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1 Summary

1.1 Function

OP10 is a Human-Machine Interface that is used with many kinds of PLC (or the other intelligent controllers with communication ports). With OP10, both the values of the PLC inner registers and the relays status of PLC can be monitored or changed through texts or LEDs. So the operation of the machines or the devices is more easy and convenient.

OP10 programmable text monitor has many features:

■ The screens are made with the editor OP10-PCLINK on PC. Text including Chinese characters can be input and the PLC address can be set. The screens are downloaded with serial port.

■ The PLC communication protocols are downloaded to the OP10 with the data of the screens, so the engineer don't need to program of communication.

- Support modbus RTU protocol.
- Users can set 6 passwords, which have 3 levels.
- Alarm list function. The current alarm information is displayed one by one.

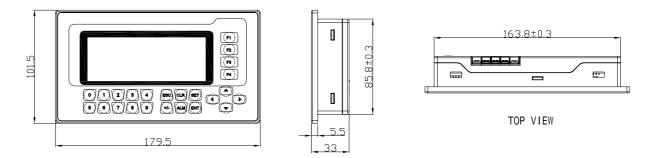
■ It has 24 keys, which can be defined as function keys. There is a keyboard for numeric input. The manipulation is simple. Some of the mechanic buttons on the controlling cabinet can be substituted with them.

■ Various communication modes can be selected. Any of RS232, RS422 and RS485 is OK. OP10 supports different screens in one project communicating with other devices through different ports.

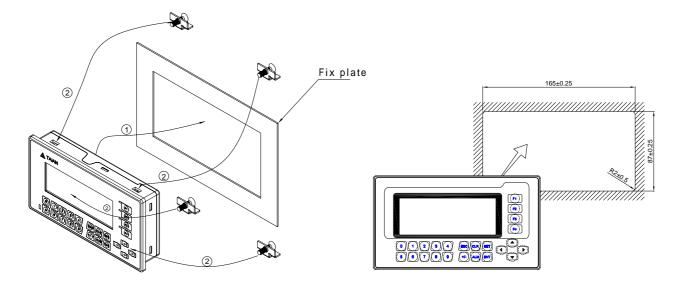
Item		Specification	Remark
Power		DC24V -15%~+10%	
Dimens	sion	179.5*101.5*33 mm	
Operation Temperatu		0 ~55	
Environment	Height	Not higher than an altitudes of 2000m	
	Relative Humidity	10%~95%,no dew	
Pollute level		Pollute level 2	IEC61131-3-3.45.2
Mechanical Running Status	Shake	5≤f < 9 Hz 1.75mm range shaking 9≤f≤150Hz 0.5g shaking	
e	Strike	3 vertical directions 15g,11ms	
	Temperature	-40 ~70	
Transport & Storage	Height	Not higher than an altitudes of 3000m	
Condition	Fall down freely	With production packing 0.3m With transport packing 1m	

1.2 General Specification

1.3 Dimension



1.4 Installation



1.5 Components

1.5.1 LCD

4.3" monochromic display, 192*64 pixels, olivine background.

1.5.2 Keys

On the front panel of OP10, there is a LCD display and 24 thin film switches. The keys have a good touch feeling, and they are endurable and reliable. Besides being used for the basic functions, all the 24 keys can be set for local functions or Chief functions.

The basic functions of the function keys:			
KEY	Basic Function		
[ESC]	When pressed, the OP10 will return to system initial screen. The user can		
	designate the system initial screen during the screen making procedure (default		
	value is screen no. 1, screen no.0 is prohibited). Usually the Main Menu screen		
	or the most-frequently-used screen is set to be the initial screen.		
[When pressed, the OP10 will shift to the predefined alarm list information		
[ALM]	screen. It can also be defined as a specific function key.(If there is no alarm list		
	in the project, system function is ineffective.)		
[◄]	Left shift the digit being edited when changing the register data. When pressed,		
[]	the digit twinkling will be shifted to the left one.		
[►]	Right shifting the digit being edited when changing the register data. When pressed, the digit twinkling will be shifted to the right one.		
[▲]	Jump to the previous screen. The number of the previous screen is designated in		
L∎]	the Screen Attribute option (default value is the result of subtracting 1 from the		
	current screen number).		
	In the data setting mode, pressing it can add 1 to the digit being edited. The		
	value will increase from 0 to 9, then return to 0 (DEC); increase from 0 to		
	F, then return to 0(HEX)		
[▼]	Jump to the next screen. The number of the next screen is designated in the		
[•]	Screen Attribute option (default value is the result of adding 1 to the current		
	screen number)		
	In the data setting mode, pressing it will subtract 1 from the digit being edited.		
	The value will decrease from 9 to 0, then return to 9(DEC); increase from		
	0 to F, then return to 0(HEX)		
[SET]	Press it to enter the mode for editing the value of registers. The register being		
	operated is displayed in reverse color. The digit being edited is flickeringly		
	displayed. If the current screen contains no register setting components, no		
	operation will be executed. When [SET] is re-pressed before [ENT] is pressed,		
	the edition done to the current register will be canceled. The user can continue		
	to operate the next data register.		
	NOTE: The function of register setting for [SET] can NOT be disabled by		
	the user-defined function.		
[ENT]	When password protection is enabled, pressing it will pop up a screen for		
[=]	password setting.		
	In register setting mode, pressing it means the edition on the current register is		
	finished. The edited data will be saved. Then the edition will move to the next		
	register. After the edition on the last register on the current screen has been		
	finished, it will quit from the register setting mode.		
[CLR]	When pressed in the process of data input, you can clear the current data.		
[+/-]	When you input the numbers with symbol, pressing it can change the symbol.		

■ The basic functions of the function keys:

0-9	1. They can be used as button controller, setting status of the coils, screen
0-9	jumping or editing the values of the registers
	2. When users in the mode of editing the value of registers, the keys can input
	values directly.
F1-F4 Chief control keys. Their basic function is switching screens, changing the status of the coils and IO, editing the values of the registers, etc. The high-l	

■ Keys, which are user-defined for local-button function

All of the 24 keys can be defined for specific functions by users, for example, setting the status of the coils, screen jumping, setting the registers, increasing by degrees, descending, etc.

Local button can be set in the current screen. It is effective only when the current screen is displayed.

Keys, which are user-defined for Chief-button function

All of the 24 keys can be defined for specific functions by users, for example, setting the status of the coils, screen jumping, setting the registers, increasing by degrees, descending, etc.

Chief button can be set under the tool menu. It is effective whatever which screen is displayed.

The priority of the functions

When a key is user-defined for a specific function, it has many functions. But only when the function which has the highest priority can be executed. Other functions are ignored.

Except for the [SET], [ALM] keys, the priority from high to low is: local button \rightarrow Chief button \rightarrow basic function.

[SET], [ALM] keys, the priority from high to low is: basic function \rightarrow local button \rightarrow Chief button.

The basic function of register setting for [SET] has the highest priority. So if there is a function of setting register in the current screen, please don't define [SET] for other functions. Pressing [SET], after entering the setting function, all of the user-defined keys' functions are not effective until setting function is ended.

[ALM] key has the highest priority when there is a alarm list. So if there is a function of adding alarm list, please don't define [ALM] for other functions. Pressing [ALM] key, after entering the alarm list, the user-defined local buttons are ineffective. $[\blacktriangle], [\lor], [ESC]$ keys return to their basic functions. Others hold the Chief button functions which have been defined before.

OP10 display has LED background light itself. As long as there is a key manipulation, the background light will be on. Consumers also can set the background light always on.

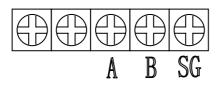
1.5.3 Communication Ports

OP10 has two communication ports: COM1 and RS485. COM1 is used for downloading user programs, and offers RS422/RS232 port. RS485 offers RS485 port.

COM1:

Pin	Definition	Explanation
1	TX+	422 send positive signal
2	RX	232 receive signal
3	TX	232 send signal
4	NC	Interior used, can not be
		connected with GND
5	GND	0 level
6	TX-	422 send negative signal
7	VCC	5V high level
8	RX-	422 receive negative signal
9	RX+	422 receive positive signal

RS485:



2 The Editing Software OP10-PCLINK

2.1 General Introduction of OP10-PCLINK

OP10-PCLINK is the specific configuration software for the programmable text monitor OP10. It can run on the SCREENS 98/2000/XP/vista platforms. It is easy to study and convenient to use. The user can input English/Chinese characters directly.

2.2 About the Project and Screen

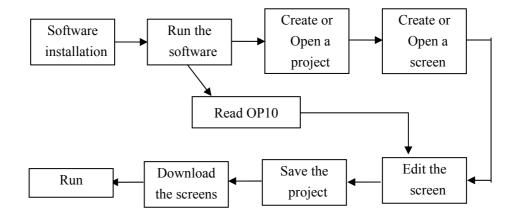
The basic element of a project is the screen. All the screens for one certain project are saved in a single project file. Every screen is made to execute some certain functions. By arranging the screens, the user can jump from one screen to another. The application project file is composed of all the screens.

2.3 Contents of the Screen

After opening a project, users can create ("new") or open ("open") a screen. The user can put some elements such as characters (English or Chinese), LEDs, switches, data inputting boxes and jump keys on every screen. Jumping between different screens is allowed. The operator can carry on the operations such as data monitoring, parameter setting, switch controlling, alarm list monitoring and data transferring between registers of PLCs.

2.4 Flowchart of Using

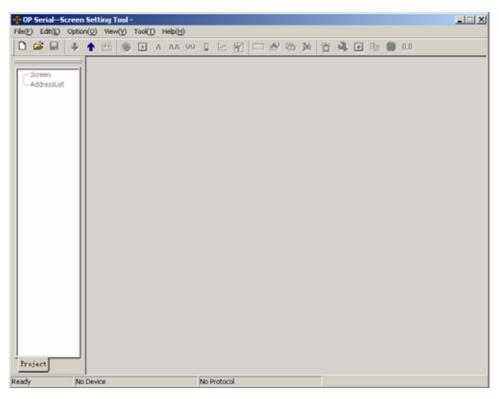
The basic flowchart of using is shown in the following figure:



2.5 Editing the User's Screen

2.5.1 Create a New Project

Run the software OP10-PCLINK and create a project, after which a screen editor will be showed on the screen.



The screen-editing region is on the center of the editor. There is a grid of white dots in the display region. The distance between every two rows and two columns is 16 points. The whole region is a matrix of 192*64 points. The user can refer to the dots nearby to align the components when laying or moving them. When necessary, change X and Y positions of the components to locate them in arbitrary positions.

Button	Function	
	Create a new project	
	Open project	
	Save project	
+	Download the configuration project to OP10.	
1	Upload the project inside OP10	
	Translate and edit the project, show the information of the project.	

The table below is the description of all the buttons in the toolbar:

	New screen, pressing the key "New" in the screen indicator will also
J	new a screen.
	Edit the attribute of the screen
-	Change a screen with the copy of another one
×	Delete the current screen
4	Designate the initial screen. When the display is running, the system will return to the initial screen directly if [ESC] is pressed. Usually the main menu or the screen most-frequently used is set to be the initial screen; set the system password; set the definition number of the interactive controlling register.
Ż	Login the Alarm List information. Every piece of information represents a status of the select variable.
•	Set Chief button
Ē	Change the data of the registers with the copy of another device.
•	Preset dynamic text
0.0	Preset register

Press or activate [File] [New] command in the menu to pop up a dialog box for PLC selection:

Ne	w And Sel	ect Device		x
Γ	New And	l Select Device —		
	Device:	TP03	New Device	
ſ	Set Par		cation with Device:	
		SG2ModBus SV300	M1: Set	
	Default	TPU3 option		1
	• R	6485 O COM1		
		ОК	Cancel	

Select the proper PLC type. Then click "Set" button down beside the port name to set communication parameter.

C	ommunication	Parameter Se	tting 🗙
	-Baud Rate		DataBit
	O 4800	0 38400	○ 7Bit ⊙ 8Bit
	C 9600	O 57600	-Stop Bit
	19200 19200	0 115200	IBit O 2Bit
	-Parity Bit-		
	None	O Odd	O Even
	ОК		Cancel

Select the proper baud rate, data bits, stop bits, parity and communication port in the dialog box. OP10 supports the function that two communication ports can connect with different PLCs and transducers using different communication formats.

Selecting the proper PLC type which bases on the destination controller. When OP10-PCLINK downloads (writes) the screens, it sends the appointed PLC communication protocol and the data of the screens to OP10 all together. When the display is running, it communicates with PLC through the protocol.

2.5.2 Making Basic Screen

In the example given below, the PLC type is TP03. The example will give you a general description of screen making.

Firstly, enter the system initial screen (default value is screen no.1) editing mode. The properties of the current screen (screen no.1) are shown at the right and bottom edge of the interface. Every screen has its own properties, which include 4 items:

- Screen Description: Descript the use of the screen. It helps the designer to note the use of all the screens. (can be omitted), for example: "main menu"
- When Up Arrow key ([▲]) pressed, jump to screen: The number of the screen that it will jump to when Up Arrow key pressed.
- When Down Arrow key ([▼]) pressed, jump to screen: The number of the screen that it will jump to when Down Arrow key pressed.
- Choose communication port:
 - OP10 supports every individual screen choosing its own communication ports.

The most convenient way for screen jumping is to press [ESC], $[\blacktriangle]$ and $[\lor]$ when the OP10 is running. The user can also jump from one screen to another by pressing the user-defined function keys.

Note:

- If the [] and [] key in the current screen are defined for other functions, the screen jumping parameters of the screen properties are invalid.
- If the screen designated by the [] key doesn't exist, the system will search up until the existing screen is found and jump to it. It will stop at screen 1 if no screen is found. The situation of the [] key is similar, that means the system will search down for the screen if the designated one doesn't exist..

- If there are some data setting components in the screen, [] and [] key will execute the function of value increase and decrease in the data setting mode. After quitting the data setting mode, the [] and [] key will execute the basic function for screen jumping.
- Choose the communication port of the screen. Users can choose COM1/485 port as the communication port of the current screen. Users also can set the COM1/485 communication port of OP10 to demand the data of different destination host at the same time.

For example: Screen 1 can be set as communicating through 232; Screen 2 can be set as communicating through 485. They are separate.

2.5.3 Configuration of OP10

Press or activate [Tools] [OP10 serial Set] command to pop up a dialog box for configuring the system parameters of OP10:

OP Serial Setting	×
OP Serial Parameter	
Screen Protect	
Screen Protect Time:	Shut Background Light
None	O Show Screen: 1 →
Encrypt Project Chief Scre	en Num: 1
Commnication Time: 20	★ mS (10-50 mS)
Overtime Time: 300	▲ mS (100-1000 mS) ▼
OP Serial Control	
Group name: D	▼ ID: 1 ÷ © RS485
Element Name: D0	 C COM1
Alternation Control	
Auto-changer Screen:	[0P <- PLC]
Clear After Changing	
Report Current Screen:	[0P -> PLC]
ОК	Cancel

Initial Screen

The first screen will be displayed after power on. Usually this screen is set to be the main menu screen or the most-frequently-used screen. Press [ESC] when the OP10 is running, the system will jump to this screen directly.

Screen Saver

Under default conditions, the backlight is set to be "never". The time can be set by the

user. If it is set to be "never", the backlight will keep on. Also, the screen can be set to jump to a screensaver screen when no key is pressed in configurable time.

Note: If the screen has jumped to a screen saver screen, the pressing of any key will not carry out any function. Any operation will awake the screen saver to return to the original screen.

OP10 serial Status Control

Usually the screen changing is executed by pressing the keys. Besides, the PLC can change screen by changing the data in register. If this property is selected, the number 'n' will be written into the D300 (for example) controlling register at the beginning of running, then OP10 will jump to screen No.n. OP10 write the current screen no. into D301, so PLC can know the status of the status of OP10. (Users can choose the function to clear the register in the screen. After jumping to that screen, the data in controlling register will be cleared.) **Note:** The user can define the address of the interactive controlling register.

Encrypt the project

Users can upload the project from OP10 to Pc and edit it. If the users hope the configuration screens in the production can't be uploaded illegally, they can choose this option. After choosing the option, although someone has the highest level password in the project, he can't upload the data.

Communication time

Communication time is the interval between OP10 sends two communication commands. Its value can be set between 10ms-100ms. If the corresponding controller answers fast, the communication time can be reduced. On the contrary, increase the time. Under the default condition, OP10 sends communication data every 20ms.

Overtime

The time decides when OP10 demanding data overflows. Some controllers read data fast, but take a long time to write data. At this condition, users can set the longest write time as overtime to avoid data setting errors when increase data of register by degrees.

Component	Function	
Α	Input text, including Chinese characters and English letters.	
AA	Dynamic text list. The content of the text can be changed under the control of PLC register.	
99	Register components. The user can dispose some data setting/monitoring components with it. (the relate address are the PLC registers)	
۲	LED indicator. Indicate the on/off status of the inner delays in PLC.	
Þ	Function key. All of 24 keys can be defined to be function keys. They can execute the functions such as screen jumping and switch control.	
1	Bar graph. Monitor the data change in PLC in the form of bar graphs.	

2.5.4 Properties of OP10

<u>L</u>	Trend line. Monitor the data change in PLC in the form of trend lines.
*	Paste pictures. Paste a monochrome BMP picture (Max. 192 × 64 pixels) onto the screen.
Ŭ	Alarm list. Users can set 8 groups of alarm lists corresponding to 8 different hosts at most. There are at most 32 pieces of alarm information in each group.

2.5.5 Text

The example below shows how to design a main menu screen as the screen no.1.

Firstly, lay the text "Main Menu". Press A and click the left button on the editing region to affirm the operation (right click will cancel it). After left click, the default text "TEXT" will be displayed in the editing region. The properties of the text are displayed below the editing region. The text string will move as the user moves the cursor. To locate the text in an arbitrary position, edit the X and Y coordinates. Changing the content of the text to "OP10_TP03", the corresponding text string will be displayed in the editing region.

	9 Serial-					_																	×
File(E) Edit(<u>(</u>		-	Wen					л	1.00	س		1.6		1	6		Do.		0.0			
	Screen		ĩ														-		-	GRAPH		URCI	E
h	sree	ist		- (X: 5 Y: 0	din: 9	ates	- Spe	cial Dou Rev	verse		T	P(3 .			· · · · · · · · · · · · · · · · · · ·	:			RAPH D		
Ready	1		TP03						Mod	Bus S	lave												

Coordinates

X value represents the horizontal position of the text string.

Y value represents the vertical position of the text string.

The origin of the position is the up-left corner of the screen.

Speciality

Double: The text will be displayed in double size, both horizontally and vertically. Reverse: The text and the background will be displayed in reversed color.

Text

The content that will be actually displayed is input here. The user can input English letters or Chinese characters with various kinds of Chinese input methods in this textbox. The content in it can be copied or pasted.

2.5.6 Dynamic Text

Press AA and click the left button on the editing region to affirm the operation (right click will cancel it). After left click, the default text "DYNAMIC TEXT" will be displayed on the editing region. The properties of the dynamic text are displayed below the editing region. The text string will move as the user moves the cursor. To locate the dynamic text in an arbitrary position, edit the X and Y coordinates.

OP SerialScreen Setting Tool - File(F) Edit(E) Option(Q) View(Y) Tool(T) Help(H)	
□ 🗃 🖬 🔸 ↑ 🛗 🕲 🗈 A AA 99 📱 🗠 🏠 🗃	🎽 🏦 🔌 🖸 🗈 🇯 0.0
Screen Screen AddressList DYNAMIC T DYNAMIC T	GRAPH OF SOURCE
Dynamic Text Property Coordinates Speciality X: 59 Double Y: 19 Reverse SIGNED Coil ID: 1 Group Name: M M0 V	Show Text
Ready TP03 ModBus Slave	

Coordinates

X value represents the horizontal position of the text.

Y value represents the vertical position of the text.

The origin of the position is at the up-left corner of the screen.

■ Speciality

Double: The text will be displayed in double size, both horizontally and vertically. Reverse: The text and the background will be displayed in reversed color.

■ Coil

The PLC data register for controlling the status change of the dynamic text.

Mode

Determine the data form of the data register. The form will affect the display form of the numeric items in the dynamic text.

Type

Users can choose "Bit element" or "word element".

When users choose bit element, dynamic text relates with the status of the select variable inside the PLC. The corresponding text can be set to 0 or 1, two kinds of status .

Dynamic Text Property Coordinates Speciality X: 59	Mode © HEX/BCD	Show Te	
Y: 19 X Reverse	• DECIMALIST	0	M0=0 M0=1
Coil ID: 1 TYPE: Bit	Element 💌		
Group Name: M Element Name: M0	•	•	×.

The picture below shows bit text:

When M0 is 0, the dynamic text shows "M0=0". By contraries, it shows "M0=1".

If the dynamic text corresponding to word element, it can keep the texts corresponding to as many as 32 different statuses.

Display Text

Log the different text content corresponding to different values of the data register. It can keep the texts corresponding to as many as 32 different statuses. The value of the text can be inconsecutive. Consumers can input the value themselves.

Example: Display the dynamic text controlled by register D10. The dynamic text to be displayed has three statuses: "In gear", "Temp. Lower" and "Position arrived". The three texts correspond to the D10 register value 2a, 30e and d43f (HEX form) respectively. Input "2a" in the "Value" space of the first row and "In gear" in the "Context" space on the right. Input the other two statuses in the same way. If the value of register D10 is 2a, the dynamic text be displayed is "In gear". If it is 30e, "Temp Lower" will be displayed. Other conditions can be inferred from the two examples above. The example is shown in the figure below:

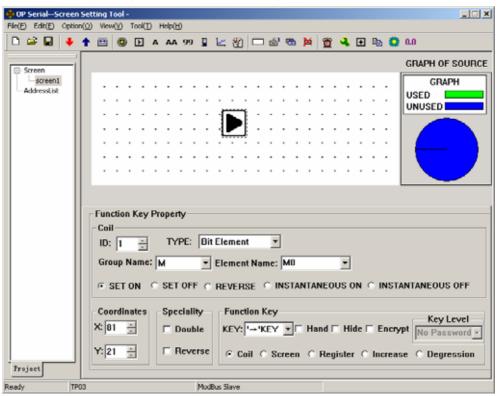
-Dynamic Text Property Coordinates Speciality	Mode	- Show Te	ext
X: 59 🕂 🗆 Double	• HEX/BCD	VALUE	CONTENT
	O DECIMALIST	2A	In gear
Y: 19 🕂 🗌 🗖 Reverse	☐ SIGNED	30E	Temp. Lower
	I DIGITED	D43F	Position arrived
Coil			
ID: 1 🕂 TYPE: W	/ord Element 💌		
Group Name: D Element Name: D10	- -		×

2.5.7 Function Keys

Next, configure the function keys in the main menu screen to execute the function of screen jumping (for example, press $[\blacktriangleleft]$ to jump to the parameter setting screen; press $[\blacktriangleright]$ to jump to the mode setting screen). The procedure of defining the function keys is:

Press \blacktriangleright to activate a dotted rectangular box. The box moves as the cursor moves. Click the left button to determine the position of the function key. A hand shape and the function key to be defined (default key is $[\blacktriangleright]$) are displayed in the editing region. The properties of the function key are displayed below the editing region. The meanings of position and style are the same as those in the text property. They indicate the position, the size and the color of the graph.

The function key setting screen is shown in the figure below:



Key

Select a proper key from the 24 keys. Do not conflict with system keys.

Hand

For the convenience of use, add a hand shape symbol before the key symbol. The hand indicates that pressing the key will carry out an operation. The user can remove the hand shape to save the space.

Hide

The user can make the symbols of some keys invisible in the screen. But the functions of those keys are still valid.

Encrypt

Only when the system password is entered correctly, the function key can execute its function.

Coil

The function key is defined to set a switch.

Screen

The key is defined to execute the screen jumping function.

Register

The key is defined to set the register parameters.

Increase

The value of the destination register will increase an appointed constant in the range of user-defined.

Degression

The value of the destination register will decrease an appointed constant in the range of user-defined.

■ ID

The station number of PLC

■ Type

When the key is defined to set a switch, the definition number of the PLC relay corresponding to the switch is determined by the type here.

■ Group name & Element name

Set the address of the relay.

■ Set ON

Set the designated relay on.

■ Set OFF

Set the designated relay off.

Reverse

Set the designated relay to be of negative logic.

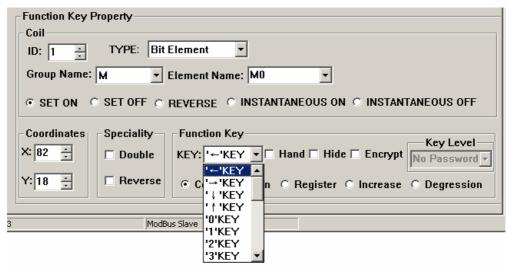
Instantaneous on

The designated relay will be set on when the key is pressed down. When the key is released, the relay will be set off.

Instantaneous off

The designated relay will be set off when the key is pressed down. When the key is released, the relay will be set on.

Click the down arrow on the right of the list to show the names of the 24 keys. Select the proper key to be defined.



To make the screen simple, the hand shape can be removed by not selecting the checkbox "Hand". So only the keys are shown on the screen. Select the option button "Jump to" to define the key as a screen jumping function key. Designate the target screen number below the key. If the number is 10, it means screen no.10 is the parameter setting screen.

To hide the parameter setting screen, select the checkbox "Password" to enable the password property. Thus the system will jump to screen no.10 only when the password entered has the same or higher priority and it is correct.

After setting the function key, put the text "set parameter" beside the key symbol to inform the operator that it will jump to the screen for parameter setting when $[\triangleright]$ is pressed.

Note: To leave some margin for inserting new screens, the number of different kinds of screens should be non-continuous.

Setting register parameter with a single function key:

To write a parameter (or constant) to a designated register, select a function key from the key list and select the option button "Register". The constant parameter will be written to the designated register when that key is pressed during running. Setting as the following figure will write the hexadecimal number 7FFF to the D register at address 0.

Function Key Property								
_ Register								
ID: 1 🔆 TYPE: Word Element 💌								
Group Name: D 🔹 Element Name: D0								
Register Num: 1 🛓 HEX 💌 Parameter: 7FFF 🙀								
Coordinates Speciality Function Key								
X: 82 * Double KEY: '-'KEY T Hand Hide Encrypt No Password V								
Y: 18 👘 🗆 Reverse C Coil C Screen @ Register C Increase C Degression								

Increasing the constant of the register with a single function key:

To increase a parameter (or constant) to a designated register, select a function key from the key list and select the option button "Increase". The constant parameter will increase by degrees until reach the upper limit value. The example below can let the register D0 add 100 every time when the key pressed, the upper limit value is FFFF (Hex).

Function Key Property									
ID: 1 TYPE: Word Element Adding Or Subtract Value Set									
Group Name: D Element Name: D0 A/S Value: 100									
Register Num: 1 VINSIGNED VUL Limit: 65535									
Coordinates Speciality Function Key X: 82 Double KEY: '~'KEY Hand Hide Encrypt No Password									
Y: 18 🛓 🗆 Reverse O Coil O Screen O Register O Increase O Degression									

Degression is similar. Users should set the lower limit value. Under the default condition, the Min limit value is 0.

2.5.8 Data Display

This section will introduce how to make a Set parameter screen. The methods of setting the components such as parameter display, parameter setting and password setting are discussed in detail.

The procedure of making the screen:

Click [Tool] [New Screen] or click the screen description to pop up a dialog box for setting the screen number and the screen description.

New Screen	X
Screen Num: 2	•
Screen Description:	creen2
ОК	Cancel

Screen Num:

The serial number of the new screen.

Screen Description

Descript the character of the new screen.

Click the blank of the screen editing region or click the screen description in the left of the dialogue box to pop "Screen Property" dialogue box of the current screen.

	Screen	
Screen Description:	screen1	
Up'Key To Screen:	1 .	Option • RS485
Down'Key To Scree	n: 1 🚊	С СОМ1

■ "Up"/"Down" Key To Screen:

Choose the screen which to jump to when the []/[] key pressed.

Option

Choose the communication port of the current screen. OP10 supports different screens in one project communicating with other devices through different ports.

Put the data display boxes. Press **99** to show a rectangular dotted box moving with the cursor. Click the left button in the proper position. The number "12345" in the dotted box indicates that this component is a five-digits register displaying/setting box.

The properties in the dialog box are:

■ ID

The definition number of the PLC register corresponding to the display component.

Register num

It is the amount of the registers being displayed or set. The minimum number is 1, and the maximum is 2.

Encrypt

If selected, the data can be changed only when the correct system password is entered. The command for setting the password is in the menu "Tools(\underline{T})".

■ Show

Input Digit

The maximum number of digits of the data being displayed or set

Point Digit

The length of the significant digits behind the decimal point

Indent Manner

Right Indent. When users only want to show the high bit, right Indent can be chosen. Left Indent. When users only want to show the high bit, left Indent can be chosen. **Example:** The presettable value of T register of SG2 is from 0 to 99999. Users can choose 4 bits to show, left indent, ignore high bits. Now, the value is from 0 to 99999.

Decimalist.

The data in the register will be displayed in decimal form.

Signed

Only valid when the "Dec." mode is selected. If the highest digit of the register is 1, the data will be displayed as a negative number. For example, the hexadecimal number FFFEH represents –2.

■ HEX/BCD

The data is displayed in hexadecimal form.

■ Set

The component can be used for setting data if it is selected. So the component can be used for both monitoring and setting the data. The register set box has some special properties: maximum, minimum and password.

Project data

Project data shows proportional data.

Example 1:

Set A output as below:

Group name= D; Element name= D0; Register Num= 1; Input Digit= 5; Point Digit= 0; Decimalist; not show the negative.

🚸 OP SerialScreen	
	n(O) View(V) Tool(I) Help(H)
🗅 🖻 🖬 🖊	🛧 🛗 🕲 🗗 A AA 99 🗓 🗠 🌇 🗁 🖆 🦉 🔧 💽 🗞 🗯 0.0
	GRAPH OF SOURCE
screen1 screen2 AddressList	A Output: 12345 ton :
Project	Register Property Coordinates Speciality X: 92 * Double Y: 11 * Reverse Y: 11 * Reverse Pecification DeclMALIST SIGNED Point Digit: 5 * Point Digit: 0 * C Left Indent Register Vint Set TYPE: Word Element * Group Name: D V Element Name: D0 V ID: 1 * Register Num: 1 * Original Data * Project Lower Limit: 0 * V
Ready TP	03 ModBus Slave
jire	productive of the second secon

Use the same method to set the current screen, which shows the output of B. The register address is D1. Other properties are the same as A.

After downloading the configuration screens from PC to OP10, OP10 will demand the value of D0 and D1. Then the value will be displayed on the screen in time. Users only need to put the output of A in D0, B in D1. They do not need to care the communication between TP03 and OP10.

Example 2: Project Data

If the input voltage of TP03 AD module voltage is 0-10V, the value of the corresponding register is 0-1023 and that users only want to show the current voltage, users can set project data. Suppose the corresponding register with AD is D0.

Help SerialScreen Setting Tool - File(E) Edit(E) Option(Q) View(V) Tool(T) Help(H)		× ==
🗅 😂 🖬 🔸 🛉 🕮 🕲 🗈 a aa	99 📱 🗠 🐒 🗆 🗟 🗠 🕽	🎽 🏦 🔌 🗈 🗞 🤩 0.0
- Screen		GRAPH OF SOURCE
AddressList	oltage) =	45 V
X: 130 🚊 🗖	ement	Point Digit: 0 👘 Cett Indent
Element Name: D0 ID: 1 Register Num: 1	Key Level No Passwor Project Data	t Upper Limit: 1023 Lower Limit: 0 Project Upper Limit: 10 Project Lower Limit: 0
Ready (TP03	ModBus Slave	

The Converted Data= (original register data – Min Input) * (Eng. Max – Eng.Min) / (Max Input – Min Input)

2.5.9 Data Setting

Continue the configuration of the parameter-setting window. Press **99** to show a dotted box moving with the cursor. Move the cursor until the proper position is reached, then click the left button to confirm the position. Select the "Set" checkbox. So the component has the function of monitoring and setting the data.

Limit Set Set 🗖 Ecrypt Upper Limit:	1023
Key Level Lower Limit:	0 🗧
No Passwor 🗾 Project Upper Limit:	10 -
Original Data 🔻 Project Lower Limit:	0 <u>*</u>

If the "Set" checkbox is selected, two additional options, "Encrypt" and "Upper/Lower Limited", are enabled.

Encrypt

To enhance the security of the device, the operation of parameter setting can be protected by password.

To set or change the password, activate the command "Tool(T)" "Encryption lever set" to pop up a dialog for password setting:

Pa	isswo	rd(Le	vel)Set		×
	-Pas	swo	rd(Level)Set—		
			Password Set	Level Set	
	1:		0000	Low-Level	-
	2:		0000	Low-Level	-
	3:		0000	Low-Level	~
	4:		0000	Low-Level	-
	5:		0000	Low-Level	-
	6:		0000	Low-Level	-
	[0	ĸ	Cancel	

Enter a new password, change the original password or set the priorities of the passwords. For example, enter "5678", choose the priority "Mid-Level" and click "Ok". Then the password is affirmed.

There are at most 6 passwords which can be set in OP10. Those passwords are classified into 3 ranks. "High-level" has the highest priority with "Low-Level" having the lowest. For example, if one specific key need a "Mid-Level" password to react, now inputting "Low-Level" password is useless. You can input "Mid-Level" or "High-Level" password to run this function.

When the operator press the key [ENT], the OP10 will pop up a password enter window. Appointed data can be changed only when the priority of the entered password the same as or higher than the one of the registers, users can modify appointed data.

The password is effective only once. Users need to input the password again, when they want to modify the data for a second time.

■ Limit Set

The designer can set limits to the data to make the data out of limits invalid. Thus the possible damage done by inputting data too great or tiny is avoided. For example, let the maximum input be 9000 and the minimum be 0. The setting value will be written into the register only when it is between 0 and 9000, or the system will halt until a correct value is entered.

Limit Set		
🗹 Set 🗖 Ecrypt Upper Limit:	1023	•
Key Level Lower Limit:	0	•

Original and Project data

After selecting the "Limit Set" checkbox, the designer can select the original data or the project data from the list.

Original data

The original data option means that the data in the register will be displayed without any operation. The position of the decimal point is determined by the value of the "Decimal"

property. For example, if "Decimal"=2 and the register value is 14561, it will be displayed as 14561

Project data

This option means that the data read from the register will be converted to project data before being displayed. The conversion is done following the formula below:

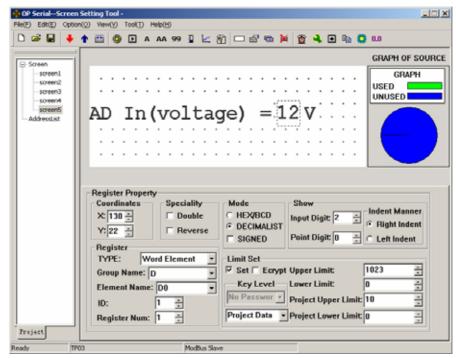
The Converted Data= (original register data – Min Input) * (Eng. Max – Eng. Min) / (Max Input – Min Input)

Users can use project data in such conditions, for example:

AD real input is 0-1023. But users want to show the data as 0-10V.

Calculate the new data which according to the input of project data. Then modify the value of corresponding register inside the PLC to the new data. Etc.

Example: Users should set 0-10V to correspond with the AD inputting register D0(0-1023). Set as below:



When user set 10, the value of D0 is 1023.

When user set 0, the value of D0 is 0.

The value of D0 (original register data – Min Input) * (Eng. Max – Eng. Min) / (Max Input – Min Input)

2.5.10 LED

Create a new screen like this:

🚸 OP SerialScr	reen Set	ting T	ool -																			-IIX
File(E) Edit(E) C	Option(<u>0</u>)	View	ŝ	Tool(]	D⊦	telp(H	0															
D 📽 🖬	+ +		٩	Þ	Α	AA	99	3	Ŀ,	80		đ	8	×	Ô	4	٠	6	0	0.0		
R-Screen	-10																			GRAPH	I OF SC	URCE
Screen Screen1 Screen3 Screen3 Screen4 Screen5 AddressList			Coo X: Y: Spe		ate:		Sho	1 upN w	lam		1	- - - - -	-		men	_	me:			USED		
Project																						
Ready	TP03							ModE	Jus S	lave												

Press log to put a LED. There is a dotted box moving with the cursor in the editing region.

Click the left button in the proper position to locate the LED.

Coil

The definition of the PLC intermediate relay that is corresponding to the LED

■ Shape

The shape of the LED, round and square.

Positive Logic

The LED is filled when the corresponding intermediate relay is ON. Unfilled when the corresponding intermediate relay is OFF.

■ Negative Logic

The LED is unfilled when the corresponding relay is ON. Filled when is OFF.

2.5.11 Function Keys (for controlling the status switches)

Press **D** to activate a dotted rectangular box. The box moves as the cursor moves. Click the left button to determine the position of the function key.

Select button Set the attribute as below:

	erial5		_	_	_	_	(T) 1	dalla O	0														_	X
File(E)		Uption Uption	-	mev iiii	0		-		-	Ð	1er	80		1 167		×	Ť	a	•	8	0	0.0		
E So		_	Ē	_	-	-				-		<u></u>		_			_	-	-	-			OF SOU	RCE
	screen2 screen2 screen4 screen4		3	Col ID: Gro	I I I I I I I I I I I I I I I I I I I	i Nam ON		SET Spe	PE:	v r r r r r r	Ele RE	Funct	t Na SE ion I	C II Key KEY	NST/	т на	and i	н	ide l		ncry		US OFF	- 1
Ready		TP	03							Mod	Bus S	lave												

It means the status of coil M0 is reverse when is pressed

2.5.12 Bar Graph

The bar graph can give a direct view of some analog parameters such as flow rate, pressure and level. The user can set the height, width and the direction of it arbitrarily.

Press **I** to show a dotted box that moves with the cursor. Move the cursor to the proper position and click the left button to locate the bar graph there.

🔶 OF	SerialS	icree	n Set	ting 1	iool -																			х
File(E) EdR(<u>E</u>)	Opti	on(Q)	View	ŝ	Took(DH	telp();	Ó															
D	i 🖉	÷	+		0	Þ	A	AA	99	3	Ы,	8		6	1	×	Ô	4	٠	1	0	0.0		
	Screen	_																				GRAPH 0	F SOURC	E
ľ	screen	2										Г	٦.									GR/ USED	лрн]
	- screen	-					:	Ċ		1	:	1	Ľ		: :	:	:				:	UNUSED		
١.	screen/											-												
								·	• •				•		• •		·			•	•			
						• •	•	:			•		÷			•	:	• •			:			
					•		•	•			•					•	·			•	•			
				- Hit	stog	ram	Prop	perty																
				EC.	oor	linat	es	ЪĽ	Size					Sho	w									
				×	: 06	;	÷	1	Widt	h: [16	÷		Full	Valu	ie:	655	35	_	_	÷			
				۲	*: Ø		-		Heig	ht:	48	÷		Zer	o Val	ue:	0				÷			
				-R	legis	ster										_	Mo							
				Ш			1	-	-			er Nu	ım:	1	÷			HE			π			
					YPE				eme	nt	•							SIC						
						Na			0				*				Dir	ectie	n:		_			
Pres	jact	_		E	lem	ent M	łam	e: I	00				٠				0	war	ds		•			
Ready	<u> </u>	In	P03		_	_	_	_	_	Mod	Bus S	Lawa	_	_	_	_	-	_	_	_	_			
									-	-		210												

Register

The address of the register corresponding to the bar graph

■ Full Value

The register value corresponding to the full bar graph

Zero Value

The register value corresponding to the empty bar graph

Direction

The direction of the bar graph, including four options: up, down, left and right.

Size

The height and width of the bar graph

The next example shows how to use bar graph to show the pressure.

Ple(F) Edt(E) Option(etting Tool -
0 📽 🖬 🖊 1	0.0 🗯 🗗 🕹 🌋 🖄 🗁 🛐 🔛 👔 🖉 🖬 🖄 🐨
E-Screen	GRAPH OF SOURCE
	Image: pressure Image: pressure Image: pressure Image: pressure
	Y: 7 - Height: 48 - Zero Value: 0 - -
Project	Register Mode ID: 1 2 Group Name: D I Element Name: D0 I
Ready TP03	ModBus Slave

The bar graph demands the data in D0.When the bar is full, it means the data is 1000 in D0.When the bar shows the scale of 500, it means the data is 500 in D0.

Bar graph shows data directly. And it is real-time updating. It's fit for showing pressure, voltage or other signals like these.

2.5.13 Trend Line

Some parameters in industrial control applications vary at a slow rate. Often, the operators want to know the variations of these parameters in a certain of time. Trend line should be the best choice.

Press key to show a dotted box that moves with the cursor. Move the cursor to the proper position and click the left button to locate the trend line there.

🕴 OP SerialScreen	Setting Tool -
File(E) Edit(E) Option	n(Q) View(Y) Tool(T) Help(H)
D 🖆 🖬 🔶	🕈 🕮 🕲 🖬 A AA 99 🕽 🔄 😭 🗔 🕼 🎽 🎬 🍓 🖬 🖏 💭 💷
Screen screen1 screen2 screen3 screen4 screen4 screen6 AddressList	GRAPH OF SOURCE
Troject	Graph Property Coordinates Y: 6 * Full Value: 65535 * Data Collection: 4 * Point Zero Value: 0 * Timing Interval: 2 * Second Size Width: 56 * ID: 1 * Register Num: 1 * Height 48 * Group Name: 0 * Element Name: D0 * Mode C HEX/BCD © DECIMALIST T SIGNED
Leady TP	03 ModBus Slave

Register

The address of the register corresponding to the trend line

■ Full Value

The register value when the trend line reaches the 100% of the scale

Zero Value

The register value when the trend line reaches the 0% of the scale

Data Collection (number of dots)

The total of the sample points in the whole trend line. The more sample dots does the trend line has, the more detail it can provide. Certainly more sample dots make the time period longer. The largest number of the dots is the width of the trend Line minus 2.

Timing Interval

The interval between two sample points . Max: 65535 seconds, Min: 1 second

Size

The length and width of the trend line. Max: 192*64 point, Min: 16*16point

Note:

1. A trend line component can display only one line.

2. There is no limit to the amount of the trend lines on the screen. But the amount of data collection can't be more than 384 on one screen.

3. The newest data is appeared on the right side of the trend line. When a new data comes, other former data move to the next left grid.

2.5.14 Alarm List

In industrial auto-control applications, alarming is a very important function. It can be used in many cases. Alarm list is the most direct and simple method.

Every project of OP10 can have a cluster of alarm list information. Every piece of information corresponds to a relay. The addresses of all the relays are continuous. The user can designate the initial address of the relays. When any of the relays jumps from OFF to ON, the corresponding alarm information is activated. OP10 will pop up the alarm window, where the alarm information is displayed in the first row. If another relay jumps to ON, the new information will be displayed in the second row. When some alarm relay jumps to OFF, the corresponding alarm information will disappear automatically.

To log the alarm information, press 🔯 to pop up the alarm list dialog box:

larm List				3
Section Num: 1	•			
Section property	of alarn	n list:		
Start Coil: M		▼ M0	*	
ID: 1	÷	Port • RS485	С СОМ1	
E NAME	ALAR	M CONTENT		
	ļ			

The list is blank for no information has been logged. Move the cursor to the "Alarm description" column and enter the information "Temp. too high". Press "Enter" to show the screen as the following figure:

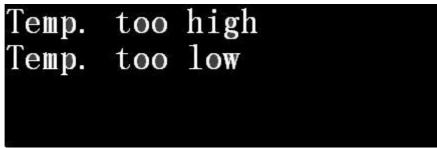
Alarm List	<u>×</u>
Section Num: 1	•
-Section property	of alarm list:
Start Coil: M	• M0 •
ID: 1	Port
E NAME	ALARM CONTENT
MO	Temp. too high

Input other information in the same way.

Section I	Num: 1	•
Section	property	of alarm list:
Start Co	oil: M	• M0 •
ID:	1	× Port → RS485 C COM1
E NAME		ALARM CONTENT
M0		Temp. too high
M1		Temp. too low
M2		Motor speed > 2000rpm

After entering all the information, set the coil type and address to M0 (for example) to indicate that the relays M0-M2 correspond to three pieces of alarm information.

When OP10 is in gear, if M0 and M1 are set ON, it will pop up an alarm window and display as the figure below shows:



Seeing this alarm window, the operator can take some measures to solute the breakdowns. To return to the monitoring window, press [ESC]. When OP10 is displayed a common screen, users can press [ALM], if they need to inquire about the status of the alarm information of current destination controller. Then system will jump to the alarm screen.

2.5.15 Chief button

Click	in the toolbar to pop a Chief Button dialogue box.
CHCK	in the toolour to pop a chief Batton alatogue box.

ief Button		
KEY:	New Delete	
Function Key Pro	perty	
Coil 10: 1 ÷	TYPE: Bit Element	
Group Name:		
	SET OFF C REVERSE C INSTANTANEOUS ON C INSTANTANEOUS OFF	
* SETUN C	SET OFFICI REVERSE CINSTANTANEOUS ON CINSTANTANEOUS OFF	
Port	Function Key Key Level	
@ RS485	Encrypt No Password -	
C COM1	Coil C Screen Jump C Set Register C Increase C Degression	
OK	Cancel	

Click [New] to add "←" button. Set the function as "set M0 on".

Chief Button	×
KEY: '←'KEY ▼ New Delete	
Function Key Property	
ID: 1 TYPE: Bit Element V	
Group Name: M T Element Name: M0 T	
G SET ON C SET OFF C REVERSE C INSTANTANEOUS ON C INSTANTANEOUS OFF	
Port Function Key Key Level	
RS485 Encrypt No Password	
C COM1 C Coll C Screen Jump C Set Register C Increase C Degression	
OK	

The button of OP10 can be set for chief function. The priority order from high to low is: basic function > local button > Chief button. So if there is a [\leftarrow] on the screen, OP10 will execute the function which on the current screen when the button is pressed.

2.5.16 Copy the value of registers form one device to other.

Copy Sou	First Gr	oup	•		
ID: 1	· · ·	• RS4	Port 185 © COM1	Register Nun	n: 1 🛓
Group Na	ame: D		 Start Elem 	ent Name: D	0
List Of Co	ру То —				
ID: 1	×		Port 85 C COM1	Register Nurr	ı: 1 🚊
Group Na	ame: D	- 	Start Elemen	t Name: D0	
New	Delete			,	
NUM	ID	G NAME	SE NAME	E NUM	PORT

Click in the toolbar to pop a Copy Register dialogue box.

Users can set 3 groups of relationships about registers transferring. Every communication scanning cycle, OP10 will check the synchronization between source PLC and those of destination PLC once. If source PLC has communication errors, OP10 won't update the registers of destination PLC. Every corresponding relationship contains one group of source addresses, 5 groups of destination addresses and can transfer 16 seriate word registers (not support double words register transfer) at most.

Click "New" Button. An "Add Register" dialogue box will be popped. Set the attribute of the register:

Add Register	×
ID: 1	
• RS485 • C	0М1
Group Name:	D
Start Element Name:	D0 •
ОК	Cancel

Example: Copy the content from D0-D10 of ID1 to D20-D30 of ID2.

Copy Register GroupNum: First Group
GroupNum: First Group
Copy Source:Port
ID: 1 🔆 © RS485 © COM1 Register Num: 11 🛬
Group Name: D 🔹 Start Element Name: DO 💌
List Of Copy To
ID: 2 * © RS485 © COM1 Register Num: 11 *
Group Name: D 💌 Start Element Name: D20 💌
New Delete
NUM ID G NAME SE NAME E NUM PORT
1 2 D D20 11 RS485
OK Cancel

It doesn't matter that source PLC and destination PLC are not on the same bus. OP10 can use download port to communicate with source PLC, then send the data of registers to the destination PLC through 485 bus. Users only need to choose the communication port in the dialogue box simply.

2.5.17 Preset dynamic text

In the example given below, the PLC type is TP03. Establish a new project, choose SV300 as the device.

New And Sel	ect Device	×
New And	l Select Device —	
Device:	TP03 🔹	New Device
-Set Par		cation with Device:
	24300	DM1: Set
- Default	TPU3 option	
• R	S485 C COM1	
	ОК	Cancel

Click in the toolbar to pop a dialogue box like this:

Pr	eset Dynamic Text					×
	Preset Dynamic	Text				
	Туре:	Bit Element	•	VALUE	CONTENT	
	GroupName:	CMD	•	0		
	Element Name:	Operation	•			
	Mode:	UNSIGNED	•			
	ОК	Cancel		1		•

Set the relationship between the status of CMD component (Operation) and the dynamic text:

Pr	eset Dynamic Text					x
	-Preset Dynamic	Text				2
	Туре:	Bit Element	•	VALUE	CONTENT _	
	GroupName:	CMD	Ţ	0		
			뷕	1	Run	
	Element Name:	Operation	-			
	Mode:	UNSIGNED	•			
		<u> </u>	_			
	ок	Cancel				

Choose the type "bit element". Element name is "Operation". When users use dynamic text in the project, the relationship which is preset will be loaded automatically.

🚸 OP SerialScr														<u>_ </u>
)ption(<u>O</u>)				-									
	<u>↓ ↑</u>	**		A AA	99 📱	<u> </u>	81 🗆	. 🔊 .	a 🎽	🖄 🍳		e d 🔅	0.0	
Screen													GRAPH	OF SOURCE
AddressList		•••	•••	•••	· · ·	•••	•••	•••	•••		• •	•••	GF USED UNUSEI	RAPH
		•••	•••	•••	•••	St	op	•••	•••	• • •	•••	•••	ONUSEL	
		•••	•••	•••	· · ·	•••	· · ·	•••	•••	• • •	•••	•••		-)
		••	•••	•••	•••	•••	•••	• •	••	• • •	•	* *		
			mic Te× rdinate				lode —			Show Te	ext —			
		X: 7			Double		⊙ HEX ⊙ DEC		ят	VALUE 0	Stop	TENT		-
		Y: 2			Revers	e	🗆 SIGI	NED		1	Run			
		ID:	1	* *	TYPE	: Bit E	lement	t	-					
			up Narr ment Na		CMD Opera	ntion		- -						_
Project					1-6-00					•				
Ready	SV300				Mo	dBus Sla	ve							

Presetting dynamic text can correspond Chinese characters with the function of the registers. It can help the users to be familiar with the registers inside the PLC quickly.

2.5.18 Preset register

Example: SV300

eset Register			
Preset Register Type:	Word E	Element _	Register Property
GroupName: Element Name:	0- 0-0		Point Digit: 0
Mode:		GNED 💌	Register Num: 1
Limit Set			
Upper Limit:		65535	× •
Lower Limit:		0	▲ ▼
Project Upper	Limit:	65535	► ▼
Project Lower	Limit:	0	* *
ОК			Cancel

Click **0.0** in the toolbar to pop Preset Register dialogue box.

Some register value has its own prescriptive format, such as the "Set Frequency" register of SV300. If we set the value of the register as 50Hz, the real value of the register is 5000. Using the presetting, we can set the actually frequency to be the same with the value which we set. Both of them are 50.

Set "Set frequency" register as the following picture.

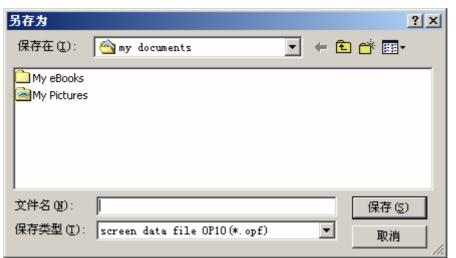
Preset Register					
Preset Register	Element Register Property Input Digit: 5				
Mode: UNSI	GNED 🔻 Register Num: 1 🚔				
Limit Set					
Upper Limit:	65535				
Lower Limit:					
Project Upper Limit:	65535 <u>×</u>				
Project Lower Limit:					
ОК	Cancel				

Now if users put "Register components" in the editing region. Choose "Set Frequency" register. The picture below will be shown on the screen:

OP SerialScreen Setting Tool - File(E) Edit(E) Option(Q) View(V) Tool(T) Help(H)									
	↑ ※ @ ▶ A AA 99 ↓ ½ ※								
- Screen - screen1 - AddressList	GRAPH OF SOURCE GRAPH OF SOURCE GRAPH USED UNUSED UNUSED GRAPH USED UNUSED UNUSED GRAPH USED UNUSED UNUSED UNUSED UNUSED UNUSED UNUSED Coordinates Y: 21 - Reverse Node Register Property Coordinates Y: 21 - Reverse Node Content Manner Register Property Coordinates								
Froject	Register TYPE: Word Element Image: Signed to the second sec								
Ready SV	/300 ModBus Slave								

It is convenient for users to use Register components to control registers with prescriptive format.

2.6 Save Project



Press or ckick [File] [Save] to show the save dialog box:

Select the proper path and filename to save the file. The system defines "opf" as the default external filename.

Enter the filename and select the proper path, then click "Save".

2.7 Download Window

Connect the 9-pin RS232 serial port of PC and that of OP10 with the communication cable. Make sure that OP10 is connected with a 24V DC power supply.

Click "File(F)" "Port" to set communication attribute:

🌵 OP SerialScreen Se	tting Tool -
File(E) Edit(E) Option(O) View(Y) Tool(I) Help(H)
New Ctrl+N Open Ctrl+O Save Ctrl+S	🖽 🐵 🗈 🗛 99 📱 🗠 街 🗆 🖆 🥨 🎽 👘 ڭ 💷 GRAPH OF SOURCE
Save as Orl+A	GRAPH OF SOURCE
Device Otri+D Port Otri+T	
Exit Otri+X	
	Function Key Property Coil ID: 1 TYPE: Bit Element
	Group Name: CMD Element Name: Operation
Project	Coordinates Speciality Function Key X: 107 ÷ □ Double KEY: '←'KEY ▼□ Hand □ Hide □ Encrypt Key Level Y: 45 ÷ □ Reverse If Coll □ Screen □ Register □ Increase □ Degression
Port Select SV300	ModDus Slave

Pop such a dialogue box:

S	elect Port	×
	Select computer's port that used to download data	
	Port: COM1 💌	
	OK	

This dialogue box is used to setting the communication port of downloading configuration screen. Users should set the attribute of serial port carefully.

Choose "Option(O)"	"write" or press 🔸 to b	egin the download process
	OP10-PCLINK	×
	Do you want to downlo	ad screen description?
		取消

Each screen has a certain character room to describe its own function. Users can choose whether these characters download to the memory of OP10. Next time, these characters can be displayed when the project is uploading.

If choose "No (N)", OP10 won't these characters.

A dialog box will be displayed to indicate the progress of downloading:

Write	
Writing	

If OP10 successfully downloads all the screens:

OP10-PCI	.INK	×
⚠	Write fin	ished!
	确定	

If OP10 fails to download the screens:

OP10-PCL	INK	×
⚠	Communicatio	on Error!
	确定	

When you see the communication error, please check the power supply, whether the download cable connected in the right way and whether users have chosen the proper COM port.

2.8 Importing .OPf Project

Users can read the data of project in OP10. The precondition is that the project isn't encrypted (the "Encrypt Project" option has not been chosen , press vou can see the dialogue box).

OP Serial Setting	×
OP Serial Parameter	
Screen Protect	
Screen Protect Time:	Shut Background Light
None	O Show Screen:
Encrypt Project Chief Scre	en Num: 1
Commnication Time: 20	🔺 mS (10-50 mS)
Overtime Time: 300	▲ mS (100-1000 mS) ▼
COP Serial Control	
Group name: D	✓ ID: 1 ✓ Port
Element Name: D0	• © COM1
-Alternation Control	
🗖 Auto-changer Screen:	[0P <- PLC]
🗖 Clear After Changing	
Report Current Screen:	$[0P \rightarrow PLC]$
ОК	Cancel

Encrypt: When this option has been chosen, the data is protected. Users can't use OP10-PCLINK to read the project.

The flow of reading project is as follows:

Press "File"→ "Port":

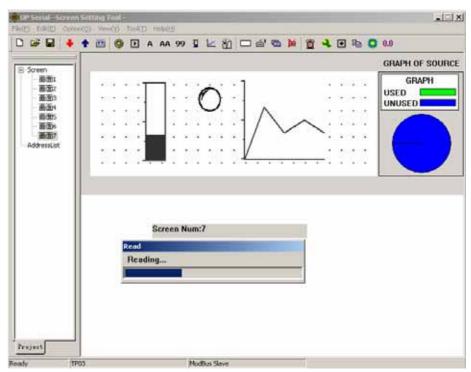
9	Select Port	×
	Select computer's port that used to download data	
	Port: COM1 💌	
	OK Cancel	_

Choose the proper PC serial port.

P OP SerialScreen	Setting Tool -
	te Col+W 🛛 🗁 🖄 🗆 🖓 🐨 🍇 🗐 🗞 🎁 00
	vple Ctrl+E GRAPH OF SOURCE
screens	ulate Ctri+M te Screen Description Ctri+D
	Function Key Property
	Coil ID: 1
Troject	Coordinates Speciality Function Key X: 99 ± □ □ Double KEY: ''KEY ± □ Hand □ Hide □ Encrypt No Password ± Y: 36 ± □ Reverse □ Coil □ Screen □ Register □ Increase □ Degression
Read TPC	73 ModBus Slave

Click **•** in the toolbar or choose "Option" "Read".

Reading:



Reading successful:

OP SerialScreen	
	n(② View(Y) Tool(T) Help(H) ▲ @ D a aa ag I 1 / ♡ □ - N = ★ 分 N D = ☆ 0.0
Screen Screen2 Screen3 AddressList	A AA 99 E A AA 99 E C OL GRAPH OF SOURCE Positive: Negative: Screen Property
Project	Screen Num:3 Screen Description: screen3 'Up'Key To Screen: 2 * 'Down'Key To Screen: 1 * C RS485 C COM1
Ready TP	03 ModBus Slave

Just as the picture show, after successful reading the project, users can go on to edit it. The condition we just talk about is that users didn't set password (level) yet.

If users already set password (level) like this:

Pa		_	vel)Set		X
	-Pas	SWO	rd(Level)Set—		
			Password Set	Level Set	
	1:	◄	6666	High-Level	•
	2:	◄	4444	Mid-Level	•
	3:	•	1111	Low-Level	•
	4:		0000	Low-Level	-
	5:		0000	Low-Level	-
	6:		0000	Low-Level	-
	[0	ĸ	Cancel	

Click **^** in the toolbar or choose "Option" "read". The dialogue box will be displayed on the Pc screen.

Read	
Reading	
Please Input Password	
Password:	
OK Cancel	Port O RS485
	○ COM1

Input the highest-level password of the project ---"6666" to go to the next step. If there are more than one high-level password, inputting anyone of them is suitable.

3 Manipulation

3.1 Communication

Connect OP10 and PLC with a communication cable. (Pay attention to 3 ways of connection: 232/422/485.)

Turn on the power supply for both OP10 and PLC. If communication is in gear, OP10 can carry on the operations such as data monitoring. If there are communication-parameter errors or connection-cable errors, the communication will be failed. The type of error will be winked in the center of the display. It shows the condition of communication.

3.2 Changing the screens

Consult other examples.

3.3 System Password

Pā	asswo	rd(Le	vel)Set		×
	-Pas	swo	rd(Level)Set—		
			Password Set	Level Set	
	1:		0000	Low-Level	-
	2:		0000	Low-Level	-
	3:		0000	Low-Level	-
	4:		0000	Low-Level	-
	5:		0000	Low-Level	-
	6:		0000	Low-Level	-
	[0	K	Cancel	

(Read the data of the project by using password: If there are passwords in the project, and there are no options to encrypt the system, users can upload the project to pc and use the software to edit it again.User must input the high-level password to read the data, when there is a dialogue box, which inquired inputting password, popped during reading.)

🔶 OP SerialScreen				×
	n(Q) Yiew(Y) Tool(T) Help(H	-	m 🎽 🏦 🔌 🗩 🗞 💭 0.0	
				OF SOURCE
Screen Screen Addresslist	Group Name: D Register Num: 1 Coordinates Sper X: 79 : C Y: 22 : F	PE: Word Element PE: Bernent Name: D UNSIGNED Param clality Function Key Double KEY: ****KEY	0 v	ry Level assword y

Example 1: Encrypt the key when the key controls registers.

Put Dutton in the editing region. Set the function as: Change the value of D0 into 1234. Users must set password (level) first to use the "Encrypt" function. So now if you choose "Encrypt" box, a warning dialogue will be popped. Because the system has not been set password yet.



🗅 😂 🖬 🔸 🛧 🔠 🚳 🗈 a aa 99 📱 🗠 資 🗔 🖆 🖄 🌋 🔍 🗈 🖏 🥨 0.0	H)	OP Serial—Screen Setting Tool - File(F) Edit(E) Option(O) View(V) Tool(T)
		production of the second se
Screen AddressLst Password((Level)Set Password((Level)Set Password(Level)Set Set Password(Level)Set Set Password(Level)Set Password(Level)Set Password(Level)Set Password(Level)Set Password(Level)Set Password(Level)Set Password(Level)S	Word(Level)Set Password Set Level Set : : : : : : : : : :	AddressList

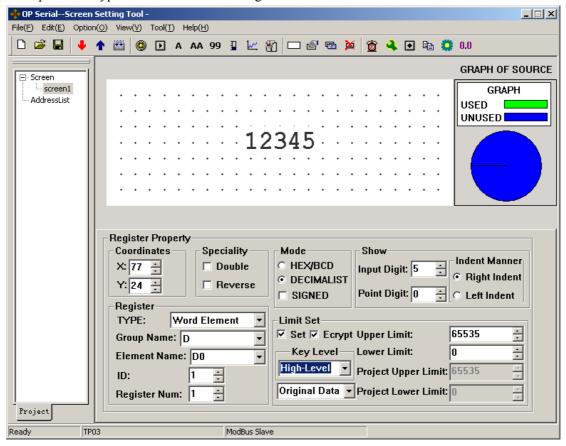
Choose "Tool" \rightarrow "Encryption level set" to pop dialogue. Set 6 passwords.

Return to the screen to set the key level. Choose "Mid-Level".

۰)P S	ierial-	Sci	ееп	Sel	ting	Too	-																					_	
File	(E)	Edit(E) (ptio	n(<u>O</u>)	Vie	w(⊻)	Т	ool(]	DН	Help(<u>F</u>	Ð																		
) 🖸	ê 🕻	3	₽.	Ť			0	Þ	Α	AA	99	1	<u>.</u>	8	ם ב	_ d	9 9	3	×	1	4	•] 🗎	a (0	.0			
	l- Sc	reen		-1																						G	RAF	эн oi	F SOL	JRCE
		reen scre idressi				Co ID Gr	il : 1 oup SE1 ordi 92	Na F O	÷ ame N tes	• •	A SET Spe	PE:	▼ Ty-	t Ele RE	WEF Func (EY:	nt N RSE ction	n Ke 'KE'	INS y Y _		Ha	nd [- н	ide	V	Enc	TAN		GRA D SEDI	S OFF	
P:	roje	ect				••]		•	1				.136		• C	oil	0	scre	en	0	Reį	jiste	er () Ir	icre	ase	0	Degr	essio)n
Read	зy			TP	03								Mod	Bus S	ilave															

After configuring the function well, users need to input password when press 🗹 button.

Because we set the Key Level as "Mid-Level", when users input low-level password can not carry out the function to set the register. Only to input Mid-Level or High-Level password can set the value of D0 1234.



Example 2: Encrypt when set the value of registers.

Users correspond the widget with D0, choose "Set" and "Encrypt" option. Set "Key-Level" as "High-Level".

Users need to input the password, when they press [SET] button. Users won't have the right to modify the data, unless the password they have just input having the high level. Any of the high-level password is ok. Then the passoword is effective for one time. The next time when you need to input password, you should input the password again.

Remind of setting password: OP10 has different levels of passwords. And the password is effective for just once. So if in one screen there are more than one widgets used for inputting and all of these widgets are needed passwords to work, users can let the screen hidden. Set a certain button (Pressing the button the display will jump to the hidden screen.)with high-level password. Make sure that only system controller can interview this screen.

4 Create new device

OP10 supports that users can add new devices based on the existent communication protocol, such as adding a new PLC device which sustains MODBUS RTU protocol.

÷0	P Serial	Screen	Set	ting T	iool -																		
File(§	Edk(E)) Optio	n(Q)	Yiev	Ś	Tool()	DH	Help(<u>}</u>	D														
	i 🖉 🔛	$ \Psi $	÷	14	٢	E	A	AA	99	1	100	衢	Ð	6	茵	Û	44	۲	励	*	0.0		
1																						 	_
	Screen																						
11-	AddressLi	st.																					
		- 1																					
		- 1																					
		- 1																					
		- 1																					
		- 1																					
		- 1																					
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		- 1																					
		- 1																					
		- 1																					
Pu		_																					
_	oject		J																				
Ready	1	No	Devi	ice						No P	rotoc	ol											

Click D in the toolbar to create a new project. A "New and Select Device" dialogue box will be popped.

New And Select Device
New And Select Device
Device: TP03 New Device
Set Parameter of Communication with Device:
RS485: Set COM1: Set
Default option
© RS485 © COM1
OK Cancel

Click "New Device":

Device Information	×
Device Information	
Protocol Select: ModBus Slave	
The size of Commnication buffer: 30	Byte
Display Format Of 32Bit–Register • Low Word Front • High Word Front	
Device Name:	
OK	

■ Protocol Select: There is a ModBus Slave protocol inside OP10. Based on the protocol, users can define address lists of communication buffer (of destination controller).

■ The size of Communication buffer: the maximal limit of communication buffer.

■ Display Format of 32Bit-Register: In the communication command, the destination controller whether displays the low word in the front or nor.

• Device Name: Set the name of new devices. The names will appear in the device list. Users can choose the new device expediently.

Set communication protocol, the size of the buffer, display format of 32bit-register and the device name. Users can edit the address list after Clicking "OK".

	ress List		×	C
Add	ress List(<u>A</u>) Edit(<u>E</u>)		
	NUM	ELEMENT NAME	ADDRESS(0×)	
	L			
	<u> </u>			
	<u> </u>			
		ОК	Cancel	

Address List(<u>A</u>)	Edit(<u>E</u>)		
	New Element Group	Ctrl+G	
	Delete Element Group		
NUM E	New Element	Ctrl+E	
NUM E	Delete Element	Ctrl+F	ADDRESS(0×)
	ок		Cancel
	ОК		Cancel
w Element Gro			Cancel
w Element Gro	pup		Cancel
Element Gr	oup oup Property Set:	n_q	
	oup oup Property Set:		English characters
Element Gr Element Gr	oup oup Property Set:	and	
Element Gr Element Gr	oup oup Property Set:	and	English characters
Element Gro Element Gro Element Pro	oup oup Property Set:— oup Name: operty: Bit Element	and t	English characters
Element Gro Element Gro Element Pro Whether h	oup oup Property Set: oup Name: operty: Bit Element ave communication	and t comman	English characters symbol v d of read and write coi
Element Gro Element Gro Element Pro Whether h O YES(Hav	oup oup Property Set: oup Name: operty: Bit Element ave communication ve communication o	and t comman command	English characters symbol v d of read and write coil)
Element Gro Element Gro Element Pro Whether h O YES(Hav	oup oup Property Set: oup Name: operty: Bit Element ave communication ve communication o	and t comman command	English characters symbol v d of read and write coi
Element Gro Element Gro Element Pro Whether h O YES(Have O NO(Have	oup oup Property Set: oup Name: operty: Bit Element ave communication ve communication c en't communication	and t comman command comman	English characters symbol v d of read and write coil)
Element Gro Element Gro Element Pro Whether h YES(Have NO(Have	oup oup Property Set: oup Name: operty: Bit Element ave communication ve communication en't communication al Of 32Bit–Registe	and t comman command comman	English characters symbol v d of read and write coil)
Element Gro Element Gro Element Pro Whether h O YES(Have O NO(Have	oup oup Property Set: oup Name: operty: Bit Element ave communication ve communication en't communication al Of 32Bit–Registe	and t comman command comman	English characters symbol v d of read and write coil)
Element Gro Element Gro Element Pro Whether h YES(Have NO(Have	oup oup Property Set: oup Name: operty: Bit Element ave communication ve communication en't communication al Of 32Bit–Registe	and t comman command comman	English characters symbol v d of read and write coil)

Choose "Edit" "New Element Group":

■ Element Group Name: the name of new group. For example, there are registers called X,Y,M,TD,etc. in TP03.

■ Element Property: There are 3 types of elements can be chosen. Bit element, word element and dword element.

• Whether have communication command of read and write coil:: Whether have communication command of read and write coil.

■ The Interval of 32 Bit-Register: Users can define the interval of 32bit-register themselves.

Set the Element group name as "M". default other attribute default Click "OK".

	ress List ress List(<u>A</u>) Edit(<u>E</u>)	
1	M		
	NUM	ELEMENT NAME	ADDRESS(0×)
	Γ	ОК	Cancel

Choose "Edit" now, some options are changed.

	ess List				ļ
Addr	ess List(<u>A</u>)	Edit(<u>E</u>)		r	
N		New Element Group Delete Element Group New Element	Ctrl+G Ctrl+D Ctrl+E		
	NUM E	Delete Element	Ctrl+F	ADDRESS(0×)	
_					
		ОК		Cancel	
		UK		Calicer	

- New Element Group: Repeat former works
- Delete Element Group: Delete the group which has been selected
- New Element: Create a new element in the selected group.
- Delete Element: Delete a new element in the selected group.

Create a new element

Click "New Element":

EL 10.1	
Element Set: Element Name:	Note:Full Element Name
(Start)Address:	Note:He×
Position:After Numbe	er: 0
Batch New Set:	
Element Number Ty	/pe—Address Interval(Increase)——
C OCTAL	Address Interval[Increase]
C OCTAL © DECIMALIST	Address Interval[Increase]
C OCTAL	1 =

- Element Group Set: Select the group of new elements
- New Manner: Add a single element or create elements as a batch
- Element Set:
 - 1. Element: add the name of the element
 - 2. (start) Address: the primal address of creating elements as a batch
 - 3. Position: the primal address

Add a single element:

New Element	×
Element Group Set:	New Manner
Element Group Name: M	Batch New
Element Set:	_
Element Name: M0	Note:Full Element Name
(Start)Address: 0	Note:Hex
Position:After Number: 0	×
Batch New Set:	
Element Number Type	-Address Interval[Increase]
C OCTAL	
C DECIMALIST	1
C HEX	
- New Element Amount:	- Start Element Name Number-
1	
	1
ОК	Cancel

Clicking "Ok", then there will be a new coil called M0 in the group M. Its address is 0.

Add	ress List		×
Add	ress List(<u>A</u>) Edit(<u>E</u>)	
ſ	м		
	NUM	ELEMENT NAME	ADDRESS(0×)
	1	MO	0
	<u> </u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		
		ОК	Cancel
	_		

Creating elements as a batch:

Choose "Batch new", you will see:

New Element	×
Element Group Set:	New Manner
Element Group Name: M	Batch New
Element Set:	
Element Name: M	Note:Name Without Number
(Start)Address: 1	Note:Hex
Position:After Number: 1	×
Batch New Set:	
Element Number Type	Address Interval(Increase)
O OCTAL	
• DECIMALIST	
C HEX	
New Element Amount:	Start Element Name Number
9	1
	,
ОК	Cancel

■ Element Number Type: Set the type of element number as oct, dec or hex. For example: The X,Y elements of TP03 are octal, but the D,T,C elements are decimal.

- Address Interval (Increase): 可 Set interval of two closer elements discretionarily.
- New Element Amount: The amount of new elements.
- Start Element Name Number: Set Start Element Name Number.

Set M1 as the primal element. The amount of new elements is 9. Its address is 1. Other attributes are default. Clicking "OK", The elements in the M group are shown in the picture as below.

NUM	ELEMENT NAME	ADDRESS(0×)
1	MO	0
2	M1	1
3	M2	2
4	M3	3
5	M4	4
6	M5	5
7	M6	6
8	M7	7
9	M8	8
10	M9	9
•		

According to the picture, the result of creating elements as a batch is the same as creating a single element. If there is a certain rule of those elements, we suggest that users can create elements as a batch.

Delete elements:

Select M9 in the address list:

	EMENT NAME	ADDRESS(0×) 📤
M)	0
2 M	1	1
3 M:	2	2
1 M:	3	3
5 M-	4	4
6 M		5
7 M		6
8 M		7
) М		8
10 MS)	9
		•

Choose "Edit" "Delete Element":

Add	ress List				X	
Add	ress List(<u>A</u>) Ed	dit(<u>E)</u>			
M			New Element Group Delete Element Group New Element	Ctrl+G Ctrl+D Ctrl+E	1	
	NUM	E	Delete Element	Ctrl+F	ADDRESS(0×)	
	1	MO			0	
	2	M1		1 2		
	3	M2				
	4	M3			3	
	5	M4			4	
	6	M5			5	
	7 N			6		
	8	M7			7	
	9	M8			8	
	10	M9			9	
	•					
_						
	ок			Cancel		

Select "Delete element" to pop a confirmation dialogue box:

OP10-PCLINK				
Do you want to delete selected ite				
	是(Y) 否(N)			

Click "Yes (\underline{Y}) ". Address list has changed:

dress List Idress List(<i>j</i> M		<u> </u>
NUM	ELEMENT NAME	ADDRESS(0×)
1	MO	0
2	M1	1
3	M2	2
4	M3	3
5	M4	4
6	M5	5
7	M6	6
8	M7	7
9	M8	8
_		
•		
		Cancel

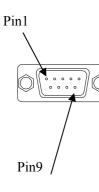
M9 has already been cancelled.

5 Communication

5.1. Communication port

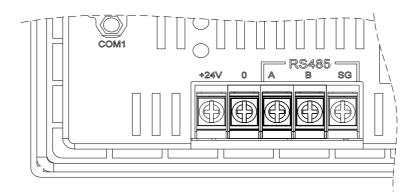
OP10 has two communication ports:COM1 and RS485.COM1 is using for downloading (writing) users' program, and affords RS422 port. RS485 affords RS485 port.

1. 9-pin D-shape male plug (COM1)



Num	Name	Description	
1	TX+	422 send positive signal	
2	RX	232 receive signal	
3	TX	232 send signal	
4	NC	(This pin connect to the CPU pin inside OP10. Low	
		level: The 232 communication port of OP10 is ready	
		to receive configuration data. High level: no use)	
5	GND	GND	
6	TX-	422 send negative signal	
7	RTS	(VCC, give power supply to SG2 program cable)	
8	RX-	422 receive negative signal	
9	RX+	422 receive positive signal	

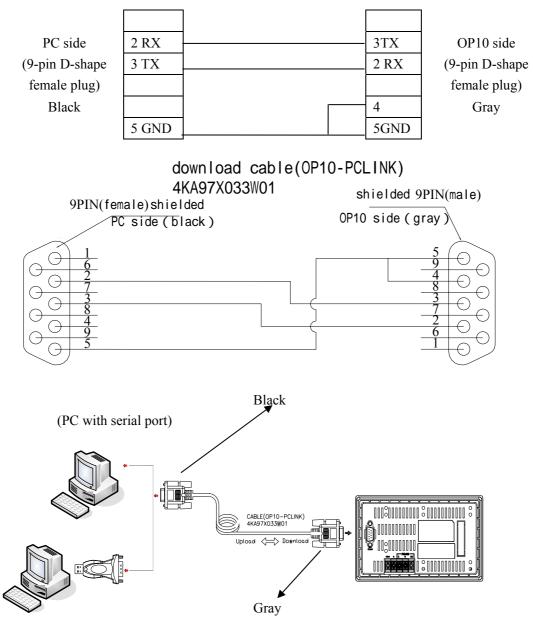
2. RS485:



Num	Name	Description	
1	А	485 positive signal	
2	В	485 negative signal	
3	SG	485 GND	

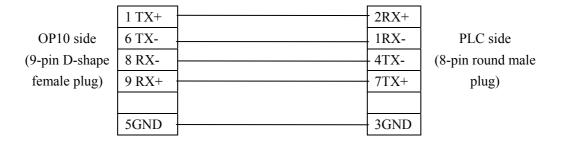
5.2 Communication connect

5.2.1 OP10 downloading cable (write configuration screens)

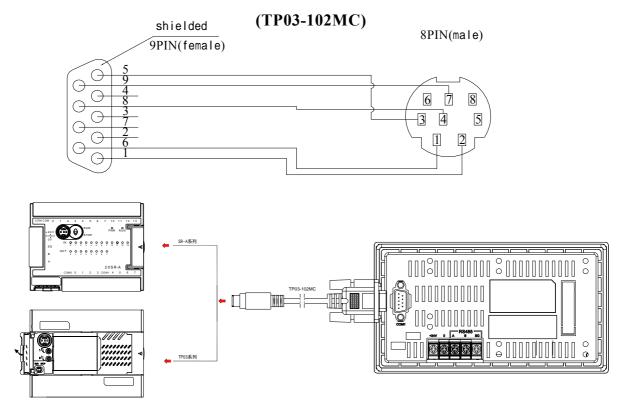


⁽If there are no serial ports on PC, we need a USB serial port: 4KA97X017W01)

5.2.2 Connect with TP03 (include SR type) PG port through RS-422



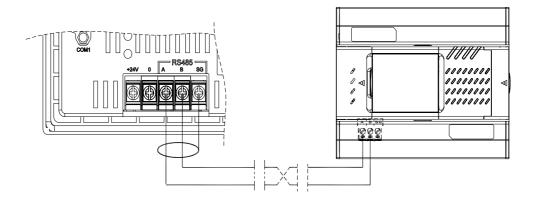
Idiographic connection: (TP03-102MC cable)



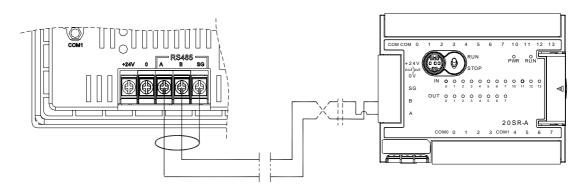
5.2.3 Connect with TP03 through 485 port

	10 485	TP03 485 port	
А		 А	1
В		 В	2

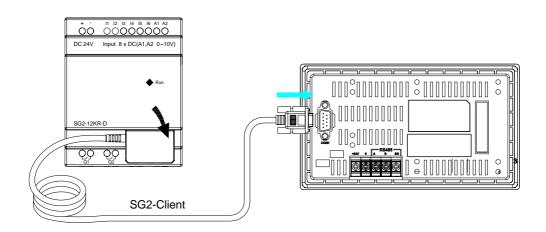
TP03:



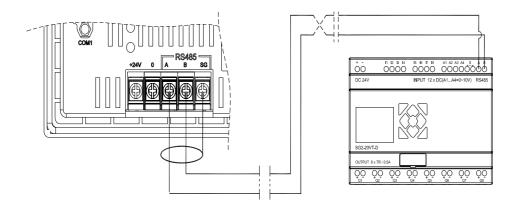
TP03SR:



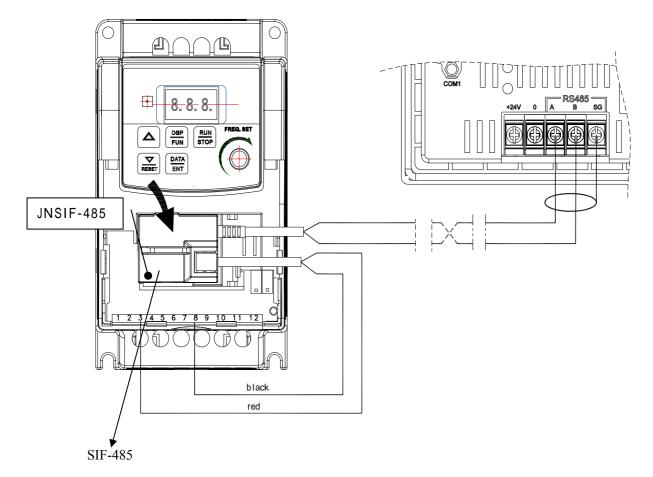
5.2.4 Connect with SG2 through 232 port (suitable for all types of SG2)



5.2.5 Connect with SG2-V type with 485 port



5.2.6 Connect with EV300 through 485 port



5.2.7 Connect with SV300

