

XINJE

OP operate panel

User manual

Xinje Electric Co., Ltd.

Data No. HOC01 20110705 8.0

VICPAS
HMI Parts Center

Basic instructions

- Thanks for buying OP series operate panel.
- This manual will introduce the hardware features and wiring of OP.
- Please read the manual carefully before wiring.
- For OP software, please refer to OP software manual.
- Please pass the manual to the final user.

User notes

- Only the operator who has electrical knowledge can use the OP. Please consult us if there is anything unclear.
- The examples in the manual are only for reference, we are not sure they can work.
- Please confirm the product is accord with related specifications when use with other products.
- Please confirm the product is accord with safety requirements when using. Please set the safety function for the machine.

Responsibility

- We can not ensure the manual contents are accord with the product totally though we have checked the manual carefully.
- We are glad to accept customers' advice. We will often check the manual contents and modify them in the next version.
- Please note that we will not inform customers if the manual has been modified.

Contact us

- Telephone: +86-0510-85134136
- Fax: +86-0510-85111290
- Address: 4th floor, building 7, originality industrial city, JiangSu province, Wuxi, China
- Post code: 214072

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1 Hardware

1-1. Introduction

OP series operate panel can control the PLC through buttons, texts, lamps.

Characteristics:

- Edit the program in OP20 software, download program via PC serial port
- Can communicate with various PLCs. Such as Mitsubishi FX series, Omron C series, Siemens S7 series, Koyo SG series and so on
- Password function
- Built-in RTC
- OP can display dynamic text
- Alarm function
- All the buttons can be defined as multi-function
- STN LCD with backlight
- Protection level is up to IP65
- Support bmp picture displaying

1-2. General specifications

1. Electrical spec

| | |
|----------------------|--|
| Input voltage | DC24V |
| Input voltage range | DC20V-DC28V |
| Power | < 4W(TYPE2.0W) |
| Power-off permission | < 20ms |
| Voltage endurance | AC1000V-10MA 1minute (signal and ground) |
| Insulated resistance | DC500V- about 10M Ω (signal and ground) |

2. Environment

| | |
|---------------------|---|
| Operate temperature | 0~50 $^{\circ}$ C, no condensation |
| Storage temperature | -20~60 $^{\circ}$ C |
| Humidity | 20~85% (no condensation) |
| Vibration endurance | 10~25Hz(X, Y, Z direction 30 minutes 2G) |
| Noise immunity | Voltage noise: 1000Vp-p, pulse width is 1 |
| Air | No corrosive gas |
| Protection | IP65 for front cover |
| Cooling method | Natural cooling |

1-3. Function specifications

OP series:

| Type | Button | LCD | Backlight | Port | Dimension (mm) | Mounting dimension (mm) |
|-----------|-------------|-------------|-----------|-----------------|------------------|-------------------------|
| OP320 | 7 | 3.7" | STN LCD | RS232/RS422 | 162.0×102.0×38.0 | 156.5×94.0 |
| OP320-S | | | | RS232/RS485 | | |
| OP320-A | 20 | | | RS232/RS422 | 172.0×94.0×30.0 | 163.0×85.0 |
| OP320-A-N | | | | RS232 | | |
| OP320-A-S | | | | RS232/RS485 | | |
| OP325-A | | | | RS232/RS422 | | |
| OP325-A-S | RS232/RS485 | | | 172.0×94.0×38.3 | 164.2×86.8 | |
| OP330 | 26 | | | RS232/RS422 | 172.0×121.0×56.5 | 164.0×113.0 |
| OP330-S | | RS232/RS485 | | | | |

1-3-1. OP320/OP320-S

| | | |
|---------|---------------|---|
| Display | Type | Blue LCD |
| | Use life | Above 20000 hours, temperature 25℃, 24-hour running |
| | Display area | 192*64 |
| | Brightness | Adjust by potentiometer |
| | Text | English (24 words×4 rows) |
| | Font | Lattice, vector |
| | Button | 7 |
| Memory | Program | 64KB FalshROM |
| | Data | 1KB SRAM |
| Port | Download | RS232 |
| | communication | OP320: RS232/RS422 |
| | | OP320-S: RS232/RS485 |

1-3-2. OP320-A/OP320-A-N/OP320-A-S

| | | |
|---------|---------------|---|
| Display | Type | Blue LCD |
| | Use life | Above 20000 hours, temperature 25℃, 24-hour running |
| | Display area | 192*64 |
| | Brightness | Adjust by potentiometer |
| | Text | English (24 words×4 rows) |
| | Font | Lattice, vector |
| | Button | 20 |
| Memory | Program | 64KB FalshROM |
| | Data | 1KB SRAM |
| Port | Download | RS232 |
| | communication | OP320-A: RS232/RS422 |
| | | OP320-A-N: RS232 |
| | | OP320-S: RS232/RS485 |

1-3-3. OP325-A/OP325-A-S

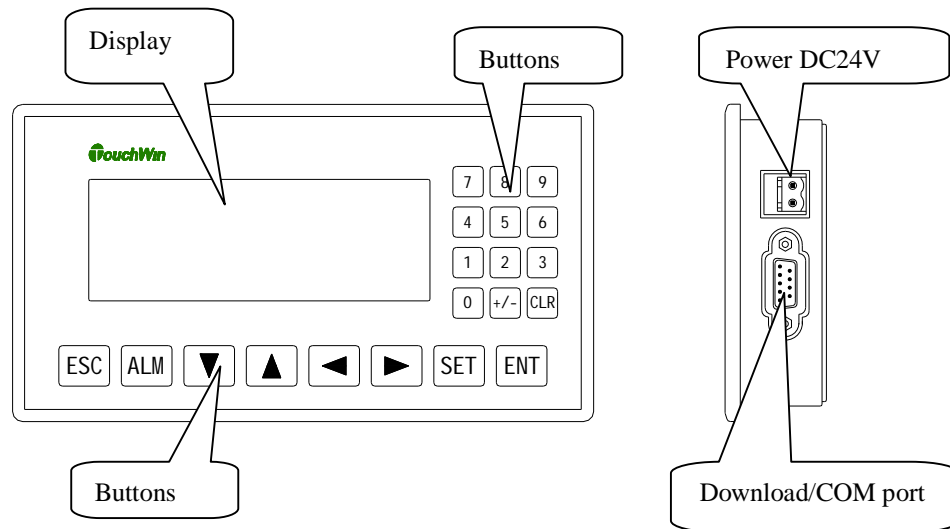
| | | |
|---------|---------------|---|
| Display | Type | Blue LCD |
| | Use life | Above 20000 hours, temperature 25℃, 24-hour running |
| | Display area | 192*64 |
| | Brightness | Adjust by potentiometer |
| | Text | English (24 words×4 rows) |
| | Font | Lattice, vector |
| | Button | 20 |
| Memory | Program | 64KB FalshROM |
| | Data | 1KB SRAM |
| Port | Download | RS232 |
| | communication | OP325-A: RS232/RS422 |
| | | OP325-A-S: RS232/RS485 |

1-3-4. OP330/OP330-S

| | | |
|---------|---------------|---|
| Display | Type | Blue LCD |
| | Use life | Above 20000 hours, temperature 25℃, 24-hour running |
| | Display area | 192*64 |
| | Brightness | Adjust by potentiometer |
| | Text | English (24 words×4 rows) |
| | Font | Lattice, vector |
| | Button | 7 |
| Memory | Program | 64KB FalshROM |
| | Data | 1KB SRAM |
| Port | Download | RS232 |
| | communication | OP330: RS232/RS422 |
| | | OP330-S: RS232/RS485 |

1-4. Part

Take OP320-A for example:



Note:














- (1) There is a potentiometer at the reverse side of OP cover. It can adjust the LCD brightness. Please rotate it with the screw. The LCD backlight will be OFF if there are no any operations for 3 minutes.
- (2) The diagram is only for your reference, each type please see the real product.

1-5. Button function

The buttons on the OP panel can be defined as many functions. They can instead of the buttons on the control machine which has long using life and better touch feeling.

Besides, these buttons can be defined to special function such as set on /off bit, screen jump. If no need special functions, the buttons will execute basic functions: set the value of register, reset original screen, page up/down.

Buttons functions:

| Button | Basic function |
|---|--|
|  | Return to the original screen (default is screen no.1). The main menu or frequenct-used screen can be set to original screen |
|  | |
|  | Left shift data bit when changing the register |
|  | Right shift data bit when changing the register |
|  | Page down, the default value = current page -1. Minus one for the data being changed, the range is 0 -> 9 -> 0 |
|  | Page up, the default value = current page +1. Plus one for the data being changed, the range is 9 -> 0 -> 9 |
|  | Press this button to change the register value, the changed bit is shining. If there is no register in the program, this button executes do-nothing operation. Press this button before pressing ENT to cancel the current modification and continue to change the next register. |
|  | Confirm the modification and continue the next one |
|  | After setting alarm list function, press this button to enter alarm screen Used as function button |
|  | Clear the register value Used as function button |
|  | Set the negative or positive of value Used as function button |
|  | Numeric button (range: 0~9) Used as function button |
|  | Overall function button or normal function button |

1-6. Port and download connection

1-6-1. Port

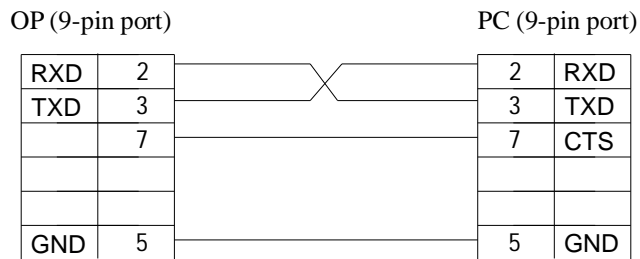
OP series has a DB9 port. It can download program and communicate with other devices.

| OP320, OP320-A, OP325-A, OP330 | | OP320-A-N | | OP320-S, OP320-A-S, OP325-A-S, OP330-S | |
|-----------------------------------|------|-----------|------|---|------|
| Pin | Name | Pin | Name | Pin | Name |
| 1 | TD+ | | | 1 | TD+ |
| 2 | RXD | 2 | RXD | 2 | RXD |
| 3 | TXD | 3 | TXD | 3 | TXD |
| 4 | | 4 | | 4 | |
| 5 | GND | 5 | GND | 5 | GND |
| 6 | TD- | 6 | | 6 | TD- |
| 7 | | 7 | | 7 | |
| 8 | RD- | 8 | | 8 | B |
| 9 | RD+ | 9 | | 9 | A |

1-6-2. Download connection

Please use OP cable to connect OP 9-pin port and PC serial port. The cable can be also used to connect OP and PLC.

OP and PC connection diagram:

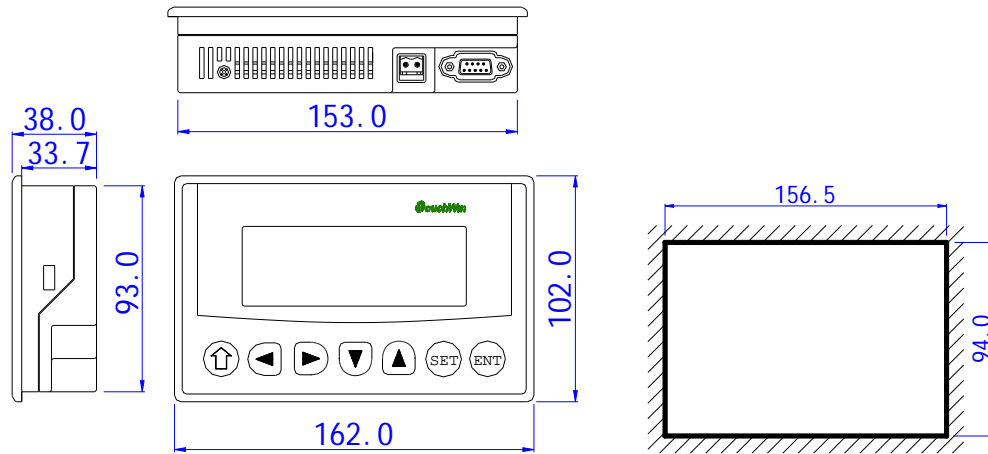


1-7. Dimension and installation

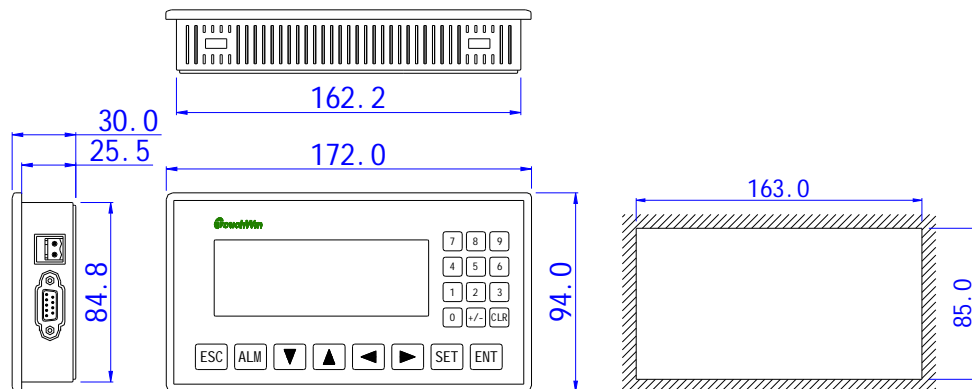
1-7-1. Dimension

Unit: mm

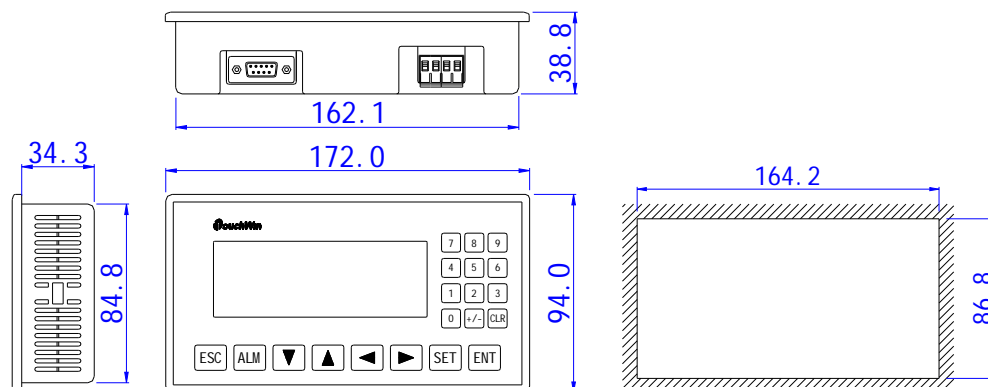
■ OP320, OP320-S



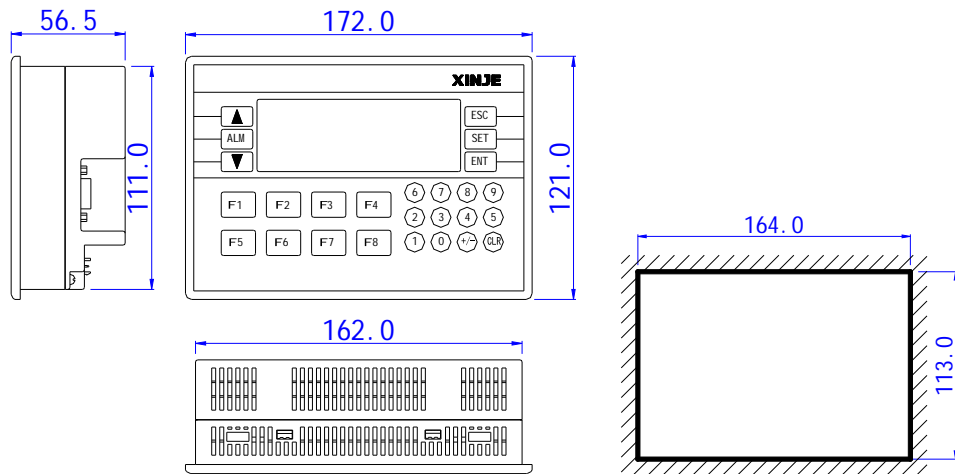
■ OP320-A, OP320-A-N, OP320-A-S



■ OP325-A, OP325-A-S

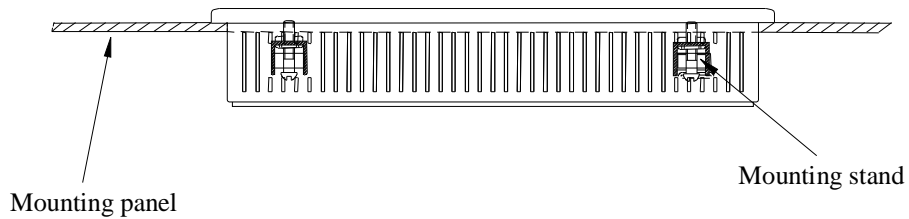


■ OP330, OP330-S



1-7-2. Installation

OP installation diagram:



Mounting steps:

- (1) Make a mounting hole on the mounting panel
- (2) Put the bottom of OP into the hole
- (3) Mount the mounting stand into the fixing hole
- (4) Tighten the 4 screws in the fixing hole

Note:

1. Make sure the mounting hole will not hurt the OP surface. Please leave some space between hole and OP.
2. Don't make the screw too tight to avoid cover damage.
3. Please add seal ring in the hole

2 Q&A

OP program is edited in OP20 software; please refer to OP software manual. This chapter will explain some general questions about using OP.

2-1. Cannot download program

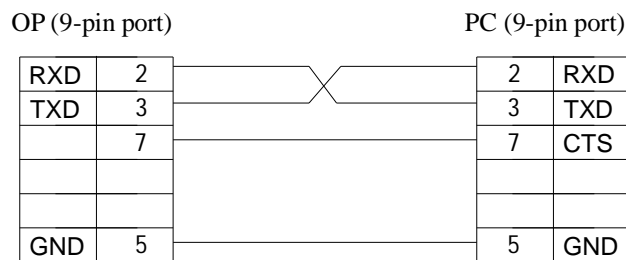
1. The version of hardware and software must be matched. Please see the following table.

| Hardware version | Software version |
|-----------------------------|------------------|
| V3.6 | V3.6 |
| V4.0—V7.0 (not include 7.0) | V6.5z |
| V7.0—V8.0 | V8.0n |

Hardware version: Please see the label at the reverse side of OP product.

Software version: please see the item Help/about.... in OP20 software.

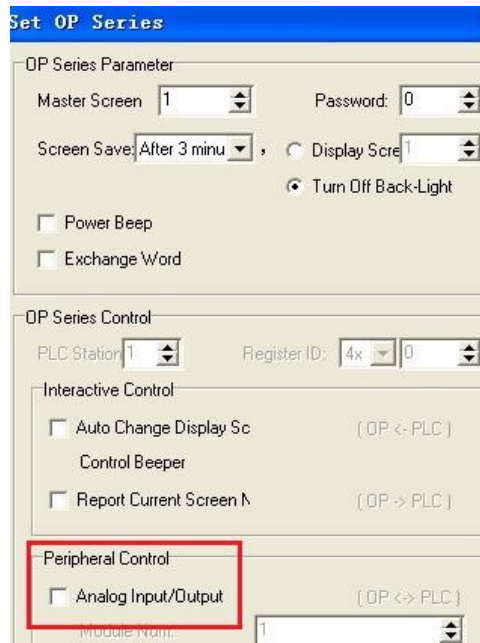
2. Check the download cable



3. Try to download program via PC serial port.
4. If download program via USB-RS232 converter, it will be error sometime. Because some converter doesn't connect pin7, but OP need to connect pin7.
5. Open the OP20 software, click file/com port... to choose the PC serial port.

2-2. Communication problem about OP and PLC

1. PLC and OP is all powered on, and the cable connection is well; the PLC device choice is correct in the OP20 software. Please refer to chapter 3 for the cable connection diagram.
2. Check the communication parameters of PLC and OP, they must be the same.
3. Check the station no. especially the station no. of alarm list, register and relay.
4. Don't choose analog input/output in Tool/Set OP series...



5. Contact us if they still cannot communicate.

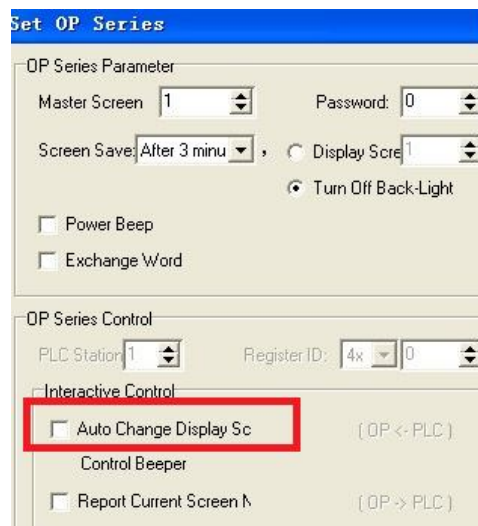
2-3. Program security

OP program cannot be uploaded for security reason.

2-4. Interactive control

Please choose “auto change display Screen” and set register address in Tool/Set OP series...

Set the register to n, OP will jump to screen No.n when power on. Then the register value will be cleared.



2-5. Set data in sequence

If there are many values need to set in one screen, please click each of them in sequence before downloading. Then you can set these values in sequence.

2-6. Others

1. When choosing Modbus or free format protocol, OP20 will have register 4x, 3x, 1x, 0x.
1x and 3x mean read only.
0x and 4x mean read and write.
2. OP320/OP320-A/OP325/OP330 cannot support RS485.

3 PLC connection

This chapter will introduce the connection method of OP and PLC.

The communication steps of PLC and OP:

1. Choose the PLC type communicating with OP. Check if the communication parameters of OP and PLC are the same. The station no. of each part in the OP program should be same to PLC.
2. Please disconnect the OP cable with PC after finish the downloading.
3. Connect OP and PLC with PLC cable, power on them, OP starts to work.

3-1. Xinje XC series PLC

3-1-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|--|------------------|-------|-----------|-------------------------|
| XC | XC1 XC2 XC3 XC5 XCM XCC | CPU | RS232 | Diagram 1 | Xinje XC series |
| | | | RS485 | Diagram 2 | |

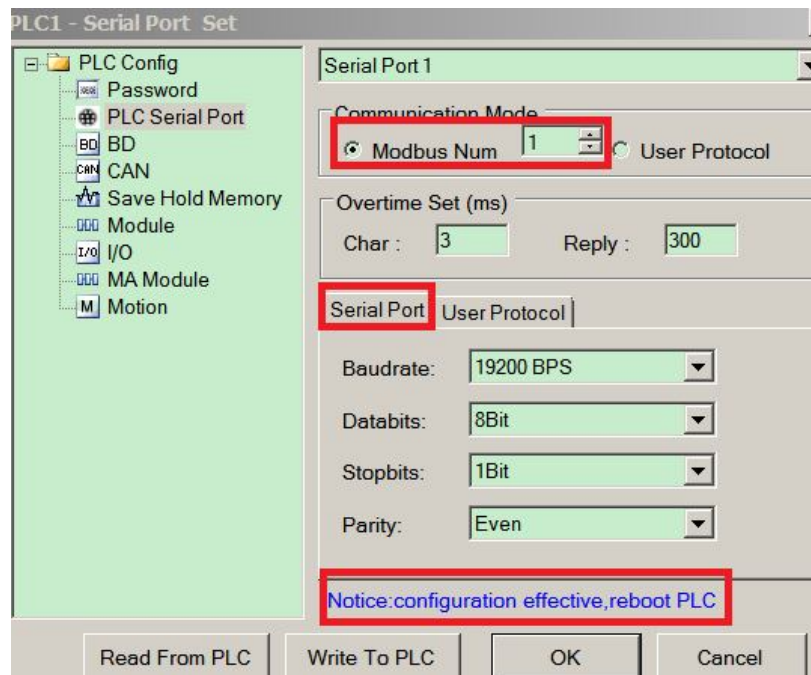
3-1-2. Communication parameter

OP software default settings:

| Parameter | Recommend Settings | Choices of settings | Note |
|-------------|--------------------|---|--|
| PLC model | XC series | FC/XC series | Choose correct PLC model communicating with OP |
| Port | RS232 | RS232/RS485 | |
| Data bit | 8 | 7/8 | Accord with PLC port settings |
| Stop bit | 1 | 1/2 | Accord with PLC port settings |
| Parity | Even parity | Even /odd/no parity | Accord with PLC port settings |
| Baud rate | 19200 | 4800/38400/9600/115200 /19200/187500 | Accord with PLC port settings |
| Station no. | 1 | 0~255 | |

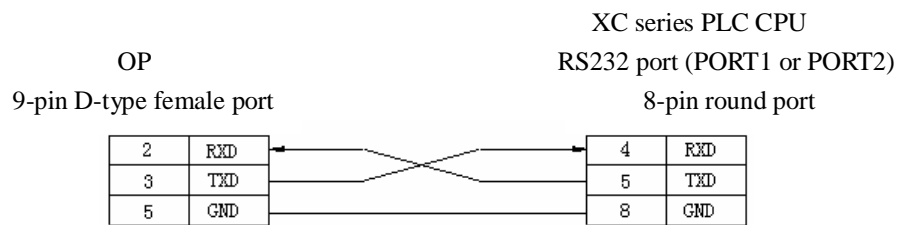
Default communication parameters of Xinje XC series PLC: 19200, 8, 1, even parity, station no.1.

PLC software settings:



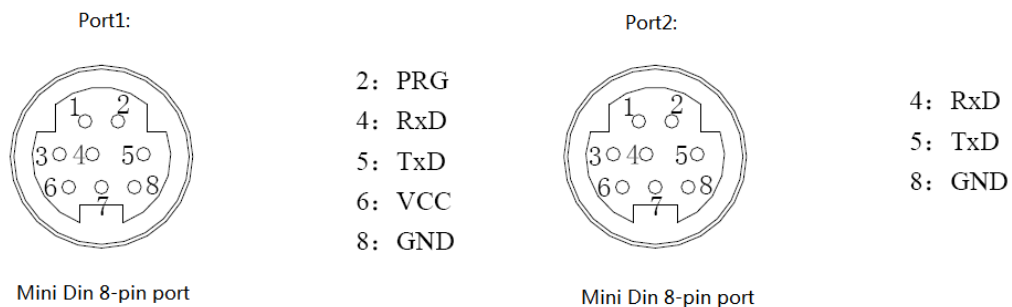
3-1-3. Cable connection

1. Direct connect to XC series PLC CPU (RS232 port)

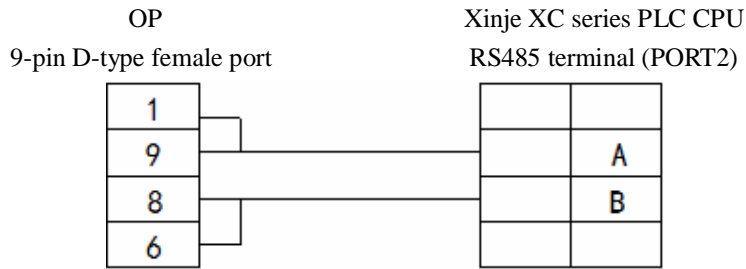


(Diagram 1: fit for OP all series)

PLC port:

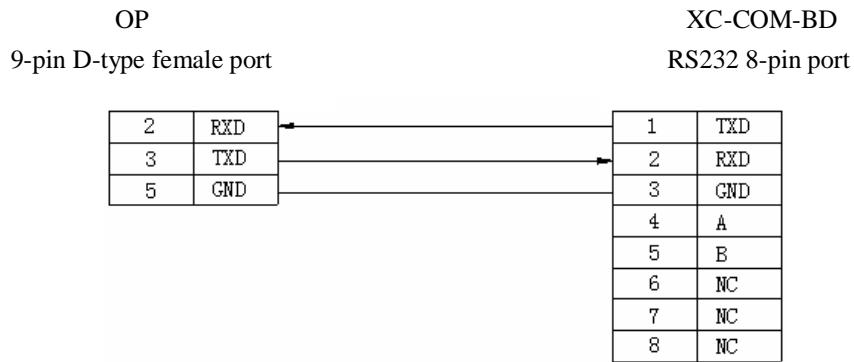


2. Direct connect to XC series PLC CPU (RS485 port)



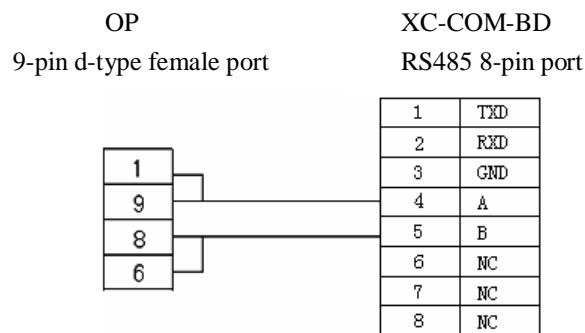
(Diagram 2— fit for OP320-S, OP320-A-S, OP325-S, OP330-S)

3. Connect PLC via XC-COM-BD (RS232)



(Diagram 3— fit for OP all series)

4. Connect PLC via XC-COM-BD (RS485)



(Diagram 4— fit for OP320-S, OP320-A-S, OP325-S, OP330-S)

3-2. Mitsubishi FX series PLC

3-2-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|--------------------------------------|------------------|-------|-----------|--------------------------|
| FX | FX0N FX1N FX2N FX1S FX3U | CPU | RS422 | Diagram 1 | Mitsubishi FX series PLC |
| | FX3G FX0 FX1 | CPU | RS422 | Diagram 1 | Mitsubishi FX series PLC |
| | FX2 | CPU | RS422 | Diagram 2 | Mitsubishi FX series PLC |

3-2-2. Communication parameters

OP default settings

| Series | Recommend settings | Choices of settings | Note |
|-------------|--------------------|---|--|
| PLC type | FX series | | Choose correct PLC model communicating with OP |
| Data bit | 7 | 7/8 | Accord with PLC port settings |
| Stop bit | 1 | 1/2 | Accord with PLC port settings |
| Parity | Even parity | Even /odd/no parity | Accord with PLC port settings |
| Baud rate | 9600 | 4800/9600/19200/38400/56000 /57600/115200/187500 | Accord with PLC port settings |
| Station no. | 0 | 0~255 | |

The default parameters of Mitsubishi FX series PLC: 9600, 7, 1, even parity, station no. 0

PLC software settings:

FX parameter

Memory capacity | PLC name | I/O assignment | PLC system(1) | PLC system(2)

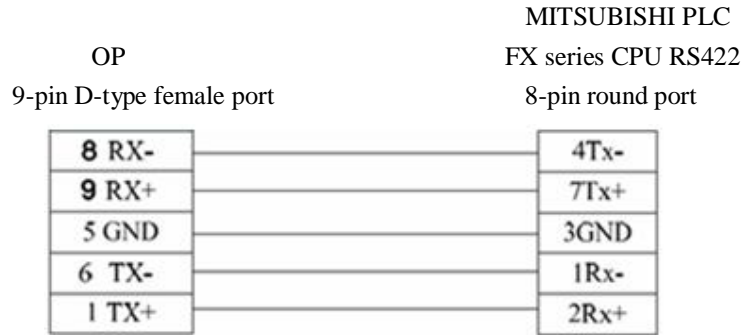
Operate communication setting

If the box is not checked, the parameters will be cleared.
(When the program is transferred to the communication board, parameters and D8120 values in the PLC must be cleared upon program transfer.)

| | |
|----------------------------------|---|
| Protocol Non-procedural | <input type="checkbox"/> Control line |
| Data length 7bit | H/W type Regular/RS-232C |
| Parity Even | Control mode Invalid |
| Stop bit 1bit | <input type="checkbox"/> Sum check |
| Transmission speed 9600 (bps) | Transmission control procedure Form1 |

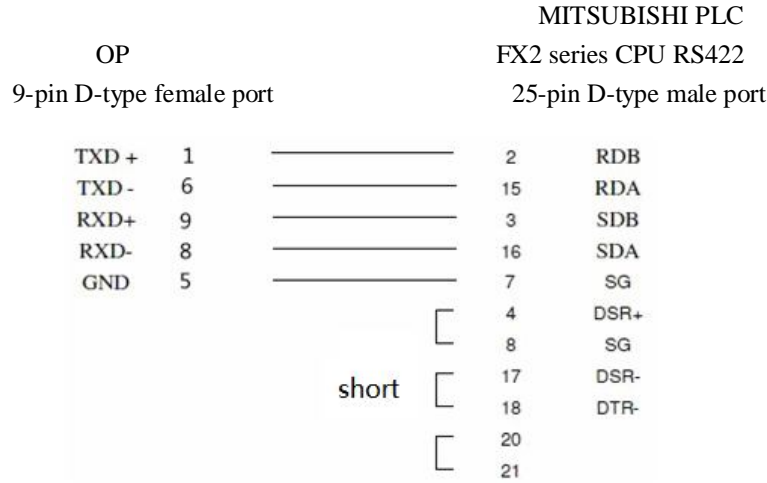
3-2-3. Cable connection

1. FX1N/2N/3U/3G/1S series PLC (RS422)



(Diagram 1— fit for OP320, OP320-A, OP325, OP330)

2. FX2 series PLC



(Diagram 2— fit for OP320, OP320-A, OP325, OP330)

3-3. Siemens S7-200 series PLC

3-3-1. Connection unit

OP series can communicate with S7-200 series PLC (PPI protocol) via programming port or expansion port.

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|--|------------------|--------------|-----------|---------------------------|
| S7-200 | CPU212 CPU221 CPU222 CPU224 CPU226 | CPU | RS485 | Diagram 1 | Siemens S7-200 series PLC |

3-3-2. Communication parameters

OP software settings

| Parameters | Recommend settings | Choices of settings | Note |
|------------|--------------------|------------------------|--|
| PLC type | S7-200 | | Choose correct PLC type when communicating with OP |
| Port | RS485 | RS485 | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/115200 | Accord with PLC port |

| | | | |
|-------------|---|---------------|------------------------------------|
| | | /19200/187500 | parameters |
| Station no. | 2 | | Must use recommend settings |

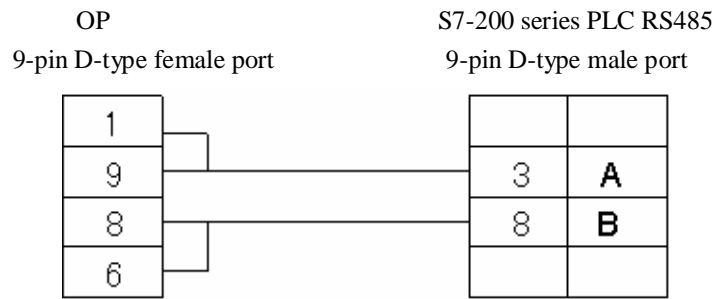
The default parameters of Siemens S7-200 series PLC: 9600, 8, 1, even parity, station no.2

PLC software settings:

S7-200 communication notes:

1. Siemens PLC register has VB(8-bit), VW(16-bit), VD(32-bit).
2. The register address is overlapped. VW address should be the times of 2; VD address should be the times of 4.

3-3-3. Cable connection



(Diagram 1— fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

3-4. Omron C series PLC

OP can communicate with Omron SYSMAC series CJ/CS/CP/CPM/CQM PLC.

Note:

1. CPM1A, CQM1-CPU series CPU don't have RS232 port, please configure OMRON CIF01 (RS232) adapter with them. In actual application, please use communication module C500-LK203, C120-LK201-V1, C500-LK201-V1 to finish the RS232 communication.
2. Please choose HostLink protocol in PLC software.
3. PLC start choice please set to MONITOR RUN.

3-4-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|--------------------------|-------------------|--------------|-----------|-------------------------|
| CP | CP1E-30N CP1H CP1L | CPU RS232 port | RS232 | Diagram 1 | Omron CP/CJ/CS series |
| | | Module CP1W-CIF11 | RS485 | Diagram 2 | |
| | | Module CP1W-CIF11 | RS422 | Diagram | |

| | | | | | |
|------|--|---|--------------|--------------|-----------------------------|
| | | | | 3 | |
| CJ | CJ1G-CPU44 CJ1G-CPU45 | CPU RS232 port | RS232 | Diagram 1 | |
| CS1 | CS1H-CPU63/ 64/65/66/67 CS1G-CPU42/ 43/44/45 CS1G-CPU42H CS1G-CPU43H CS1G-CPU44H CS1G-CPU45H CS1H-CPU63H CS1H-CPU64H CS1H-CPU65H CS1H-CPU66H CS1H-CPU67H | CPU RS232 port | RS232 | Diagram 1 | |
| C200 | C200HE | CPU RS232 port | RS232 | Diagram 1 | |
| CPM | CPM2A CPM2AE CPM2AH-40CDR-A | CPU RS232 port | RS232 | Diagram 1 | Omron CPM/CQM series |
| CQM1 | CQM1-CPU42 | | | | |
| | CPM1A | OMRON CIF01(RS232) Communication adapter | | | Omron CP/CJ/CS series |
| | CQM1-CPU11 | | | | |
| | C1000HF | C500-LK203 (Communication module) | RS232 | Diagram 1 | |
| | C2000 | C120-LK201-V1 (Communication module) | | | |
| | | C500-LK201-V1 (Communication module) | | | |
| | | C500-LK203 (Communication module) | | | |

3-4-2. Communication parameters

(1) Omron CP/CJ/CS series

OP software settings:

| Parameters | Recommend settings | Choices of settings | Note |
|------------|-----------------------|---|---|
| PLC type | Omron CP/CJ/CS series | Omron CP/CJ/CS series Omron CPM/CQM series | Please choose correct PLC type in OP20 software |
| Port | RS232 | RS232 | |
| Data bit | 7 | 7/8 | Accord with PLC port parameters |
| Stop bit | 2 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd/no parity | Accord with PLC port |

| | | | |
|-------------|------|---|---------------------------------|
| | | | parameters |
| Baud rate | 9600 | 4800/38400/9600/115200 /19200/187500 | Accord with PLC port parameters |
| Station no. | 0 | 0~255 | |

The default parameters of Omron CP/CJ/CS series: 9600, 7, 2, even parity, station no.0

(2) Omron CPM/CQM series

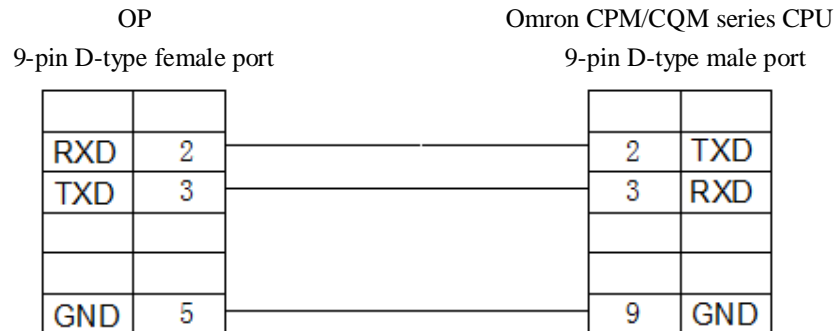
OP software settings:

| Parameters | Recommend settings | Choices of settings | Notes |
|-------------|----------------------|---|---------------------------------|
| PLC type | Omron CPM/CQM series | Omron CP/CJ/CS series Omron CPM/CQM series | Choose correct PLC type in OP20 |
| Port | RS232 | RS232 | |
| Data bit | 7 | 7/8 | Accord with PLC port parameters |
| Stop bit | 2 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd/no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/115200 /19200/187500 | Accord with PLC port parameters |
| Station no. | 0 | 0~255 | |

The default parameters of Omron CPM/CQM series PLC: 9600, 7, 2, even parity, station no.0

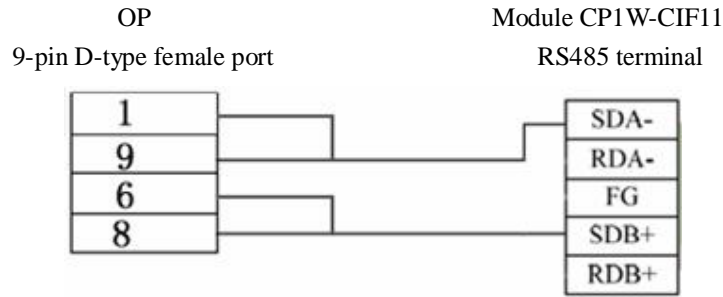
3-4-3. Cable connection

1. CPU RS232:



(Diagram 1— fit for OP all series)

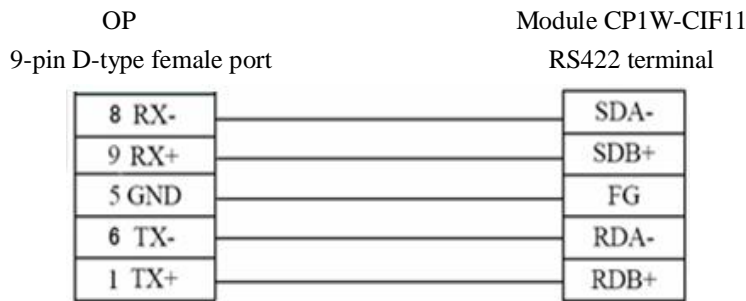
2. Module CP1W-CIF11 RS485:



(Diagram 2— fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

Note: For Omron module CP1W-CIF11, please turn OFF SW1; turn ON SW2, 3, 6; turn ON or OFF SW4.

3. Module CP1W-CIF11 RS422:



(Diagram 3— fit for: OP320, OP320-A, OP325, OP330)

Note: For Omron485 module CP1W-CIF11 RS422 connection, please turn OFF SW1~6.

3-5. Koyo S series PLC

3-5-1. Connection unit

OP can communicate with Koyo KOSTA-S series, Koyo Direct-Logic series PLC.

1. Koyo Kostac S series, SH\SM\SN PLC (direct connect to CPU)

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|---------|------------------|-------|-----------|-------------------------|
| SH | SH-48RS | CPU | RS232 | Diagram 2 | Koyo S series |

| | | | | | |
|-------|--------|-----|--------------|-----------|--|
| SM | SM24-T | | | | |
| SN | | | | | |
| SU-6 | | CPU | RS232 | Diagram 1 | |
| SU-6B | | | RS232 | Diagram 1 | |
| | | | RS422 | Diagram 3 | |

Note: Koyo SH-48RS doesn't have Run, Stop switch, but only one port (modular plug)

2. Koyo Direct Logic series DL05, DL250 PLC (direct connect to CPU)

| Series | CPU | Connected module | Port | Cable | Choose correct PLC in OP20 |
|---------------------|--|------------------|--------------|-----------|----------------------------|
| Direct Logic | DL05 DL105 DL230 DL240 DL250 DL350 DL450 | CPU RJ-11 port | RS232 | Diagram 2 | Koyo S series |
| | DL250 | CPU com port | RS422 | Diagram 3 | |
| | DL430 DL440 DL450 DL350 | CPU com port | RS232 | Diagram 2 | |

Note: DL250 CPU PORT2 has RS232 and RS422, please choose the correct communication cable.

3-5-2. Communication parameters

OP software settings:

| Parameters | Recommend settings | Choices of settings | Notes |
|------------|--------------------|------------------------|--|
| PLC type | Koyo S series PLC | | Please choose correct PLC type in OP20 |
| Port | RS232 | RS232/RS422 | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Odd parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/115200 | Accord with PLC port parameters |

| | | | |
|-------------|---|---------------|--|
| | | /19200/187500 | |
| Station no. | 0 | 0~255 | |

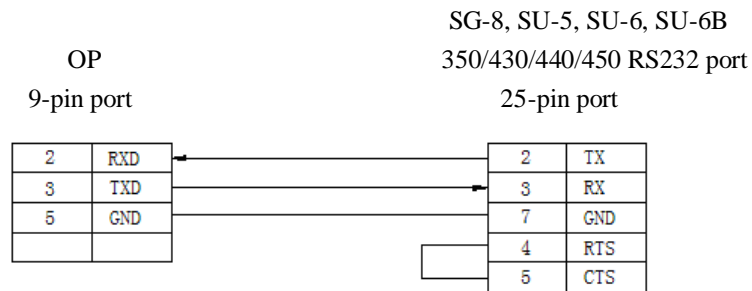
The default parameters of Koyo S series PLC: 9600, 8, 1, odd parity, station no.0

PLC software settings:

1. Choose K protocol, station no.1 in the software.
2. Koyo K protocol doesn't have station no. problem, the communication parameters cannot be changed. It is no need to change the station no. of OP. (OP20 default station no. is 0, it is not need to be changed).
3. The register address starts from R2000 in OP20.

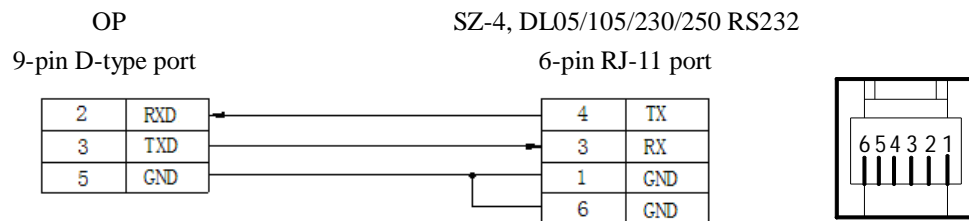
3-5-3. Cable connection

1. CPU or communication unit 25-pin RS232 port



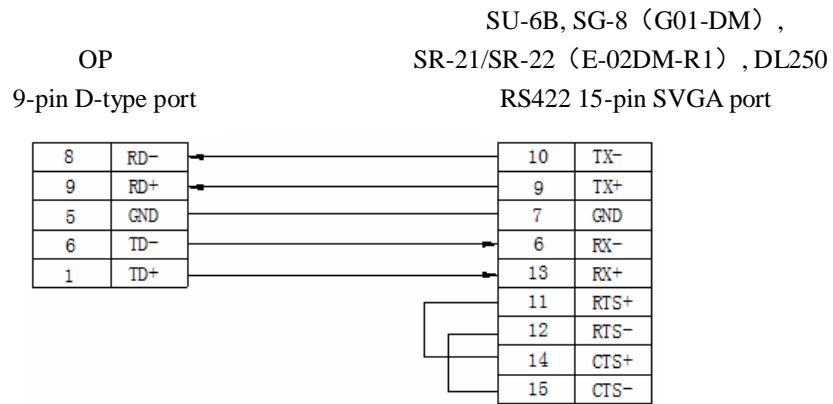
(Diagram 1— fit for OP all series)

2. CPU 6-pin RJ-11 RS232 port



(Diagram 2— fit for OP all series)

3. RS422 connection:



(Diagram 3— fit for OP320, OP320-A, OP325, OP330)

3-6. Delta DVP series PLC

3-6-1. Connection unit

OP can communicate with Delta DVP series PLC through PLC programming port.

| Series | Connected module | Port | Cable | Choose PLC type in OP20 |
|-------------|------------------|-------|-----------|-------------------------|
| ES/EH/EX | CPU | RS232 | Diagram 1 | Delta DVP series |
| | | RS485 | Diagram 2 | |
| SS/SA/SC/SX | | RS232 | Diagram 1 | |
| | | RS485 | Diagram 2 | |

3-6-2. Communication parameters

OP software settings:

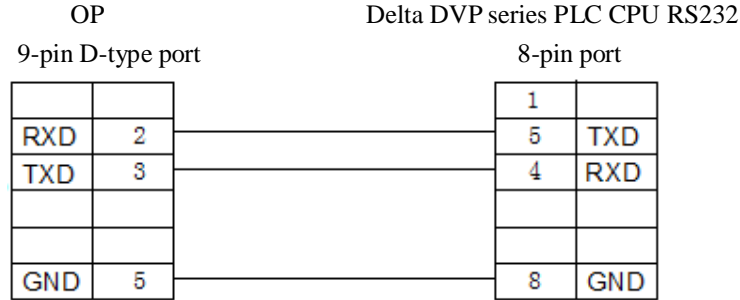
| Parameters | Recommend settings | Choices of settings | Notes |
|------------|----------------------|------------------------------------|---------------------------------|
| PLC type | Delta DVP series PLC | | Choose correct PLC type in OP20 |
| Port | RS232 | RS232/RS485 | |
| Data bit | 7 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/115200/19200/18750 | Accord with PLC port parameters |

| | | | |
|-------------|---|-------|--|
| | | 0 | |
| Station no. | 1 | 0~255 | |

The default parameters of Delta DVP PLC: 9600, 7, 1, even parity, station no.1

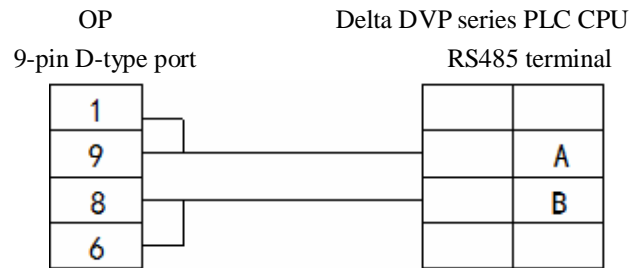
3-6-3. Cable connection

1. CPU RS232 port:



(Diagram 1— fit for OP all series)

2. CPU RS485 port:



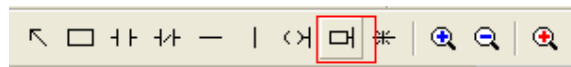
(Diagram 2— fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

3-7. LG Master-K (programming port) series PLC

OP can communicate with LG Master-K series PLC.

Note:

- (1) OP can communicate with LG PLC through CPU RS232 port or expansion Cnet module.
- (2) Please add END instruction at the end of LG PLC program. Otherwise, the ERR LED will light.



3-7-1. Connection unit

| Series | Connected module | Port | Cable | Choose |
|-------------|------------------|-------|-----------|------------------------------------|
| K80 K120 | CPU | RS232 | Diagram 1 | LG Master-K80/120-programming port |

3-7-2. Communication parameters

LG Master-K80/120-programming port, OP software settings

| Parameters | Recommend settings | Choices of settings | Notes |
|-------------|------------------------------------|--------------------------------------|---------------------------------|
| PLC type | LG Master-K80/120 Programming port | | Choose correct PLC type in OP20 |
| Port | RS232 | RS232 | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | No parity | Even /odd/no parity | Accord with PLC port parameters |
| Baud rate | 38400 | 4800/38400/9600/115200 /19200/187500 | Accord with PLC port parameters |
| Station no. | 0 | 0~255 | |

The default parameters of LG Master K PLC programming port: 38400, 8, 1, no parity, station no.0

PLC software settings:

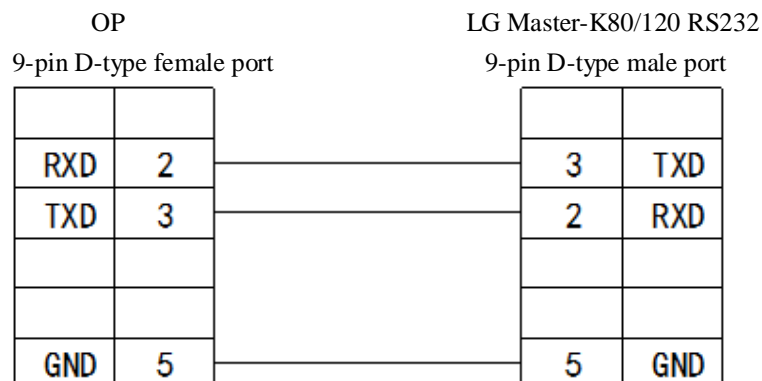
The screenshot shows the 'Communication' tab in the PLC software settings. The 'Communication' tab is selected, and the 'Communication' parameter is set to '允许' (allow). The 'Station no.' is set to '0', 'Baud rate' is '38400', 'Data bit' is '8', and 'Stop bit' is '1'. The 'Parity' is set to '无校验' (no parity). The 'Communication channel' is set to 'RS232C 无调制解调器或 RS422/485' (RS232C no modem or RS422/485). The 'Initial command' is 'ATZ'.

Annotations:

- Communication
- permit
- station no.0 baud rate 38400 no parity data bit: 8 stop bit: 1
- RS232C no modem or RS422/485

3-7-3. Cable connection

CPU RS232 port:



(Diagram 1— fit for OP all series)

3-8. LG Master-K (Modbus) series PLC (multi-function port)

3-8-1. Connection unit

Connect through Modbus Rtu protocol

| Series | Connected module | Port | Cable | Choose PLC type in OP20 |
|-------------|---------------------|--------------|-----------|---|
| K80 K120 | Modbus Rtu protocol | RS232 | Diagram 1 | LG Master-K80/120S multi-function port (Modbus) |

Note: For LG Master K-Modbus Rtu, please turn ON switch 2 and turn OFF switch 1. (it is no need to change the switch for LG Master KxxxS programming port).

3-8-2. Communication parameters

LG Master-K80/120 (Modbus Rtu) series PLC OP software settings:

| Parameters | Recommend settings | Choices of settings | Notes |
|------------|--|---|-------------------------------------|
| PLC type | LG Master-K80/120 Multi-function port (Modbus Rtu) | | Choose the correct PLC type in OP20 |
| Port | RS232 | RS232 | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/ 115200/19200/187500 | Accord with PLC port parameters |

| | | | |
|-------------|---|-------|--|
| Station no. | 1 | 0~255 | |
|-------------|---|-------|--|

The default parameters of LG Master K-Modbus : 9600, 8, 1, even parity, station no.1

PLC settings:

- Note:** (1) Turn on PLC switch BUILT-IN CNET
 (2) Please choose Modbus Slave protocol

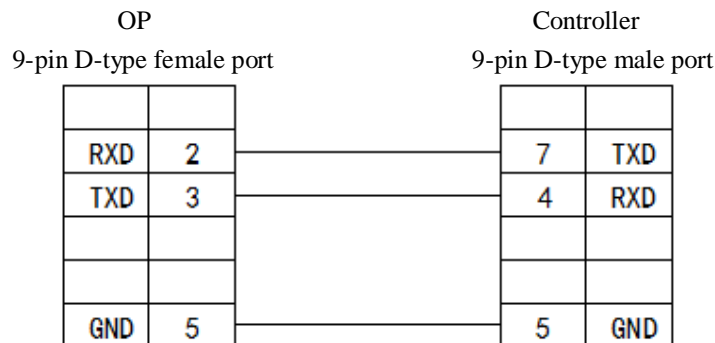
RS232 communication



Modbus: slave
 Transmission mode: RTU(Hex)

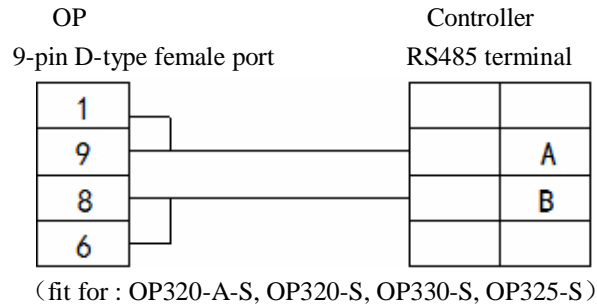
3-8-3. Cable connection

1. LG Modbus Rtu RS232:



(fit for : OP all series)

2. LG Modbus Rtu RS485:



3-9. LG Master-K (Cnet) series PLC (multi-function port)

3-9-1. Connection unit

Expansion Cnet module:

| Series | Connected module | Port | Cable | Choose PLC type in OP20 |
|-------------|------------------|-------|-----------|---|
| K80 K120 | Cnet | RS232 | Diagram 1 | LG Master-K80/120S multi-function port (Cnet) |
| | | RS485 | Diagram 2 | |

Note:

- (1) For LG Master K-cnet, please turn ON switch 2 and turn off switch 1. (It is no need to change the switch of LG Master KxxxS)
- (2) LG Master KxxxS programming port cannot support RS485. Cnet can support RS485.

3-9-2. Communication parameters

LGMaster-K80/120 (Cnet) PLC OP software settings

| Parameters | Recommend settings | Choices of settings | Notes |
|-------------|--|---|-------------------------------------|
| PLC type | LG Master-K80/120 Multi-function port (Cnet) | | Choose the correct PLC type in OP20 |
| Port | RS232 | RS232 | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | No parity | Even /odd/no parity | Accord with PLC port parameters |
| Baud rate | 19200 | 4800/38400/9600/115200 /19200/187500 | Accord with PLC port parameters |
| Station no. | 1 | 0~255 | |

The default parameters of LG Master K-cnet: 19200, 8, 1, no parity, station no.1

PLC settings

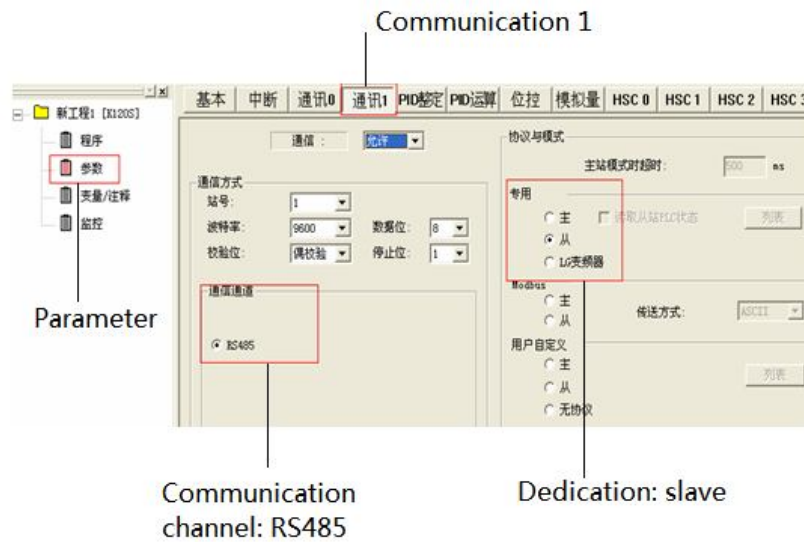
Notes: (1) Turn ON switch BUILT-IN CNET of PLC.

(2) Please choose special slave protocol. (Cannot choose Modbus slave).

RS232

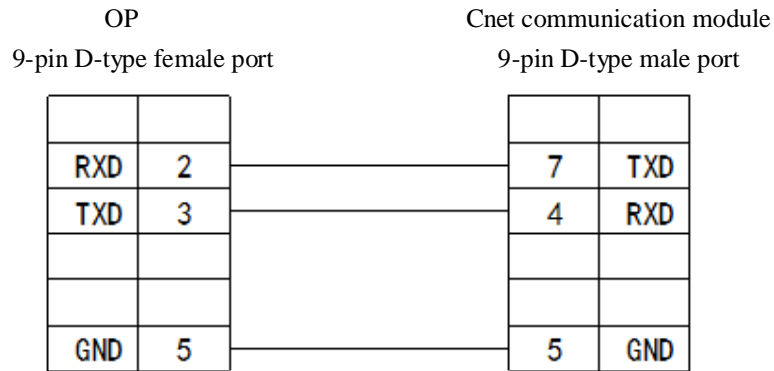


RS485



3-9-3. Cable connection

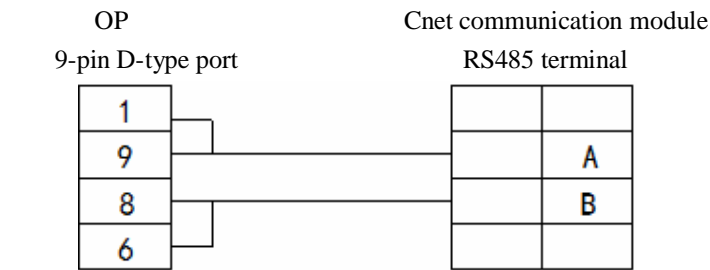
1. CPU (or expansion Cnet module)



(Diagram 1— fit for OP all series)

- Note:** (1) Turn ON switch BUILT-IN CNET of PLC.
 (2) Choose CNet port when making new PLC program.

2. RS485 connection:



(Diagram 2— fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

3-10. Matsushita FP series PLC

OP can communicate with Matsushita FP series PLC through programming port or expansion port.

3-10-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|-----------------|-----------|------------------|-----------|-----------|---------------------------|
| FP | FP0 | CPU | RS232 | Diagram 1 | Matsushita FP0/FP1 series |
| | FP-M | CPU | RS232 | Diagram 1 | |
| | FP-X | CPU | RS232 | Diagram 1 | |
| | FPΣ | CPU | RS232 | Diagram 1 | |
| | FP2 | CPU | RS232 | Diagram 1 | |
| | | CPU RS232 | RS232 | Diagram 2 | |
| | FP2SH | CPU | RS232 | Diagram 1 | |
| | | CPU RS232 | RS232 | Diagram 2 | |
| | FP1 | CPU RS232 | RS232 | Diagram 2 | |
| | | CPU RS232 | RS422 | Diagram 3 | |
| | FP3 | CPU RS232 | RS422 | Diagram 4 | |
| FP10SH FP10S | CPU RS232 | RS232 | Diagram 2 | | |
| FP-e | CPU | RS232 | Diagram 1 | | |

Note: Only FP0-CXXCXX has RS232 port.

3-10-2. Communication parameters

OP software settings

| Parameters | Recommend settings | Choices of settings | Note |
|-------------|----------------------|---|-------------------------------------|
| PLC type | Matsushita (FP1/FP0) | | Choose the correct PLC type in OP20 |
| Port | RS232 | | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Odd parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/ 115200/19200/187500 | Accord with PLC port parameters |
| Station no. | 1 | 0~255 | |

The default parameters of Matsushita FP series PLC: 9600, 8, 1, odd parity, station no.1

PLC settings



Programming port settings

No. 410 station no.1
No. 412 Communication mode:
PC connection

Note:

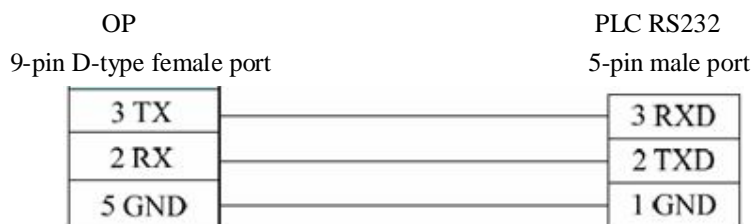
- (1) Please set the PLC register like this in OP software:

| PLC | OP |
|-----|---------|
| R45 | R 4 . 5 |

- (2) Make sure the PLC switch is turn to PPOG
- (3) The PLC must RUN when communicating with OP.
- (4) Do not choose general communication mode when setting the PLC parameters, otherwise, the communication will be error.
- (5) FP series PLC station no. is 1, but FP3 must be no.0.

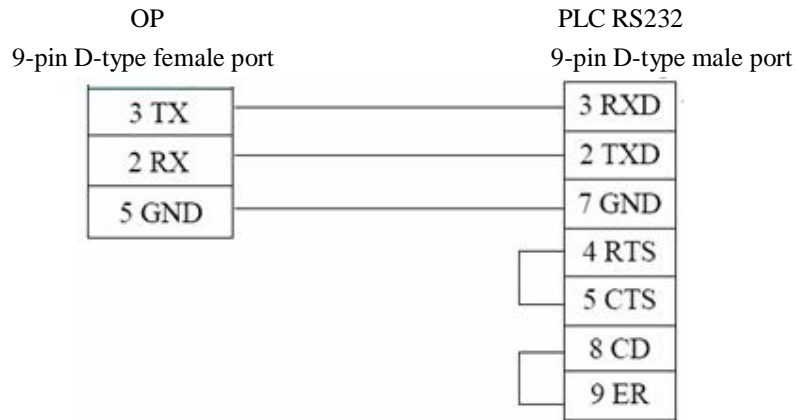
3-10-3. Cable connection

1. CPU RS232 port:



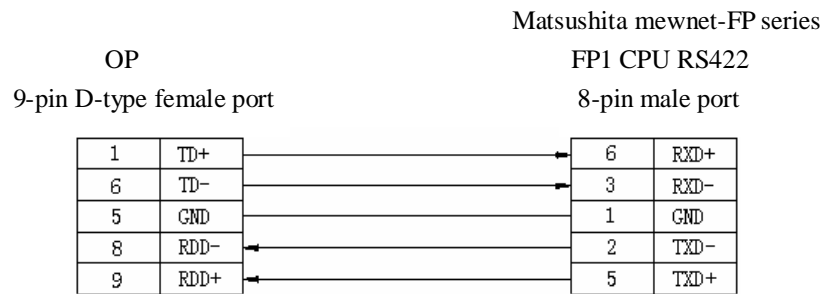
(Diagram 1— fit for OP all series)

2. CPU RS232:



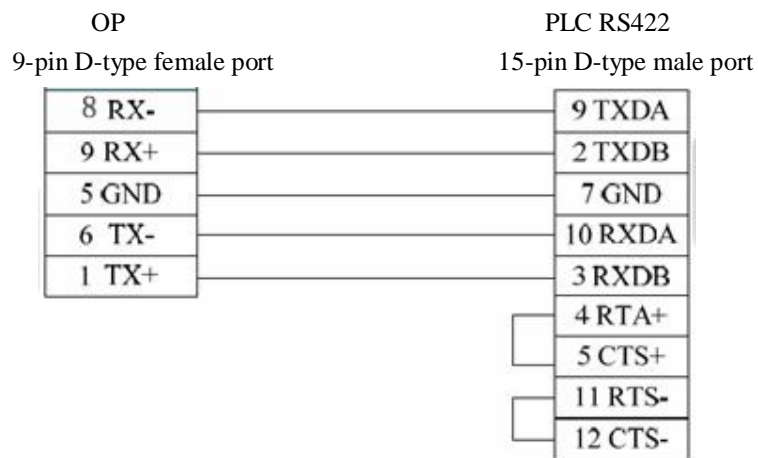
(Diagram 2— fit for OP all series)

3. CPU RS422:



(Diagram 3— fit for OP320, OP320-A, OP325, OP330)

4. CPU 15-pin port:



(Diagram 4— fit for OP320, OP320-A, OP325, OP330)

3-11. Schneider NEZA series PLC

OP can communicate with Schneider NEZA PLC through programming port. (Modbus protocol)

3-11-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|---|------------------|-------|-----------|---|
| Micro | TSX 37-05 TSX 37-08 TSX 37-10 TSX 37-21/22 | CPU | RS485 | Diagram 1 | Schneider Micro/NEZA/Twido Series PLC |
| Twido | Twido CPU | CPU | RS485 | Diagram 1 | |
| M | M218/M238 /M258 | CPU | RS485 | Diagram 2 | |
| NEZA | TSX07 CPU | CPU | RS485 | Diagram 1 | |

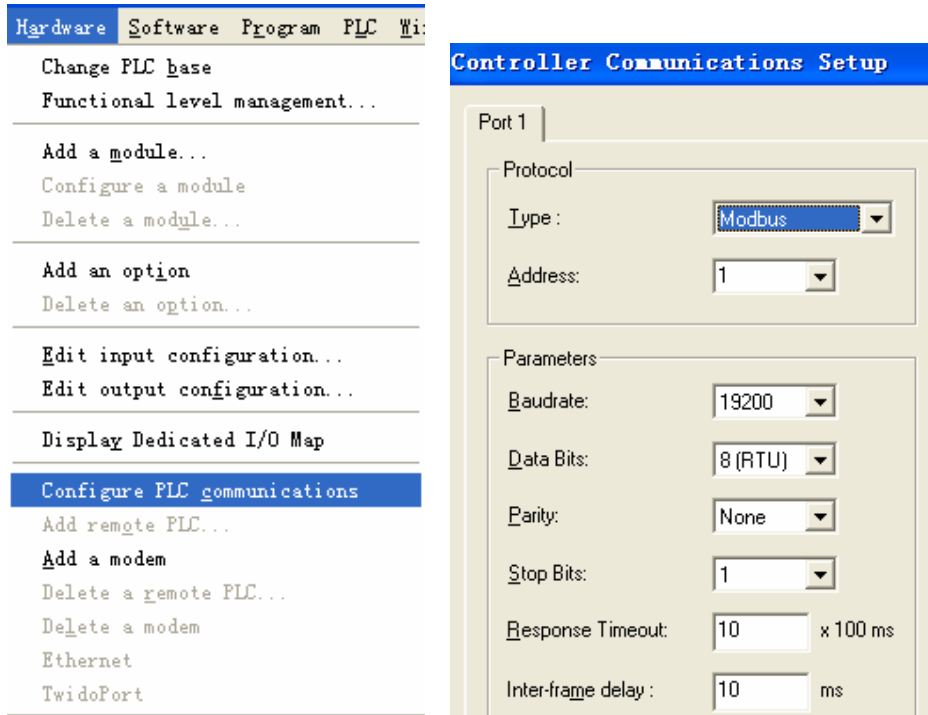
3-11-2. Communication parameters

OP software settings

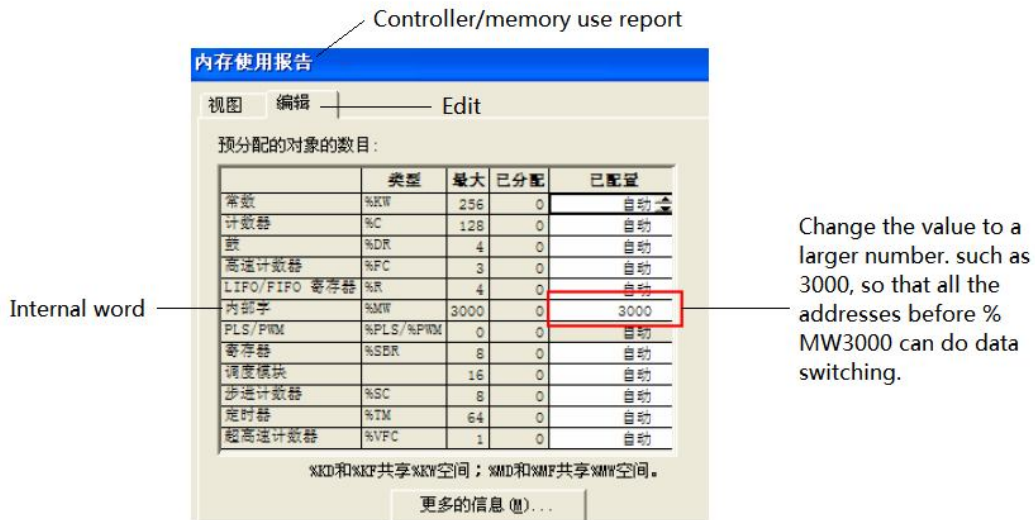
| Parameters | Recommend settings | Choices of settings | Notes |
|-------------|--|---|-------------------------------------|
| PLC type | Schneider Micro/ NEZA/ Twido series PLC | | Choose the correct PLC type in OP20 |
| Port | RS485 | | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 19200 | 4800/38400/9600 /115200/19200/187500 | Accord with PLC port parameters |
| Station no. | 1 | 0~255 | |

Schneider Micro/NEZA/ Twido series PLC: 19200, 8, 1, even parity, station no.1

PLC software settings:



Note: 1. The register of Twido is dynamic managed. Please add a sentence at the end of PLC program to avoid communication error.

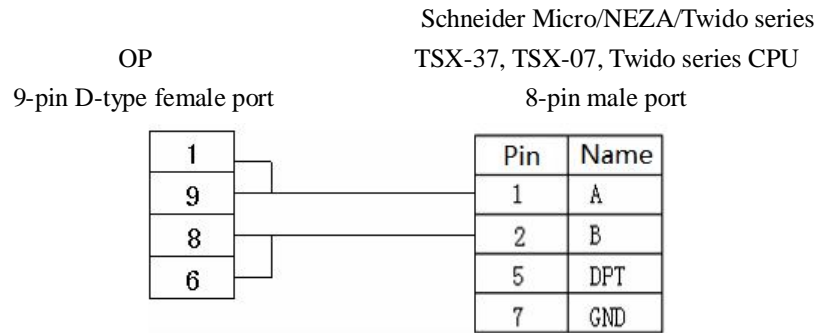


2. To open the bit address range, you have to make a program as below. For example: drive a coil of %M127, all the addresses before %M127 can do data switching.



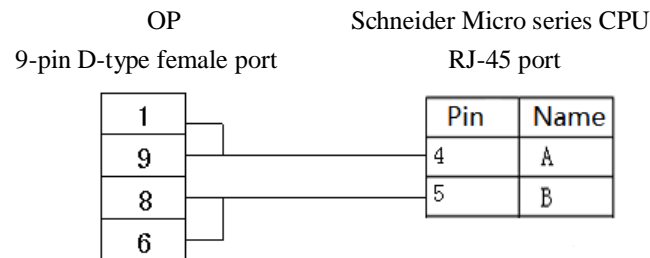
3-11-3. Cable connection

1. CPU RS485:



(Diagram 1— fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

2. M238 CPU:



(Diagram 2— fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

3-12. Fatek FB series PLC

OP can communicate with Fatek FB series PLC through programming port or com port.

3-12-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose |
|--------|----------------------------------|------------------|-------|-----------|------------------------|
| FBs | FBs-20MN FBs-32MN FBs-44MN | CPU | RS232 | Diagram 1 | Fatek MU/MA series PLC |
| | | | RS485 | Diagram 2 | |
| FB -MC | 20MC/28MC 40MC/19MCT | | RS232 | Diagram 1 | |

| | | | | | |
|--------|----------------------|---------------------------|--------------|-----------|--|
| | 26MCT/36MCT | | RS485 | Diagram 2 | |
| FB -MA | 20MA 28MA 40MA | FB-DTBR/ DTBR-E module | RS232 | Diagram 3 | |
| | | | RS232 | Diagram 4 | |
| | | | RS485 | Diagram 5 | |

Note: For MA series CPU, please transform the com port to RS232 or RS485 through FB-DTBR or FB-DTBR-E module.

3-12-2. Communication parameters

OP software settings

| Parameters | Recommend settings | Choices of settings | Notes |
|-------------|------------------------|---|-------------------------------------|
| PLC type | Fatek MU/MA Series PLC | | Choose the correct PLC type in OP20 |
| Port | RS232 | RS232/RS485 | |
| Data bit | 7 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd /no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/115200 /19200/187500 | Accord with PLC port parameters |
| Station no. | 1 | 0~255 | |

The default parameters of Fatek MU/MA series PLC: 9600, 7, 1, even parity, station no.1

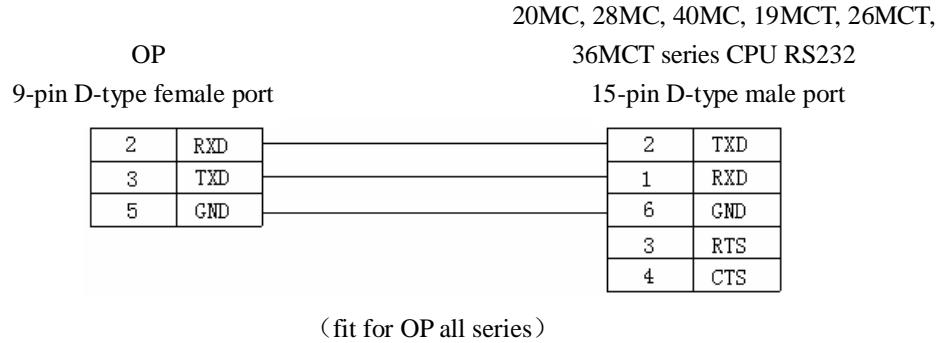
3-12-3. Cable connection

1. CPU RS232:

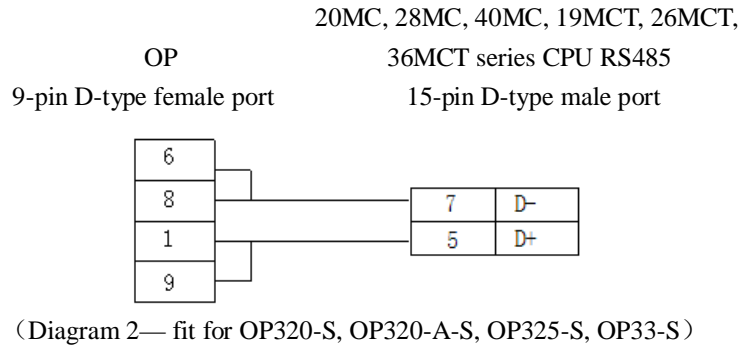


(Diagram 1— fit for OP all series)

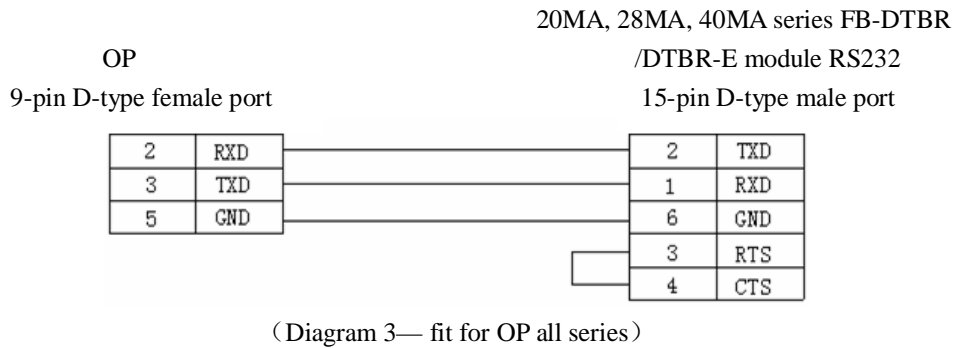
CPU port:



2. CPU RS485:



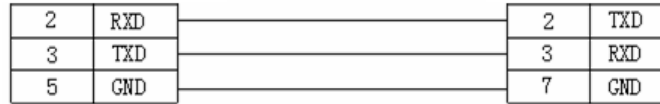
3. FB-DTBR/DTBR-E module RS232:



4. FB-DTBR/DTBR-E RS232:

OP
9-pin D-type female port

20MA, 28MA, 40MA series FB-DTBR
/DTBR-E module RS232
9-pin D-type male port

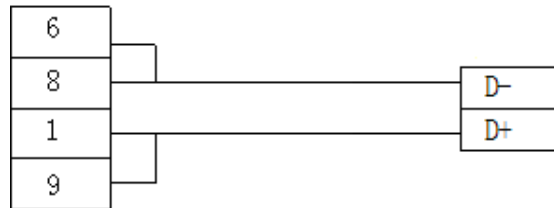


(Diagram 4 — fit for OP all series)

5. FB-DTBR/DTBR-E RS485:

OP
9-pin D-type female port

20MA, 28MA, 40MA series FB-DTBR
/DTBR-E module RS485
3-pin terminal



(Diagram 5 — fit for OP320-S, OP320-A-S, OP325-S, OP33-S)

3-13. Vigor VB series PLC

OP can communicate with Vigor VB series PLC (including VB0, VB1, VB2) through CPU programming port.

3-13-1. Connection unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|--|------------------|--------------|-----------|-------------------------|
| VB | VB0-14M VB0-20M VB0-28M VB0-32M VB1-14MT-D VB1-24MT-D VB1-32MTMT-D | CPU | RS232 | Diagram 1 | Vigor VB series PLC |
| | | Expansion card | RS232 | Diagram 2 | |
| | | | RS422 | Diagram 3 | |

| | | | | |
|----|--------------------|-----|--------------|-----------|
| | VB2-16M VB2-32M | | RS485 | Diagram 4 |
| VH | VH -14MR | CPU | RS232 | Diagram 1 |

3-13-2. Communication parameters

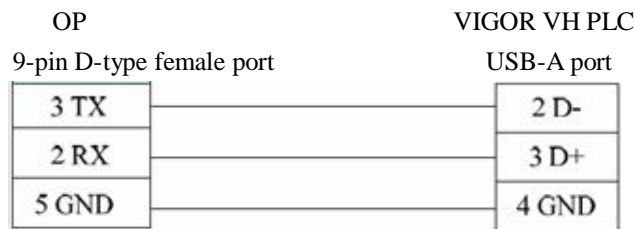
OP software settings

| Parameters | Recommend settings | Choices of settings | Note |
|-------------|---------------------|---|---------------------------------|
| PLC type | Vigor VB series PLC | | Choose correct PLC type in OP20 |
| Port | RS232 | RS232/RS485/RS422 | |
| Data bit | 7 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even /odd / no parity | Accord with PLC port parameters |
| Baud rate | 19200 | 4800/38400/9600/ 115200/19200/187500 | Accord with PLC port parameters |
| Station no. | 0 | 0~255 | |

The default parameters of Vigor VB series PLC: 19200, 7, 1, even parity, station no.0

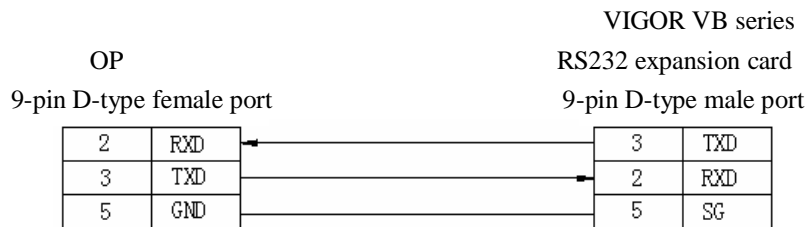
3-13-3. Cable connection

1. CPU RS232-A USB connector:



(Diagram 1— fit for OP all series)

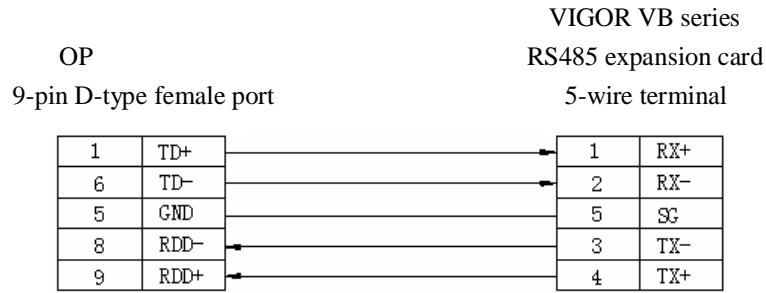
2. CPU RS232 expansion card:



(Diagram 2— fit for OP all series)

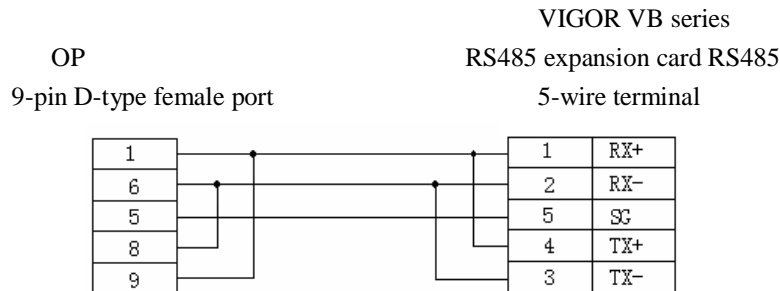
3. CPU RS485 expansion card:

(1) RS422 connection



(Diagram 3— fit for OP320, OP320-A, OP325, OP330)

(2) RS485 connection



(Diagram 4 — fit for OP320-S, OP320-A-S, OP325-S, OP33-S)

3-14. Emerson EC20 series PLC

3-14-1. Connected unit

| Series | CPU | Connected module | Port | Cable | Choose PLC type in OP20 |
|--------|------|------------------|-------|----------|-------------------------|
| EC20 | EC20 | COM0 | RS232 | Diagram1 | Emerson EC20 series PLC |
| | | COM1 | RS485 | Diagram2 | |
| | | | RS232 | Diagram3 | |

3-14-2. Communication parameters

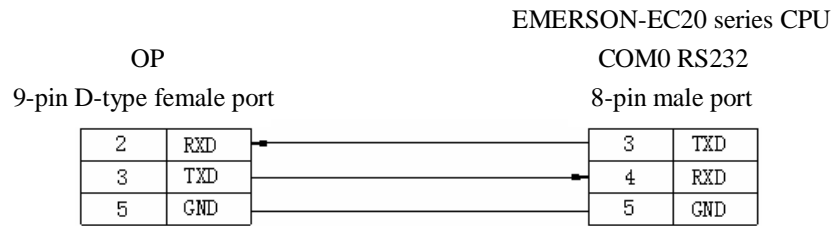
OP software settings

| Parameters | Recommend settings | Choices of settings | Note |
|-------------|-------------------------|---|---------------------------------|
| PLC type | Emerson EC20 series PLC | | Choose correct PLC type in OP20 |
| Port | RS232 | RS232/RS485 | |
| Data bit | 8 | 7/8 | Accord with PLC port parameters |
| Stop bit | 1 | 1/2 | Accord with PLC port parameters |
| Parity | Even parity | Even / odd / no parity | Accord with PLC port parameters |
| Baud rate | 9600 | 4800/38400/9600/ 115200/19200/187500 | Accord with PLC port parameters |
| Station no. | 1 | 0~255 | |

Emerson EC20 series PLC: 9600, 8, 1, even parity, station no.1

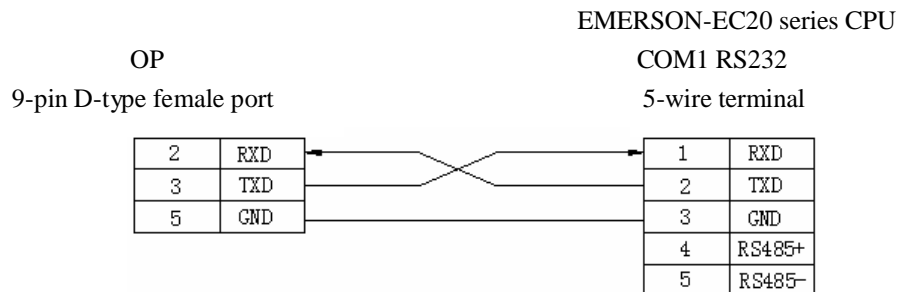
3-14-3. Cable connection

1. Emerson EC20 PLC COM0 (RS232):



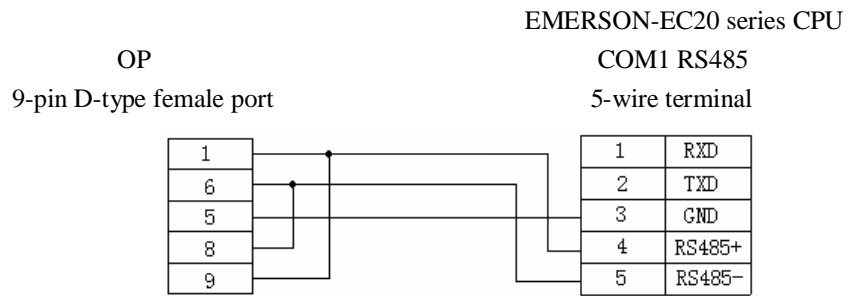
(Diagram 1— fit for OP all series)

2. Emerson EC20 series PLC COM1 (RS232):



(Diagram 2— fit for OP all series)

3. Emerson EC20 series PLC COM1 (RS485) :

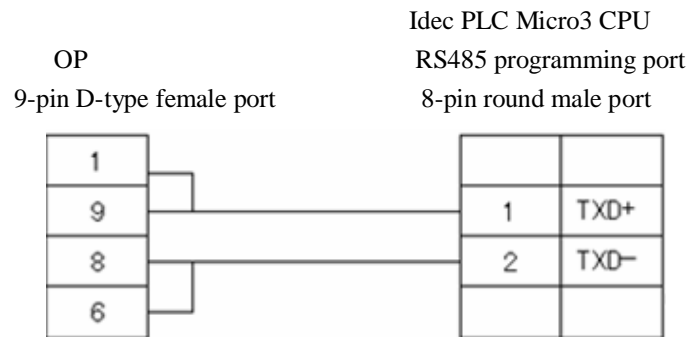


(Diagram 3— fit for OP320-S, OP320-A-S, OP325-S, OP33-S)

Note: Emerson EC20 series PLC COM1 has RS232 and RS485. Only one of them can be used at the same time. Do not connect unused com to avoid interference.

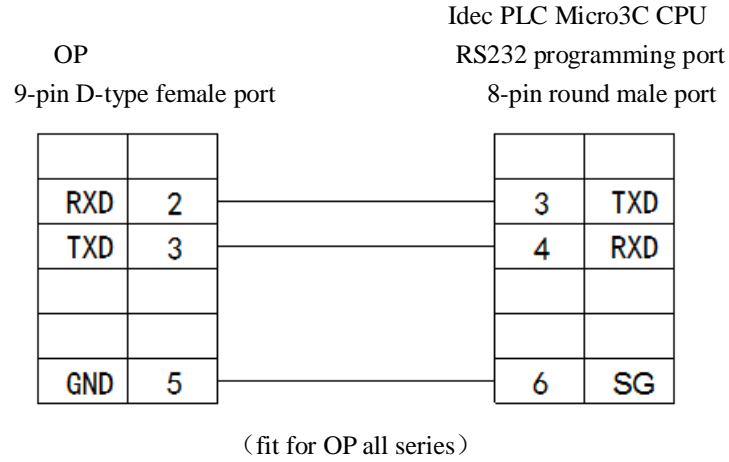
3-15. IDEC Micro Smart series PLC

1. IDEC CPU (Micro3 series) RS485:



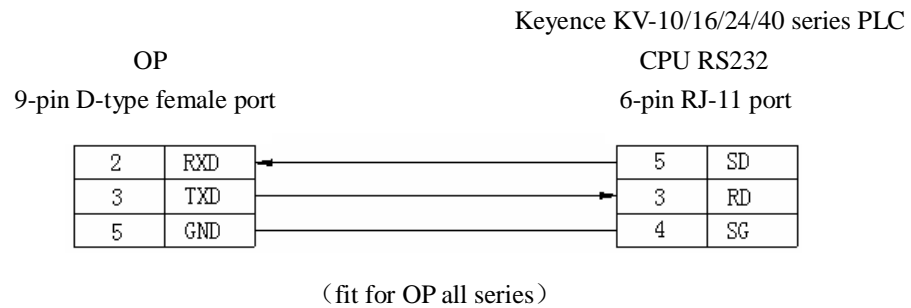
(fit for OP320-A-S, OP320-S, OP330-S, OP325-S)

2. IDEC CPU (Micro3C series) RS232:

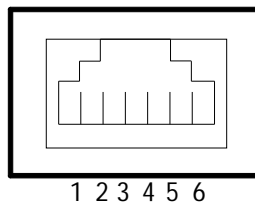


3-16. Keyence KV series PLC

Keyence KV series PLC CPU RS232 port:



PLC RJ-11 port:



3-17. SAIA-Burgess PCD series PLC

SAIA-Burgess PCD series PLC RS232 port:

