First address of the power failure memory area of S | 512 | S0~S31 |

XP2/XMP2:

| Soft component | Area | Function | Default value | Power failure memory area |
|----------------|--------|---|---------------|---------------------------|
| D | FD8202 | First address of the power failure memory area of D | 4000 | D4000~D4999 |
| M | FD8203 | First address of the power failure memory area of M | 3000 | M3000~M7999 |
| T | FD8204 | First address of the power failure memory area of T | 640 | No set |
| C | FD8205 | First address of the power failure memory area of C | 320 | C320~C639 |
| S | FD8206 | First address of the power failure memory area of S | 512 | S512~S1023 |

XP3/XMP3:

| Soft component | Area | Function | Default value | Power failure memory area |
|----------------|--------|---|---------------|---------------------------|
| D | FD8202 | First address of the power failure memory area of D | 4000 | D4000~D7999 |
| M | FD8203 | First address of the power failure memory area of M | 3000 | M3000~M7999 |
| T | FD8204 | First address of the power failure memory area of T | 640 | No set |

| | | | | |
|----|--------|--|-----|-------------|
| C | FD8205 | First address of the power failure memory area of C | 320 | C320~C639 |
| S | FD8206 | First address of the power failure memory area of S | 512 | S512~S1023 |
| ED | FD8207 | First address of the power failure memory area of ED | 0 | ED0~ED16383 |

NOTE:

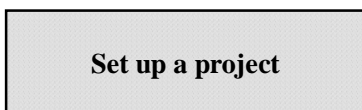
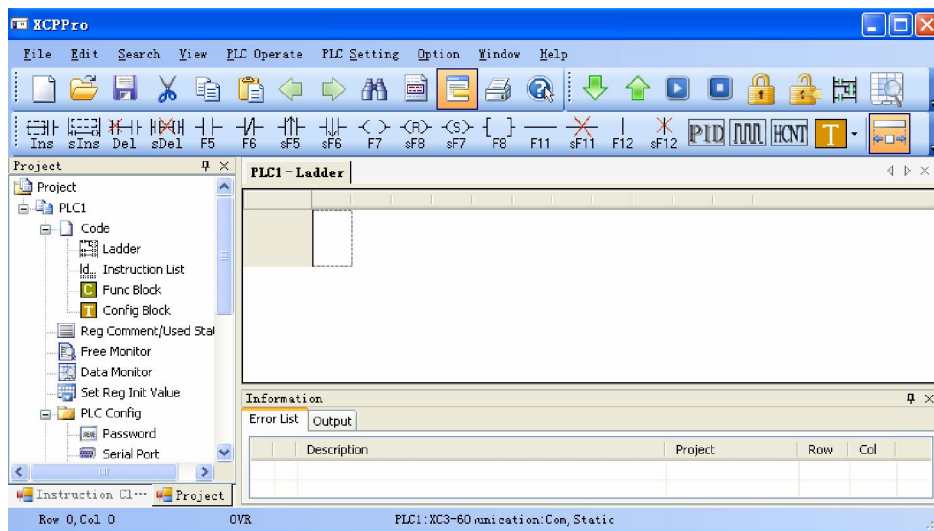
Users can set the power failure memory area, but the area can not over the soft component area.

3-3. Set up a project



The PLC program editing software is the same as Xinje XC series. Software name is XCPPro.

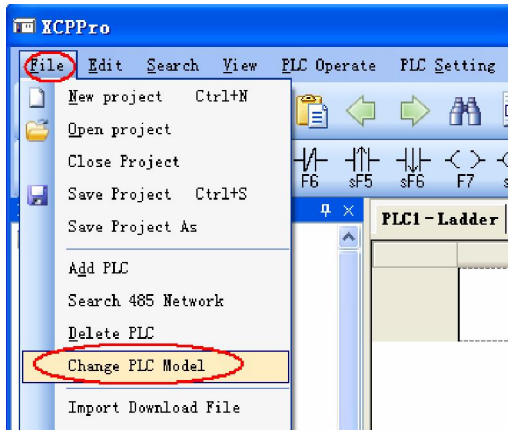
The interface of software is as below:



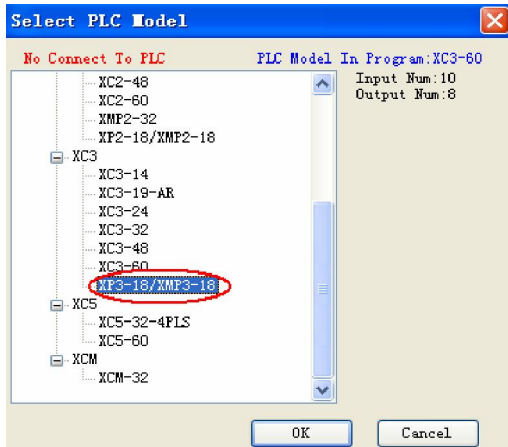
We take XP3-18R as an example to explain how to set up a project.

1. Modify the type

Open the software, click file---change PLC model:



Choose “XP3-18/XMP3-18”:



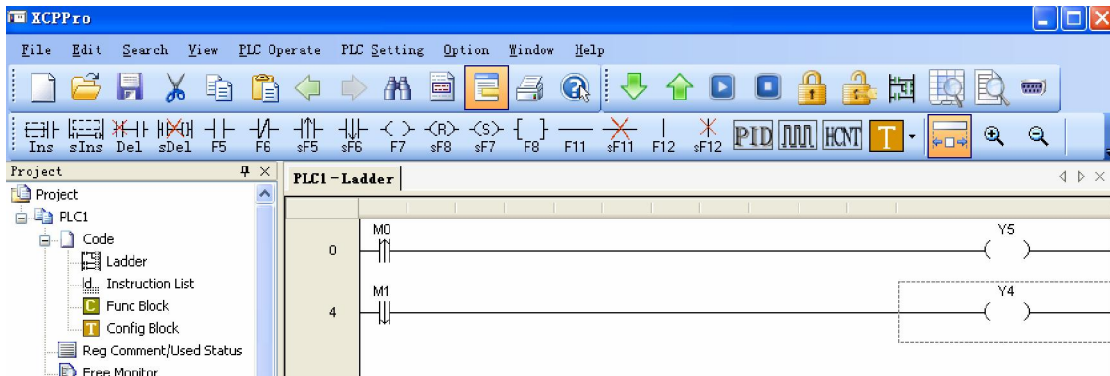
XP1/XMP1series choose
XP1-18/XMP1-18;

XP2/XMP2 series choose
XP2-18/XMP2-18 ;

XP3/XMP3 series choose
XP3-18/XMP3-18

2. Compile the program


For program compiling and software operating please refer to XC Series Edit Tool XCP Pro User Manual.

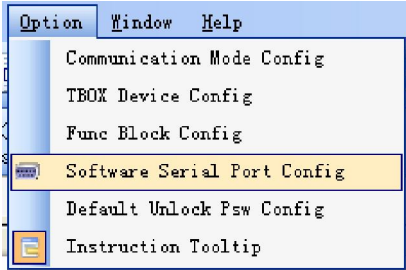


Download the program

1. Connection

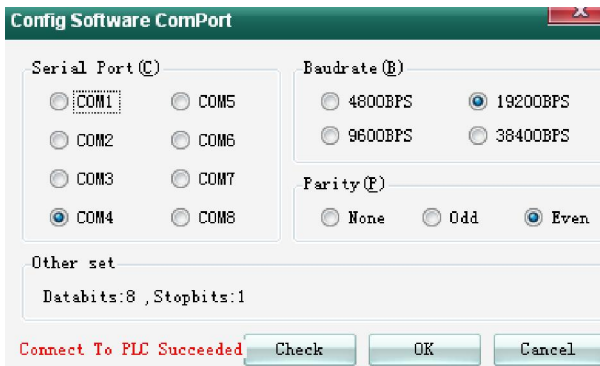
Before downloading the program, please ensure the XP/XMP has connected with PC successfully.
(The cable connection please refer to paragraph 1-3).

Click  to open software serial port configuration:

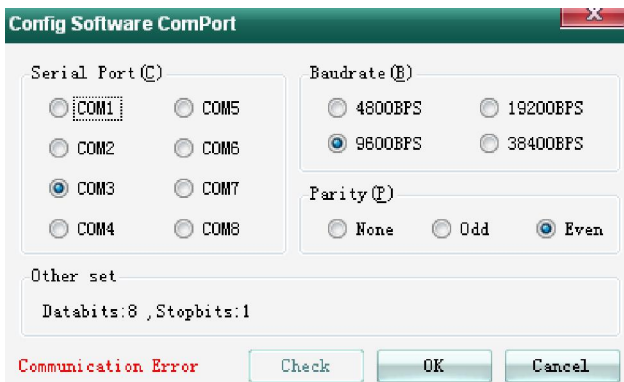


Choose the correct serial port, baudrate and parity or click “check” to choose these parameters automatically.


When below window shows “ connect to PLC succeeded ”, it means the connecting is successful.
Click OK to continue.

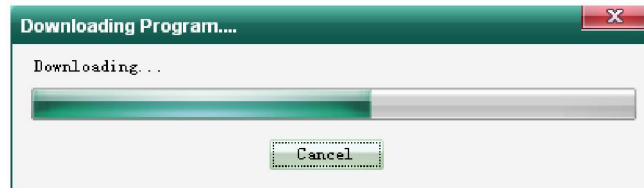
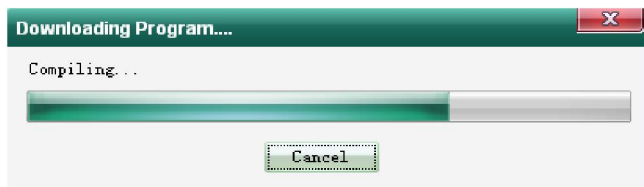


If the connecting is not successful, the window will show “ communication error ”. Please check the serial port and the cable.





2 Download the program

After connecting successfully, click  to download the PLC program. If the PLC is running, it will pop up the stop running window, click OK to continue downloading.



After downloading, click  to run the PLC program.

3 Upload the program

If you want to check the PLC program in XP/XMP, click  to upload the program to the PC. Then click  to save the program.



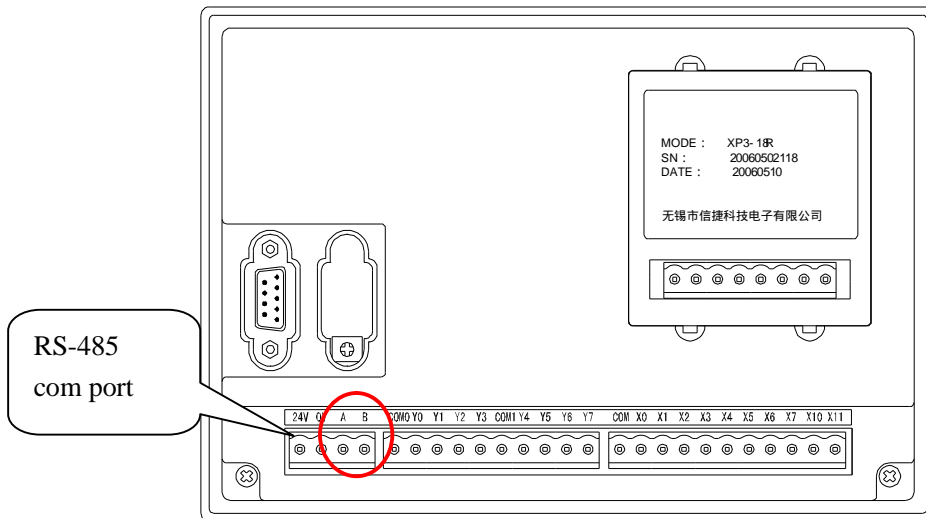
3-4. communication function

XP/XMP series support Modbus and free format communication protocol. The instructions please refer to XC Series PLC Operating Manual paragraph 6-4-1 and 6-4-2.



XP/XMP series product have program port (DB9 pins port) and RS-485 com port (A, B point). Program port can only be used to download PLC program and HMI pictures. However, RS-485 port can be used to communicate with other devices.

RS-485 port can be connected with varied devices, the communication parameters (baud rate, data bit, etc) can be set via software.



RS-485 com port: Point A means “ + ” signal, point B means “ - ” signal.

Attention:

XP1/XMP1 series product can only be used as slaver station while using their RS-485 port to communicate with other devices.

Communication parameter

| | |
|-------------|--|
| Station No. | Modbus station No. : 1-254, 255(FF) is for free format communication |
| Baud rate | 300bps~115.2Kbps |
| Data bit | 8 or 7 bits |
| Stop bit | 2 or 1 bits |
| Check | Even, odd, no check |

The defaulted parameters of the port:

Station number is 1, baud rate is 19200bps, 8 data bit, 1 stop bit, even check

Parameter setting

User can set com port parameters. Please see below list for details.

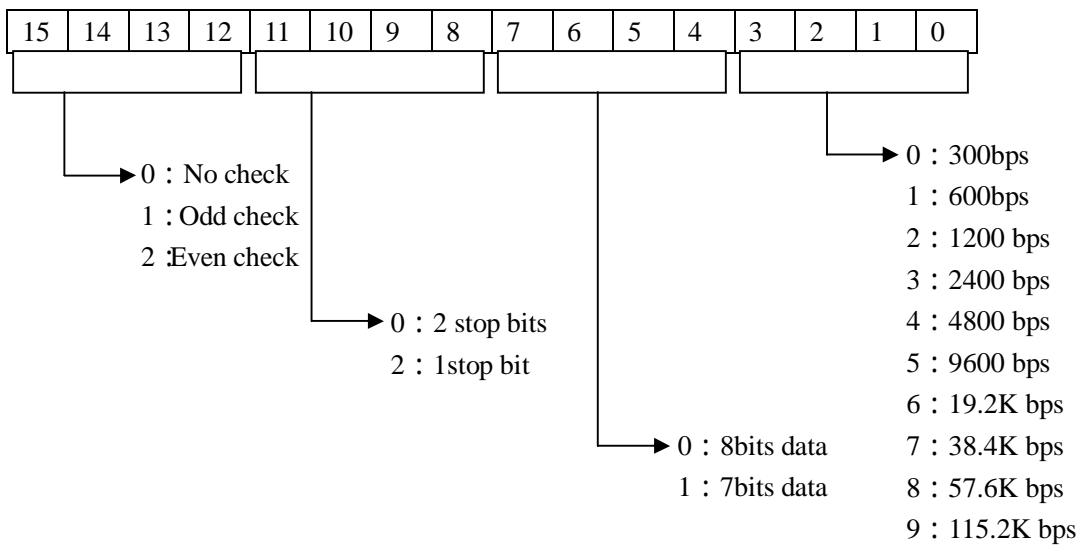
Attention:

After changing the parameters in Flash register, it is need to reboot the XP/XMP to make the setting become effective.

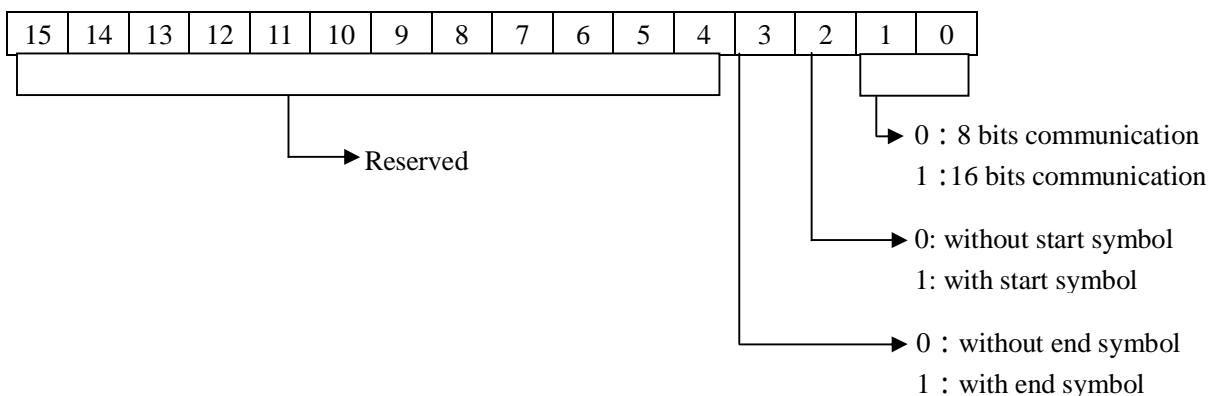
| | Number | Function | Description |
|-------------------|--------|--|--|
| AB com port | FD8220 | Communication mode (station number) | 255 is free format, 1~254 is modbus station number |
| | FD8221 | Communication format | Baud rate, data bit, stop bit, check |
| | FD8222 | ASC timeout judgment time | Unit: ms, 0 means no timeout waiting |
| | FD8223 | Reply timeout judgment time | Unit: ms, 0 means no timeout waiting |
| | FD8224 | Start symbol | High 8 bits invalid |
| | FD8225 | End symbol | High 8 bits invalid |
| | FD8226 | Free format setting | 8/16 bits cushion, with/without start bit, with/without stop bit |

The way of setting communication parameters:

FD8221:



FD8226:



Modbus communication

XMP series product support master and slave mode of Modbus communication protocol.

Master format: When PLC is set to be master station, PLC sends request to other slave station devices via Modbus instructions, other devices respond to the master station.

Slave format: When PLC is set to be slave station, it can only respond to other master devices.

The defaulted status of XMP is Modbus slave mode.

Communication address

The internal soft unit's numbers of XMP are corresponded with Modbus station address numbers, please see the following table:

Coil space: (Modbus address prefix is " 0x ")

| Bit component address | Modbus address (decimal K) | Modbus address (hex H) |
|-----------------------|---------------------------------|-----------------------------|
| M0~M7999 | 0~7999 | 0~1F3F |
| X0~X1037(octal) | 16384~16927 | 4000~421F |
| Y0~Y1037(octal) | 18432~18975 | 4800~4A1F |
| S0~S1023 | 20480~21503 | 5000~53FF |
| M8000~M8511 | 24576~25087 | 6000~61FF |
| T0~T618 | 25600~26218 | 6400~666A |
| C0~C634 | 27648~28282 | 6C00~6E7A |

Register space: (Modbus address prefix is " 4x ")

| Word component address | Modbus address (decimal K) | Modbus address (hex H) |
|------------------------|---------------------------------|-----------------------------|
| D0~D7999 | 0~7999 | 0~1F3F |
| TD0~TD618 | 12288~12906 | 3000~326A |
| CD0~CD634 | 14336~14970 | 3800~3A7A |
| D8000~D8511 | 16384~16895 | 4000~41FF |
| FD0~FD5000 | 18432~23432 | 4800~5B88 |
| FD8000~FD8511 | 26624~27135 | 6800~69FF |

Free format communication

Free format communication transfer data in the format of data block, each block can transfer 128 bytes at most. Meanwhile each block can set a start symbol and a end symbol, or not set.











When communicating in free format mode, FD8220 should be 255.

| | | |
|-----------------------|-----------------------------|---------------------|
| Start Symbol (1 byte) | Data Block (max bytes 128) | End Symbol (1 byte) |
|-----------------------|-----------------------------|---------------------|

4. HMI function and application

4-1. HMI function introduction

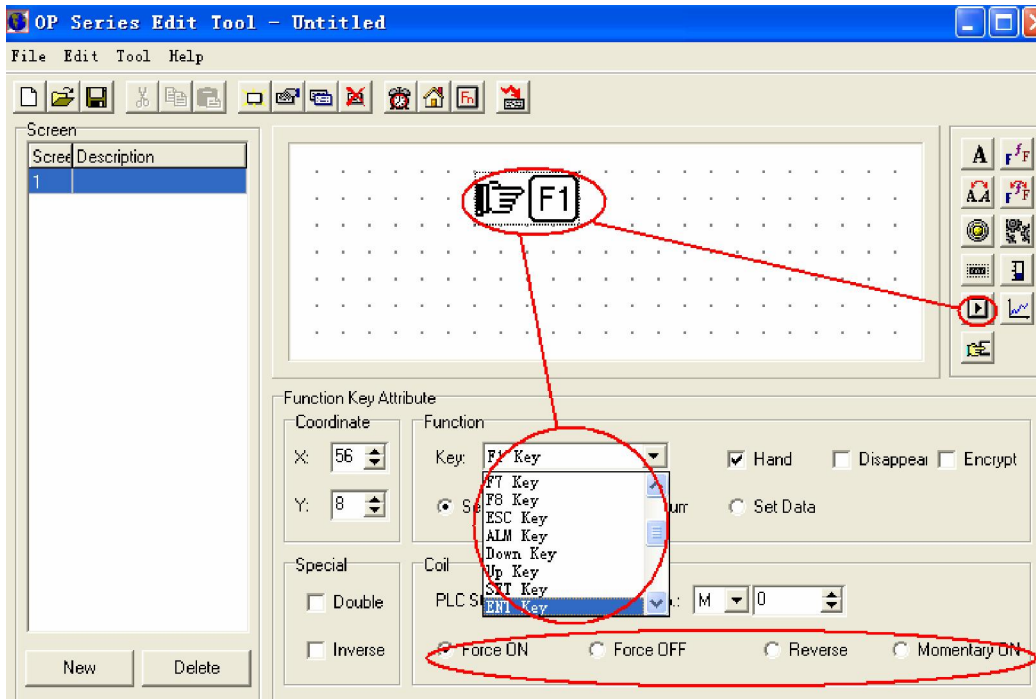
The HMI part of XP/XMP used OP330/MP330 series display. The faceplate key-press function is as below:

| Key-press | Function |
|---|--|
|  | Whatever the mode of the display is in, it will return to original system screen once you press the key (the defaulted screen is No.1). Generally, set the original system screen to be main menu or most used screen. |
|  | Turn the screen to the last page |
|  | Turn the screen to the next page |
|  | Press the key to modify the register value. The register which is being modified will display in reverse colour and the bit will twinkle. If there is no register component in the screen it will do vacancy operation once. Before pressing [ENT] key, press [SET] key again to cancel the setting and continue modifying the next data register. |
|  | To write the modified value in the register and continue modifying next register. After the last register in the screen has been modified, it will quit the setting. |
|  | Alarming list key. After setting the function of alarming list, press this key to jump to the alarming list screen. |
|  | Clear the selected area when modifying the register data. |
|  | Set the positive or negative of the data when modifying the register data. |
|  | Number key 0-9, press the key to set the number you want |
|  | Function key F1-F8 |

NOTE:

Besides the function listed in the up table, all the keys can be defined as the function of “force ON”, “force OFF”, “reverse” or “momentary ON”.

Please see below picture. Open OP software, put a button in the screen. All the faceplate key-presses are displayed in the key menu, user can set the function as they need.

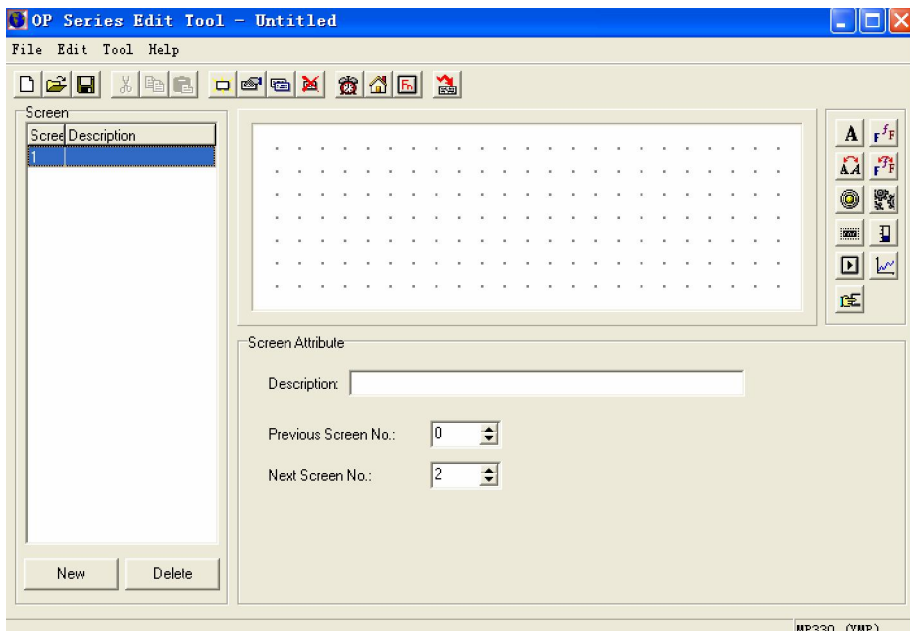


4-2. Build a project



XP/XMP series product integrated the function of HMI and PLC, when editing the HMI screen, use HMI software OP20.


The interface of OP20 is shown as below:



Build a project

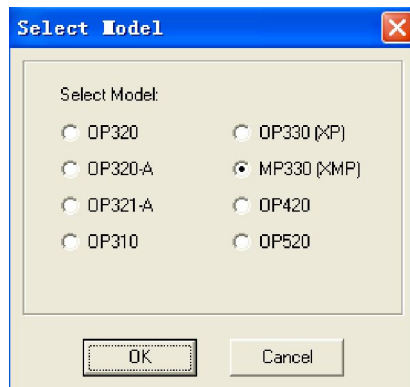
We take XMP3-18R as an example to explain how to build a project.

1. build a new project

Open the OP software, click “file”-“new project” or click “” to build a new project.

2. choose the display type

In the “select model” window, choose the correct type of XP/XMP. For this example we select “MP330(XMP)”.



This window shows all the display type supported by OP software.

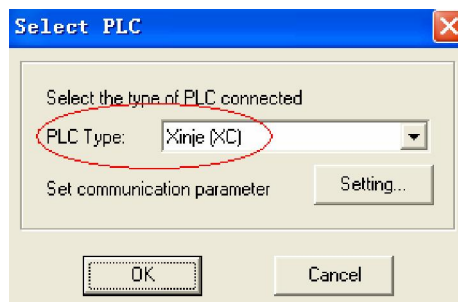
We can select the correct type according to the content in the bracket.

XP series should select OP330

XMP series should select MP330

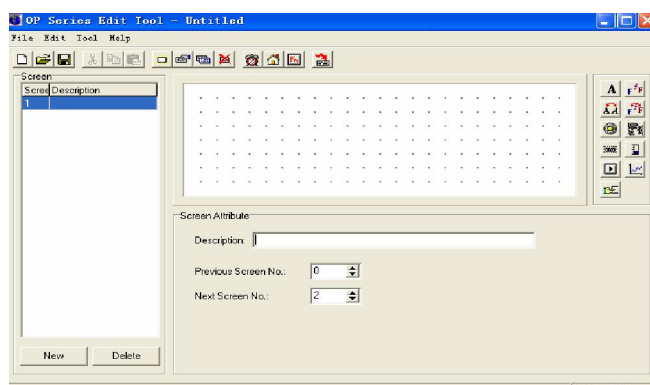
3. select PLC type

As the XP/XMP is a integrated product of OP and XC, the OP will communicate with XC inside the product, the communication parameters are defaulted.



4. edit the screen

After these three steps, we can enter screen editing mode. For the editing details, please refer to OP Series Display User Manual chapter 2.



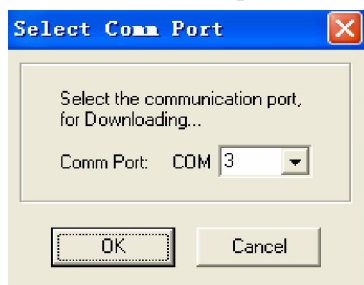
Screen download

1. Select com port


Before downloading the screen, select the correct com port. The port is DB9 pins serial port of PC. The computer will select the port automatically, user only need to know the port number. If user can not confirm which port to use, try each port in file. If the com port is wrong, it will prompt you with the note “can not open”:



Click “file”-“comm port...” to select the correct com port:



2. download

Connect the XP/XMP DB9 pins com port and PC serial port using download cable. Power on the XP/XMP, click  to start downloading:



If the downloading is completed, it will pop up below window:



Attention:

- (1) Do not cut the power when downloading, or you have to download again
- (2) The downloading cable of downloading OP screen is the same as downloading PLC program
- (3) Do not download when XCPPro and OP software are both opened

5. The extension ability of XP/XMP

5-1. Extend BD board

XP3/XMP3 series product (exclude XMP2-32R/T-E) can extend XP3 series BD board via the insertion groove at the back in order to control and measure the analog quantity.

The specs and type of BD board is as below table:

BD board type

| Type | Function |
|------------------|--|
| XP3-2AD2PT-BD | 2 channels analog input 2 channels PT100 temperature measurement |
| XP3-2TC-P-BD | 2 channels K thermocouple temperature measurement PID adjustment inside |
| XP3-2PT2AD1DA-BD | 2 channels PT100 temperature measurement 2 channels analog input 1 channel analog output |

BD board specs

XP3-2AD2PT-BD:

| Item | Voltage input | Temperature input |
|-------------------------------|-------------------------------------|---|
| Analog input signal | DC0~5V、0~10V(Input resistor 300k) | Platinum resistor Pt100 (2-line format) |
| Temperature measurement range | - | -100~350 |
| Distinguish ratio | 0.15mV (10/16383) | 0.1 |
| Digital output range | 0~16383 | -1000~3500 |
| Integrated precision | ± 0.8% of the full-scale | |
| Convert time | 15ms × 4 channels | |
| PID output value | 0~K4095 | |
| Empty loader defaulted value | 0 | 3500 |

| | | |
|----------------------|---|--|
| Input characteristic | | |
| Insulation | No insulation among each channel of PLC | |
| I/O point | 0 point (As it is operated via data register, it is not restricted by master PLC's standard max control points) | |

XP3-2TC-P-BD:

| Items | Content |
|-------------------------------|--------------------------------------|
| Analog input signal | K type thermocouple |
| Input points | 2 points |
| Temperature measurement range | 0 ~970 |
| Digital output range | 0~9700, 16 bits binary |
| Output points | 2 points |
| Output format | NPN collector open transistor output |
| Control precision | 0.4 |
| Distinguish ratio | 0.1 |
| Integrated precision | ± 0.8% (relative max value) |
| Convert speed | 45ms × 2 channels |
| Analog using power | DC24V ± 10%,50mA |

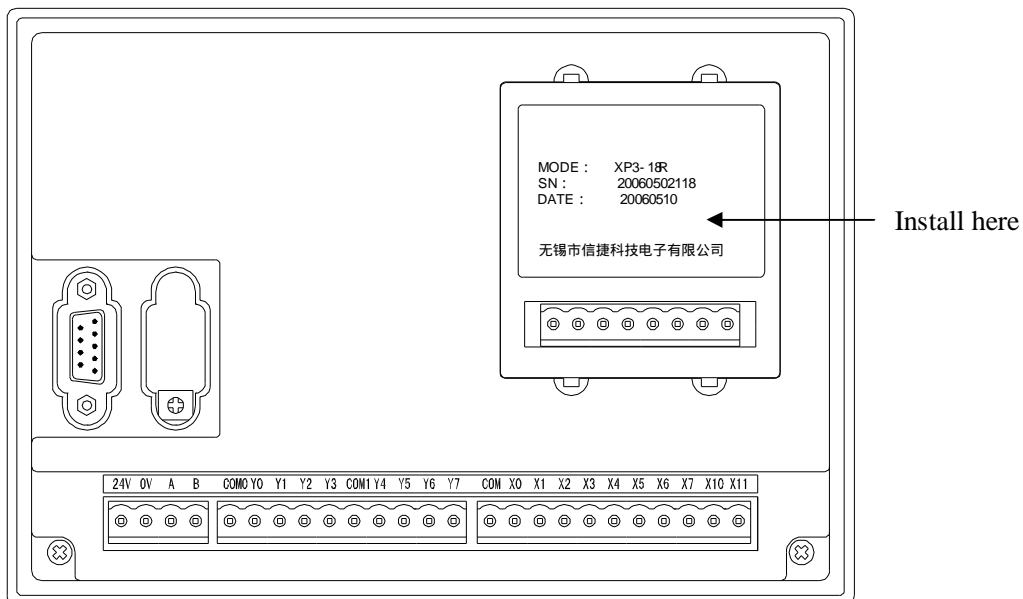
XP3-2PT2AD1DA-BD:

| Item | Voltage input | Temperature input | D/A output |
|-------------------------------|-------------------------------------|--|-------------------------|
| Analog input signal | DC0~5V, 0~10V(input resistor 300k) | Platinum resistor Pt100 (2 lines format) | - |
| Digital input range | - | - | 10 bits binary (0-1023) |
| Analog output range | - | - | 0 ~ 20mA, 4 ~ 20mA |
| Temperature measurement range | - | -100~350 | - |
| Distinguish rate | 0.15mV (10/16383) | 0.1 | 1/1023 |
| Digital output | 0~16383 | -1000~3500 | - |

| | | | |
|------------------------------|---|------|---|
| range | | | |
| Integrated precision | ± 0.8% of the full-scale | | |
| Convert time | 15ms × 4 channels | | |
| PID output | 0~K4095 | | |
| Empty loader defaulted value | 0 | 3500 | - |
| In-out characteristics | | | |
| insulation | There is no insulation among each channel of PLC | | |
| I/O point | 0 point (As it is operated via data register, it is not restricted by master PLC's standard max control points) | | |

Installation position of BD board

The installation position of BD board on XP3/XMP3 is as below:



The configuration method and using details please refer to BD Board Manual.

5-2. Extend MA model

XP/XMP can extend MA model via RS-485 com port (A and B point) in order to control and measure analog quantity.

The type and specs of MA model are as below:

MA model type

| Type | Function |
|------------|---|
| MA-8X8YR | 8 channels digital input, 8 channels digital output |
| MA-16X | 16 channels digital input |
| MA-16YR/T | 16 channels digital output |
| MA-4DA | 4 channels analog output |
| MA-4AD | 4 channels analog input |
| MA-8AD-A/V | 8 channels analog input |
| MA-4AD2DA | 4 channels analog input, 2 channels analog output |
| MA-6TC-P | 6 channels type K thermocouple temperature control |
| MA-6PT-P | 6 channels PT100 temperature control |

MA model specs

| Type | Description |
|----------|---|
| MA-8X8YR | 8 channels digital input, 8 channels digital relay output |
| MA-16X | 16 channels digital input |
| MA-16YR | 16 channels digital relay output |
| MA-16YT | 16 channels digital transistor output |

MA-4DA

| Item | Voltage output | Current output |
|--------------------------|---|---|
| Analog output range | DC0 ~ 5V, 0 ~ 10V | DC0 ~ 20mA, 4 ~ 20mA |
| | (exterior load resistor 2K ~ 1M) | (exterior load resistor less than 500) |
| Digital input range | 10 bits binary numbers | |
| Resolution ratio | 1/1023 (10Bit) | |
| Integrated precision | 0.8% | |
| Conversion speed | 3ms/1 channel | |
| Power of analog quantity | DC24V ± 10% , 100mA | |
| Installation | Use M3 screw or fix on DIN46277 rail (width 35mm) | |

| | |
|-------------------|-----------------------|
| Profile dimension | 63mm × 102mm × 73.3mm |
|-------------------|-----------------------|

MA-8AD-A/V

| Item | Voltage | Current |
|-------------------------|---|---|
| Analog input range | DC0 ~ 5V、0 ~ 10V | DC0 ~ 20mA、4 ~ 20mA |
| | (exterior load resistor 2K ~1M) | (exterior load resistor less than 500) |
| Maximum input range | ± 18V | 0 ~ 40mA |
| Digital output range | 12 bits binary numbers | |
| Resolution | 1/4095 (12Bit) | |
| Integrated precision | 0.8% | |
| Conversion speed | 20ms per channel | |
| Power supply for analog | DC24V ± 10% , 100mA | |
| Installation | Use M3 screw or fix on DIN46277 rail (width 35mm) | |
| Profile dimension | 63mm × 102mm × 73.3mm | |

MA-4AD

| Item | Analog input (4AD) | |
|----------------------|--|---------------|
| Analog input type | Voltage input | Current input |
| Analog input range | 0~5V,0~10V | 0~20mA,4~20mA |
| Maximum input range | DC ± 18V | 0~40mA |
| Digital output range | 12 bits binary value (0~4095) | |
| Resolution | 1/4095(12Bit) | |
| PID output range | 0~K4095 | |
| Integrated precision | 0.8% | |
| Converting speed | 20ms per channel | |
| Power for analog | DC24V±10% , 100mA | |
| Installation | Fix up the module with M3 screw or put on DIN46277 rail (width 35mm) | |
| Profile dimension | 63mm×102mm×73.3mm | |

MA-4AD2DA

| Item | Analog input (4AD) | | Analog output (2DA) | |
|---------------------|----------------------|---------------|---|--|
| | Voltage input | Current input | Voltage output | Current output |
| Analog input range | 0~5V,0~10V | 0~20mA,4~20mA | - | |
| Max input range | DC ± 18V | 0~40mA | - | |
| Analog output range | - | | 0~5V、0~10V、 (exterior load resistor 2K ~1M) | 0~20mA、4~20mA (exterior load resistor less than 500) |

| | | |
|----------------------------------|---|--------------------------------|
| Digital input range | - | 10 bits binary number (0~1023) |
| Digital output range | 12 bits binary number (0~4095) | - |
| Resolution | 1/4095(12Bit) | 1/1023(10Bit) |
| PID output value | 0~K4095 | |
| Integrated precision | 0.8% | |
| Conversion speed | 20ms/1 channel | 3ms/1 channel |
| Power supply for analog quantity | DC24V±10% , 100mA | |
| Installation | Use M3 screw or fix on the DIN46277 (width 35mm) rail | |
| Profile dimension | 63mm×102mm×73.3mm | |

MA-6TC-P

| Item | Specs |
|---------------------------|---|
| Using environment | 0 ~ 60 |
| Measure temperature range | 0 ~ 1000 |
| Digital output range | 0 ~ 4095, 12 bits with sign, binary |
| Precision | 1 |
| Integrated precision | 1 |
| Conversion speed | 20ms/1 channel |
| Power supply for analog | DC24V ± 10%, 50mA |
| Installation | Use M3 screw or fix on DIN46277 (width 35mm) rail |
| Profile dimension | 63mm×102mm×73.3mm |

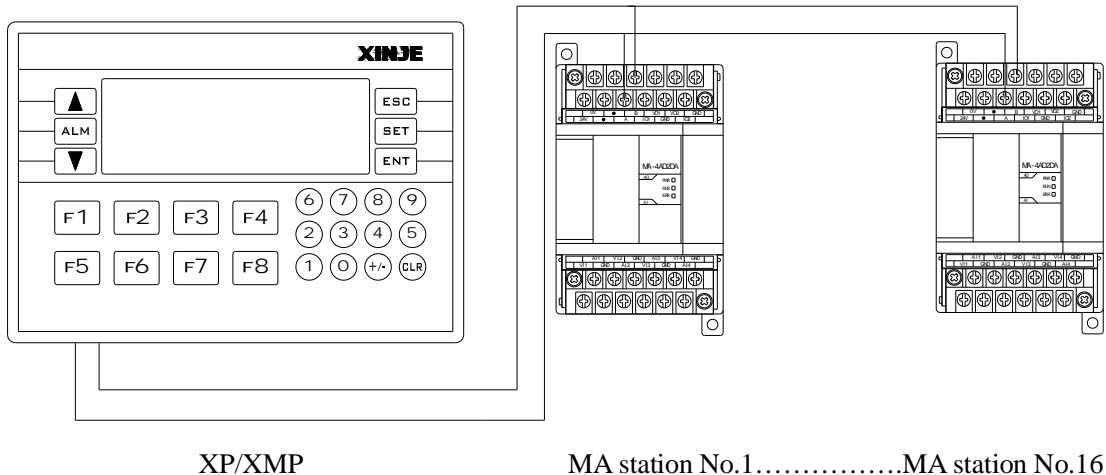
MA-6PT-P

| Item | Description |
|---------------------------|---|
| Analog input signal | Pt100 Pt hot resistance |
| Measure temperature range | -100 ~ 350 |
| Digital output range | Full-scale 4095, 12 bits with sign, binary |
| Control precision | ± 0.1 |
| Resolution | 0.1 |
| Integrated precision | 0.8% (related maximum) |
| Conversion speed | 20ms/1 channel |
| Power supply for analog | DC24V ± 10% , 50mA |
| Installation | Use M3 screw or fix on DIN46277 rail (width 35mm) |
| Profile dimension | 63mm×102mm×73.3mm |

MA model connection

XP/XMP can connect with MA model via RS-485 com port (A and B point). It can extend 16 MA models via setting DIP switch of MA model.

Please see the connection figure:



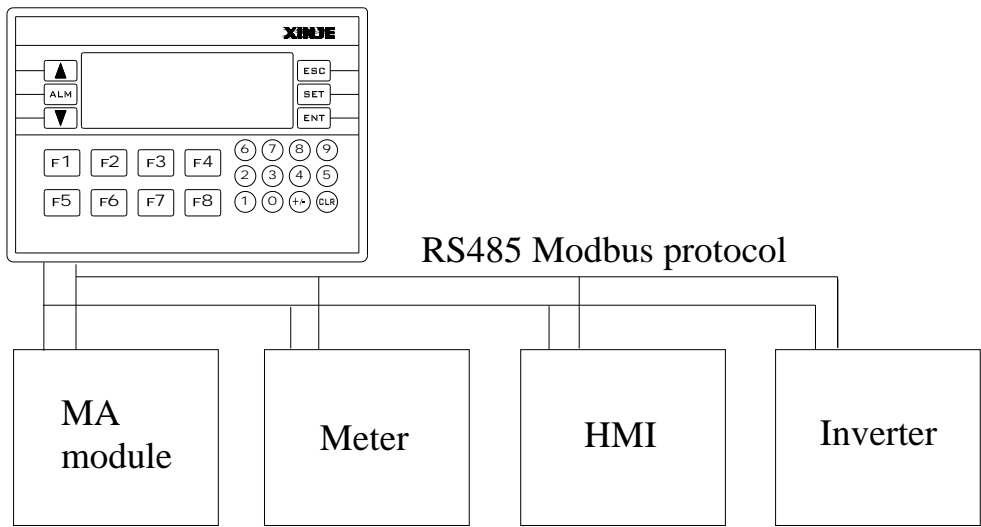
The details and using method please refer to MA Model Manual.

5-3. Other extension

Besides BD board and MA model, XP/XMP series product can extend other devices which support RS-485 and Modbus protocol.

XP/XMP can extend 32 devices via RS-485 com port such as PLC, meter, printer, inverter, HMI etc.

The connection figure is as below:



Attention:

The connection method is Bus mode, transmission line should start from station 1 to station 2, then from station 2 to station 3....., connect as this sequence until the last station. Star mode or ring mode connections are not permitted.