



OP Series HARDWARE MANUAL

OP320	RS232/RS422, LCD Display with Backlight STN
OP320-S	RS232/RS422, LCD Display with Backlight STN
OP320-A-S	RS232/RS422/RS485, 16 Button Lamps, 320x240 Resolution, LCD Display with Backlight STN

listo:

OP series USER MANUAL

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Summary of Operator Panels

1-1	Function
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1-2	General specification
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1-3	Product types
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1-4	Name
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1-5	Interface definition and connection diagram
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1-1 Function

The OP series is a mini human machine interface

The OP320 display has the following:

- The communication port is RS232/RS422
- Seven keys can be defined as function keys, and they can substitute some machine keys on the control table
- LCD display with backlight STN. It can display 24 characters × 4 lines, i

The OP320-S display has the following:

- The communication port is RS232/RS422
- LCD display with backlight STN. It can display 24 characters × 4 lines.
- The OP320-A display has the following:
- 20 keys can be defined as function keys (12 of them can be defined as digital keys and for other use), and they can substitute some machine buttons on the control table
- Communication format , RS232/RS422
- LCD display with backlight STN. It can display 24 characters × 4 lines.

The OP320-A-S display has the following:

- The communication format is , RS232/RS422

The OP520 display has the following:

- 42 film buttons: 10 number keys, 32 function keys, in these function keys 16 can be defined with the card.
- There are 16 button lamps on the panel, which can be used to status PLC's status
- The communication format is RS232/RS422/RS485
- LCD display with backlight STN. The resolution is 320×240. It can display 40 characters × 15 lines.



1-2 General specification

1. Electrical specification

Type	Description
Input voltage	DC20V ~ DC28V
Power consumption	Less than 4W(TYP2.0W)
Momentary power-cut	Less than 20ms
Voltage endurance	AC1000V-10MA 1 minute (between signal and earth)
Insulation resistance	DC500V- about 10MΩ (between signal and earth)

2. Environmental conditions

Type	Description
Ambient operating temperature	0 ~ 50°C, with no condensate
Storage temperature	-20 ~ 60°C
Environment temperature	20-85%, with no condensate
Vibration Resistance	10-25Hz (2G per 30min in X, Y, Z direction each)
Interfere immunity	Voltage noise:1000Vp-p, pulse width 1μs,1 min
Ambient atmosphere	With no corrosive air
Protect configuration	Fit the IP65



1-3 Product types

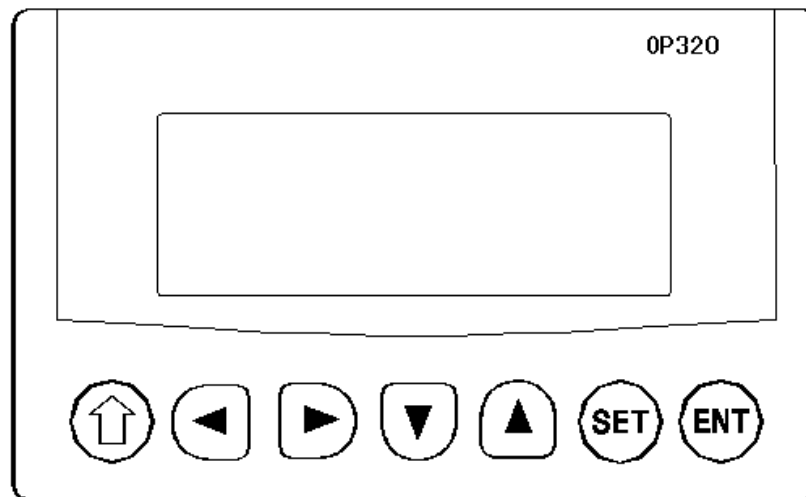
	Description				
OP series	OP320	OP320-S	OP320-A	OP320-A-S	OP520
The number of keys	7		20		42
Size of the screen	3.7"				5.7"
The background lamps	LED				CCFL
The display colour	Monochrome				
Communication port	RS232/ RS422	RS232/ RS485	RS232/ RS422	RS232/ RS485	RS232/RS422/ RS485
Shape and size	163.5W×101.7H×50.4 D		172W×94H×30D		284W×194H×50D








1-4 Name

1-4-1 OP320/OP320-S

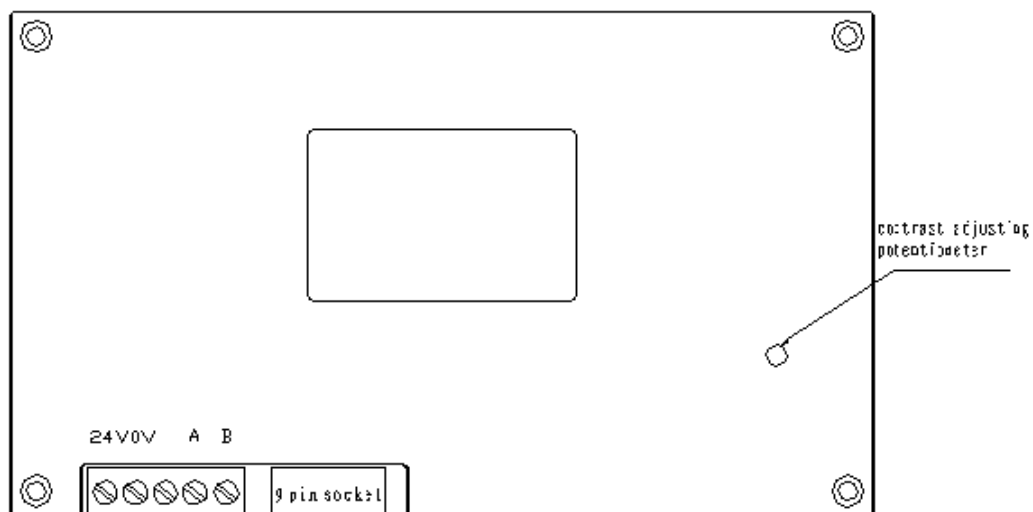
The OP320(OP320-S), has the LCD display window, and 7 user buttons, The seven buttons can be set to be special function keys, screen jump or on-off set and other functions.



Button	Basic function(These keys are not used as function keys)
 []	Normally sets the main menu or the screen which is used most often to be the system's initial screen.
 []	When modifying the register's data, shift the modified data bit to the left.
 []	When modifying the register's data, shift the modified data bit to the right.
 []	Previous page button or if in the status of data setting , the modified data bit plus 1.
 []	Next page button or if in the status of data setting , the modified data bit plus -1.

[SET]	Press this key to start modifying a register's value.
[ENT]	Exit changing a registers value.

At the back of OP320 (OP320-S) there are power terminals, a communication socket and contrast adjusting potentiometer.



OP320 display has backlight auto turn off if there is no operation for three minutes.

1-4-2 OP320-A/OP320-A-S

On the face of OP320-A (OP320-A-S), there is not only LCD display but also 20 buttons for user special function. Refer to OP520 for detail button definition.

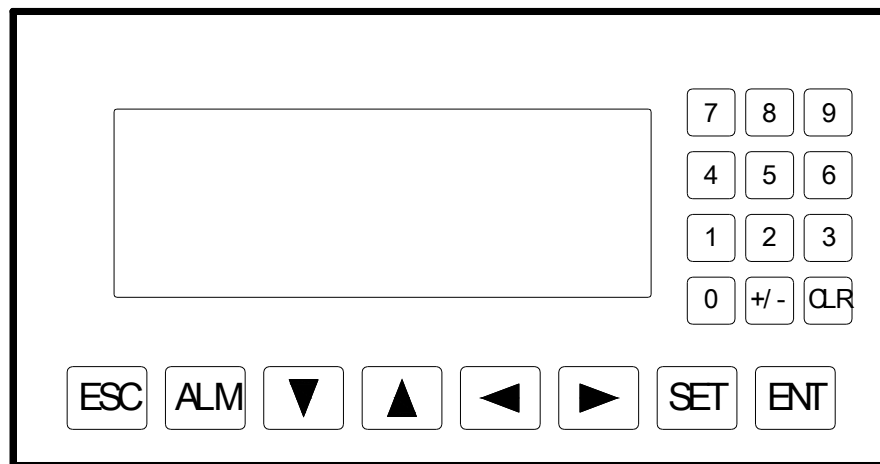











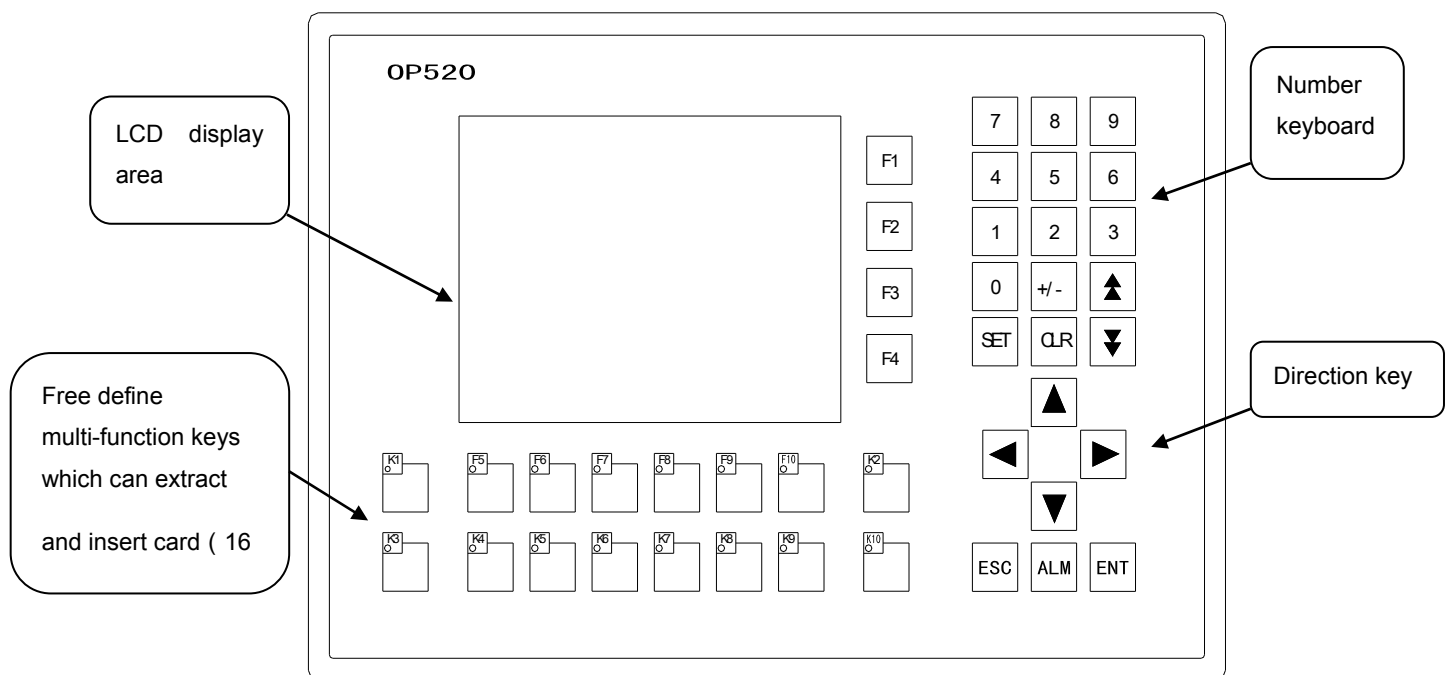


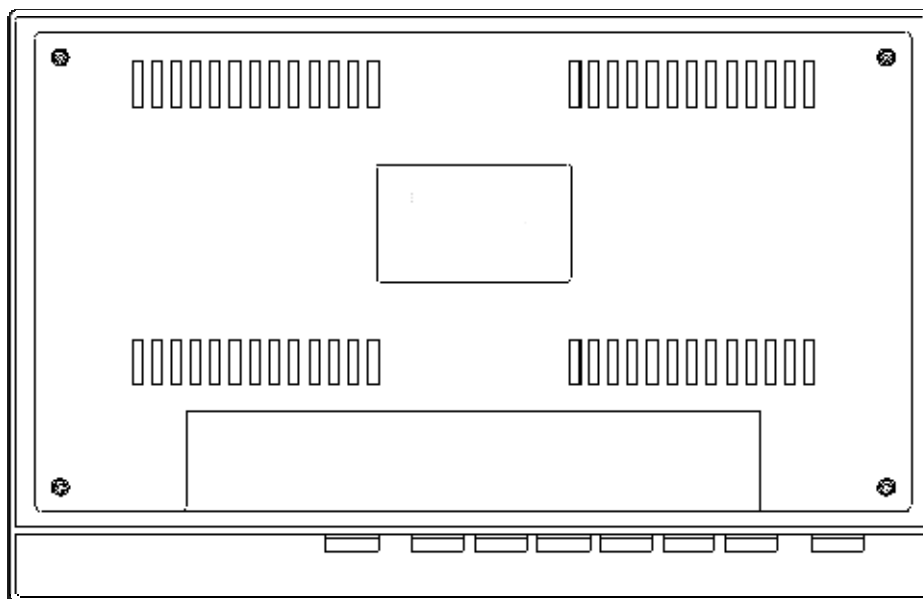
Table of keys' basic function:

Key	Basic function
	Escape to the system's initial screen is appointed by the user when designing the screen It can also be used as a function key.
	It is used as a function key.
	It is used as a function key.
	It is used as a function key.
	It is used as a function key.
	Press this key to start modifying a register's value.
	Write the modified data to the register and then continue to modify the next data .
	Alarm list key (When the key is not set as a function key).
	When modifying the register's data , clear the value area
	When modifying the register's data , it sets the data positive or negative bit.
	Number key (0-9) , in the status of number being set , the modified number bit changes to the correspond key value.

1-4-3 OP520






On the front of OP520, there is not only a LCD display window, but also 42 film buttons.

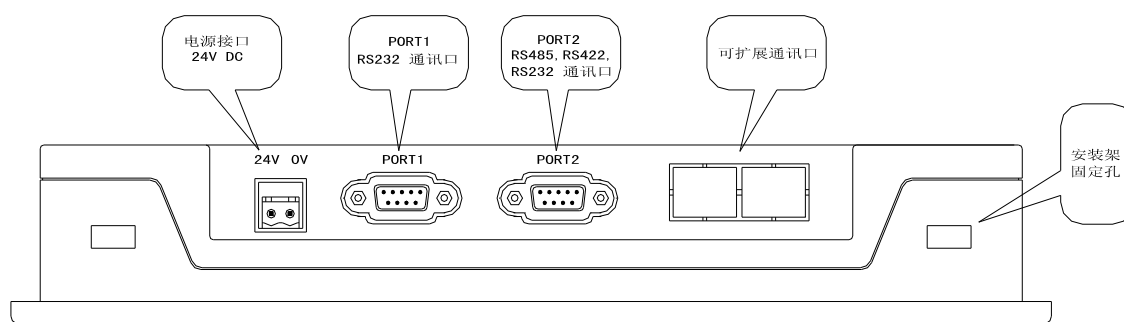




Button's basic function table

Button	Basic function
	Escape to the system's initial screen is appointed by the user when designing the screen It can also be used as a function key.
	When modifying the register's data, shift the modified data bit to the left.
	When modifying the register's data, shift the modified data bit to the right.
	The default value is the current screen's ID minus 1) If setting data , the modified data bit plus 1
	The default value is the current screen's ID plus 1) If setting data , the modified data bit minus 1.
	Press this key to start modifying a register's value.
	Write the modified data to the register and then continue to modify the next data register.
	Alarm list key , after setting alarm list function , press this button to fast switch to the alarm list screen。 (When the key is not set as a function key)
	When modifying the register's data , clear the selected area
	When modifying the register's data , it will set the data positive or negative

	Number key (0-9).
	Go to the previous data set register.
	Go to the next data set register
	Can be used as a global function key or normal function key
	Can be used as a global function key or normal function key



There are three communication formats for PORT2: RS232, RS422, or RS485. Connect the OP520 with any series of PLC with the communication cable, and you can also download using the same communication between the OP520 or the PLC.



1-5 Interface definition and connection diagram

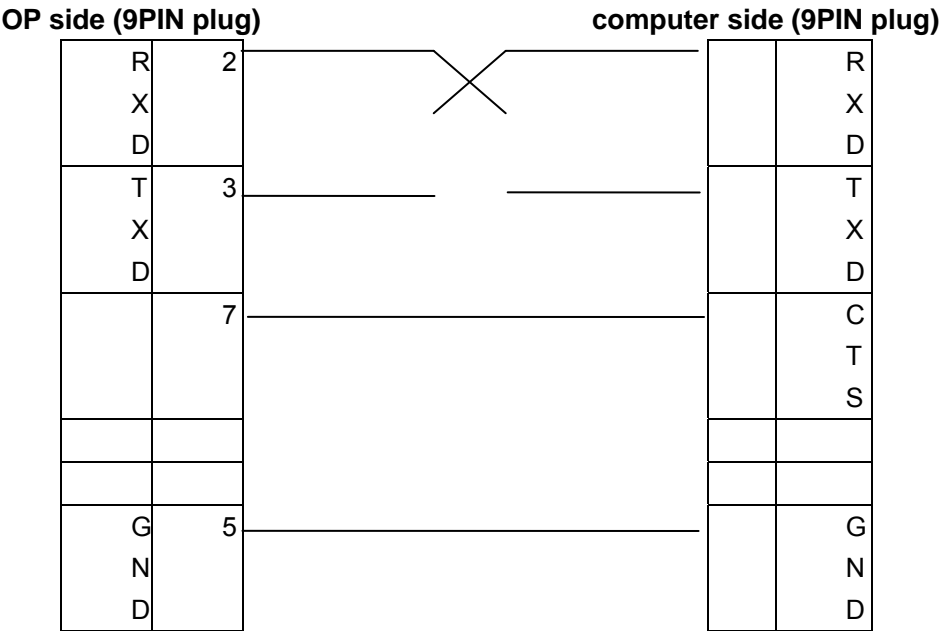
1-5-1 OP320

Serial pin out for the OP320.

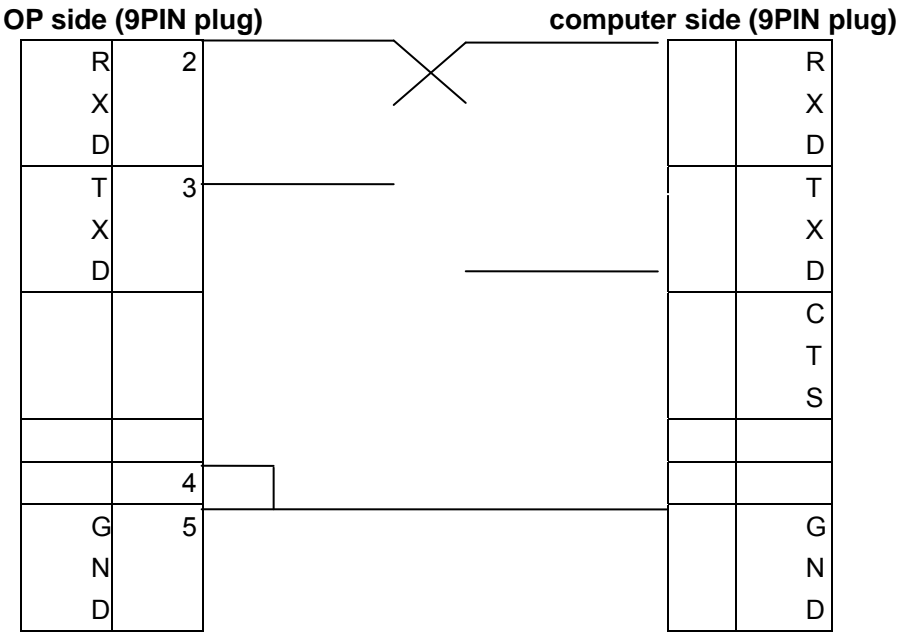
Pin ID	Definition
1	TD+
2	RXD
3	TXD
4	
5	GND
6	TD-
7	
8	RD-

9	RD+
---	-----

OP-SYS-CAB connecting diagram



OP-SYS-CAB connecting diagram (V4.0) :

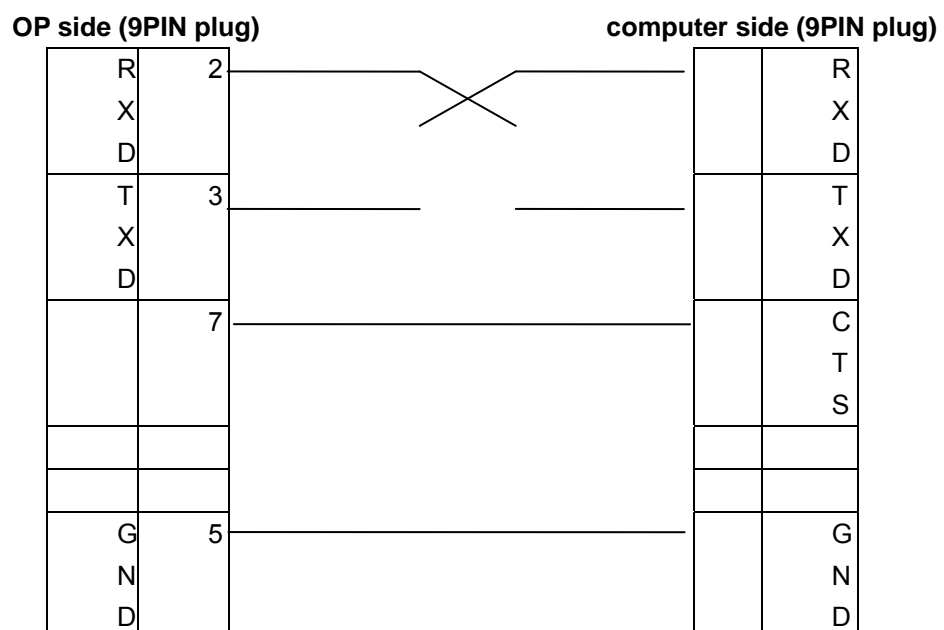


1-5-2 OP320-S

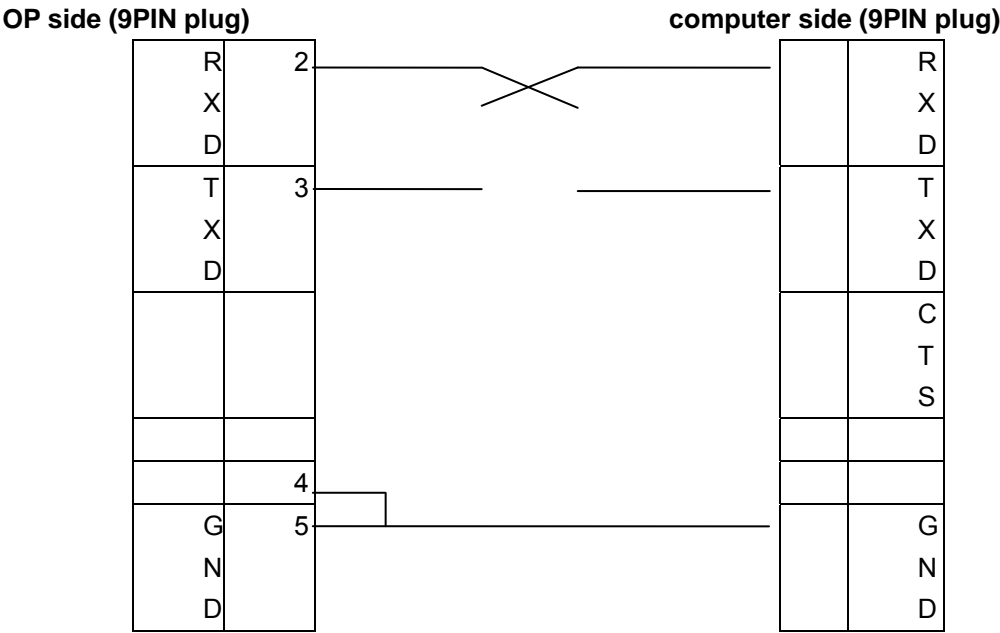
Serial port pin's definition ID number for the OP320-S.

Pin ID	Definition
1	TD+
2	RXD
3	TXD
4	
5	GND
6	TD-
7	
8	B
9	A

OP-SYS-CAB connecting diagram:



OP-SYS-CAB connecting diagram: (V4.0)

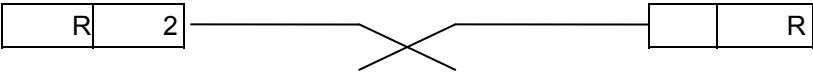


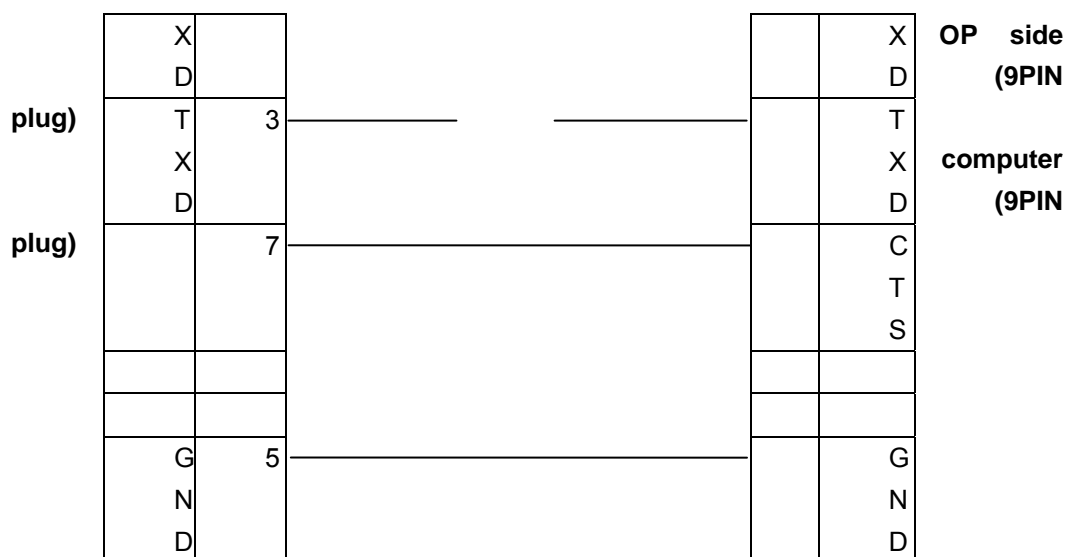
1-5-3 OP320-A

Serial port pin's definition ID number of the OP320-A.

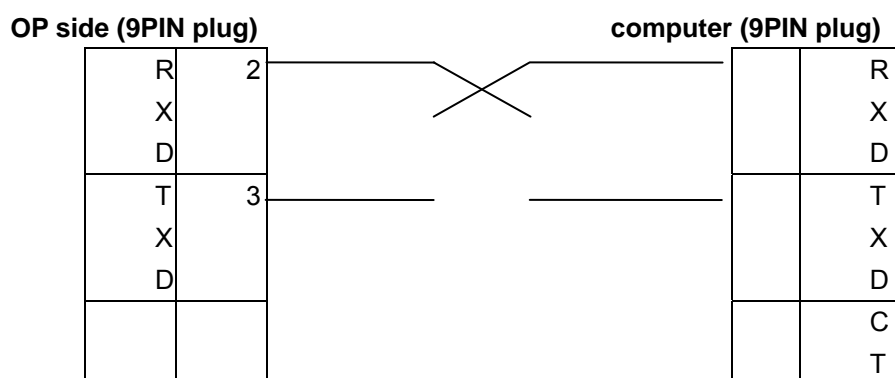
Pin's ID	Definition
1	TD+
2	RXD
3	TXD
4	
5	GND
6	TD-
7	
8	RD-
9	RD+

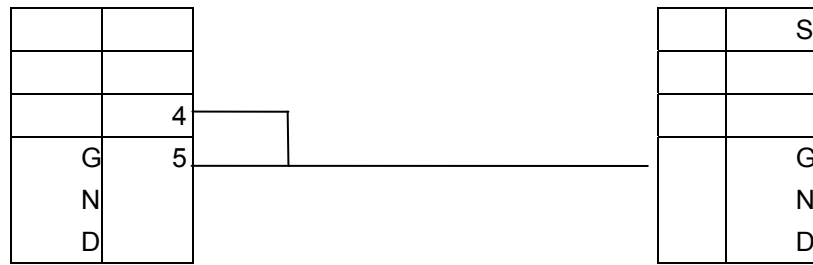
OP-SYS-CAB connecting diagram:





OP-SYS-CAB connecting diagram: (V4.0) :



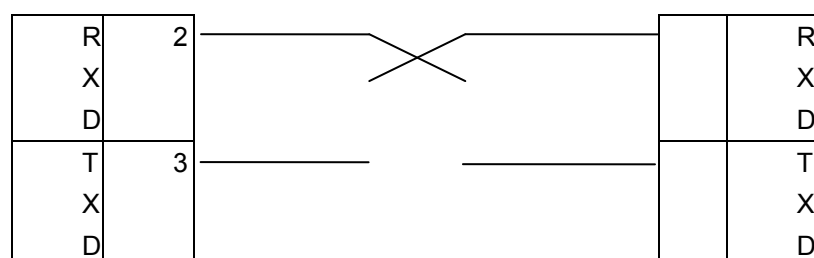


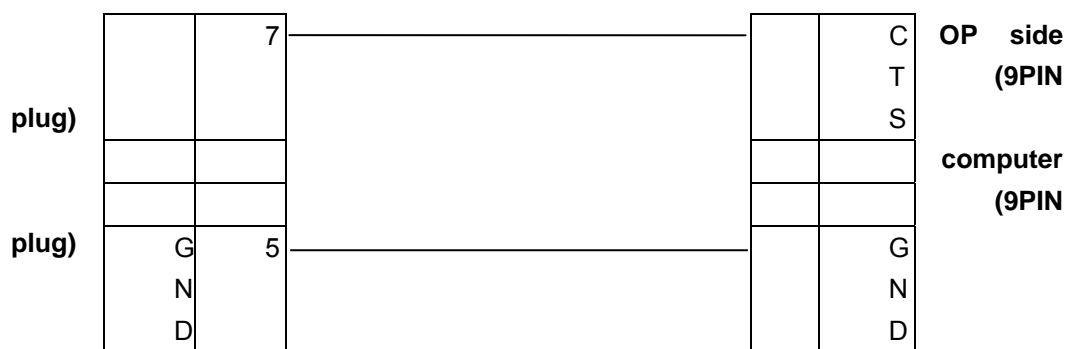
1-5-4 OP320-A-S

Serial pin's definition ID number of OP320-A.

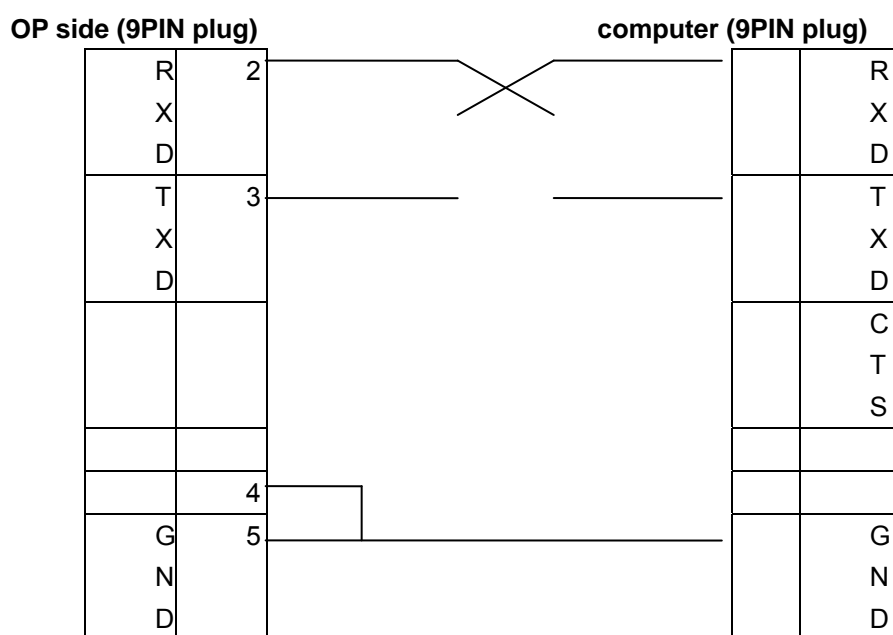
Pin's ID	Definition
1	TD+
2	RXD
3	TXD
4	
5	GND
6	TD-
7	
8	B
9	A

OP-SYS-CAB connecting diagram:





OP-SYS-CAB connecting diagram: (V4.0):



1-5-5 OP520

Serial port pin's definition ID number of the OP520.

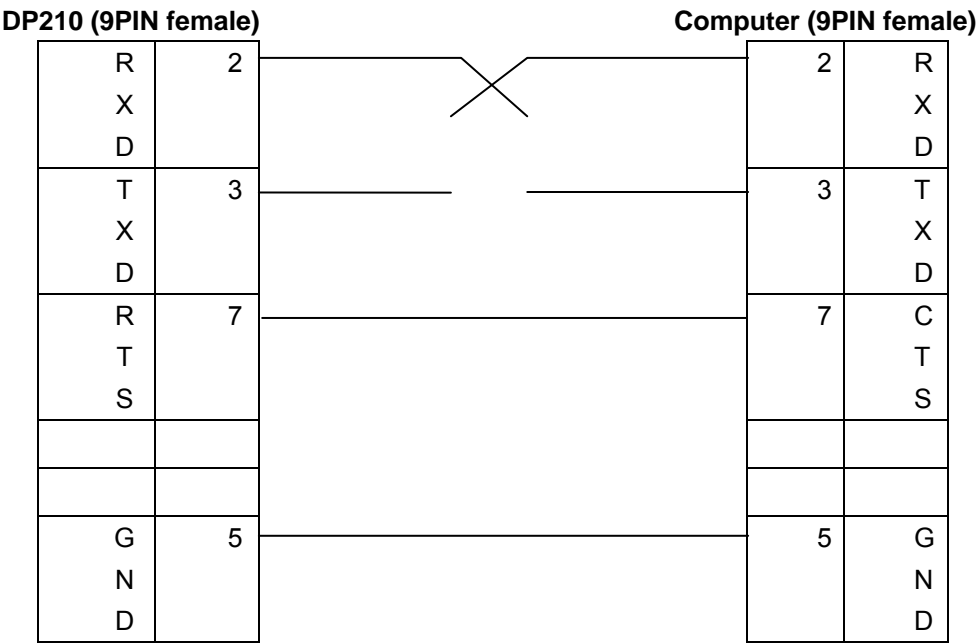
PORT1 (download port):

Pin's ID	Definition
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	RTC
8	NC
9	NC

PORT2 (communication port):

Pin's ID	Definition
1	TD+
2	RXD
3	TXD
4	Empty
5	GND
6	TD-
7	空
8	RD-
9	RD+

OP-SYS-CAB connecting diagram:

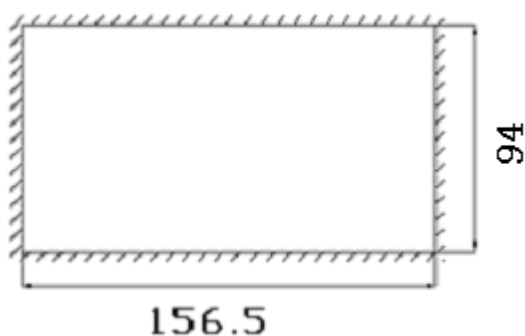




1-6 Installation methods

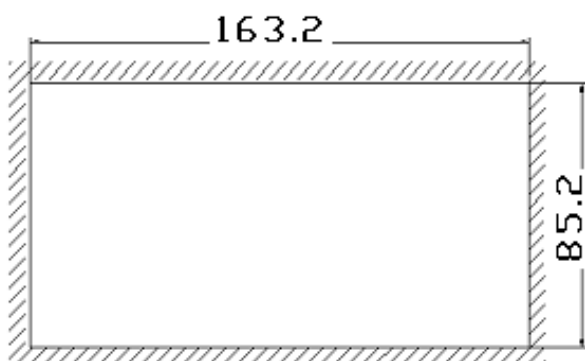
OP320 (OP320-S) The product's actual size is : 155.5×92.7×50.4 (in mm).

The cut-out size is: 156.5×94 (in mm)



OP320 –A (OP320-A-S) The product's actual size is: 162.2×84.2×30 (in mm)

The cut-out size is: 163.2×85.2 (in mm)



OP520 The product's actual size is: 284×194×50 (in mm)

The cut-out size is: 269.2×156.4 (in mm)

2 OP20 software

1-1	Function
1-2	General specification
1-3	Product types
1-4	Name
1-5	Interface definition and connection diagram



2-1 Basic summary of the OP20

OP20 develops software for character display for the OP series application screen. It runs on WINDOWS 98/2000/XP system.

2-1-1 Project screens

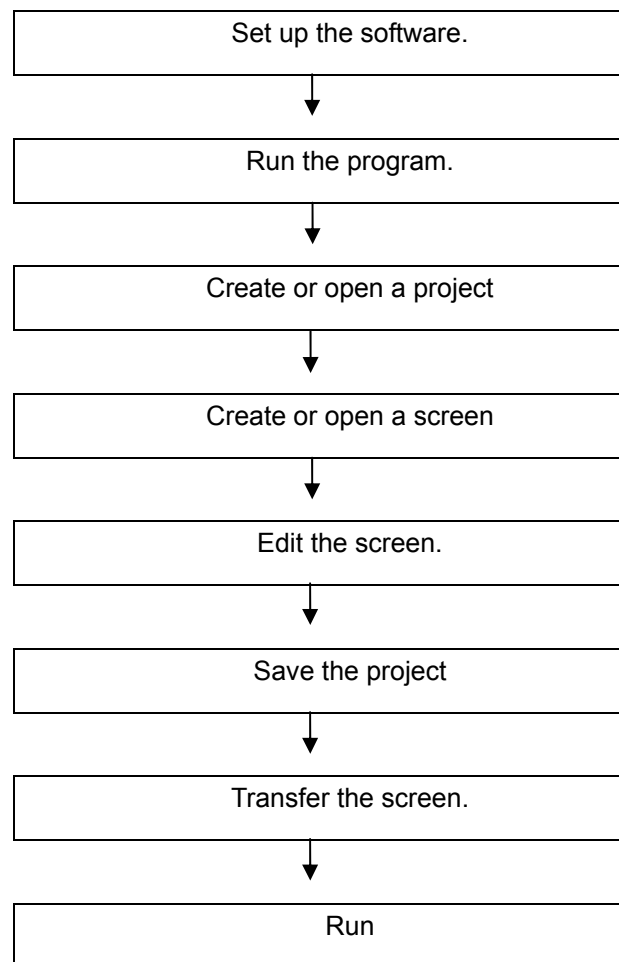
The project's basic element is the screens.

2-1-2 Screen content

You can place Characters, lamps, switches, data display set windows, and next screen keys and other element in each screen. You can also set the alarm list monitoring.

2-1-3 The use flow of OP20

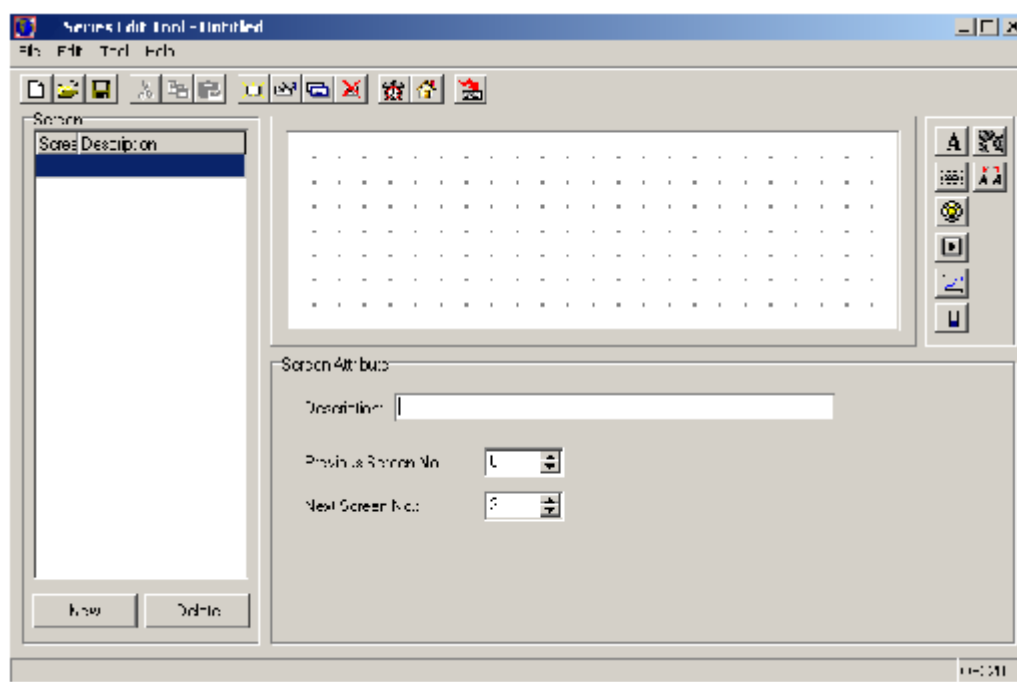
The basic use flow for an OP20 program:


















2-2 Editing the user's screen

After running the OP20 Software, There will be a screen editor in the center of the computer's display.



- Screen
Display all the screen's serial number in the project.
- Description
Description of the screen function
- "New" key
Create a new screen.
- "Delete" key

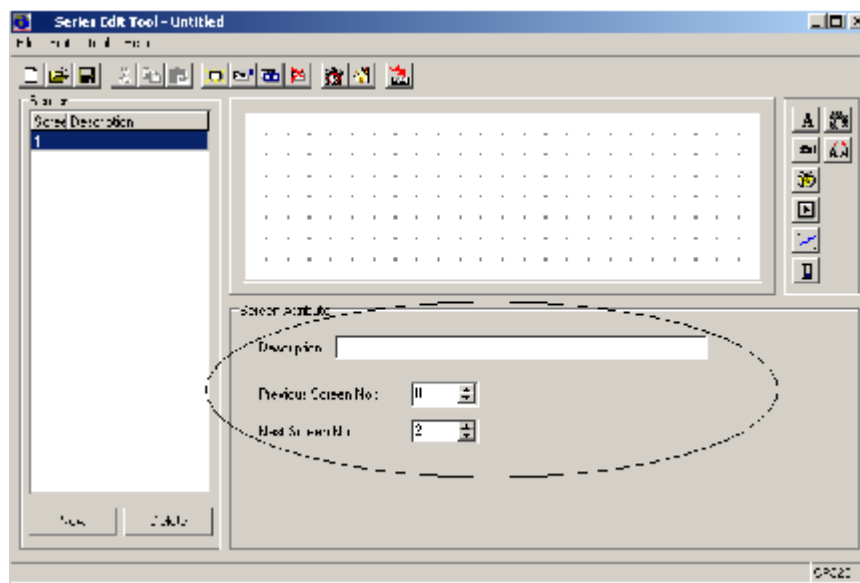
Delete the current screen

Key	Description
	Create a new project.
	Open a saved project.
	Save a project that is editing currently
	Cut the characters in the textbox.
	Copy the characters in the textbox.
	Paste the characters in the textbox.
	Create a new screen,
	Display the normalty content of the current screen.
	Copy a screen to be another one
	Delete the current screen.
	Point to the system's initial screen, when the display is working, click the [] button to return back to this screen.
	Log in the alarm list information, each piece of alarm information corresponds with an internal relay.
	Via RS232 port of the computer, download the completed project file to OP320 display.

Select the PLC's type so when the OP20 is downloaded the screen, will transfer the appoint PLC's communication protocol along with the screen data to the display.


2-2-2 Make a basic screen

The following we will take Mitsubishi FX series PLC as the example to describe:



First, enter the edit status of the system's initial screen (If default it will be the No.1 screen). In the bottom of the screen is the current screen's (No.1 screen) normality

2-2-3 The system parameters of OP20

Click  button, or click "tool"→"set OP20" command

- The main control screen

After powering up, the first screen OP320 displays the main menu. Password

All the screens in a project use the same password, when the encrypt normalty of "data set window", "function key" is valid, only when the system's password has been opened.

- Power conservation protection

The default value of the backlight hold time is 3 minutes. When its set it to be 0, the backlight will light stay on.









- Sample analog quantity data


OP320 can connect with a 8-channel analog value sample module or an 8-channel temperature sample module via the RS485 communication port.

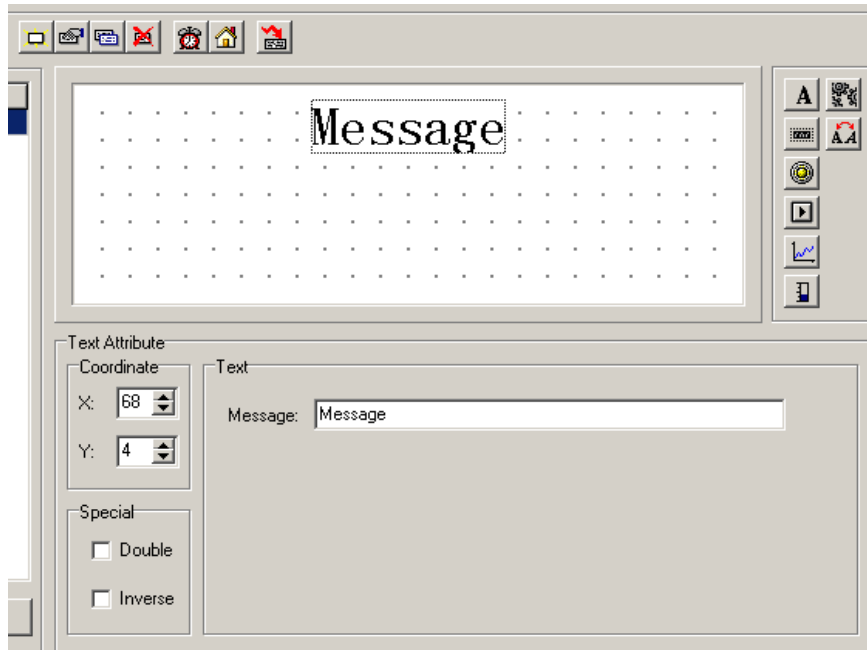
The register's head address which the analog quantity is auto stored is assigned by this parameter.

2-2-4 Text

Before editing the screen, describe the 8 elements' function in the right of the screen edit window.

Parts	Function
	Input texts.
	Data monitor window or data set window (The address is a PLC data register)
	Indication lamp, displays the on-off status of internal relay.
	Function key, all the seven keys in the bottom of OP320 can be defined as function keys.
	Create a real time trend .
	Bar is used to display analog quantities parameter intuitively, such as flux, pressure, liquid level, etc. Its height, width and direction can be appointed randomly.
	Insert a bitmap file, it can display the machine's diagram, make the operator easy to understand. It can also display the mark and badge of the factory, improve the product image.
	Dynamic text, display the current status of the machine with dynamic text. Make the operator easy to operate, improve the produce efficiency. Dynamic text is your ideal choice.

Click the  button, there will be a rectangle dashed frame in the screen



➤ Coordinate

The X value status this text's horizontal position

The Y value status this text's vertical position

The coordinate origin point is in the left top of the screen.

➤ Special

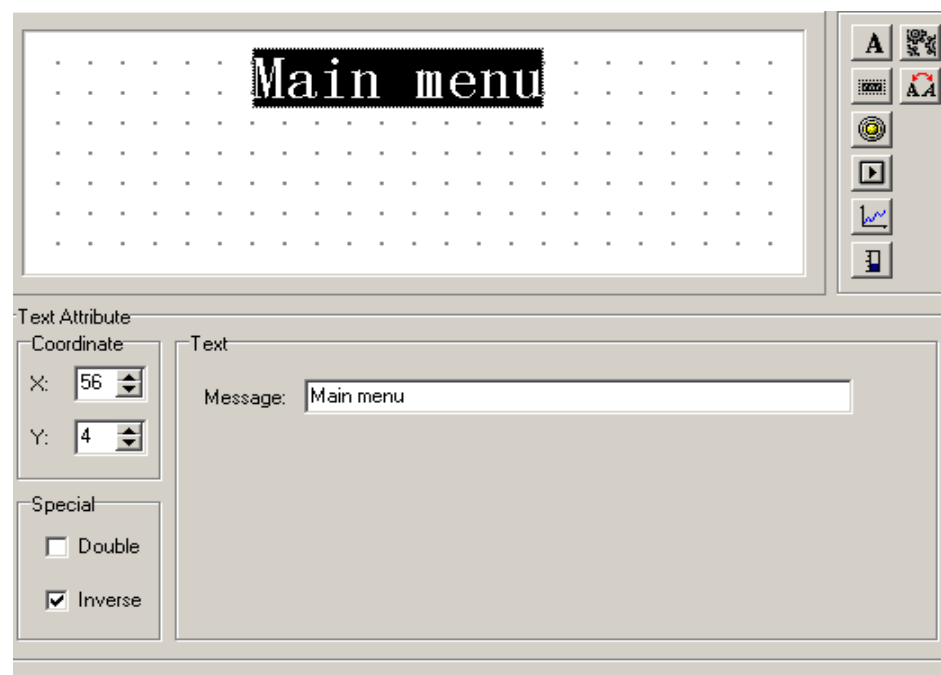
Double: Display the characters multiply in horizontal and vertical.

Inverse: The color of the message and the background displays inversely.


➤ Message

. The content of this column can be cut, copied or pasted.

E.g. Display the text “main menu” in inverse. Input “main menu” in the set column, and select the “inverse” in the “special” frame.



2-2-5 Function key (screen jump)

Click  button, there will be a dashed rectangle frame that moves with the mouse. Click the left button of the mouse to confirm the position of the function key. Then there will be a hand diagram and the function key to be set in the window.

➤ Key

In the pull down menu of “key”, select the appropriate key from seven keys.

➤ Hand

In order that the operator can operate it correctly and quickly, add a hand diagram in front of the button.

Encrypt

This function key is only valid when the system’s password has been opened.

➤ Set coil

The function key's action will switch the value setting.

➤ Screen jump

This function key's action will set the screen jump.

➤ Coil No.:

Address of the PLCs coil.

➤ Force ON

Set the appointed internal relay to be ON.

➤ Force OFF

Set the appointed internal relay to be OFF.

➤ Reverse

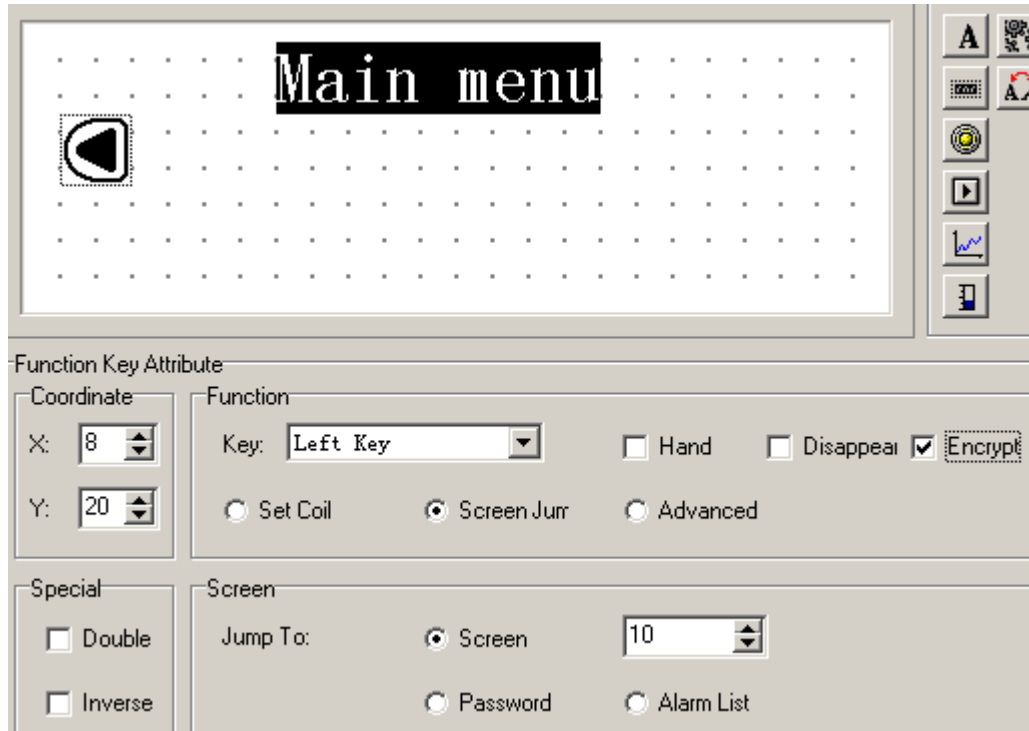
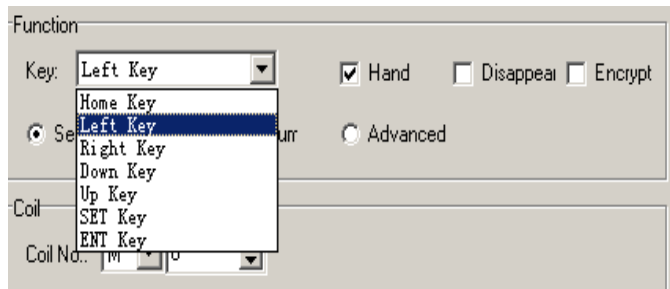
Set the appointed internal relay to be the reverse logic.

➤ Momentary ON

When the key been pressed down, set the appointed internal relay to be ON; when the key pops up, set the appointed internal relay to be OFF.

The screenshot shows a software interface for configuring a function key. The main window displays a 'Main menu' screen with a dotted grid and a key icon. Below the main window is the 'Function Key Attribute' dialog box. The dialog has several sections: 'Coordinate' with X and Y spinners (X: 8, Y: 20); 'Function' with a 'Key' dropdown menu (set to 'Left Key'), checkboxes for 'Hand', 'Disappear', and 'Encrypt', and radio buttons for 'Set Coil', 'Screen Jurr', and 'Advanced'; 'Special' with checkboxes for 'Double' and 'Inverse'; and 'Coil' with a 'Coil No.' field (M 0) and radio buttons for 'Force ON', 'Force OFF', 'Reverse', and 'Momentary ON'.

Select a key in the pull-down menu of “key”, there are seven keys



After setting the function key, place text “set parameter” to the right of the button diagram to prompt the operator. Click “<” key to enter parameter.

You can set the NO.20 screen to be the state set screen.

Main menu

◀ Set parameter

Function Key Attribute

Coordinate

X: 8

Y: 20

Function

Key: Left Key

☐ Hand ☐ Disappear ☒ Encrypt

☐ Set Coil ☒ Screen Jurr ☐ Advanced

Special

☐ Double

☐ Inverse

Screen

Jump To: ☒ Screen 10

☐ Password ☐ Alarm List

Main menu

◀ Set parameter

▶ Set status

Function Key Attribute

Coordinate

X: 4

Y: 32

Function

Key: Right Key

☐ Hand ☐ Disappear ☐ Encrypt

☐ Set Coil ☒ Screen Jurr ☐ Advanced

Special

☐ Double

☐ Inverse

Screen

Jump To: ☒ Screen 20

☐ Password ☐ Alarm List

In the main menu screen, add an alarm screen jump key. You can jump to the alarm list screen, refer to the alarm information.

Main menu

- ◀ Set parameter
- ▶ Set status
- SET Alarm list

Function Key Attribute

Coordinate
X: 4
Y: 48

Function
Key: SET Key
☐ Hand ☐ Disappear ☐ Encrypt
☐ Set Coil ☒ Screen Jump ☐ Advanced

Special
☐ Double
☐ Inverse

Screen
 Jump To: ☐ Screen 1 ☐ Password ☒ Alarm List

For the alarm information, you can refer to 2-2-14

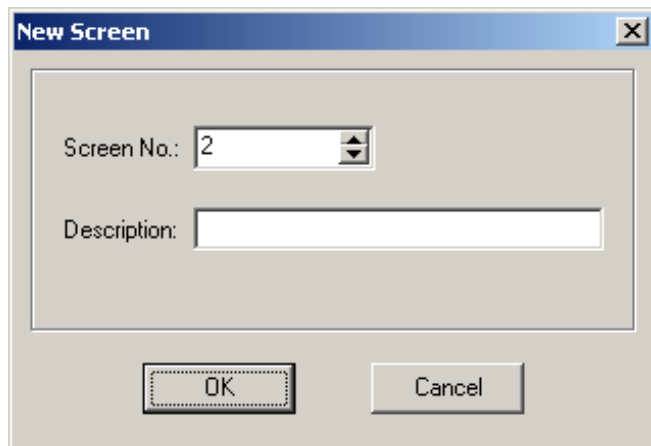
2-2-6 Data display window

Setting methods of parameter display windows, parameter set windows in detail and also how to set the password.

E.g. The NO.10 screen can monitor and set three groups of parameters, with the production of Class A, Class B, Class C. The row in the left is the current value, the row in the right is the target value. The current value can only be used to monitor the data, the target value can not only monitor but also modify the data. The relationship between the three groups of parameters and PLC data register is as follows:

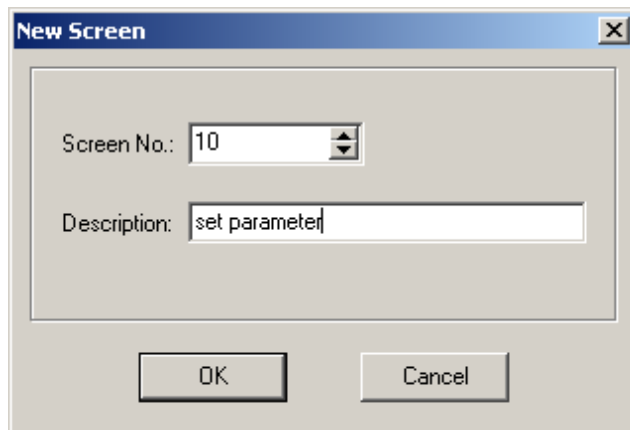
The correspond address of the current value		The correspond address of the target value
The production of Class A	D100	D110
The production of Class B	D101	D111
The production of Class C	D102	

Click the [new] button, there will be a dialog box of the screen's ID No. and screen description setting:

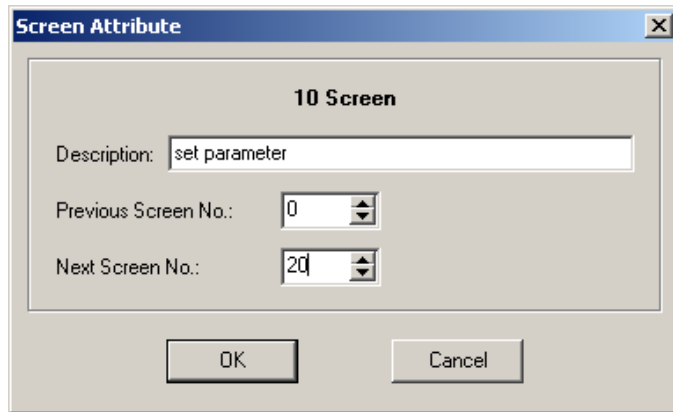


- Screen No.
The new screen's ID number
- Description
Describe the new screen's normalty.

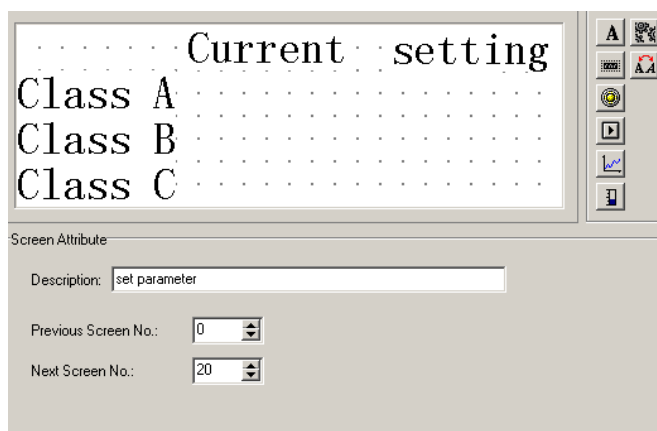
Set the screen No. to be 10, enter the screen description "set parameter".




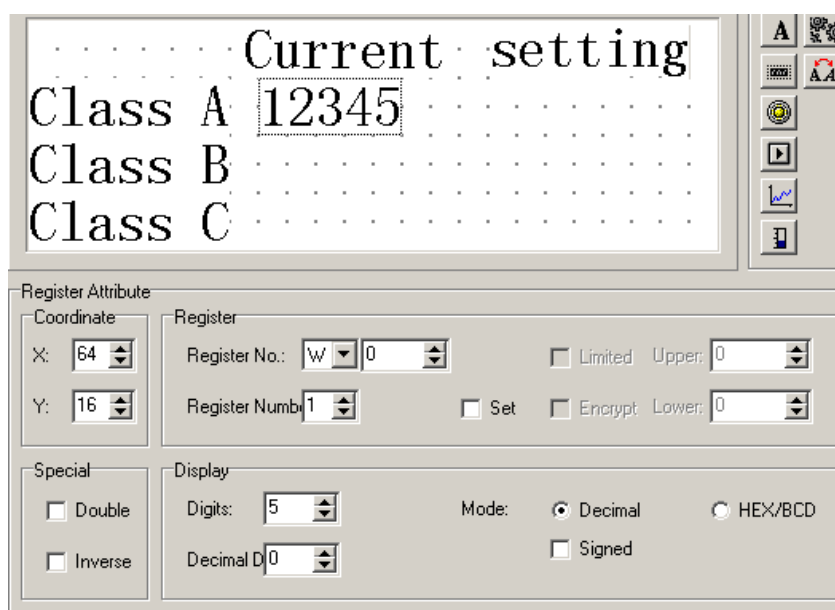
Click [OK] button to confirm. After that, there will be the content of screen attribute in the right bottom of the screen. Set the "Previous Screen No." to be 0, set the "Next screen No." to be 20. Then in the normal display status (not in the status of data setting), click "Λ" key to directly enter the main menu screen, click "v" key to directly enter the state setting screen



At the normal position, place text “the current value”, “the target value” , “the production of Class A”, “the production of Class B”, “the production of Class C”.



Click the  button, there will be a rectangle dashed frame moves with the mouse, move it to normal position, then click on the left button of mouse to confirm it.



Display “12345” these five numbers inside the dashed frame, that means that this element is a register display window or register set window whose length is five bits.

➤ Register No.

PLC register's No.

➤ Register number

Sequential display or set the number of registers, the minimum is 1, the maximum is 2.

➤ Set

This part has the function of setting a value to the register.

➤ Encrypt

Only when the system's password has been opened can you modify the data, the password value is set by the tool menu.

➤ Digits

Display or set the data's max digit.

➤ Decimal

The number of decimal places.

➤ Decimal system

Display the data in the register in decimal format

Signed

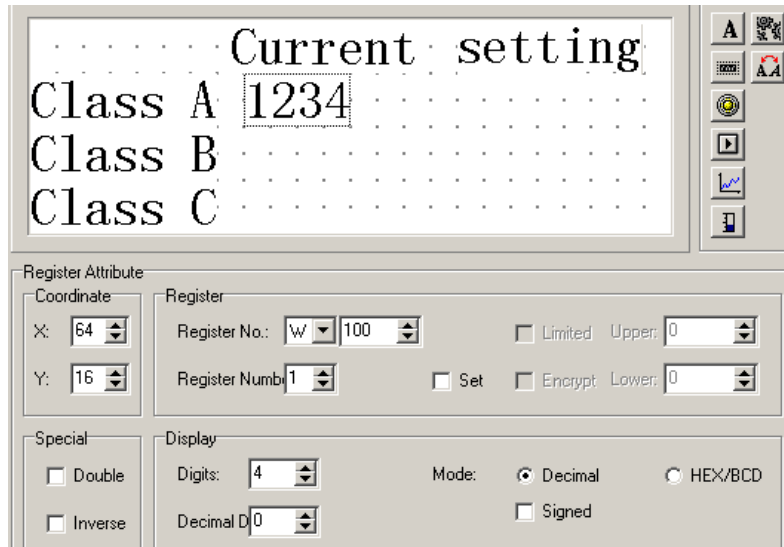
Select this normality only when the display data in decimal format, if the highest bit of the register is 1, then display the data in negative. e.g. FFFE_H equals -2.

➤ HEX/BCD

Display the data in HEX.


In this example, set by the following contents:

Register's address = D100; the number of the register = 1; the digits of data =4; the number of decimal fraction = 0; display in decimal system; dont display negative data.



Set the current values display window of Class B and Class C. The addresses of the registers are D101 and D102 respectively, the other normalities are the same as before.

2-2-7 Data set window

Click  button, there will be a rectangle dashed frame which moves with the mouse in the screen. Click on the left key of mouse to confirm. In the register column, select “set”, the monitor function, the element also has a set function.

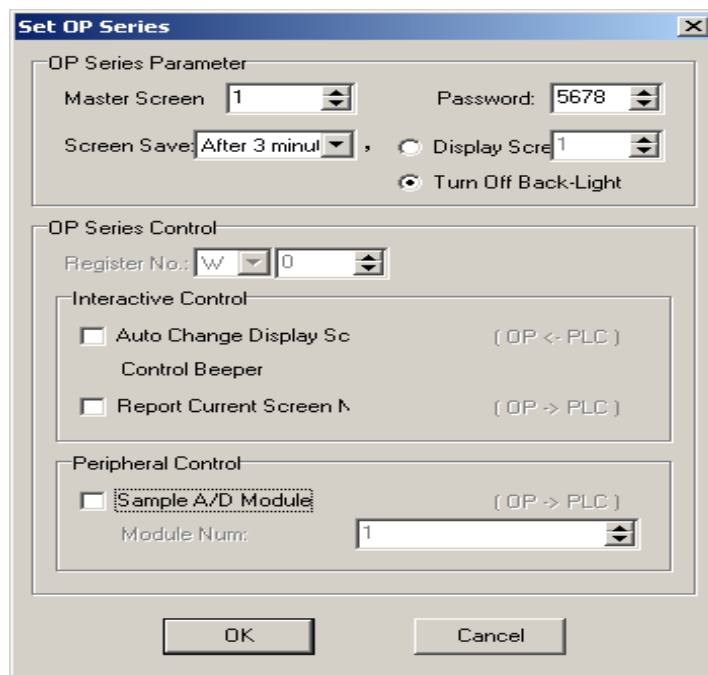
Current		setting	
Class A	1234	12345	
Class B	1234		
Class C	1234		

Register Attribute			
Coordinate		Register	
X: 140	Register No.: W 0	<input type="checkbox"/> Limited	Upper: 0
Y: 16	Register Number 1	<input checked="" type="checkbox"/> Set	<input type="checkbox"/> Encrypt Lower: 0
Special		Display	
<input type="checkbox"/> Double	Digits: 5	Mode: <input checked="" type="radio"/> Decimal	<input type="radio"/> HEX/BCD
<input type="checkbox"/> Inverse	Decimal D 0	<input type="checkbox"/> Signed	

After the frame “Set” been selected, add another two options: “Encrypt” and “upper/lower limitation”.

Encrypt: All parameters can be protected by a password. The methods of setting and modifying the password is as follows:

Pick “tool”→ “set OP20” command, there will be a dialog box: set OP series:



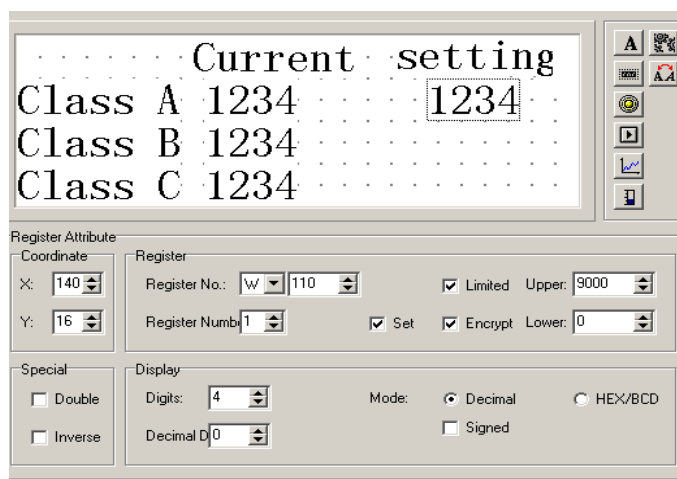
The "Set OP Series" dialog box is divided into three main sections:

- OP Series Parameter:**
 - Master Screen: 1
 - Password: 5678
 - Screen Save: After 3 min
 - Display Screen: 1
 - ☒ Turn Off Back-Light
- OP Series Control:**
 - Register No.: W 0
 - Interactive Control:**
 - ☐ Auto Change Display Screen (OP <- PLC)
 - ☐ Control Beeper
 - ☐ Report Current Screen No. (OP -> PLC)
 - Peripheral Control:**
 - ☐ Sample A/D Module (OP -> PLC)
 - Module Num: 1

Buttons: OK, Cancel

Input the password or modify the original password, e.g. input password “5678”, then press “OK” button, the password is confirmed.

Upper/lower limit: can be set. This will limit an input too large or too small. E.g. set the upper limit to be 9000, the lower limit to be 0. Only when $0 < \text{the set value} < 9000$ can the set value be written into the PLC.



The "Current setting" screen displays the following information:

- Class A 1234
- Class B 1234
- Class C 1234

Below the display is the "Register Attribute" section:

- Coordinate:** X: 140, Y: 16
- Register:**
 - Register No.: W 110
 - Register Num: 1
 - ☒ Limited Upper: 9000
 - ☒ Set ☒ Encrypt Lower: 0
- Special:**
 - ☐ Double
 - ☐ Inverse
- Display:**
 - Digits: 4
 - Mode: ☒ Decimal ☐ HEX/BCD
 - Decimal D: 0
 - ☐ Signed

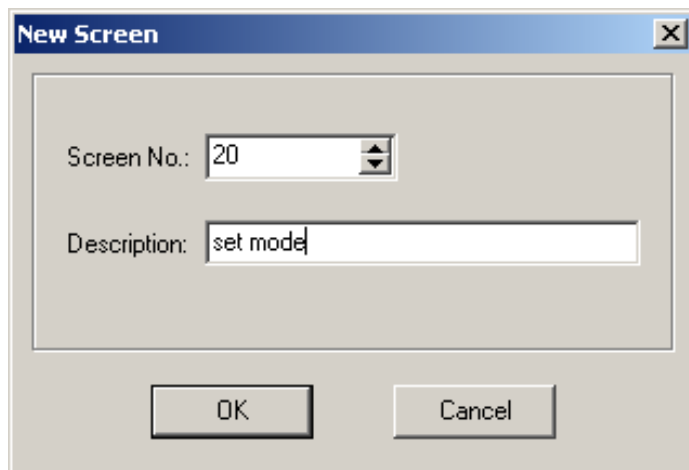
2-2-8 Indication lamps

How to make a mode set screen. At the same time set the indicator lamps and function keys in detail.

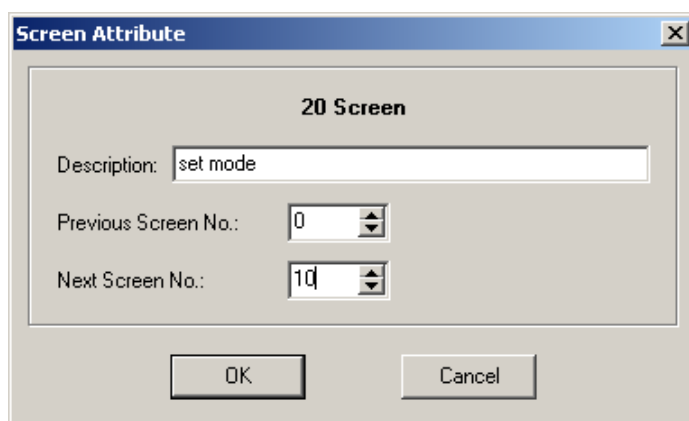
E.g. The function of No.20 screen is to select the machine's work mode. Manual/automatic: In the manual mode, and to control the machine .


The status of the internal relay	The content of action
M10 = 1	Automatic mode
M10 = 0	Manual mode
M20 = 1	Motor run forward
M21 = 1	Motor run back
M20 = 0 , M21 = 0	Motor stop

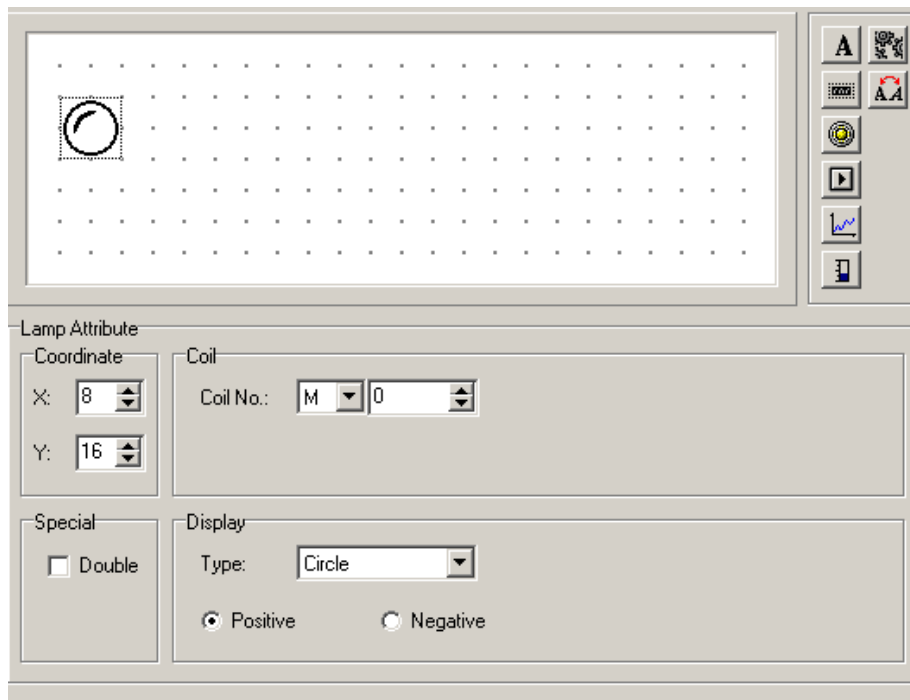
Click the [new] button, and pop up a dialog box of “New Screen”. Set the screen's No. to be 20, and type “set mode” in the description.



Click [OK] button to confirm. Then there will be the screen's normality display.



Click  button to place the status lamp, there will be a rectangle dashed frame that moves with the mouse. Click the left key of the mouse to confirm.



➤ Coil No.

The define ID No. of the internal relay of the PLC.

➤ Type

The shape of the status lamp, either square or circle.

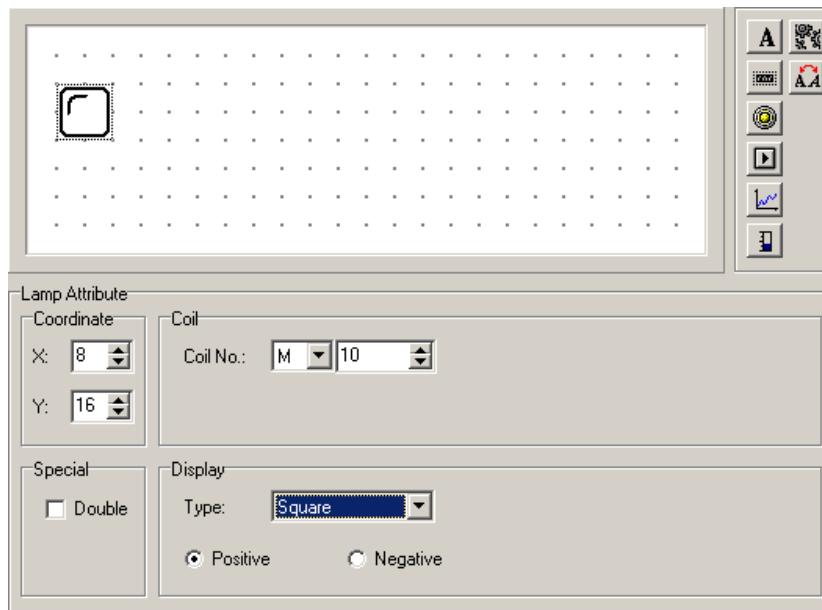
➤ Positive


When the relay is ON, the status lamp display in solid.

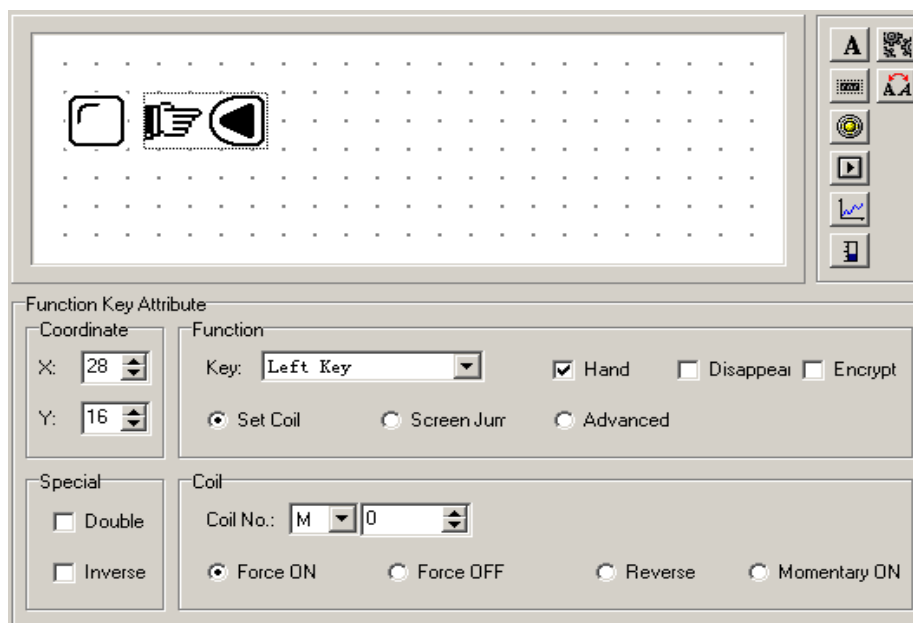
➤ Negative

When the internal relay is ON, the indicator lamp display in vacant.

Set the coil's No. to be M10, select the square lamp; positive logic. Then in the window there will be a vacant square status lamp.



Click the  button to lay the function key, there will be a rectangle dashed frame which moves with the mouse, then move it to the normal position and click on the left key of mouse to confirm it.



In the function column, select the “SET” button to be the auto mode setting button. Set the coil’s definition No. to be M10, and set the action mode to be ON..

Function Key Attribute

Coordinate X: 28 Y: 16	Function Key: SET Key <input type="checkbox"/> Hand <input type="checkbox"/> Disappear <input type="checkbox"/> Encrypt <input checked="" type="radio"/> Set Coil <input type="radio"/> Screen Jurr <input type="radio"/> Advanced
Special <input type="checkbox"/> Double <input type="checkbox"/> Inverse	Coil Coil No.: M 10 <input checked="" type="radio"/> Force ON <input type="radio"/> Force OFF <input type="radio"/> Reverse <input type="radio"/> Momentary ON

Place text “automatic” to the right of the button., it means that this button’s function is select automatic mode.

OP Series Edit Tool - F:\Untitled.dp2

File Edit Tool Help

Screen

Screen	Description
1	
10	set parameter
20	set mode

New Delete

Text Attribute

Coordinate X: 40 Y: 16	Text Message: auto-
Special <input type="checkbox"/> Double <input type="checkbox"/> Inverse	

OP320

Set the manual button and the manual status lamp with the same method. The address of the lamp is still M10. Select the display normalty negative logic. The button is “ENT” button, the button’s function is to set M10 relay OFF.

Function Key Attribute

Coordinate
X: 24
Y: 48

Function
Key: ENT Key ☐ Hand ☐ Disappear ☐ Encrypt
☒ Set Coil ☐ Screen Jurr ☐ Advanced

Coil
Coil No.: M 10
☐ Force ON ☒ Force OFF ☐ Reverse ☐ Momentary ON

Special
☐ Double
☐ Inverse

Set two circle lamps, positive logic. Each one's address is M20 and M21, to monitor the motor's working states. When the lamp in the left lights, it means the motor is running forward, when the lamp in the right lights, it means the motor is running back.

Lamp Attribute


Coordinate
X: 156
Y: 0

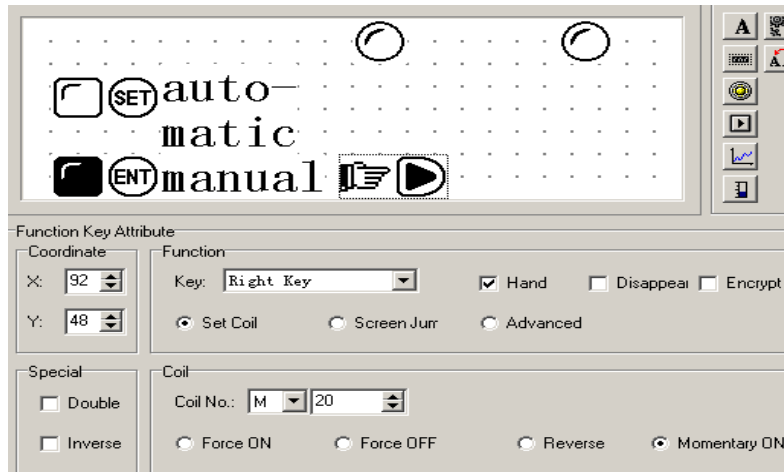
Coil
Coil No.: M 21

Display
Type: Circle
☒ Positive ☐ Negative

Special
☐ Double


2-2-9 Function key (switch quantity operation)

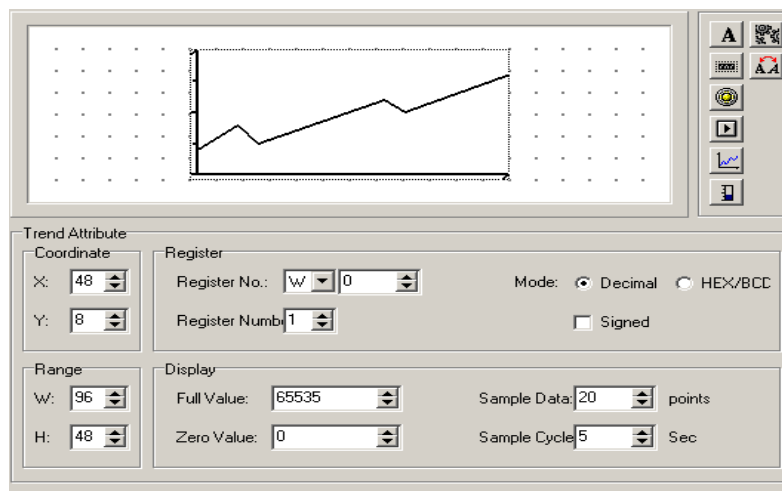
Click  button to place the function key, select ">" button, the correspond address is M20 its function is momentary set M20 relay to be ON, and keep the hand diagram. It status that when you click on the ">" button, M20 of PLC is set to be ON, and the motor begins to run forward. (PLC program, uses M20 to trigger Y0); when you release the ">" button, M21 of PLC goes back to the OFF state, and the motor will stop running.



2-2-10 Single line Trend

In the process industry, the value of some parameters changes slowly. The operator wants to know these parameters' change process in a certain time. The trend diagram is the best way to display these values.


Click the  button, there will be a rectangle dashed frame moving with the mouse. Move to the desired position and click the mouse's left key to confirm.

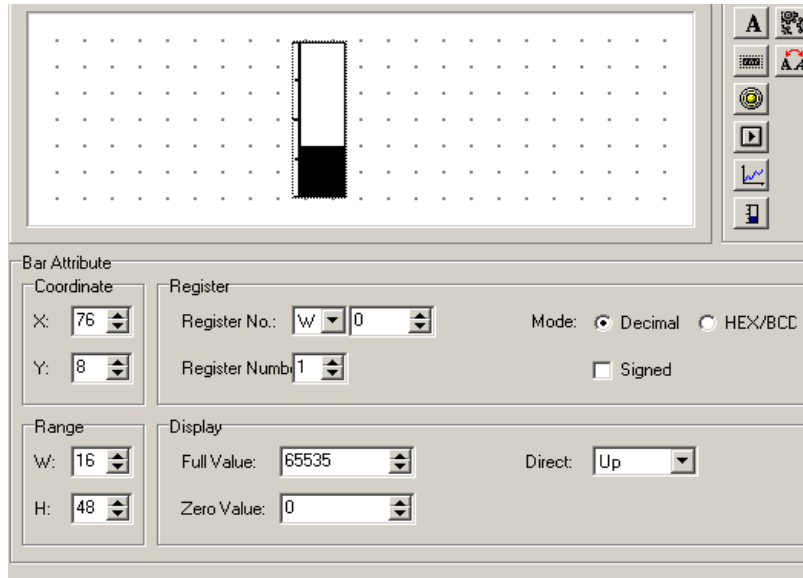


- **Register No.**
The address corresponds with the trend diagram.
- **Full value**
When the trend diagram displays in 100% scale, the value corresponds with the register
- **Zero value**
When the trend diagram displays in 0% scale, the value corresponds with the register
- **Sample data (the number of the dots)**
The number of all the sampled dots from left to right. The larger the number, the more detailed the trend has.
- **Sample cycle**
The interval time of every two sampled dots.
- **Range**
This value sets the length and the width of the trend diagram.

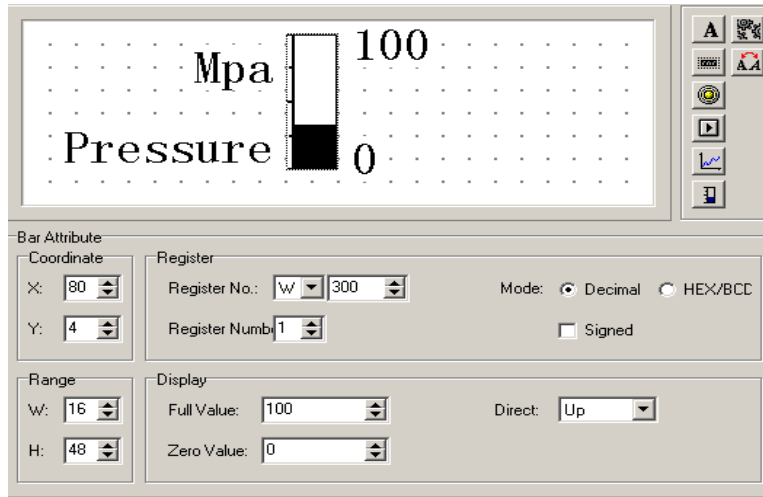
Note: One trend diagram element can only display one line.

2-2-11 Bar graph

Click the  button, there will be a rectangle dashed frame that moves with the mouse. Move to the normal position and click the left key of the mouse to confirm.




- Register No.
The register's address corresponds with the bar graph.
- Full value
When the bar graph displays in 100% scale, the value corresponds with the register.
- Zero value
When the bar graph displays in 0% scale, the value corresponds with the register.
- Direct
The display direction of the bar, it can be up, down or be left, right.
- Range
This value dictates the length and the width of the bar.



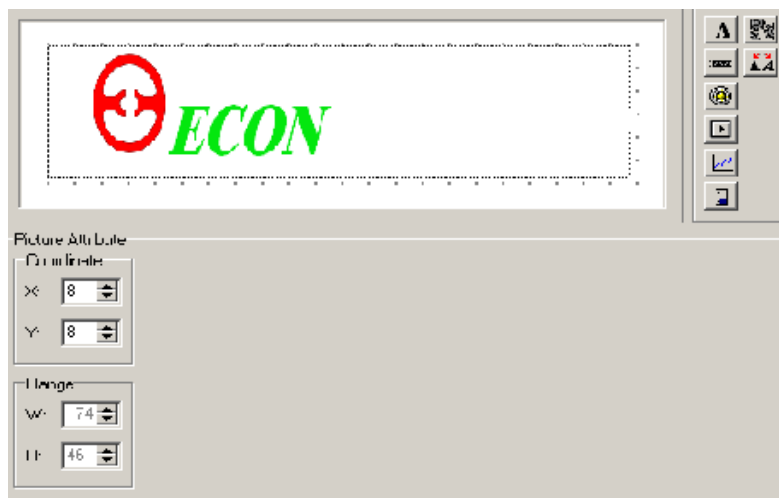
This bar monitors the value in D300. When the bar displays in the full scale, it statuss that the value in D100 is 100; when the bar displays in 50% scale, it statuss that the value in D300 is 50.

2-2-12 Diagram display

Insert a bitmap file, which can display the machine's picture and makes it easy for the operator to understand. Also it can display the factory's logo, badge.

Click the  button, there will be a search dialog box in the screen.


Select the bitmap file which you intend to display, then double-click it or click on the open button, there will be a rectangle dashed frame that moves with the mouse. Move it to the normal position and click the mouse's left key to confirm.

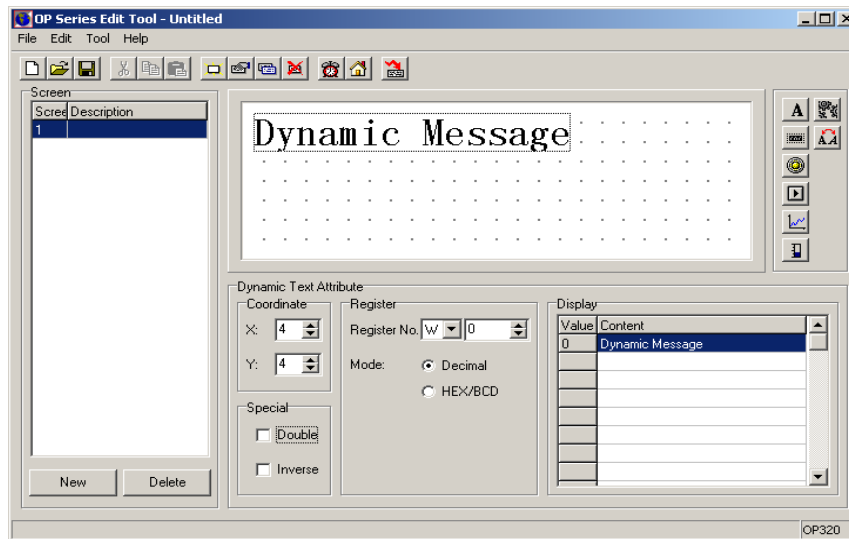


Note: it can display a bitmap with 192×64 pixels at most. The extra part will be removed automatically.

2-2-13 Dynamic messages

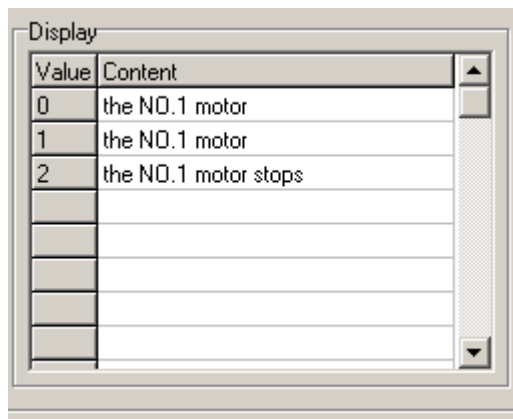
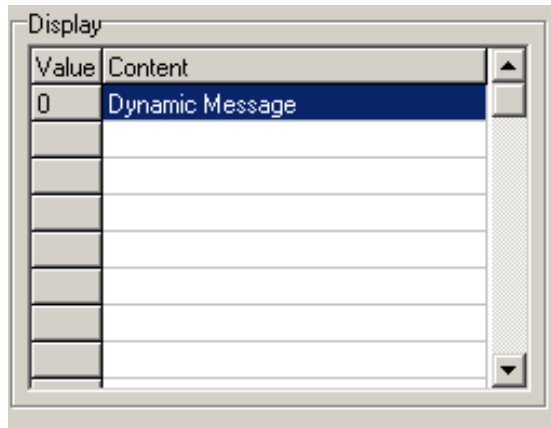
You can display the current machine's status via words which makes the operators job easier, and will improve the monitoring efficiency. The dynamic message is your best choice.

Click the  button, there will be a rectangle dashed frame that moves with the mouse. Move to the normal position and click the mouse's left key to confirm.



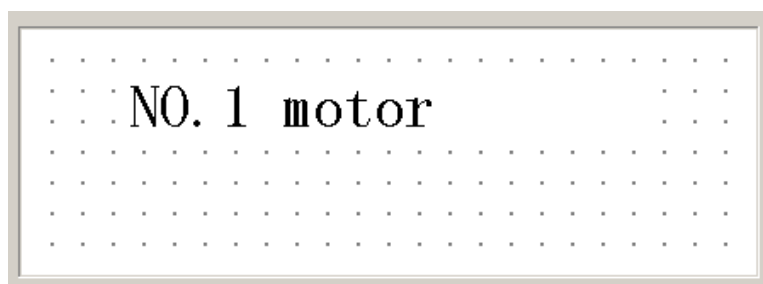
In the screen's edit area, there are some initial words "dynamic message" and the following normalities in the dialog box.

- Register No.
The register's No. of the PLC.
- Decimal
Value format.
- HEX/BCD
Display the data in hex system.
- Display
Text edit area. Write the text that needs to be displayed.
- Value
Data in the PLC register.
- Content
Now, begin to edit the content. First, select the line to be edited, then click the left key of mouse, "Dynamic Message".

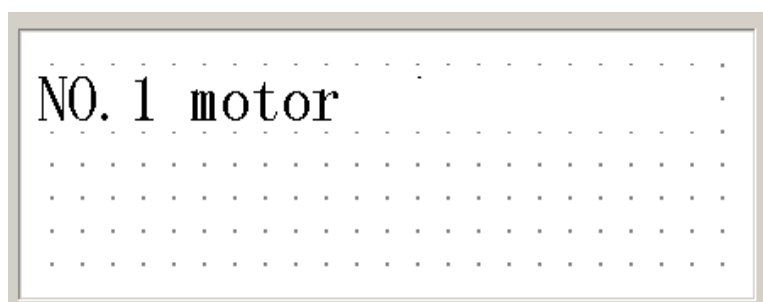


E.g. Input “No.1 motor runs forward” in the first line, input “No.1 motor runs in reverse” in the second line, input “No.1 motor stops” in the third line.

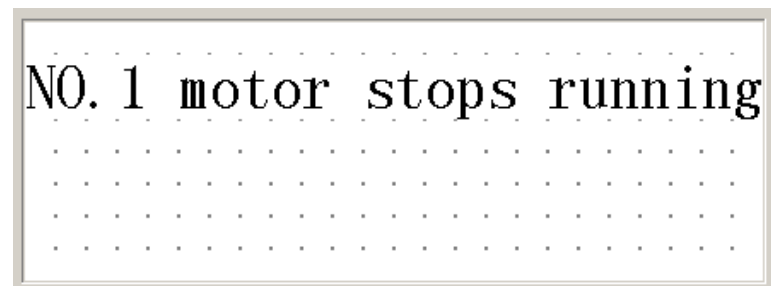
The dynamic message responds to data in D200. If data in D200 hasn’t been set, then the text frame has no display, if data in D200 is 0, then display “No.1 motor clockwise”.



If data in D200 is 1, then display “No.1 motor”.




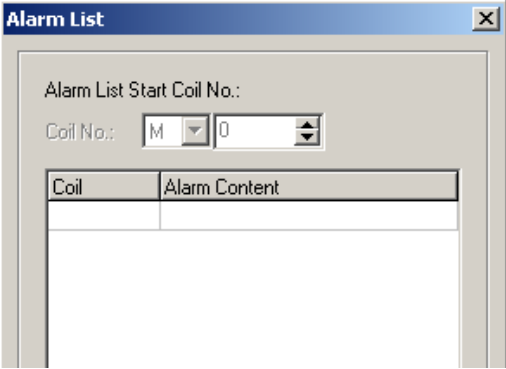
If data in D200 is 2, then display “No.1 motor stops running”.



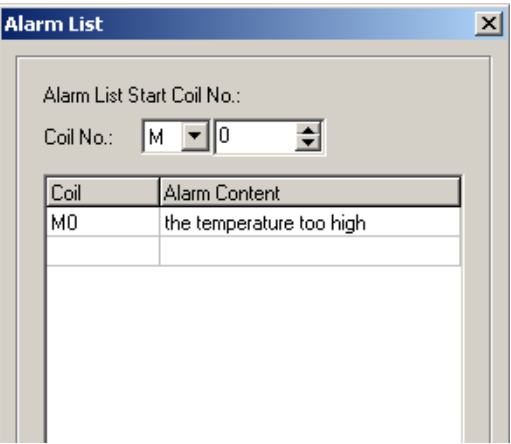
2-2-14 Alarm list

Each project of the OP320 can set a group of alarm list information. A piece of alarm information corresponds with a internal relay. The definition No. is sequential. The internal relay's initial address can be set by the user according to the actual program. When any of the internal relay turns to ON from OFF, that means that when there is an alarm, the OP320 will automatically pop up the alarm display screen, then displays the alarm information in the first line. When another internal relay be ON, display a new alarm information in the second line.

Click the  button, there will pop up an alarm list dialog box:



The 'Alarm List' dialog box is shown. It has a title bar with 'Alarm List' and a close button. Inside, there is a label 'Alarm List Start Coil No.:' followed by a 'Coil No.:' label. The 'Coil No.:' is followed by a dropdown menu showing 'M' and a text box showing '0'. Below this is a table with two columns: 'Coil' and 'Alarm Content'. The table is currently empty.



The 'Alarm List' dialog box is shown again, but now the table has one row of data.

Coil	Alarm Content
M0	the temperature too high

Input other information in the same way.

Alarm List

Alarm List Start Coil No.:

Coil No.: M 0

Coil	Alarm Content
M0	the temperature too high
M1	the temperature too low
M2	the speed exceeds 2000/min
M3	the electricity exceeds 8.5 A
M4	the bobbin speed exceeds 300m/min
M5	the left works
M6	the right works

After all the alarm information has been input, change the coil's No. to be M100 (example), i.e. it status that M100 to M106 individually corresponds with the 7 alarms.

Alarm List

Alarm List Start Coil No.:

Coil No.: M 100

Coil	Alarm Content
M100	the temperature too high
M101	the temperature too low
M102	the speed exceeds 2000/min
M103	the electricity exceeds 8.5 A
M104	the bobbin speed exceeds 300m/min
M105	the left works
M106	the right works

The operator can immediately react to solve the problem. If you want to return back to the monitor screen, just click [↑] button.



2-3 Save a project

After finish the screen editing, you can save the project file, and download the screen project to the OP20.

Press button, in the screen there will be a dialog box for you to save the project.


Select the correct path and file name to save it, and the file's extend name will automatically be defined to be .dp2 .

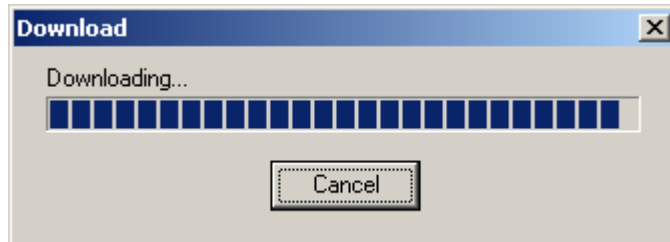
Input the file name, select the right path, then press "save" button to save it.



2-4 Downloading the screen

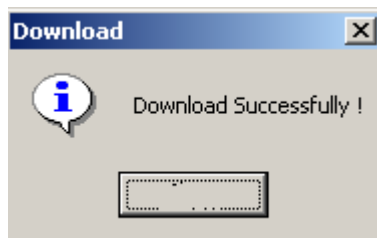
Connect the computer's 9 pin RS232 port and the 9 pin port of OP320 with the

download cable. Make sure that OP320 is powered. Click the  button to begin downloading the data.



Note: In the process of downloading the screen's data, make sure that the OP320 does not lose power

After finishing transferring the screen, there will be a dialog box, that says all the screens have been transferred.



Turn off the display's power. Pull out the screen's transfer cable OP-SYS-CAB0, connect the OP320 and PLC with the PLC communication cable. There will be "communicating" in the right bottom of the display, that means OP320 is communicating with PLC.

3

OP320 Operation methods

3-1 Online communication

3-2 Shift the screen

3-3 System's password

3-4 Modify the data

3-5 Switch value operating



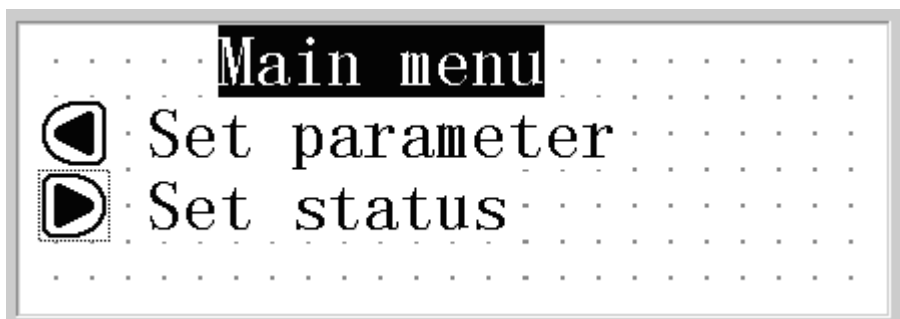
3-1 Online communication

Note: No matter if the PLC is running or programming, the OP320 will operate normally.



3-2 Shift the screen

OP320 will first display the NO.1 screen. (Because the system's initial screen is No.1 screen.)



The No.1 screen is a menu screen.

Current Setting			
Class A	342		0
Class B	5680		0
Class C	6470		0

Now, data in the left column displays the three classes each, corresponding with the PLC's address: D100,D101, and D102.



3-3 System's password

Before modifying the data, you should first open the system's password. Press the password select key, and type the password.

input password

Hand icon pointing to left arrow key

Function Key Attribute

Coordinate

X: 48

Y: 36

Function

Key: Left Key

☒ Hand ☐ Disappear


☐ Set Coil ☒ Screen Jurr ☐ Advanced

Special

☐ Double ☐ Inverse


Screen



Jump To: ☐ Screen 1 ☒ Password ☐ Alarm List

Click the  button to enter the password screen, the screen displays the following:

1. Open password

2. Close password

 Exit

Select , execute the operation of opening password; select 2, to close the password. Click on the  button, returning back to the monitor status.

Select 1, the screen displays:

Please input password
0000

Click the “^” button or “v” button to input the password’s value, and click the “ENT” button to confirm.

If the password value is correct, the screen displays:

Password has been opened
Press any key
to continue ...

If the password value is in error, the screen displays:

Password is error
Press any key
to continue ...

Select 2 , close the password, the screen displays:

Password has been closed
Press any key
to continue ...



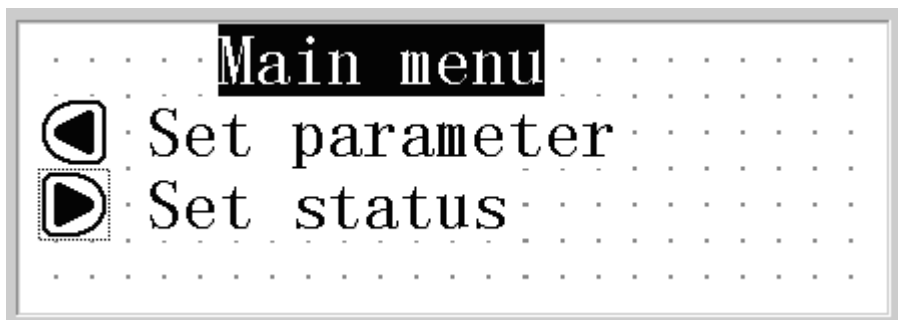
3-4 Modify the data value

If the password has been entered, click the “ENT” button. The production set value of class A will high light, which means you can set class A’s production value. Click the “^” button and “v” button to modify the value, click on the “<” and “>” to set the digit’s position, the data range is 0 to 9.



3-5 Switch value

After the set value, click the “ ” button to return back to the system’s initial screen (the NO.1 screen.).



Click the “>” button to enter status set screen.

4

New additional functions of the OP520

4-1	Setting general function key
-----	------------------------------


4-2	Status lamp
-----	-------------

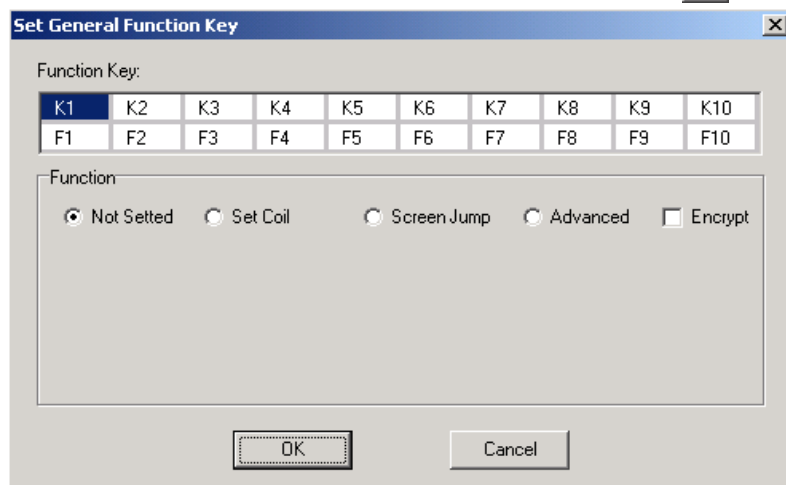
4-3	Application examples of global function key and button status lamp
-----	--

4-4	Internal clock (optional)
-----	---------------------------



4-1 Setting general function key

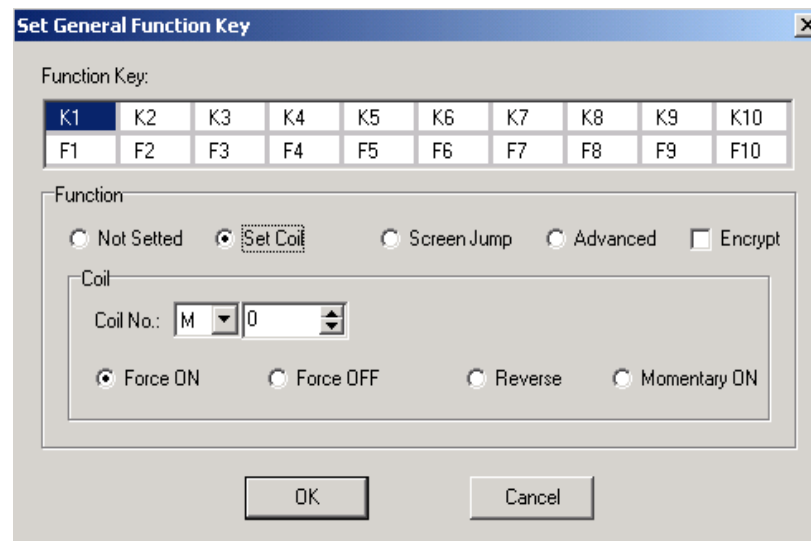
When editing the project screen of the OP520, press the  key, there will be a dialog box for you to set the general function key.



The dialog box displays 20 function keys (K1~K10,F1~F10), If the function key is not set, it means that this key can only be used as the normal function key. Only when the display's screen shows this function key can it be effective to operate this key. After setting the global function key, the display will display any screen.

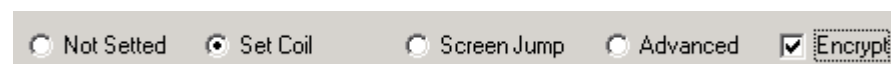
4-1-1 Setting a coil's function

In the “set the global function key” dialog box. Select “set coil” for K1, the dialog box will display coil set option:



- Force ON
When the key is pressed down, set the coil ON.
- Force OFF
When the key is pressed down, set the coil OFF.
- Reverse
When the key is pressed down, set the coil in reverse.
- Momentary ON
When the key is pressed down, set the coil ON, when the key pops up, the coil will be set OFF.

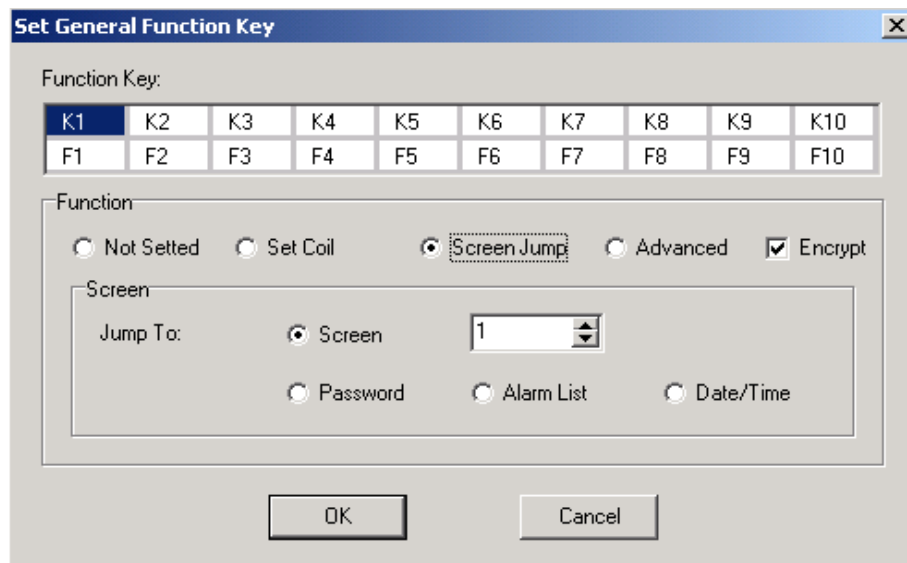
Set encryption



Select encryption multi-select frame. Then the function key will have the function of the password protection. Press this button, there will be a password check screen.

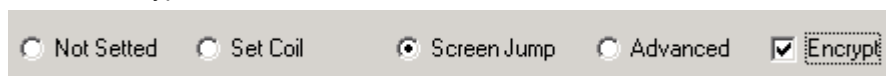
4-1-2 Screen jump function

In the “Set General Function Key” dialog box, set function key K1 to make it have the function of screen jump. The dialog box will display screen jump select:



- Screen
The screen will jump to one which has the number in the number select frame as the screen No.
- Password
The screen will jump to the password check screen.
- Alarm list
The screen will jump to the alarm list screen
- Date/time
The screen will jump to the Time/Date screen.

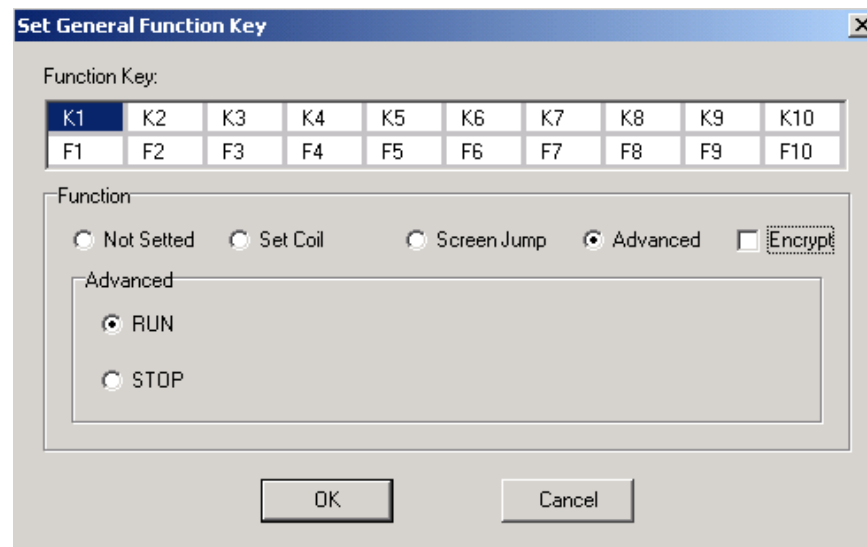
Set the encryption



Select the encryption check box, then the key will have the function of the password protection.

4-1-3 Advanced functions

In the dialog box “Set Global Function Key”, select the advanced functions for K1. The dialog box will display advanced function option:




- RUN
The PLC will go into run mode.
- STOP
The PLC will go into stop mode.

After you finish setting the global function key, press [OK] button, then the set global function key will be saved.



4-2 Status lamps

There are 16 button status lamps in the left bottom of OP520, they can display the register's data, it will reflect the machine's work status.

Press the  key, open the system setting.

Select the display function for the status lamp. The 16 button status lamps are each controlled by Bit0-Bit10 of D0 register.

Bit7	Bit8	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
K1	F5	F6	F7	F8	F9	F10	K2

K3	K4	K5	K6	K7	K8	K9	K10
Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8


E.g. If you want to light [K1] status lamp, then Bit7=1, D0=H0080.

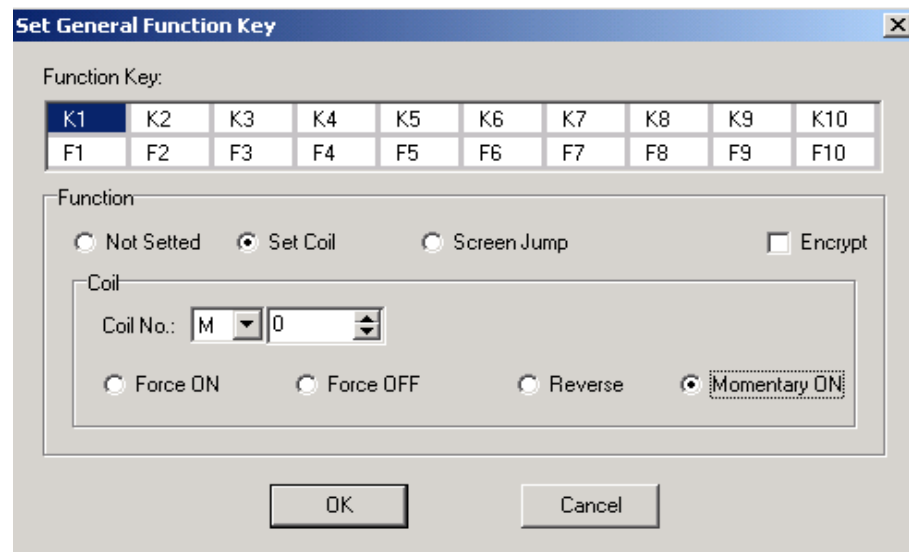
If you want to light [K3] status lamp, then Bit3=1, D0=H8000.



4-3 Examples of global function keys and button status lamp

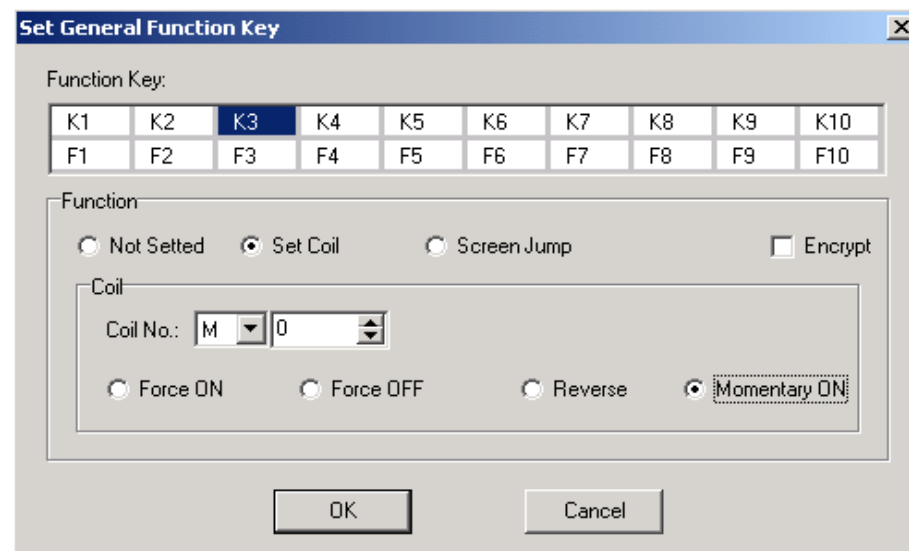
In the following example, we will start/stop the motor with the global function key. And use the panel status lamp to monitor the ON/OFF status.

Create a new project, in the displays selected dialog box, select OP520. Select Mitsubishi in the PLC selection dialog box and press the  key.



The dialog box is titled "Set General Function Key". It contains a "Function Key:" section with a grid of 20 buttons labeled K1 through K10 and F1 through F10. K1 is selected. Below this is a "Function:" section with four radio buttons: "Not Setted", "Set Coil", "Screen Jump", and "Encrypt". "Set Coil" is selected. Below the radio buttons is a "Coil:" section with a "Coil No.:" label, a dropdown menu showing "M", and a text box showing "0". Below the text box are four radio buttons: "Force ON", "Force OFF", "Reverse", and "Momentary ON". "Momentary ON" is selected. At the bottom are "OK" and "Cancel" buttons.

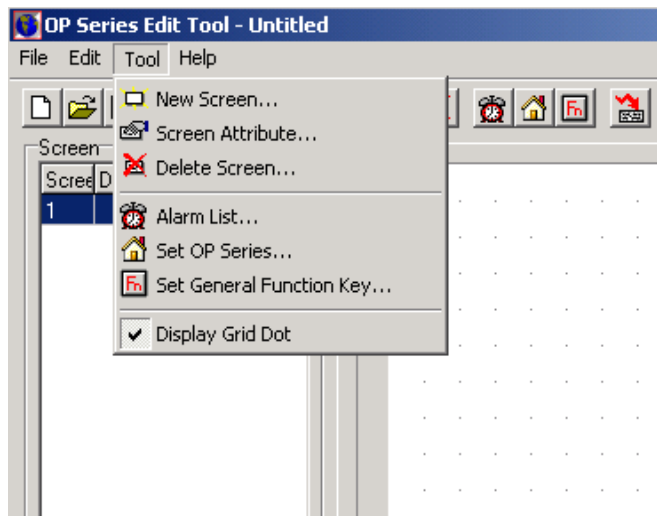
Set [K1] to make it the general function key, its function is set M0 momentary ON.



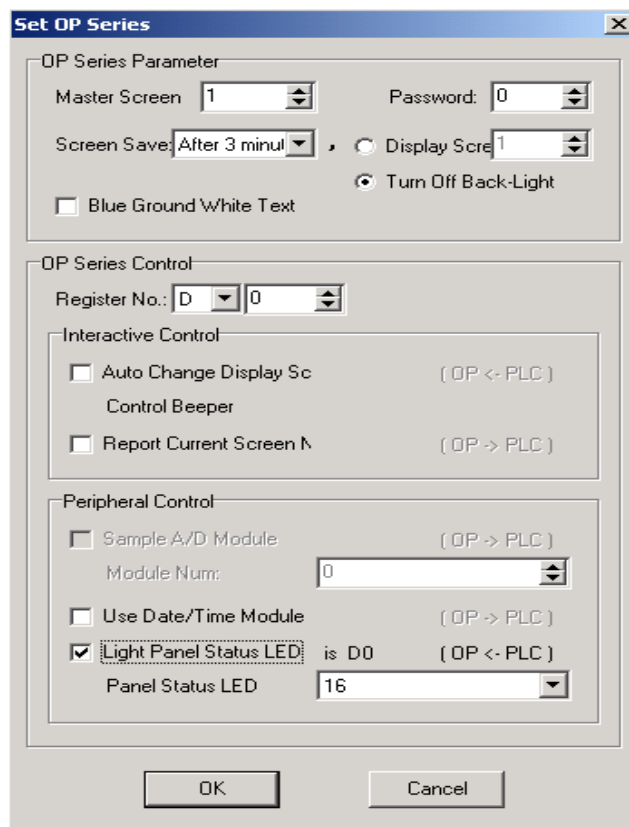
The dialog box is titled "Set General Function Key". It contains a "Function Key:" section with a grid of 20 buttons labeled K1 through K10 and F1 through F10. K3 is selected. Below this is a "Function:" section with four radio buttons: "Not Setted", "Set Coil", "Screen Jump", and "Encrypt". "Set Coil" is selected. Below the radio buttons is a "Coil:" section with a "Coil No.:" label, a dropdown menu showing "M", and a text box showing "0". Below the text box are four radio buttons: "Force ON", "Force OFF", "Reverse", and "Momentary ON". "Momentary ON" is selected. At the bottom are "OK" and "Cancel" buttons.

Set [K3] to make it the general function key, its function is set M1 momentary ON.

Set the correspond address for the status lamp, single click the 《Tool bar》 menu:



Single click 《Set OP Series》



Select 《Light Panel Status LED》 check box, the corresponding word address of the 16 status lamps is D0.


Program the PLC with the following action:

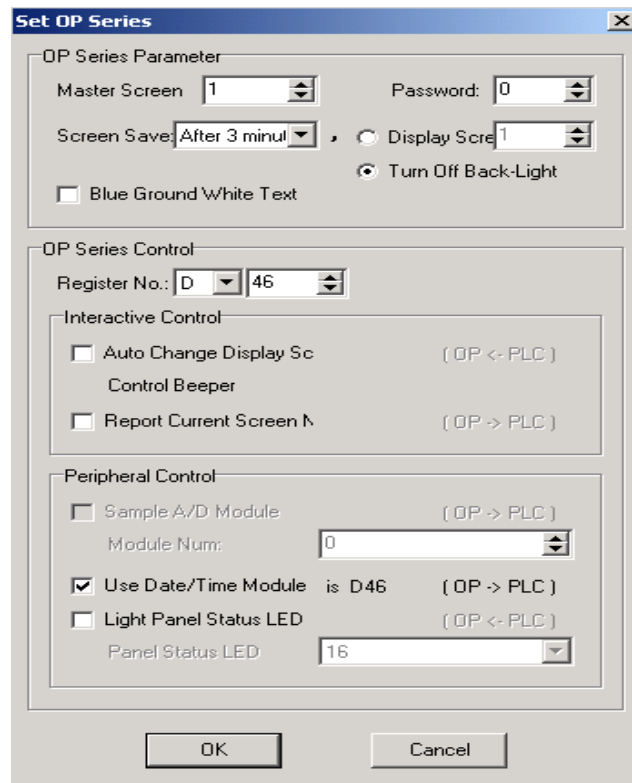
If M0=1 Then SET Y0 RST Y1 D0=H0080

If M1=1 Then RST Y0 SET Y1 D0=H8000



4-4 Internal clock (optional)

To set the clock, click the  button, or click “Tool” -> “Set OP Series” command, there will be a OP20 system parameter setting dialog box:



Set OP Series

OP Series Parameter

Master Screen: 1 Password: 0

Screen Save: After 3 min Display Screen: 1

☐ Blue Ground White Text ☒ Turn Off Back-Light

OP Series Control

Register No.: D 46

Interactive Control

☐ Auto Change Display Sc (OP <- PLC)

Control Beeper

☐ Report Current Screen N (OP -> PLC)

Peripheral Control

☐ Sample A/D Module (OP -> PLC)

Module Num: 0

☒ Use Date/Time Module is D46 (OP -> PLC)

☐ Light Panel Status LED (OP <- PLC)

Panel Status LED: 16

OK Cancel

Select “Use Data/Time Module”, and set the control register’s No. if you use. E.g. D46, then the clock’s data will be placed into three groups of registers which start with D46. D46 will store of year and month, D47 will store date and hour, D48 will store minute and second.

After finish setting the clock, set a button with which we can enter the clock display screen:

5

Application examples of OP520

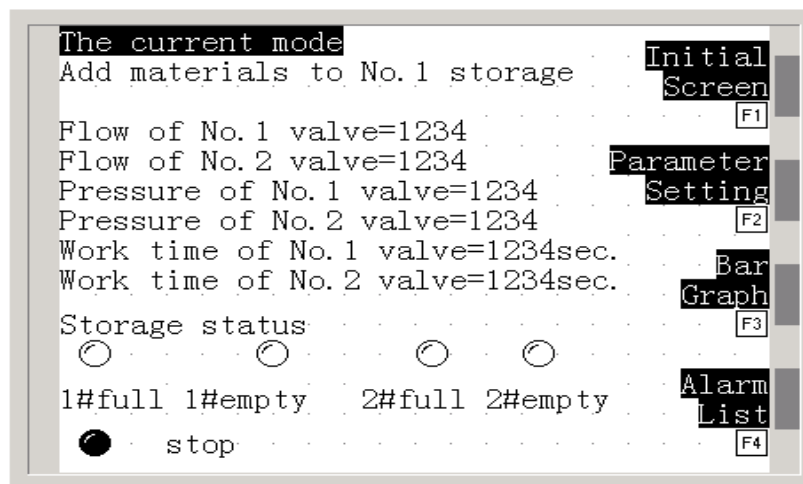
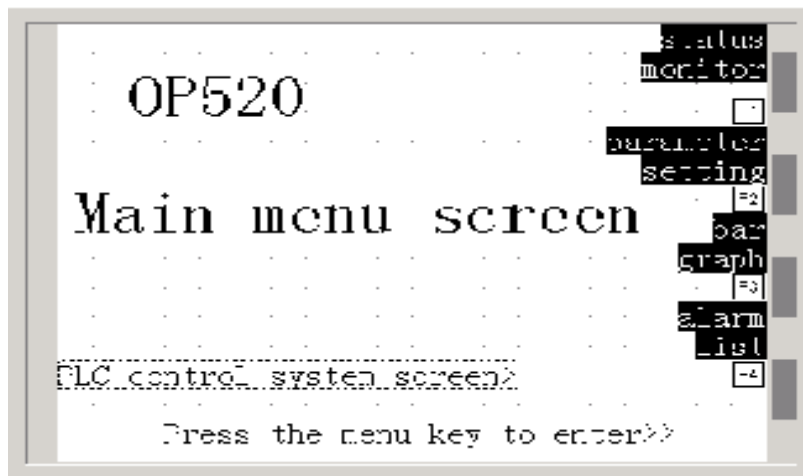
5-1	Examples
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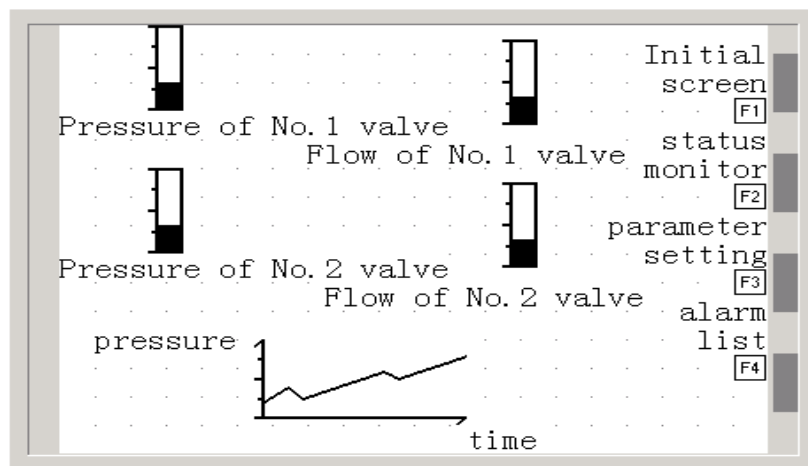
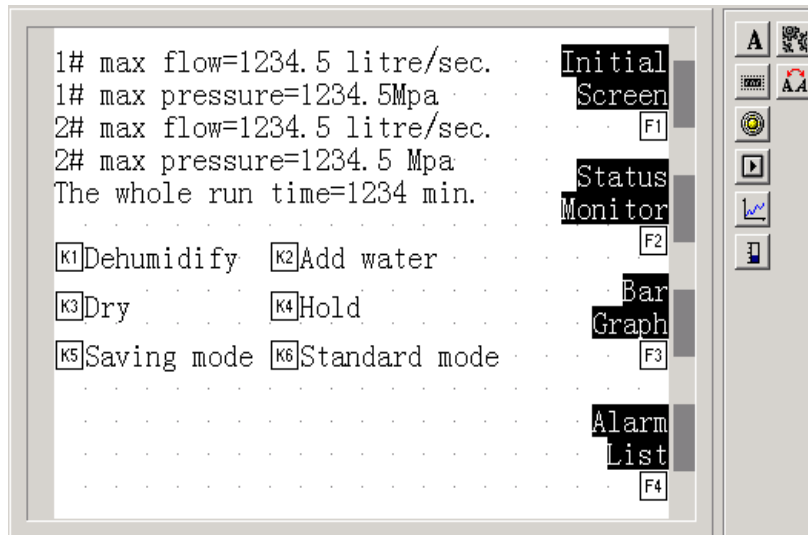
5-2	Make a screen
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5-1 Examples

In the following example we will take our company's XC series PLC to make a project.

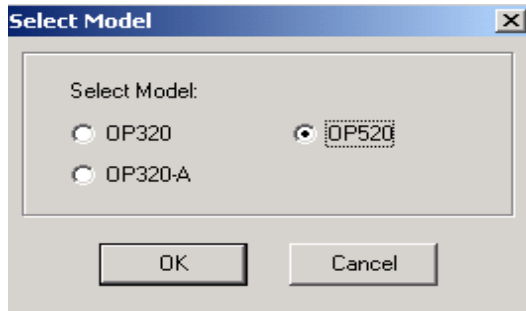






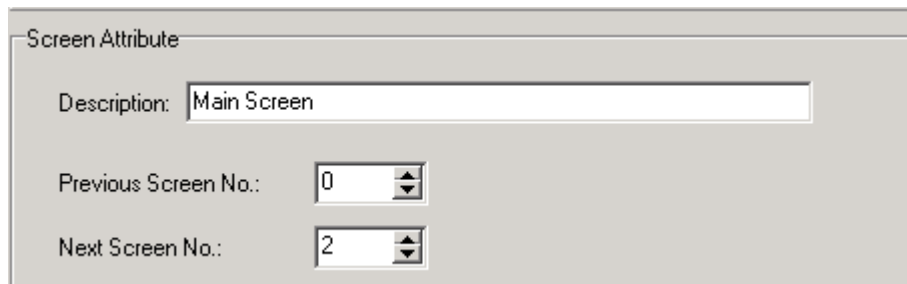
5-2 Make a screen


Open the OP20 screen set tool and create a new project, selected dialog box from the program. Select OP520 and click OK.

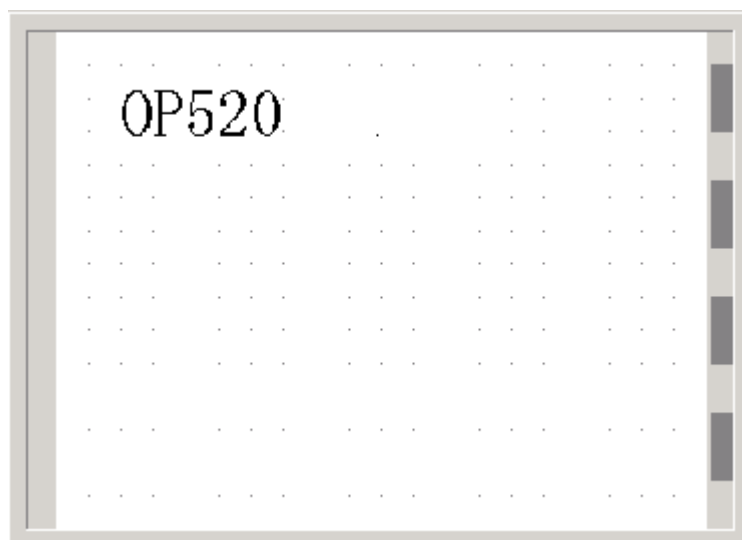


There will pop up a PLC selection dialog box. In the pull down menu, select xinje XC series and click OK. Then you can start screen edit.

Now first, edit the main screen, here No.1 screen has defaulted (the program defaults it), select No.1 screen to be the main screen. In the screen description text, fill in the main screen.



To insert a diagram: Press the  button, Select the LOGO diagram that has been made and insert it in, place the diagram to the normal position in the screen.



6

OP320-S, OP320-A

6-1 Op320-S/OP320-A-S



6-1 Op320-S/OP320-A-S

OP320-A/OP320-A-S is a cut down version of OP520, you can refer to OP520 for its use, but there is no global set function keys, you can refer to OP320 for its use and refer to OP520 for its number keys'.

7

PLC Connection method

7-1	Xinje FC series PLC
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7-2	Mitsubishi FX series PLC
-----	--------------------------

7-3	Siemens S7-200 series PLC
-----	---------------------------

7-4	Omron C series PLC
-----	--------------------

7-5	Koyo S series PLC
-----	-------------------

7-6	Schneider NEZA series PLC
-----	---------------------------

7-7	DELTA DVP series PLC
-----	----------------------

7-8	LG Master-K series PLC
-----	------------------------

7-9	Matsushita FP series PLC
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7-10	FACON series PLC
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7-11	Kenyence series PLC
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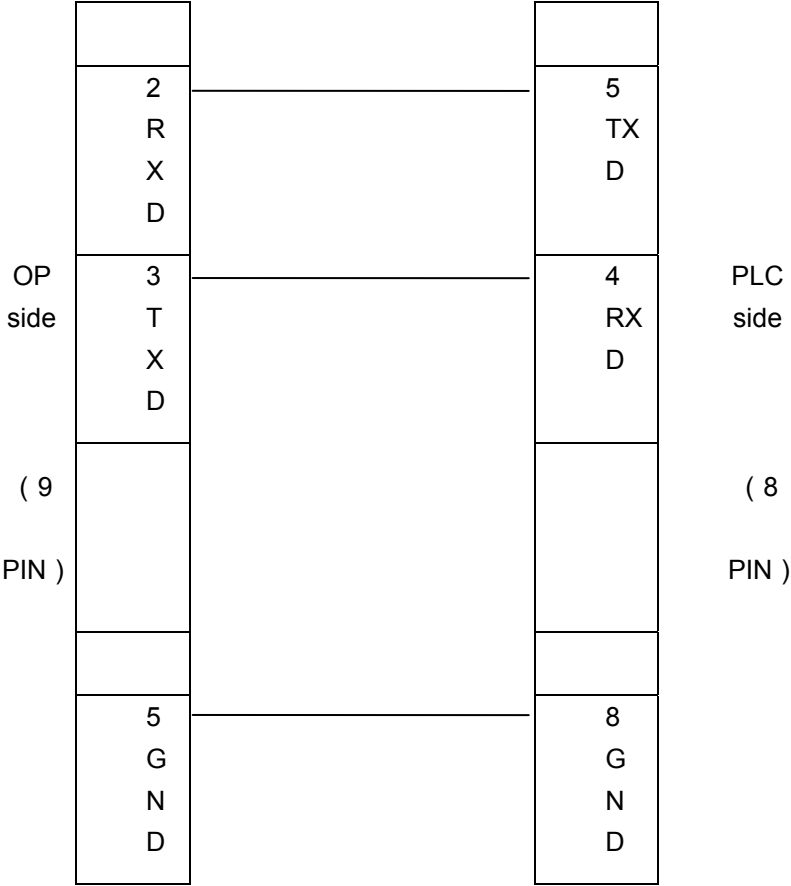


7-1 Xinje FC series PLC

OP series can communicate with Xinje XC series PLC, the communication port is the PLC's program port.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Program port
The default communication parameter	9600 bps, 8 bit, 1 stop, ODD
ID	1
Communication distance (the farthest)	15 m
Communication format	RS232
The type of the cable	OP-FC-CAB0
The corresponding addresses of the switch value	M0-M383
The corresponding addresses of the digital value	W0-W2047, FW0-FW191, TW0-TW127, CW0-CW127, WX0-WX13, WY0-WY13, WM0-WM23

The connection diagram of OP-FC-CAB0



Note: it is normal for all OP series models

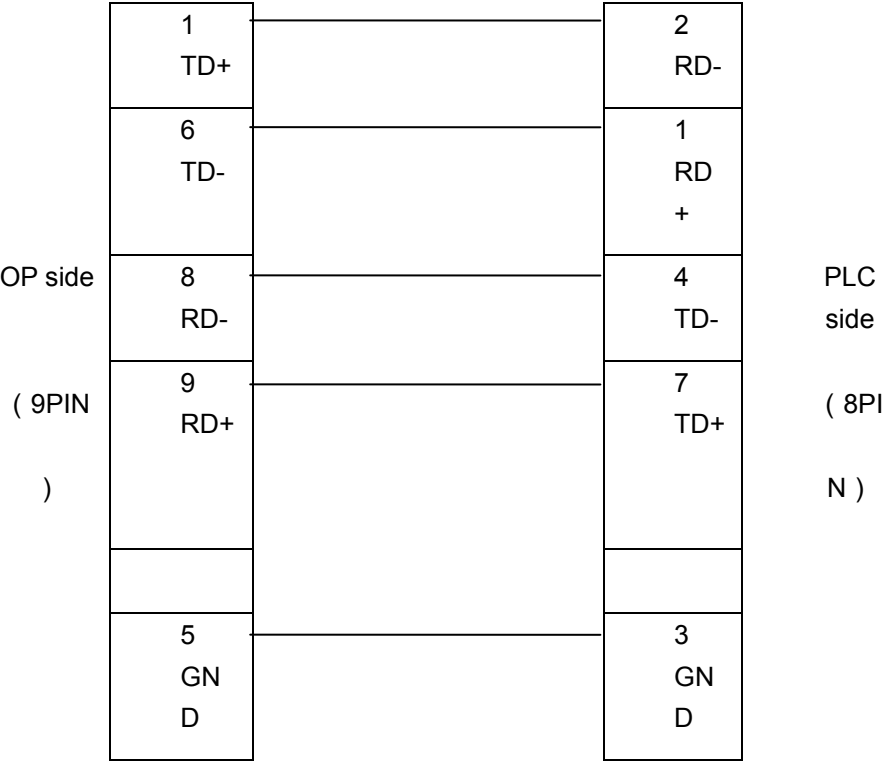


7-2 Mitsubishi FX series PLC

OP series can communicate with all FX series of Mitsubishi at present. The communication port is PLC program port or FX2N-422BD module of the FX2N series PLC.

Item	Content		
OP320 communication port	9 pin communication port		
PLC communication port	Program port or FX2N-422BD		
The default communication parameter	9600bps, 7bit, 1 stop, Even		
ID	0		
Communication distance (the farthest)	70 m		
Communication format	RS422		
The type of cable	OP-FX-CAB0		
	FX0S	FX0N	FX2N
The corresponding addresses of the switch value	M000-M511	M000-M511	M000-M511
The corresponding addresses of the digital value	D00-D31	D000-D255	D000-D511

The connection diagram of OP-FX-CAB0



Note: it is normal for OP320, OP320-A, OP520.

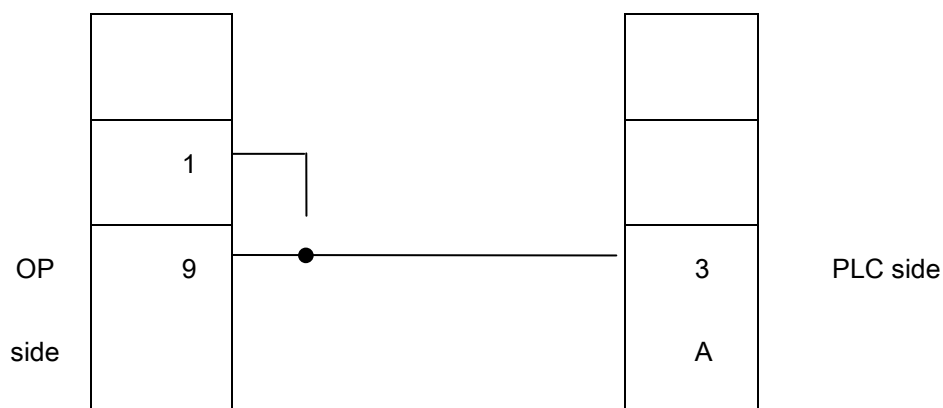


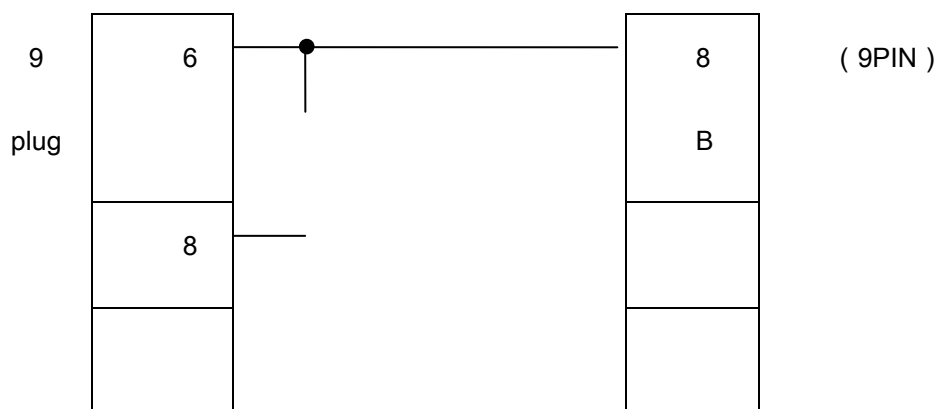
7-3 Siemens S7-200 series PLC

OP series can communicate with the program port or extension port of S7-200 series PLC via PPI protocol.

Item	Content
OP320 communication port	RS485 communication port
PLC communication port	Programming port or expansion port
The default communication parameter	9600 bps, 8 bit, 1 stop, Even
ID	2
Communication distance (the farthest)	100 m (twisted-pair)
Communication format	RS485
The type of the cable	OP-S7-CAB0
The corresponding addresses of the switch value	M000-M317
The corresponding addresses of the digital value	VW000-VW4096

The connection diagram of OP-S7-CAB0





Note: it is normal for OP320-S, OP320-A-S, OP520.

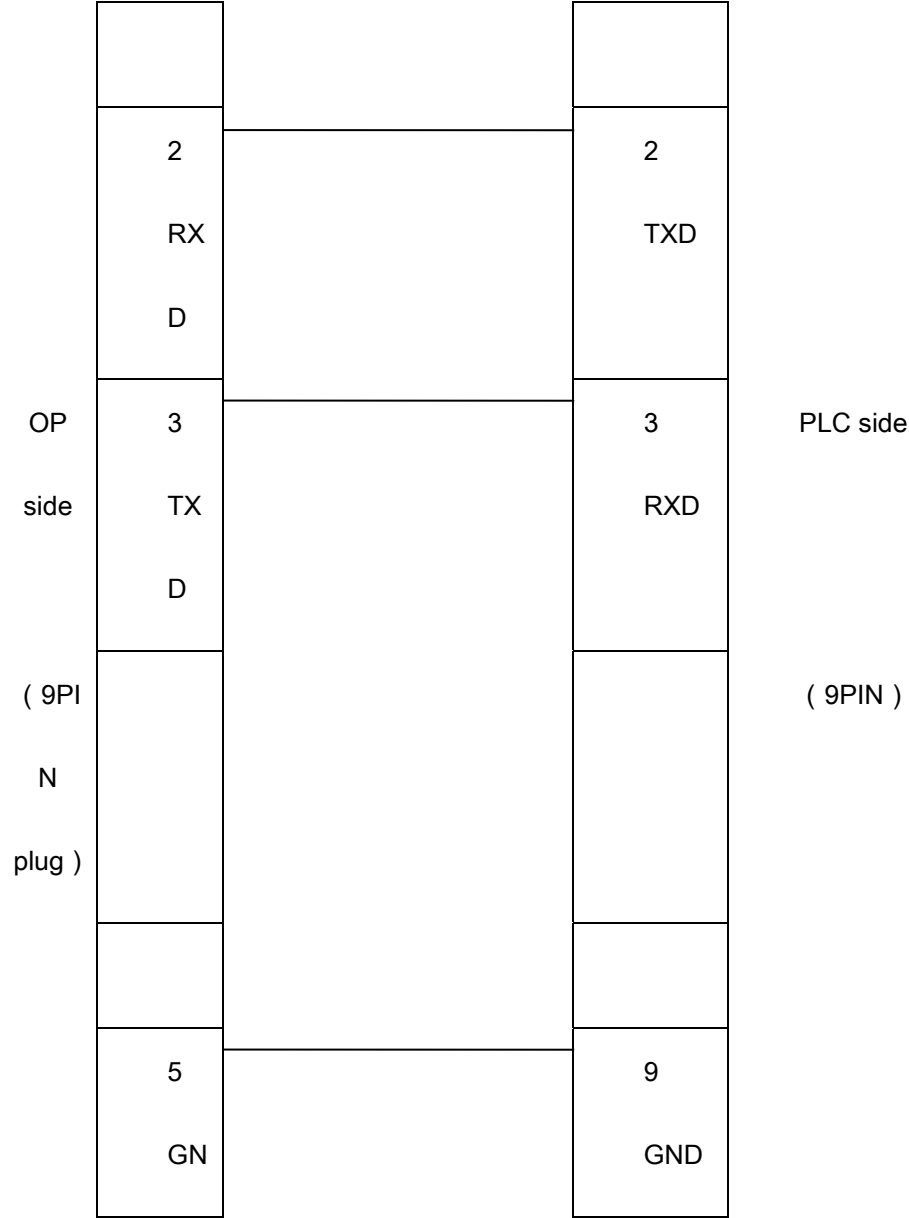


7-4 Omron C series PLC

CPM1A, CQM1-CPU11 has only one communication port. In order to communicate with the OP320, it needs the communication cable CIF01-CAB produced by our company to transfer the program port's signal to RS232 signal.

Item	Content
OP320 communication port	9 pin communication terminal
PLC communication port	Program port or expansion port
The default communication parameter	9600 bps, 87bit, 2 stop, Even
ID	0
Communication distance (maximum)	15 m
Communication format	RS232
The type of the cable	OP-CQM-CAB0 or CIF01-CAB0
The corresponding addresses of the switch value	IR20000-22715
The corresponding addresses of the digital value	DM0000-DM1024

The connection diagram of OP-CQM-CAB0





Note: it is normal for all OP series models.



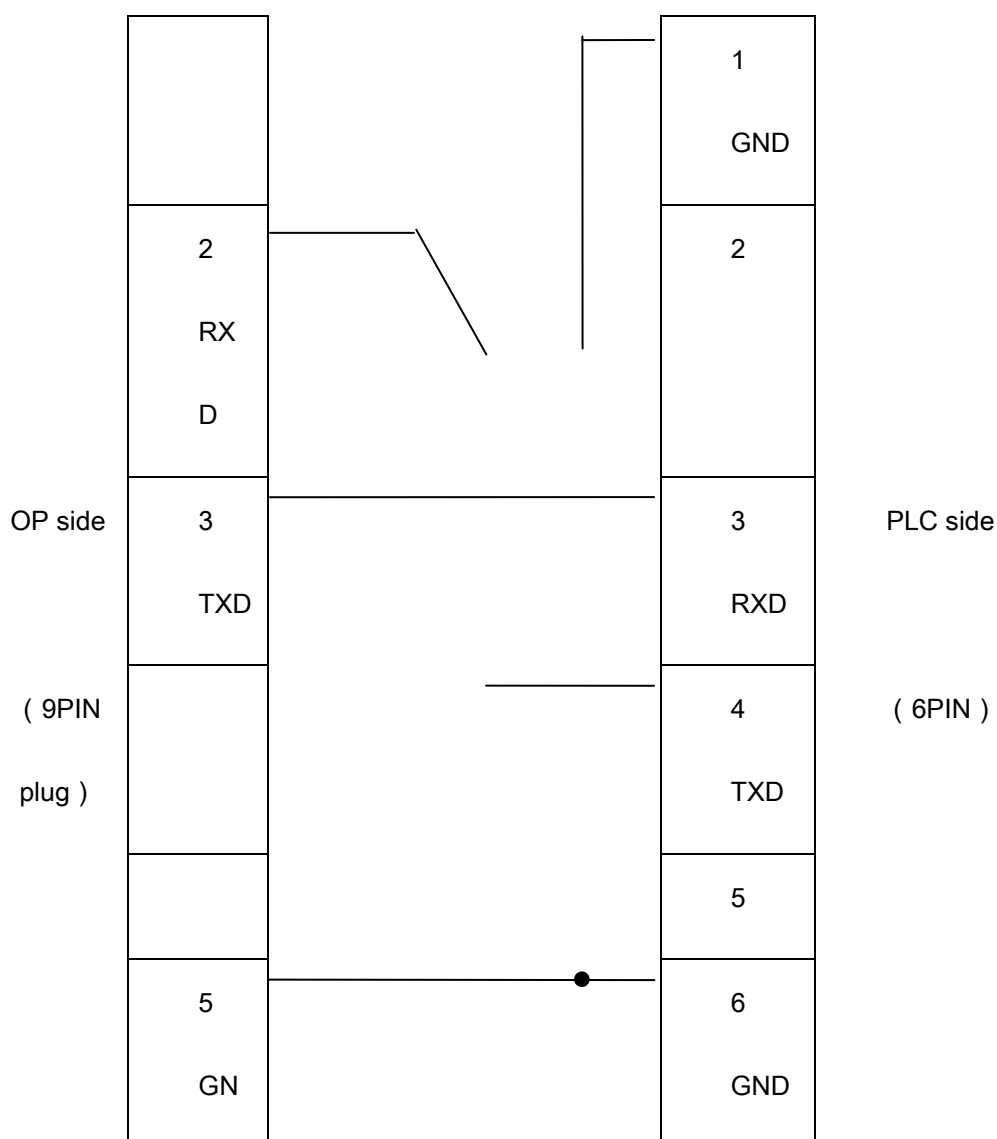
7-5 Koyo S series PLC

When OP series communicates with SZ-4, OP320 can connect with not only Port1 but also Port2.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Program port or extension port
The default communication parameter	9600 bps, 8 bit, 1 stop, ODD
ID	1

Communication distance (the farthest)	15 m
Communication format	RS232
The type of the cable	OP-SZ-CAB0 corresponds with SZ, SH, SH series OP-SG-CAB0 corresponds with SU, SG series
The corresponding addresses of the switch value	M000-M377
The corresponding addresses of the digital value	R2000-R3777

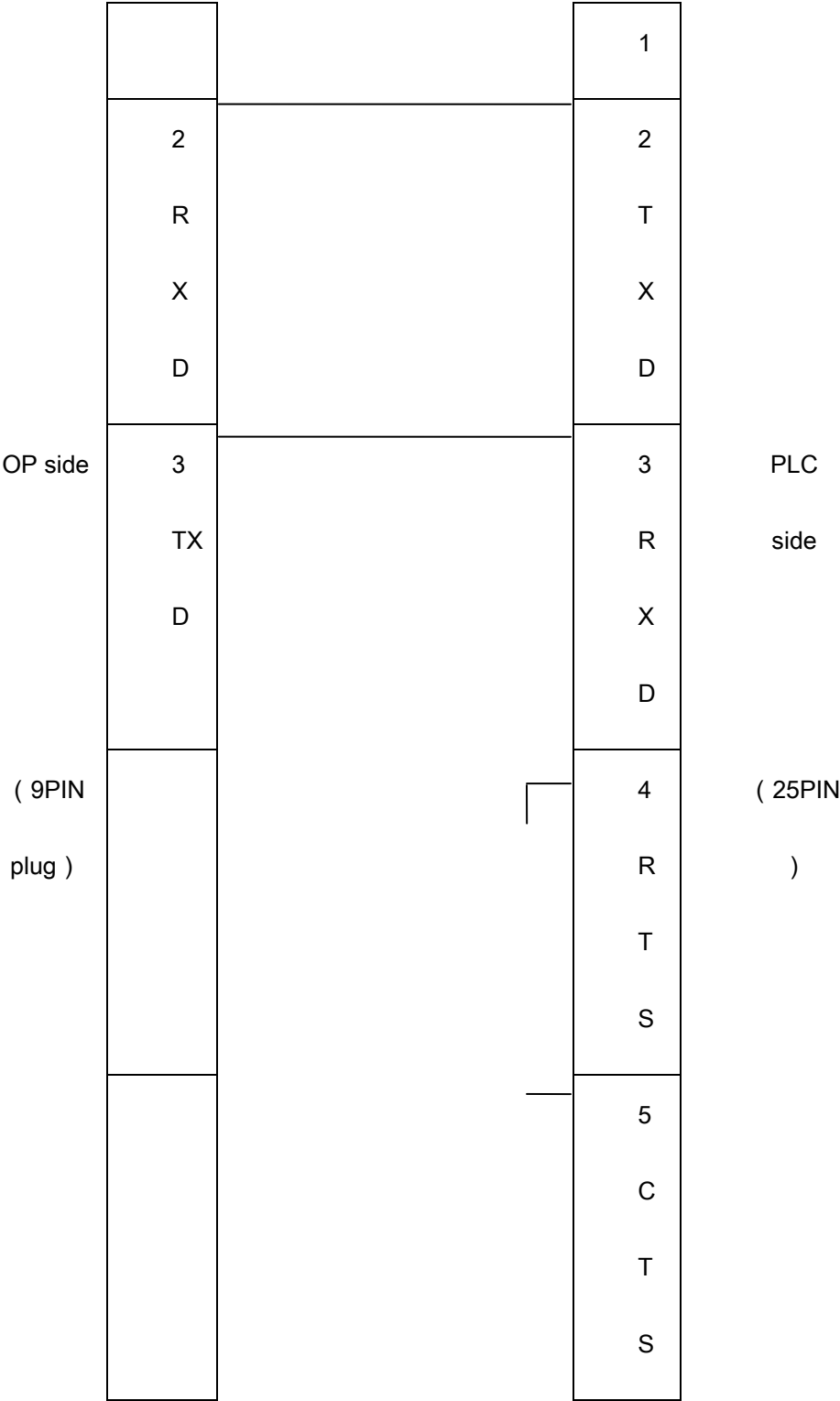
The connection diagram of OP-SZ-CAB0

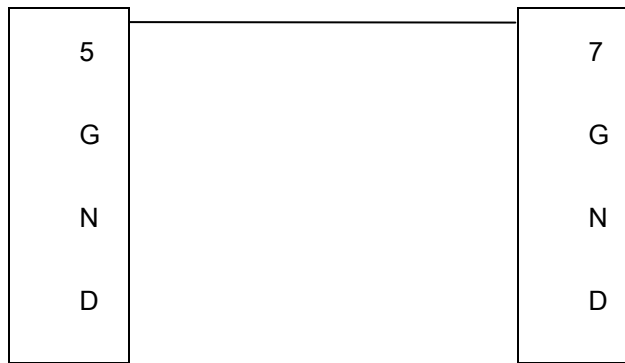


D



The connection diagram of OP-SU-CAB0





Note: it is normal for all OP series models.



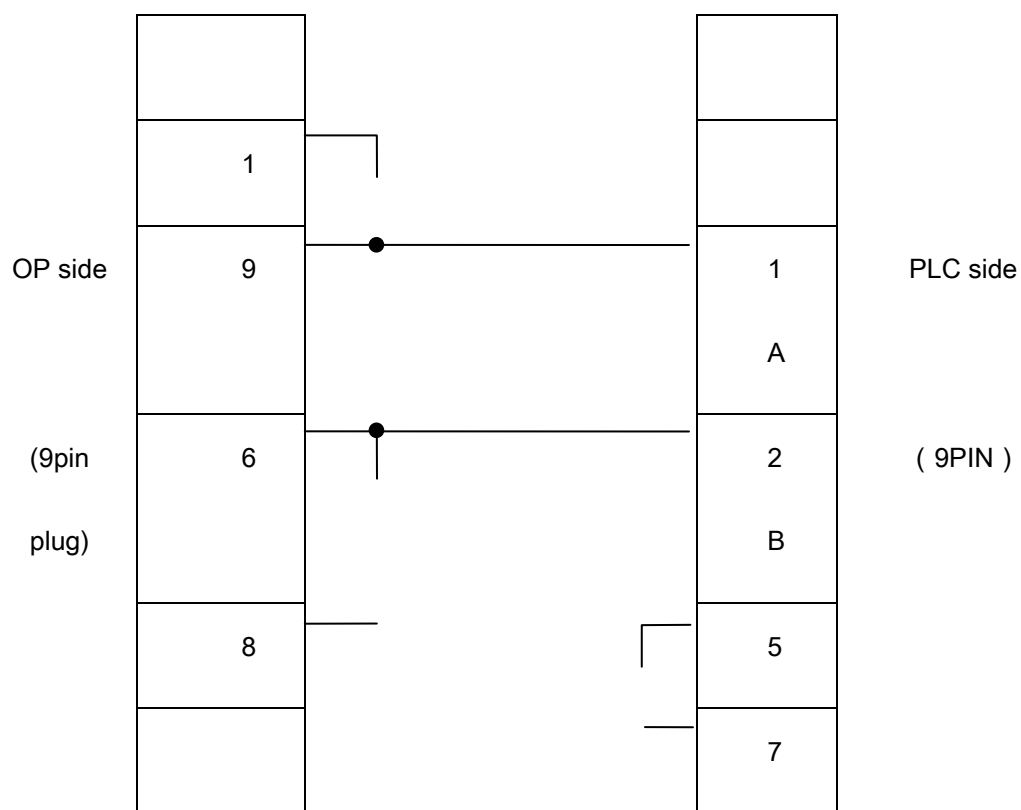
7-6 Schneider NEZA series PLC

The OP series can communicate with the NEZA series PLC via MODBUS protocol.

Item	Content
OP320 communication port	RS485 communication port
PLC communication port	Program port
The default communication parameter	9600 bps, 8 bit, 1 stop, Even
ID	1

Communication distance (the farthest)	100 m
Communication format	RS485
The type of the cable	OP-NEZA-CAB0
The corresponding addresses of the switch value	%M000-%M127
The corresponding addresses of the digital value	%MW000-%MW511

The connection diagram of OP-NEZA-CAB0



Note: it is normal for OP320-S, OP320-A-S, OP520.

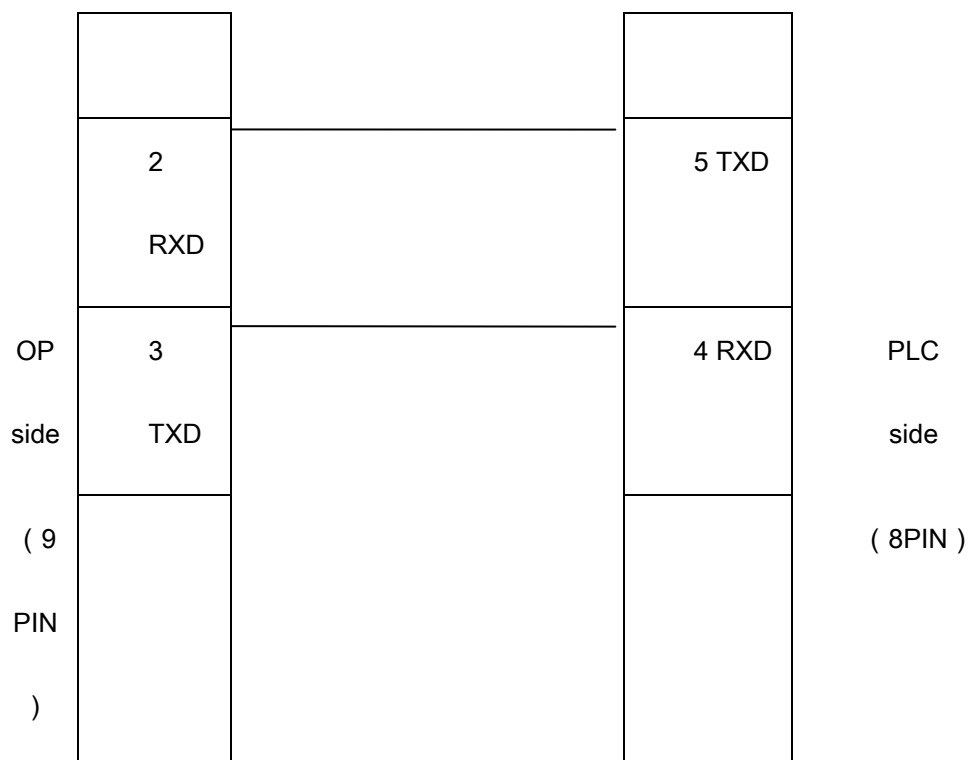


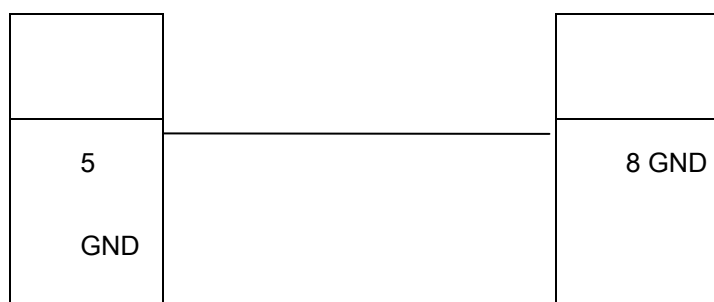
7-7 DELTA DVP series PLC

OP series can communicate with DVP series PLC, the communication port is PLC program port.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Program port
The default communication parameter	9600 bps, 8 bit, 1 stop, Even
ID	1
Communication distance (maximum)	15 m
Communication format	RS232
The type of the cable	OP-DVP-CAB0
The corresponding addresses of the switch value	M0-M999
The corresponding addresses of the digital value	D0-D599

The connection diagram of OP-DVP-CAB0





Note: it is normal for all OP series models.

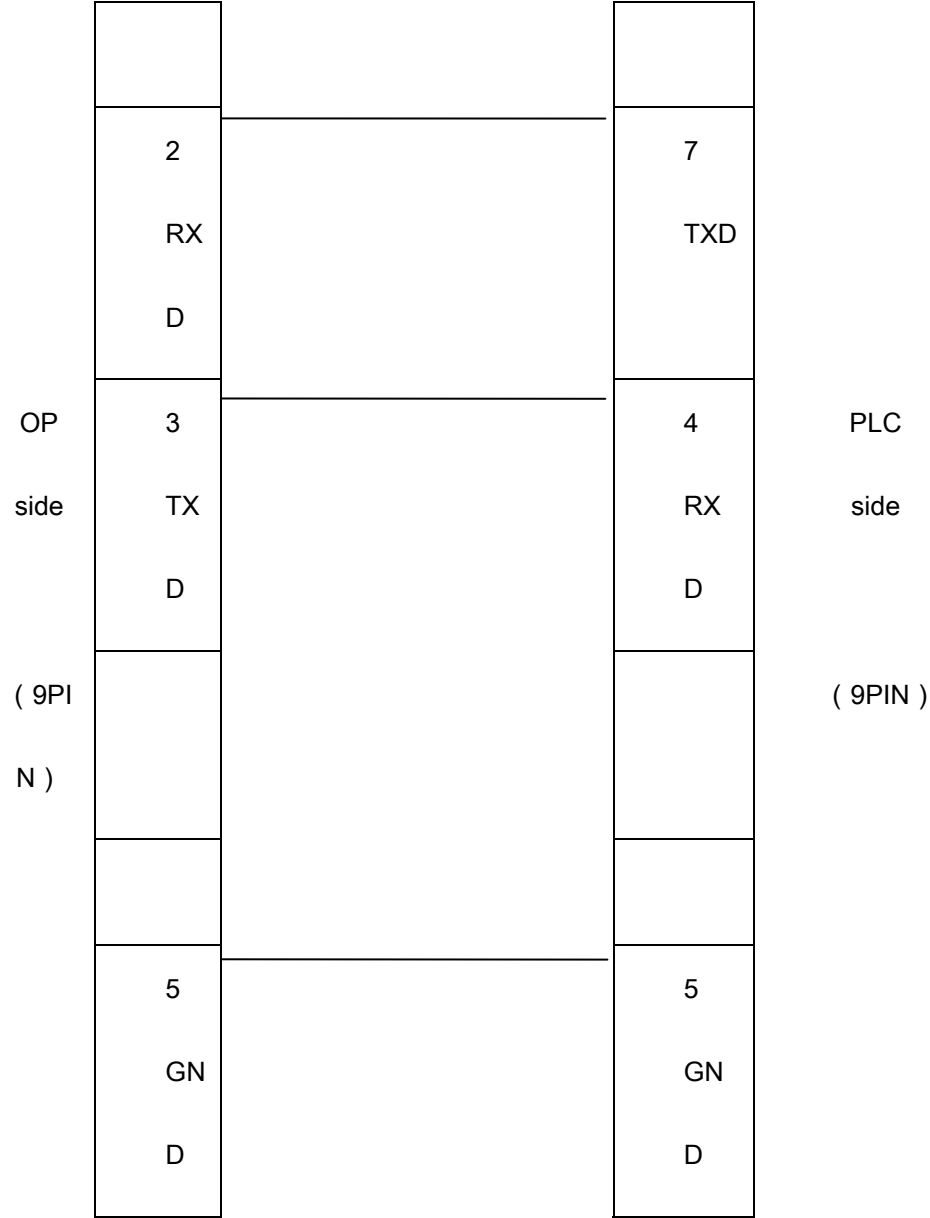


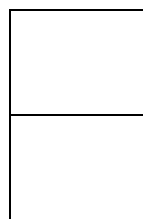
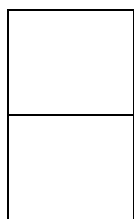
7-8 LG Master-K series PLC

The OP series can communicate with LG Master-K series PLC, the communication port is port 2.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Port2
The default communication parameter	9600 bps, 8 bit, 1 stop, Even
ID	1
Protocol	Modbus Slave (RTU (HEX))
Communication distance (maximum)	15 m
Communication format	RS232
The type of the cable	OP-LG-CAB0
The corresponding addresses of the switch value	M000-M191F
The corresponding addresses of the digital value	D0000-D4500

The connection diagram of OP-LG-CAB0





Note: it is normal for all OP series product.



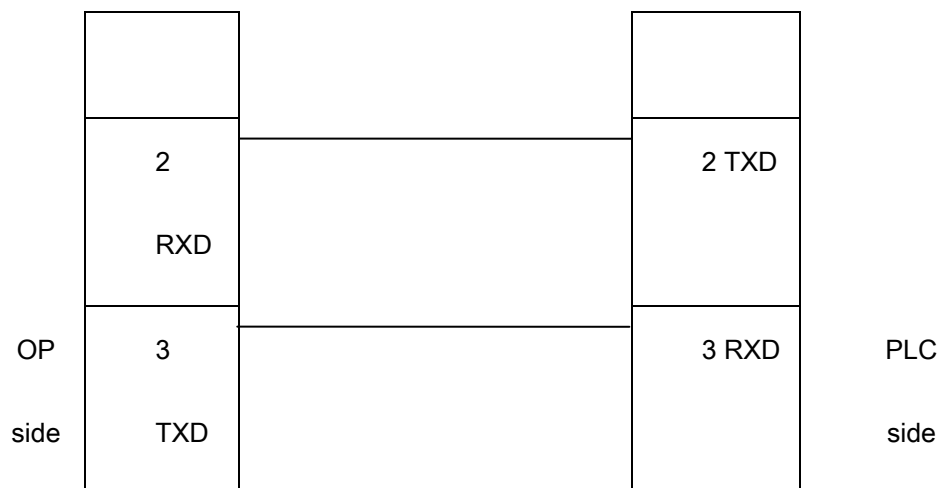
7-9 Matsushita FP series PLC

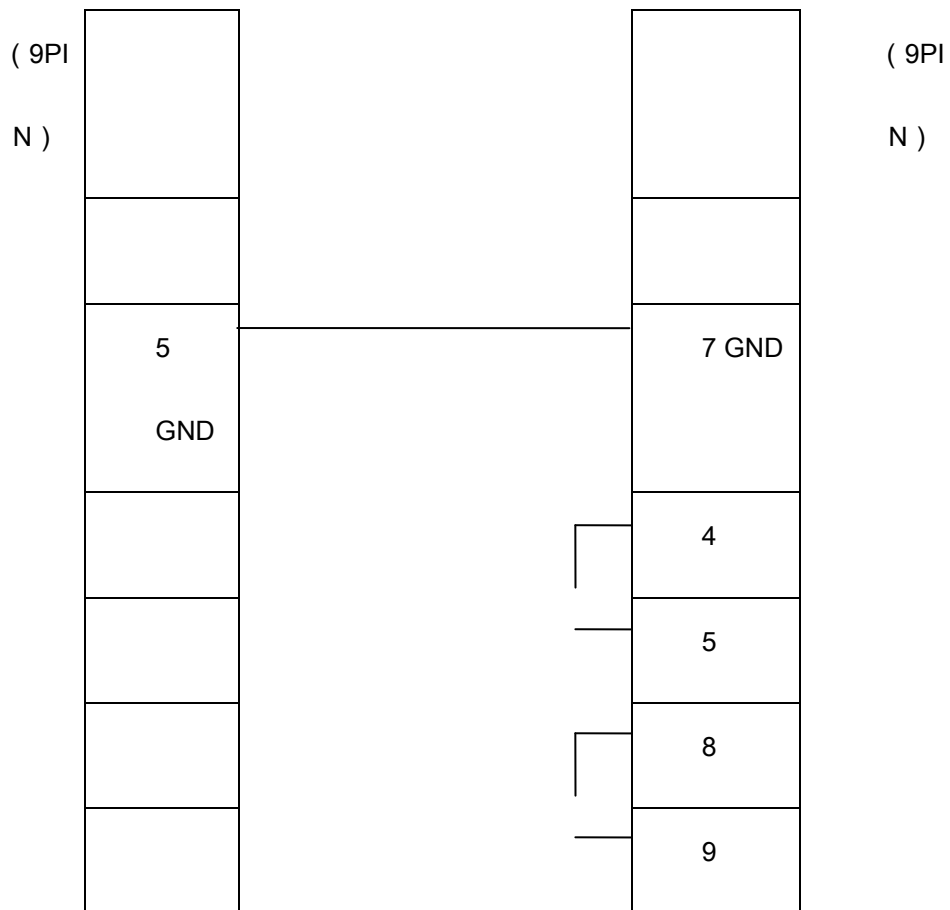
The OP320 can communicate with Matsushita FP series PLC, the communication port is PLC program port or extension port.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Program port or extension port
The default communication parameter	9600 bps, 8 bit, 1 stop, ODD
ID	1

Communication distance (maximum)	15 m
Communication format	RS232
The type of the cable	OP-FP1-CAB0
The corresponding addresses of the switch value	R0000-R875F
The corresponding addresses of the digital value	DT0000-DT9999

The connection diagram of OP-FP-CAB0





Note: it is normal for all OP series models.

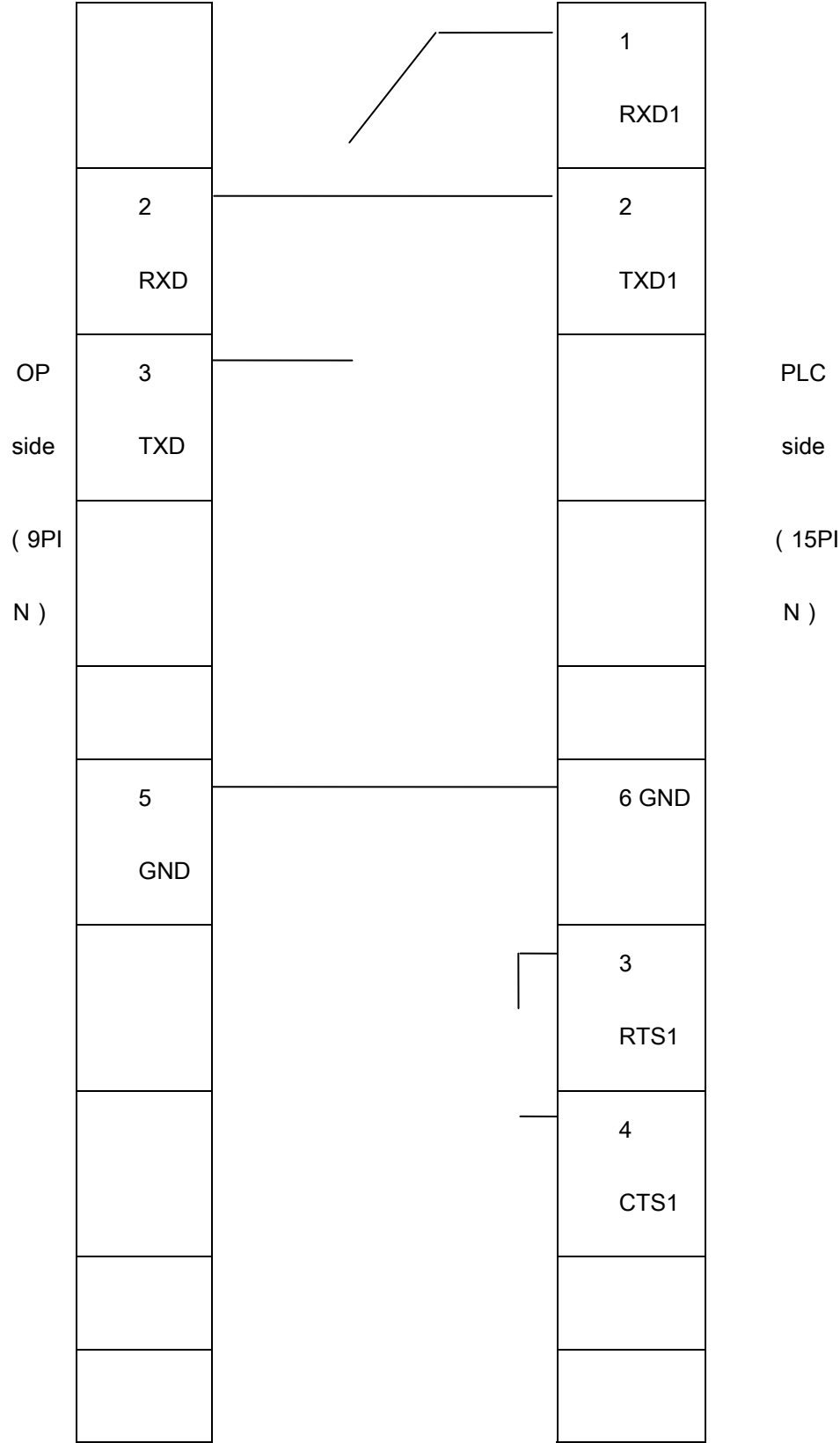


7-10 FACON FB series PLC

The OP320 can communicate with FACON FB series PLC, the communication port is PLC program port or extension port.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Program port or extension port
The default communication parameter	9600 bps, 8 bit, 1 stop, Even
ID	1
Communication distance (the farthest)	15 m
Communication format	RS232
The type of the cable	OP-FB-CAB0
The corresponding addresses of the switch value	M0000-M1911
The corresponding addresses of the digital value	R0000-R8071

The connection diagram of OP-FB-CAB0



Note: it is normal for all OP series models



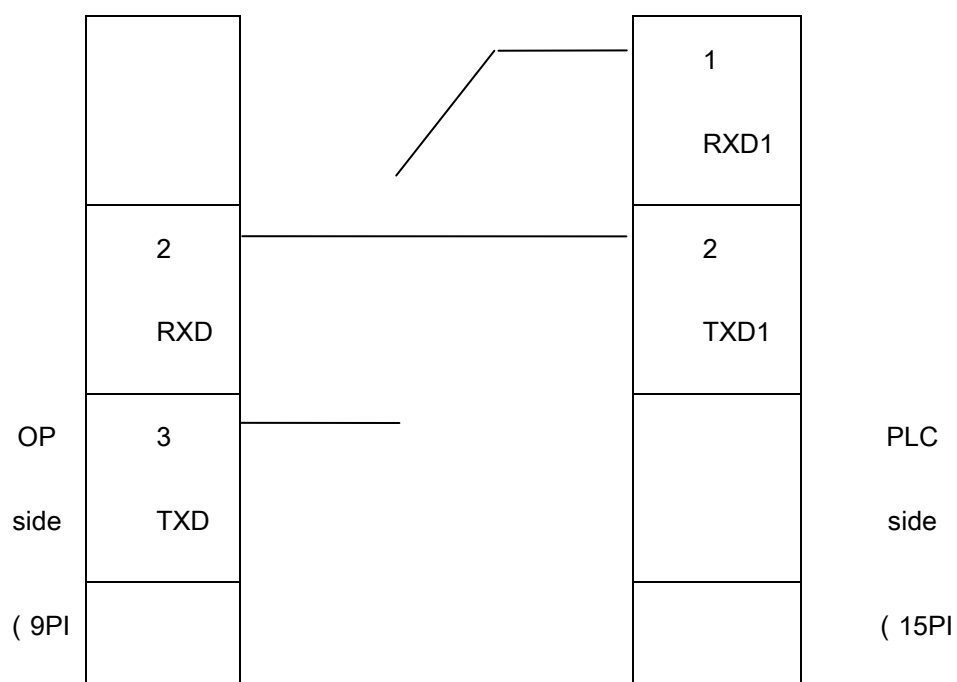
7-11 Kenyence series PLC

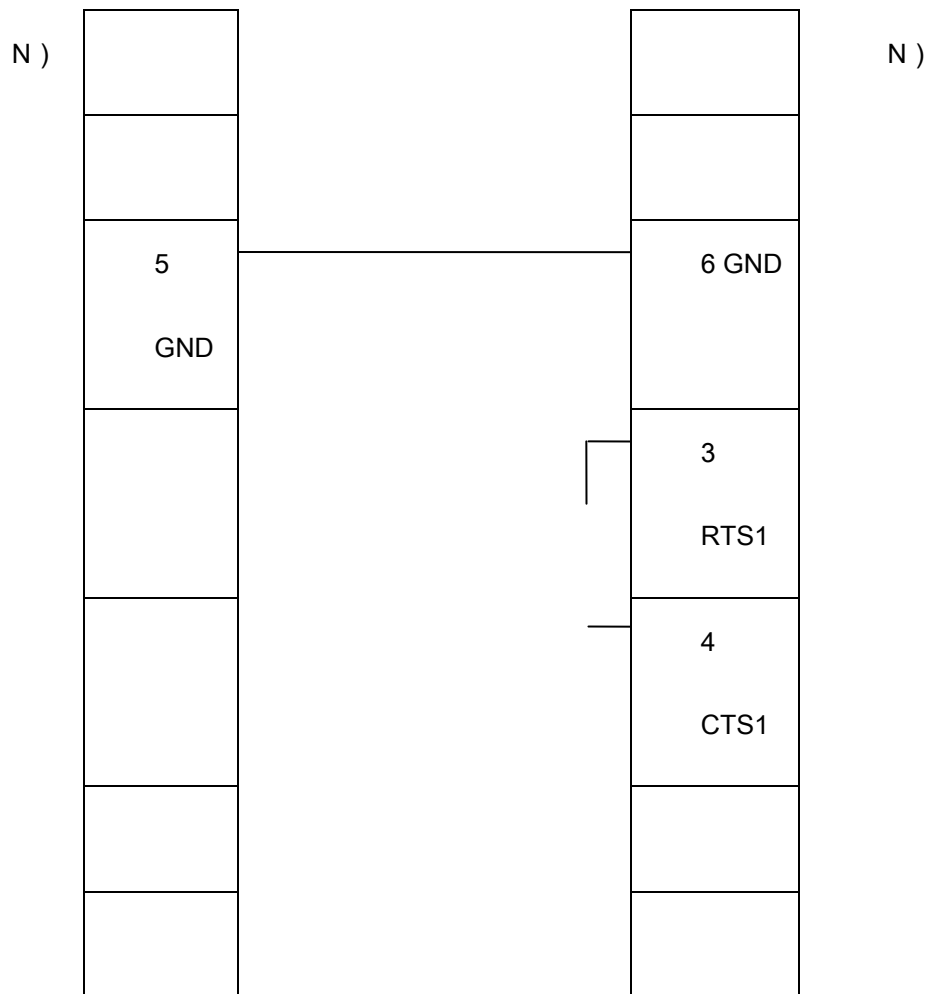
The OP320 can communicate with Kenyence series PLC, the communication port is PLC program port or extension port.

Item	Content
OP320 communication port	9 pin communication port
PLC communication port	Program port or extension port
The default communication parameter	9600 bps, 8 bit, 1 stop, Even
ID	1
Communication distance (the farthest)	15 m
Communication format	RS232

The type of the cable	OP-FB-CAB0
The corresponding addresses of the switch value	M0000-M1911
The corresponding addresses of the digital value	R0000-R8071


The connection diagram of OP-FB-CAB0





Note: it is normal for all OP series models

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