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# **Chapter 1 Introduction**

#### 1-1 DOP-A Series Human Machine Interface

Thank you for purchasing DELTA's DOP-A series. DOP-A series are manufactured by adopting high-speed hardware to provide you a useful and programmable interface.

#### 1-2 Features

#### PLC serial drives support

We support more over twenty brands, including Delta, Omron, Siemens, Mitsubishi, etc. For new PLC, we will provide corresponding communication protocol on our website for upgrade to meet your requirement. (All other trademarks in this manual are property of their respective companies.)

#### Multi-language support for screen editor

Except Simplified Chinese, traditional Chinese and English these three languages, screen editor also provides those fonts that Windows® uses.

#### Quick execution and communication macro

It can handle complicated calculation by executing macro. User can also write communication protocol with communication macro command to connect specific system via COM port.

#### Rapidly USB upload/download

It will shorten upload/download time by using USB Ver1.1.

#### Recipes

It provides useful recipe editor that is similar to Microsoft excel for user to edit recipe easily and input multiple recipes simultaneously (size limit is 64K). When downloading multiple recipes at the same time, it can exchange by internal memory of HMI. If data has finished editing when downloading, you can download recipe individually.

## Support two different PLCs connections

Built-in 2 COM ports to connect two different controllers or two same controllers simultaneously.

### Support multiple PLCs connections

Connecting multiple controllers in serial by using COM2 of RS485. (Note: controller should provide RS485 interface)

#### On-line Simulation

After finishing editing, it can simulate on PC by connecting controller to see if it is correct.

#### Off-line Simulation

After finishing editing, it can simulate on PC directly (without connecting controller) to see if it is correct.

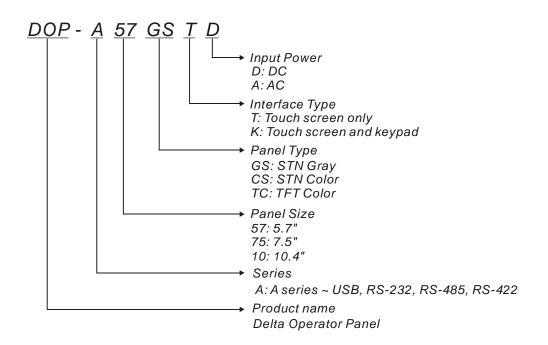
## Using SMC Card to backup data

It is not necessary to use PC to download by using SMC card to backup or insert SMC card to another HMI to copy data. History list and alarm message can be also saved in SMC card and user can read these files by card reader for collecting data and printing.

#### Multiple Security Protection

It provides passwords to protect designer's intellectual property rights and also for user to set user priority for important component.

#### 1-3 Model number



### 1-4 Caution

#### Operation Environment (temperature and humidity)

Please operate in following environment to adjust screen brightness and contrast for getting the best image. If operating out of the range, LCD may be improper display when using for long time.

Ambient Operating Temperature: 0 °C to 50 °C (32 °F to 122 °F) Relative Humidity: 10% ~ 90%, no condensation allowed

#### SMC Card

SMC card can be used to save and transmit data. Only SMC card that formatted by HMI can be used on both HMI and Windows® OS system. (Even it can be read/wrote in some format, but fault may occurs due to different format among Win95/98/2000/XP versions)

#### DO NOT plug/unplug the cable from COM port during operation

Please turn the power off before plug or unplug the cable.

#### Recommend System Requirements

- Pentium III, 500MHz or greater
- 256MB RAM
- Windows® 2000 & 98

# **Chapter 2 Scredit Introduction**

# 2-1 Scredit Setup

In this chapter, it will introduce general functions of screen editor with windows. User can use it to design what he wants. Detail functions will be discussed in following chapters.

#### Minimum hardware requirement

- 1. 80486 or above PC
- 2. 16 MB RAM
- 3. 10 MB free hard disk space
- 4. VGA or super VGA monitor. Display setting of Windows should be set to 256 colors or above.
- 5. Windows compatible mouse.
- 6. Windows compatible printer.

#### Software installation

To start the Delta HMI Screen Editor setup, please refer to the following steps:

Step 1: Please start-up your computer to Win98/NT/XP/2000 system. (Fig. 2-1-1)

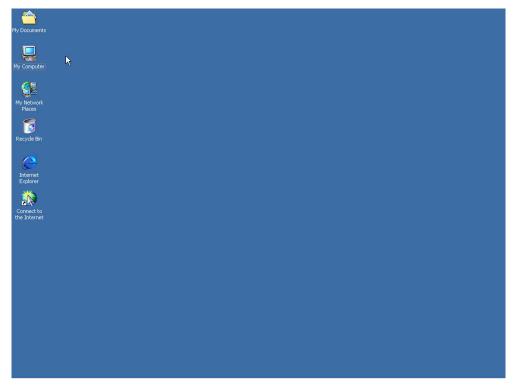


Fig. 2-1-1 open Microsoft Windows

- Step 2: Insert the setup CD into your CD-ROM drive and you can execute setup.exe from Windows taskbar by clicking Start > Run. (Fig. 2-1-2)
- Note: If there are other Windows applications running, close them before running Setup.

Ay Documents
My Computer
My Network Places
Recycle Bin
Internet Explorer
Connect to the Internet
Run ? X
Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.         Open:       D:\setup.exe
OK Cancel Browse

Fig. 2-1-2 execute setup.exe under windows system

Step 3: After pressing <u>Y</u>es button, system will setup automatically and you will get a dialog box. You will get following dialog box to choose destination location.

To select the default directory C: \Program file\Delta\Screen editor\, click <u>N</u>ext>. Setup will install in the directory indicated in the Destination Directory box at the bottom of the dialog box.

To select a directory other than the default directory, click Browse... A list of available directories appears. Highlight the desired directory for the Delta HMI Screen Editor and click OK, then <u>N</u>ext>.

If necessary, click <  $\underline{B}$  ack button to take you back through Setup dialog boxes one by one.

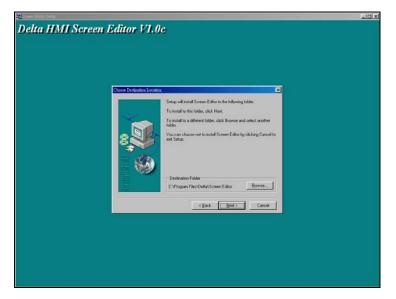
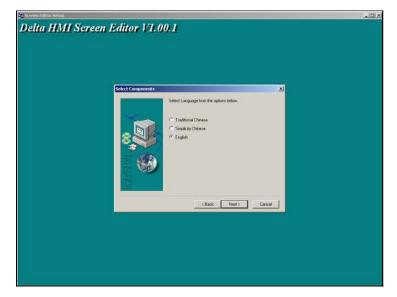


Fig. 2-1-3 Directory for installing Screen editor

Step 4: In this dialog box, you can choose setup language: Traditional Chinese, Simplified Chinese or English. And then click <u>N</u>ext> to get following program folder selection dialog box.





Step 5: This dialog box displays the progress of copying files while the Setup program copies all necessary files into the designated directory. (Fig. 2-1-5, Fig. 2-1-6)

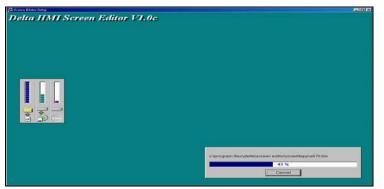


Fig. 2-1-5 Screen editor installation

Range Haus Song	دلملد
Delta HMI Screen Editor V1.0c	
Ettip Complete	
Setup has finished installing Screen Editor on your computer	
Setup can lounch the Read Me life and Screen Editor. Choose the options you want below.	
288	
Cick Firsth to complete Setup	
Trith Frith	



Step 6: At this time, you have finished completed setup. Please click Finish to complete setup. (Fig. 2-1-7)

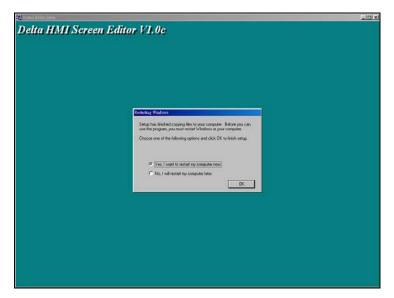


Fig. 2-1-7 Exit installation

Step 7: Click OK to allow Setup to restart your computer and finish setup. Otherwise, click the radio button to "No, I will restart my computer later." And click OK. You will have to restart your computer before you can use the Delta HMI Screen Editor.

#### 2-2 How to Start Scredit

After setup, you can start Scredit from Windows taskbar, click Start > Programs > Delta HMI > Screen Editor. (Refer to figure 2-2-1)

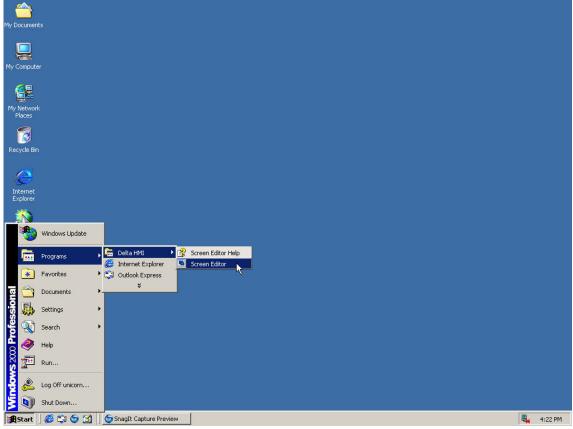


Fig. 2-2-1



Fig. 2-2-2 Start-up display

When you start Screen editor,

- 1. It will open last file automatically if you check "auto open last file automatically" in environment setting.
- 2. If you didn't check "auto open last file automatically" in environment setting or you didn't save last file, it will show basic function as fig. 2-2-3.

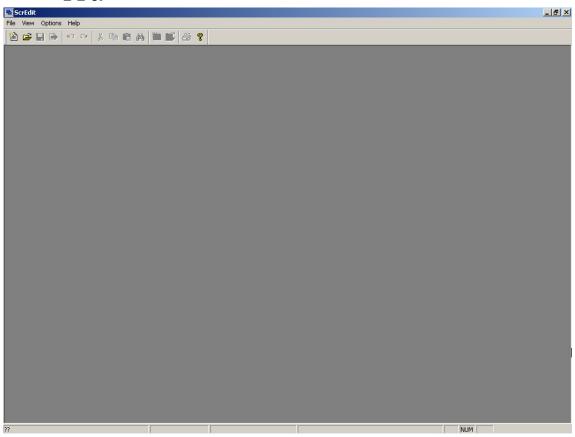


Fig. 2-2-3 Screen without editing file

After opening new file, you will get Screen editor window as shown in the following. (Fig. 2-2-4)

🖸 - ScrEdit		_ 8 ×
File Edit View Element Screen Tools Options Window Help		트립스
🏦 😅 🖬 🖻 🕫 🐇 🐘 💼 🛤 🛍 🗭 💡 100% 🔽 🍳 Q, Q,		
ଃ ⊻ · · · · · · · · · · · · · · · · · ·		
	Screen {Screen_1}	
	Screen Name SubScreen	Screen_1 Detail
	Background Color	(252, 252, 252)
	Screen Open Macro	0
	Screen Close Macro	0
	Screen Cycle Macro	0
	Screen Width	640
	Screen Height	480
	~	
	J	
		ㅋㅋ
	Dutput Focus	
	•	<b>F</b>
	Record Output	
「「「「「」」」」」 「「「「」」 「「」 「」 「」 「」 「」 「」 「」		
?? Download:USB [667,573] Build:Fri Apr 9 09:36:40 2004	NUM	

Fig. 2-2-4 New file screen for Screen editor

There are five parts in the following for Screen editor application window.

#### Menu bar

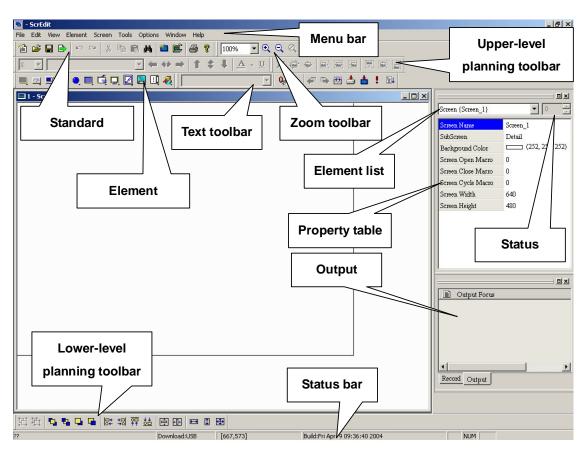
There are nine functions for selection.

File Edit View Element Screen Tools Options Window Help

#### Toolbar

Toolbar is like those toolbar in Windows® program you can arrange its position by yourself.

- 1. Standard toolbar
- 2. Zoom toolbar
- 3. Text toolbar
- 4. Upper-level planning toolbar
- 5. Lower-level planning toolbar





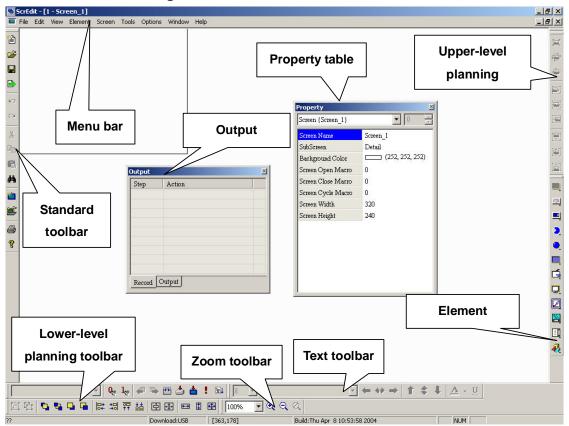
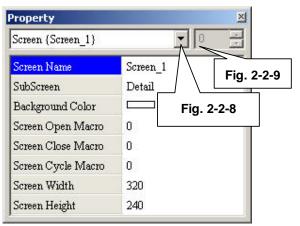
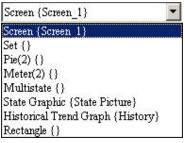


Fig. 2-2-6 Moves Screen editor toolbar and property table

#### Element property table

It provides property setting for each object. Refer to chapter 3 for detail.





#### Fig. 2-2-8 Property list

Fig. 2-2-7 Property table



#### Output window

All editor actions and output message during display compiler will be shown here. When compiling, Screen editor will detect error of user program automatically. Once error occurs, the correspondent message will display in output window. User clicks error message to get error element window.

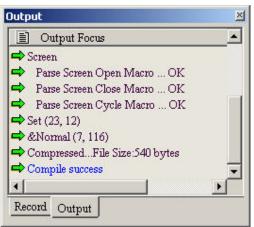


Fig. 2-2-10 Output window

#### Work area

Getting suitable edition area by different HMI type of DOP series. Following is edition example (Fig. 2-2-11).

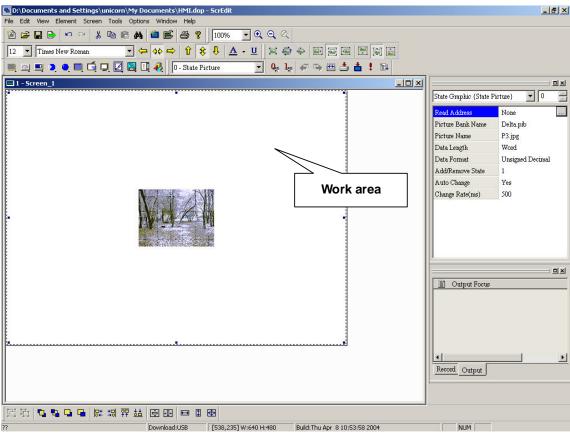


Fig. 2-2-11 The interface for open Screen editor application or create new application

# 2-3 Menu bar and toolbar

The tools that screen editor provided for user to edit includes objects, pictures, recipes and display tools. Menu toolbar contains pull-down menu options.

File Edit View Element Screen Tools Options Window Help

2-3-1 File

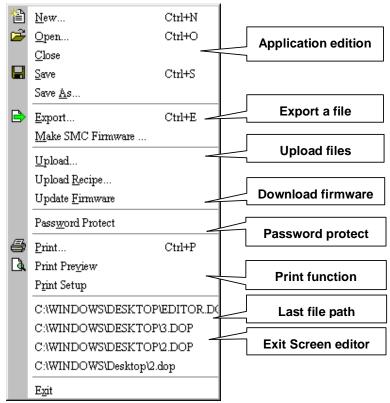
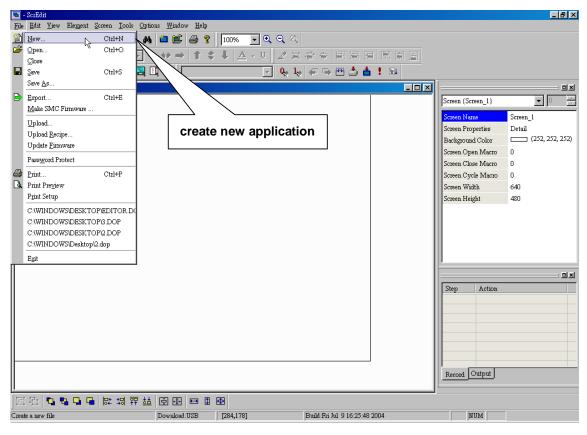


Fig. 2-3-1 File options

Create a new application

<u>Mew...</u> Ctrl+N : Creates a new application by clicking the New

icon <sup>(2)</sup>, or choosing File>New as Fig.2-3-2, or using keyboard shortcuts by pressing Ctrl + N.





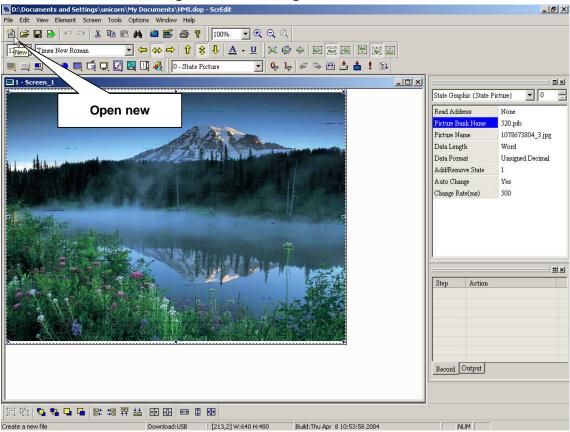


Fig. 2-3-3 Choosing from toolbar

You will get following dialog box (Fig. 2-3-4) to input application name, screen name, screen ID, HMI type and controller brand after opening new application.

ew Application	
Application Name	
HMI	
Screen Name	
Screen_1	
Screen ID	
1	
HMI	
DOP-A57CSTD 256 Colors	•
Controller	
Product Delta	
	10

Fig. 2-3-4 New application dialog box

If an application already exists, you will get following dialog box to remind you saving application (Fig. 2-3-5) before opening application.

Warning			×
?	The document has been chang	ed ! Are you sure you (	want to save (Y/N) ?
	Yes	No	

Fig. 2-3-5 Saving dialog box

**Open Old application** 

Open... Ctrl+O : Open current application by clicking the Open

icon 崖, or choosing File>Open as Fig.2-3-7, or using keyboard shortcuts by

pressing Ctrl+O or double-click the application icon in your file system.

5	- ScrEdit					_ 8 ×
File	<u>E</u> dit <u>V</u> iew Ele <u>m</u> ent <u>S</u> creen <u>T</u> ools	<u>Options Window H</u> elp				
徻	New Ctrl+N	🗛 🛅 🖻 🖨 🤋 🛛	100% 🔽 🔍 🔍 🔍			
<u> 2</u>	Open Ctrl+O		↓ ▲ • ⊔ ⊿ ≈ ⊕ ⇔ =			
				📥 🛔 🗄		
	Save <u>A</u> s					
₿	Export Ctrl+E				Screen {Screen_1}	<b>•</b> 0 <del>•</del>
	Make SMC Firmware	Or	pen old application		-	
	Upload		••		Screen Name	Screen_1
	Upload <u>R</u> ecipe				Screen Properties	Detail (252, 252, 252)
	Update <u>F</u> irmware				Background Color	
	Password Protect				Screen Open Macro Screen Close Macro	0
6	Print Ctrl+P				Screen Cycle Macro	0
ā					Screen Width	640
	Print Setup				Screen Height	480
	C:\WINDOWS\DESKTOP\EDITOR.D(					100
	C:WINDOWS/DESKTOP/3.DOP					
	C:\WINDOWS\DESKTOP\2.DOP					
	C:\WINDOWS\Desktop\2.dop					
	Exit					
E					-	
						므포
					Step Action	
					- · · ·	
					Record Output	
			-		1	
	(19) 🗳 🗳 🖬 🖬 🛤 🛱					
Edit	a file	Download:USB	[262,11] Build Fri Jul 9	16:25:48 2004	NUM	



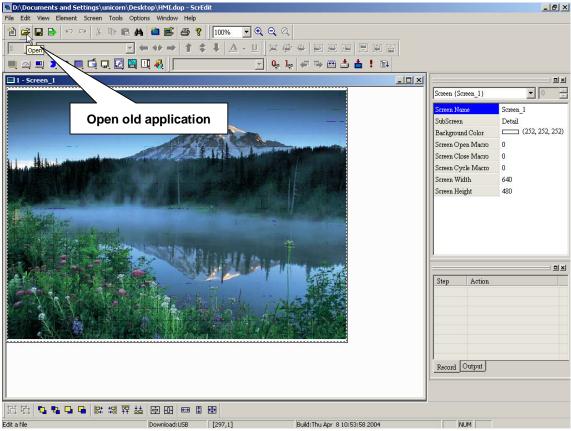


Fig. 2-3-7 Choosing from toolbar

If other application exists before opening, you will get dialog box as fig. 2-3-5 to remind you saving file and then get following dialog (Fig. 2-3-8).

Open					<u>? ×</u>
Look in:	🔁 My Documen	its	•	+ 🗈 💣 📰	-
History Desktop	image My Pictures rcp ScreenEdit SnagIt Catalog MHI.dop	3			
My Documents	2024 - 24				
My Computer					
	, File name:	J		•	Open
My Network P	Files of type:	Delta Operator Panel (*.d	op)	•	Cancel

Fig. 2-3-8 Open old application

Close file

Close : closes current application by clicking File > Close

as Fig. 2-3-9.

5	- ScrEdit						_ & ×
File	Edit View Element Screen Tools						
徻	New Ctrl+N	🗛 🍋 🖻 🖨 🤋	100% 💽 🔍 🔍 🖉				
2	Open Ctrl+O		LA-UZE				
	Close Save Ctrl+S						
	Save <sup>rvy</sup> Ctrl+S Save <u>As</u>		- Q, 1,				
							<u></u>
D	Export Ctrl+E Make SMC Firmware		$\geq$ $\sim$			Screen {Screen_1}	<b>v</b> 0 <del>v</del>
			Close applie	ration		Screen Name	Screen_1
	Upload					Screen Properties	Detail
	Upload <u>R</u> ecipe Update <u>F</u> irmware					Background Color	(252, 252, 252)
						Screen Open Macro	0
_	Password Protect					Screen Close Macro	0
8	Print Ctrl+P					Screen Cycle Macro	0
L9.	Print Pre <u>v</u> iew Print Setup					Screen Width	640
						Screen Height	480
	C:\WINDOWS\DESKTOP\EDITOR.D( C:\WINDOWS\DESKTOP\3.DOP						
	C:WINDOWS/DESKTOP/2.DOP						
	C:\WINDOWS\Desktop\2.dop						
	Exit						
ΠT.	Eğit						
							<b>_</b>
						Step Action	
						Record Output	
	· [1] · · · · · · · · · · · · · · · · · · ·	🔠 🗗 🖽 🗊	æ				
1	: → ←	Download:USB	[95,8]	Build:Fri Jul 9 16:25:48	2004	NUM	

Fig. 2-3-9 Close application

If application doesn't save before closing application, you will get saving dialog box (Fig. 2-3-10) to remind you saving application.

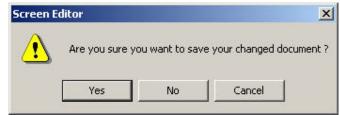


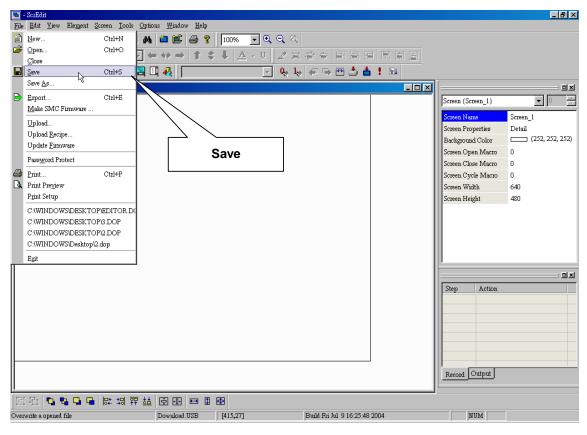
Fig. 2-3-10 Saving dialog box

#### Save file

Save Ctrl+S : Saving current application into disk with

extension file DOP by clicking the Save icon **I**, or choosing File > Save as

Fig.2-3-11, or using keyboard shortcuts by pressing Ctrl + S.





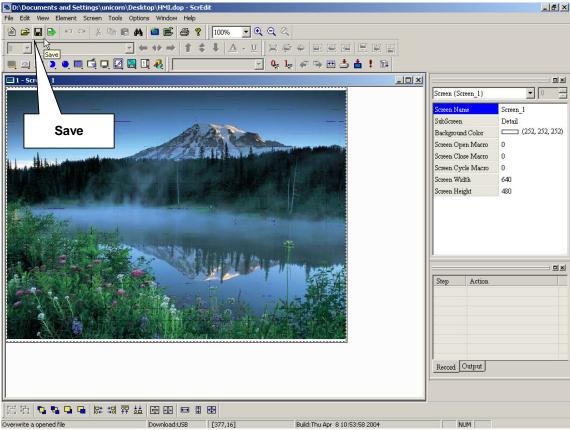
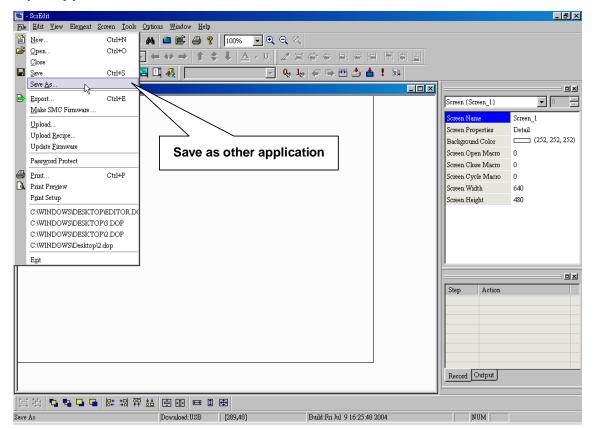


Fig. 2-3-12 Choosing from menu bar

#### Save as

Save <u>As...</u>: Saving current application as other application by clicking File > Save As (fig. 2-3-13). You will get dialog box as fig. 2-3-14 to input application name with extension file DOP.



#### Fig. 2-3-13 Choosing from menu bar

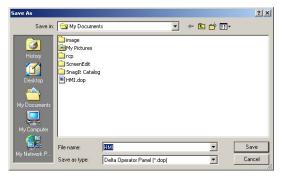
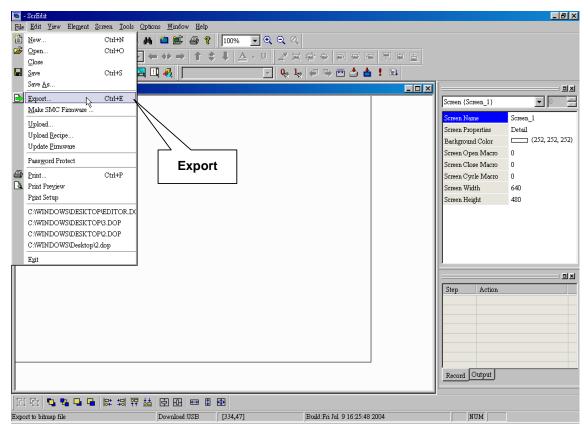


Fig. 2-3-14 Input application name dialog box

#### Export

<u>Export...</u> Ctrl+E : Exporting data to picture format (bmp file) by clicking the Export icon (fig. 2-3-16), or choosing File > Export (Fig.2-3-15), or using keyboard shortcuts by pressing Ctrl + E.





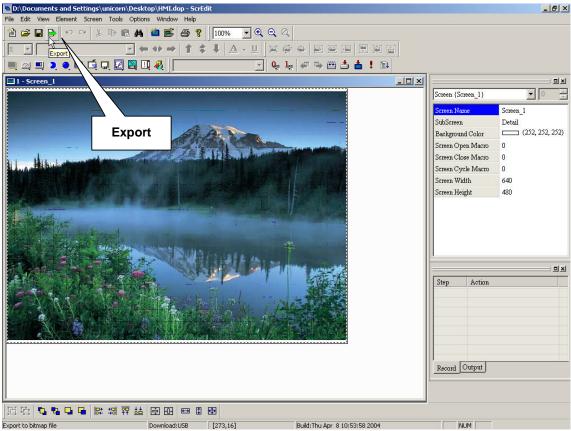


Fig. 2-3-16 Choosing from toolbar



Fig. 2-3-17 Result of exporting file (bmp file)

Make SMC Firmware

Make SMC Firmware ... : After clicking File > Make SMC Firmware (Fig. 2-3-18) to write HMI program into SMC card, you can startup HMI by using SMC card. You will get dialog box for choosing to startup from SMC card or HMI after inserting SMC card and turn the power on. Please choose to startup from SMC card for it. You can use this function to transmit a program to one/more HMIs without PC to shorten transmission time. (NOTE: Ensure that card reader has been driven by PC and SMC card has inserted into card reader before writing.)

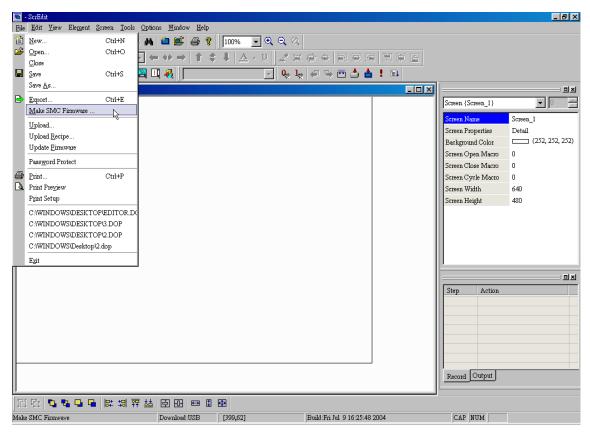
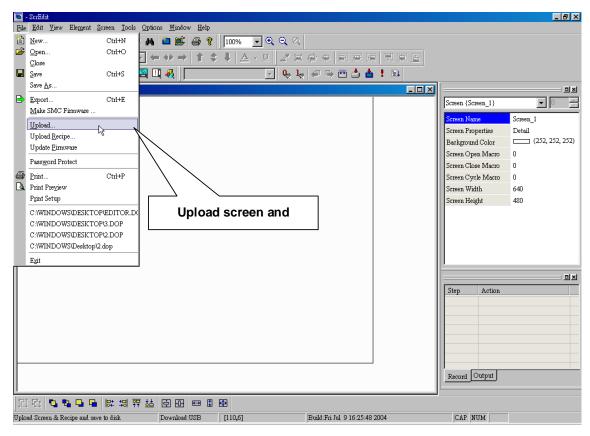
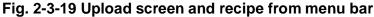


Fig. 2-3-18 Choosing from menu bar

Upload screen and recipe

**Upload**... : After clicking File > Upload (Fig. 2-3-19), you need to input password (the password is the highest priority saved in HMI) to get save as dialog box (Fig. 2-3-14). After inputting application name, you will get fig. 2-3-20 dialog box to start uploading. You can get the progress with progress box and stop uploading by clicking Stop button. The file uploaded from HMI will be converted to original edition file for user to edit file to avoid losing the original edition file.





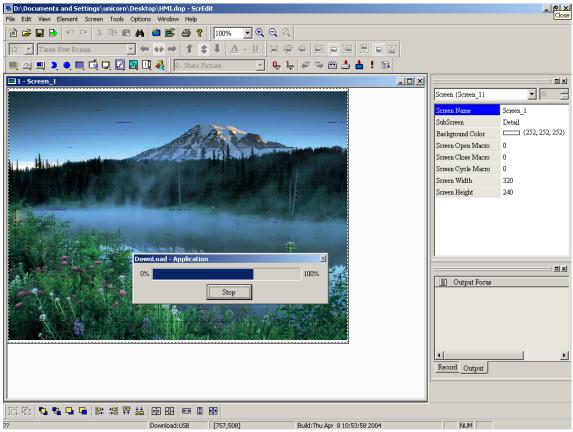


Fig. 2-3-20 Upload screen and recipe display

#### **Upload recipe**

Upload Recipe...: : This function is similar to upload function but it can only upload recipe. It also needs password (the highest priority password saved in HMI) before uploading.

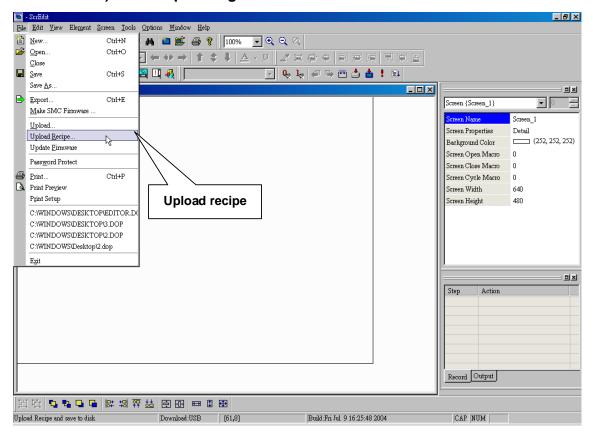


Fig. 2-3-21 Upload recipe

#### **Update firmware**

Update Firmware : upgrading HMI firmware or adding function for HMI.

- 12	ScrEdit					_ 8 ×
File	$\underline{E}$ dit $\underline{V}$ iew Element Screen	Tools Option	ons <u>W</u> indow <u>H</u> elp			
	New Ctrl+		🛅 🖻 🚑 🢡 100% 💽 🔍 🔍 🖉			
	Open Ctrl+	۰ <u>ا</u> -	- ↔ →   ↑ ↓ ↓ ▲ - ∪ 2 등			
	Close					
	Save Ctrl+	-S 🗃 🛙	L 🚯 📃 🤤 🐙	/# 🗣 🛗 🃥 💺 💷		
	Save <u>A</u> s					<u> </u>
	Export Ctrl+	-E			Screen {Screen_1}	▼ 0 <u>×</u>
	Make SMC Firmware				Screen Name	Screen 1
	<u>U</u> pload				Screen Properties	Detail
	Upload <u>R</u> ecipe	_			Background Color	(252, 252, 252)
Ļ	Update Eirmware				Screen Open Macro	0
	Password Protect				Screen Close Macro	0
6	Print Ctrl+	P	$\backslash$		Screen Cycle Macro	0
۵.	Print Preview				Screen Width	640
	Print Setup				Screen Height	480
	C:\WINDOWS\DESKTOP\EDIT(	OR.D(				
	C:\WINDOWS\DESKTOP\3.DOF	P	Update firmware			
	C:\WINDOWS\DESKTOP\2.DOF	P	· · ·			
	C:\WINDOWS\Desktop\2.dop					
	Exit					
					Step Action	
					Step Action	
					Record Output	
					record output	
	12 <b>5 5 5 6 6</b> 12 3	湖 砰 喆				
1	te Firmwave			Build:Fri Jul 9 16:25:48 2004	CAP NUM	

Fig. 2-3-22 Update firmware

#### **Password Protect**

Password Protect : You can enable and disable password protect by clicking File > Password protect (Fig. 2-3-23). Once you enable password, you will get Fig. 2-3-24 and ✓ before "Password Protect". You will need to input password before open DOP file. The password is set by clicking Option > Model parameter to get following dialog box (Fig. 2-3-26). If you disable password, you will get fig. 2-3-25.

5	- ScrEdit			_ 8 ×
Fi	<u>le E</u> dit <u>V</u> iew Ele <u>m</u> ent <u>S</u> creen <u>T</u> ools	Options <u>W</u> indow <u>H</u> elp		
眢		🗛 🛍 🗭 🤔 🦹 100% 🔽 🔍 🔍		
É	-			
	Close			
	-			
	Save <u>A</u> s			
Ē			Screen {Screen_1}	▼ 0 <u>×</u>
	Make SMC Firmware		Screen Name	Screen 1
	<u>U</u> pload		Screen Properties	Detail
	Upload <u>R</u> ecipe		Background Color	(252, 252, 252)
	Update <u>F</u> irmware		Screen Open Macro	0
	Password Protect		Screen Close Macro	0
6	Print Ctrl+P		Screen Cycle Macro	0
2	Print Preview		Screen Width	640
	P <u>r</u> int Setup		Screen Height	480
	C:\WINDOWS\DESKTOP\EDITOR.DO			
	C:\WINDOWS\DESKTOP\3.DOP	Password Protection		
	C:\WINDOWS\DESKTOP\2.DOP			
	C:\WINDOWS\Desktop\2.dop			
	Exit			
1				
1			Step Action	
11				
1				
11				
1				
1				
⊩				
1			Record Output	
Ļ	当時 🕒 🗣 🖵 🖷 🛤 第			
Pas	sword Protected	Download:USB [98,39] Build:Fri Jul 9 16:25:48 2004	CAP NUM	

Fig. 2-3-23 Password protection

ScrEdit	×	ScrEdit	×
⚠	Enable password protected		Disable password protected
	ОК		ОК
	Fig. 2-3-24		Fig. 2-3-25

Standard	Control Block
Application Name	Address 1@D0
HMI	Size 0 💌
HMI DOP-A75CSTD 256 Colors Base Port Controller	Status Block Address 1@D10
Product Delta Type Delta DVP PLC	Upload/Download USB 1.1 C PC COM Port COM1
HMI Station	Start up Screen 1 - Screen_1
Security	Default Format Unsigned Decimal 💌
Password 12345678 Starting Level 0	Startup Delay Time 0 (s) Clock Macro Delay 100 (ms

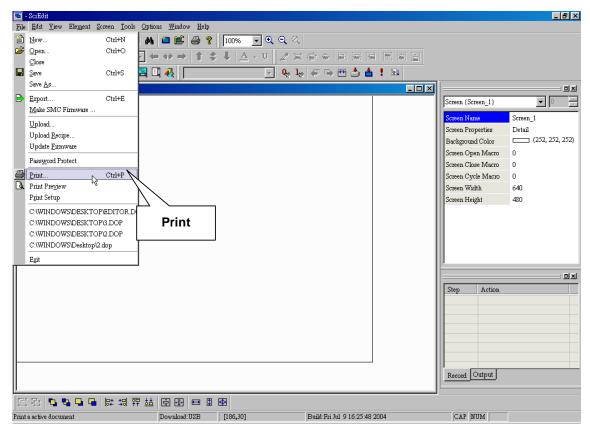
Fig. 2-3-26 Password settings

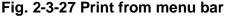
Print

Print...

Ctrl+P : Print current screen by clicking the Print icon

(fig. 2-3-28), or choosing File > Print (Fig.2-3-27), or using keyboard shortcuts by pressing Ctrl + P.





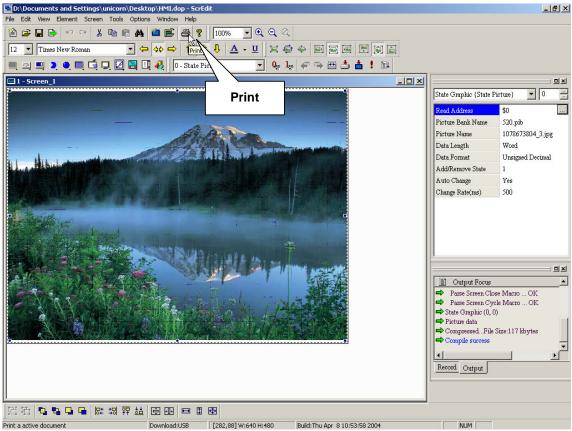


Fig. 2-3-28 Print from toolbar

#### **Print Preview** Print Preview : Printing preview by clicking File > Print Preview. ScrEdit File Edit Liew Element Screen Iools Options Window Help \_ 8 × ≧ <u>N</u>ew... ☑ Open... Ctrl+N 🚜 🛍 🖻 🚭 💡 🛛 100% 💽 🔍 Q. 🔍 Ctrl+O Z ← ↔ → | ↑ ¢ ↓ ▲ - U | ∠ ¤ @ + ■ ■ ■ ■ ■ ■ $\underline{C}$ lose E Save 🖹 🗓 🚸 🗌 🔽 🍬 🍬 🥔 🖙 🛗 📥 🚦 💷 Ctrl+S Save <u>A</u>s.. - 🗆 × ㅋㅋ× Export... Ctrl+E Screen {Screen\_1} - 0 A. Make SMC Firmware ... Screen Name Screen 1 <u>U</u>pload.. Screen Properties Detail Upload <u>R</u>ecipe... (252, 252, 252) Background Color Update <u>F</u>irmware Screen Open Macro 0 Pass<u>w</u>ord Protect Screen Close Macro 0 Print... Ctrl+P Screen Cycle Macro 0 Screen Width 640 R Print Setup Screen Height 480 C:\WINDOWS\DESKTOP\EDITOR.DO **Print Preview** C:\WINDOWS\DESKTOP\3.DOP C:\WINDOWS\DESKTOP\2.DOP C:\WINDOWS\Desktop\2.dop Exit 믜뇌 Step Action Record Output | 空 空 🗣 🗣 🗣 🛤 🛱 喆 🖻 🚥 🖽 🖽 Download:USB [225,77] Build:Fri Jul 9 16:25:48 2004 CAP NUM Preview

Fig. 2-3-29 Print preview

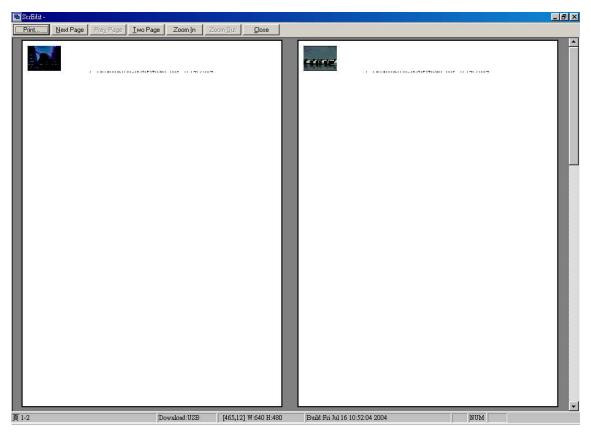


Fig. 2-3-30 Preview result

#### **Print Setup**

Print Setup : printer and paper settings.

Last file path

Last file path: Last four applications. You can open application by clicking their path as fig. 2-3-31.

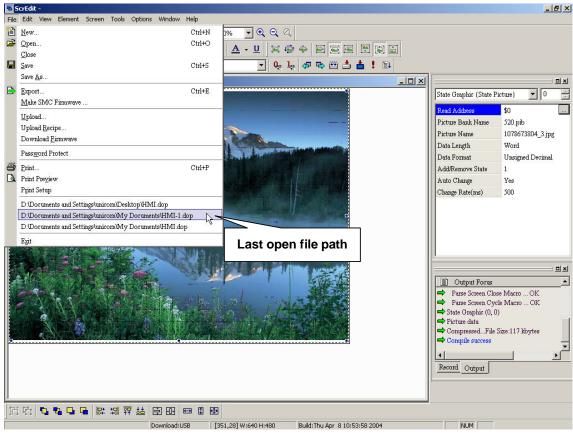


Fig. 2-3-31 Last open file path

#### Exit

Exit : Exiting screen editor with saving application by clicking File > Exit as fig. 2-3-32. If application isn't saved before exit, you will get fig. 2-3-10 dialog box to remind you saving.

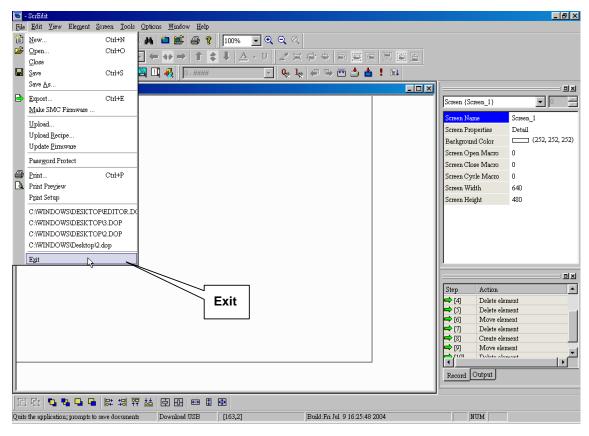


Fig. 2-3-32 Exit

2-3-2 EDIT

5	<u>U</u> ndo	Ctrl+Z
3	Redo	Ctrl+Y
Ж	Cut	Ctrl+X
	<u>С</u> ору	Ctrl+C
C	Paste	Ctrl+V
	<u>D</u> elete	Del
	Select <u>A</u> ll	Ctrl+A
桷	<u>F</u> ind	Ctrl+F
	<u>R</u> eplace	
G	Group	
凸	UnGroup	
	Layer	ŀ
	<u>A</u> lign	•
	Make Same <u>S</u> ize	•
	Text Process	•
	Dupl <u>i</u> cate	

Fig. 2-4-1 Edition options

## 1. Undo

Undo Ctrl+Z : Undo the last operation. Click the Undo icon 🎽 as

Fig.2-4-3, or choose File > Undo as Fig.2-4-2, or use keyboard shortcuts by pressing Ctrl + Z. All actions are recorded in output window.

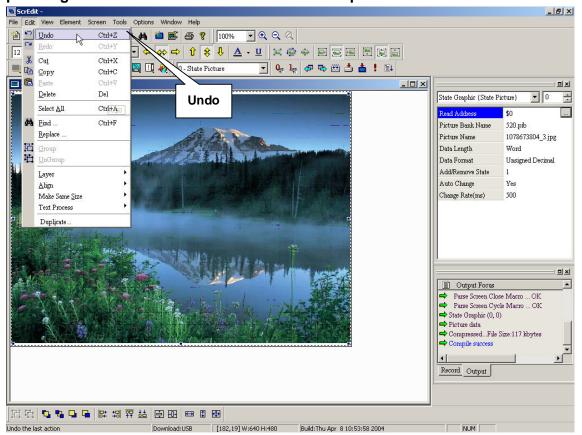


Fig. 2-4-2 Choosing from menu bar

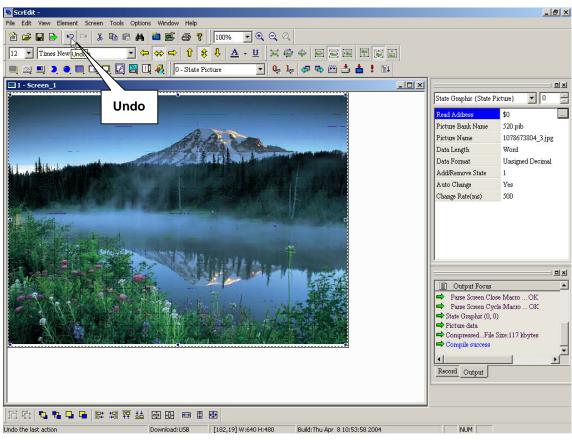
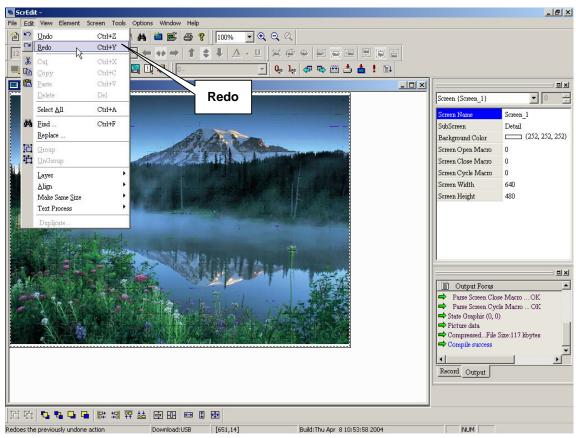


Fig. 2-4-3 Choosing from toolbar

#### 2. Redo

Redo Ctrl+Y : Redo the undo operation. Click the Redo button as

Fig.2-4-5, or choose File > Redo as Fig.2-4-4, or use keyboard shortcuts by pressing Ctrl + Y.





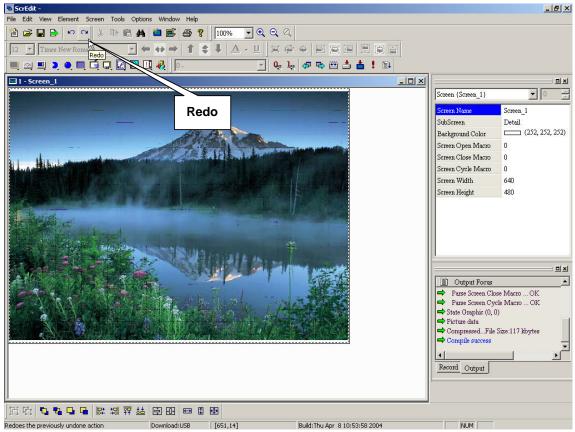
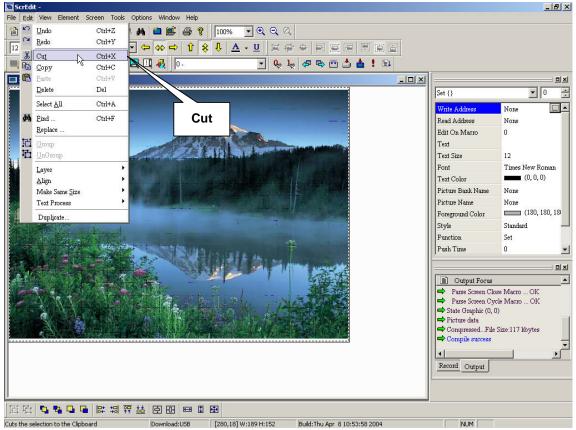


Fig. 2-4-5 Choosing from toolbar

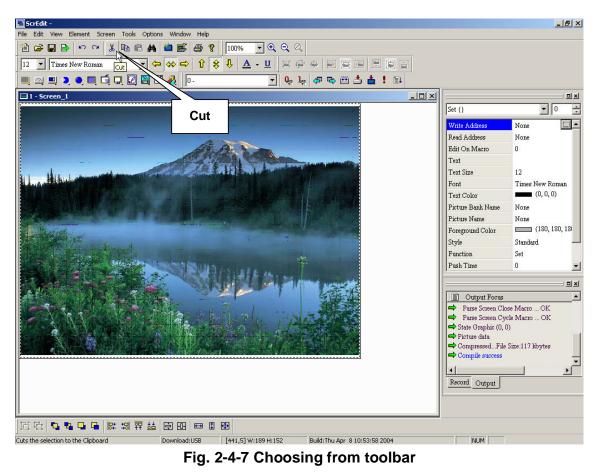
3. Cut Cut Ctrl+X : Deletes the selected element and save it in clipboard to

paste to other place. Click the Cut button 🐰 as Fig.2-4-7, or choose File > Cut



as Fig.2-4-6, or use keyboard shortcuts by pressing Ctrl + X.

Fig 2-4-6 Choosing from menu bar



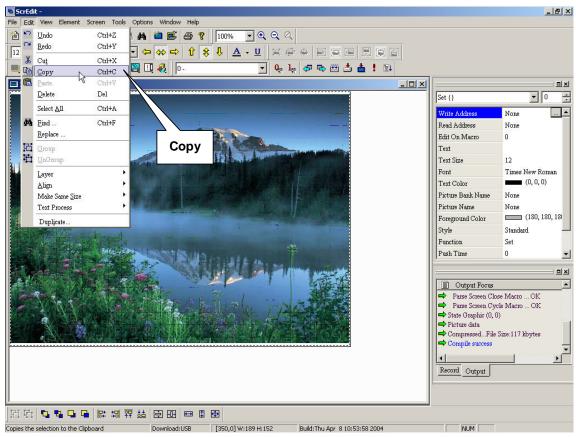
#### 4. Copy

Copy

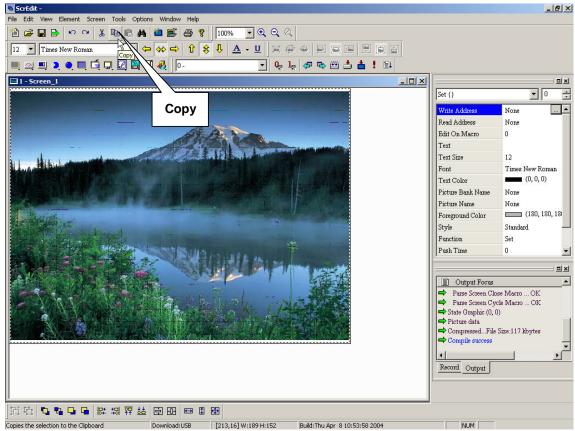
Ctrl+C : Copy the selected element to the clipboard. Click the

Copy button as Fig. 2-4-7, or choose File > Copy as Fig. 2-4-8, or use

keyboard shortcuts by pressing Ctrl + C.









#### 5. Paste

Paste Ctrl+V : Paste element from clipboard. Click the Paste icon

as Fig. 2-4-11, or choose File > Paste as Fig. 2-4-10, or use keyboard shortcuts by pressing Ctrl + V.

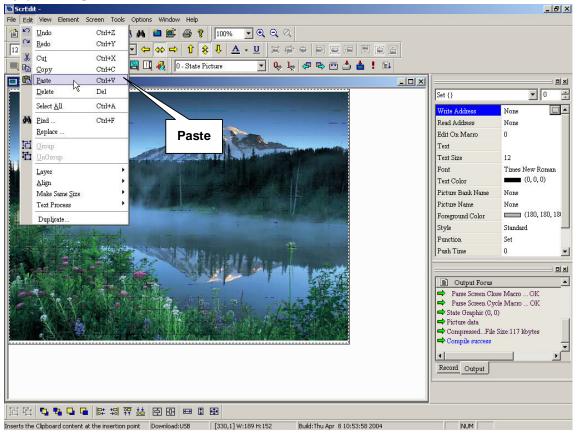


Fig. 2-4-10 Choosing from menu bar

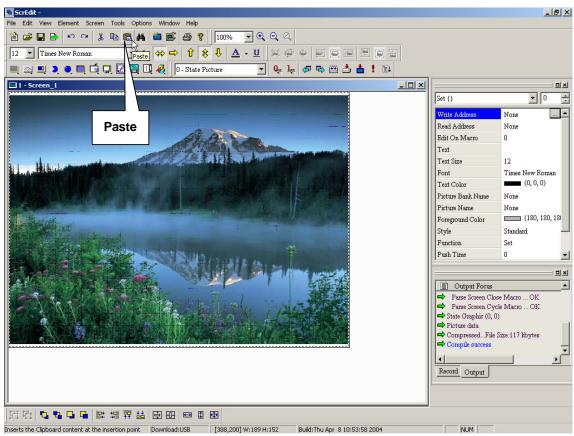


Fig. 2-4-11 Choosing from toolbar

#### 6. Delete

Delete

Del

: Delete selected element as Fig. 2-4-12.

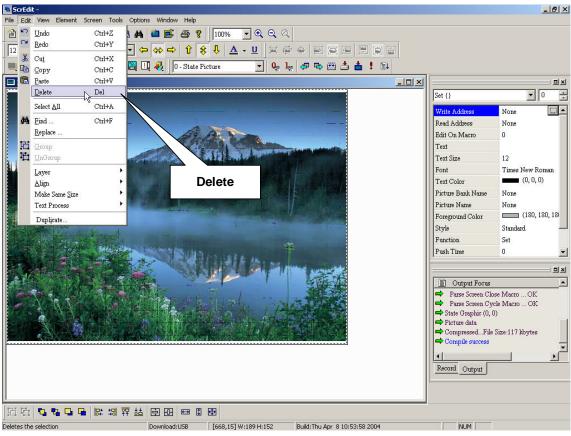


Fig. 2-4-12 Delete

## 7. Select All

Select <u>All</u> Ctrl+A : it is used to select all elements as fig. 2-4-13. When selecting all, the element at the left upper corner will be selected with square filled with blue and white border as a base element. Others will be selected with square filled with white and black border. The base element is used to align or resize.

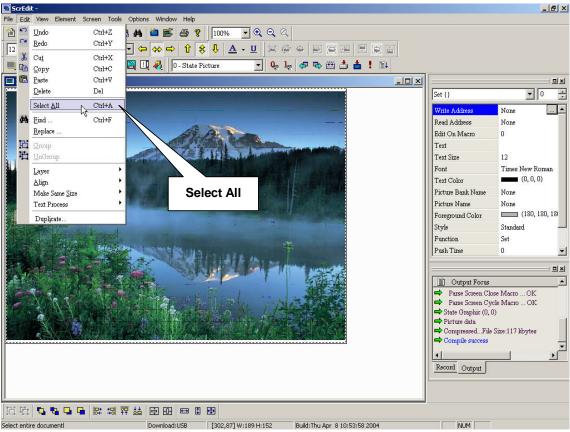
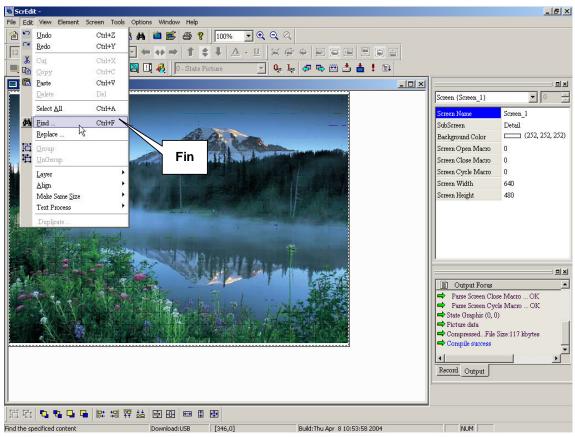


Fig. 2-4-13 Choosing from menu bar

#### 8. Find

<u>Find</u>...<u>Ctrl+F</u>: You can use keyboard shortcuts by pressing Ctrl + F to find. You can find element text, read address or write address in current screen or all screens as fig. 2-4-14. Once it finds, the element will be shown in the output window. You can see this element by clicking in the output window as fig. 2-4-16.





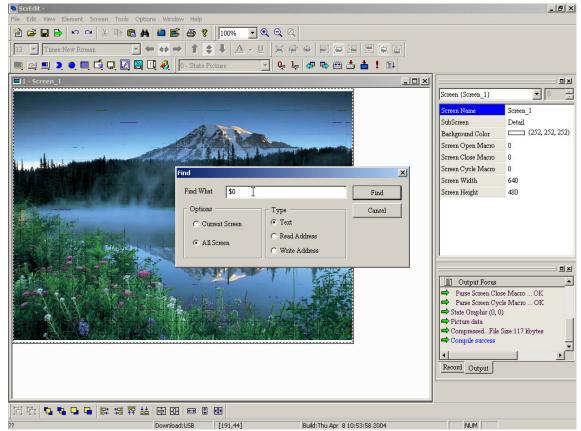


Fig. 2-4-15 Find dialog box

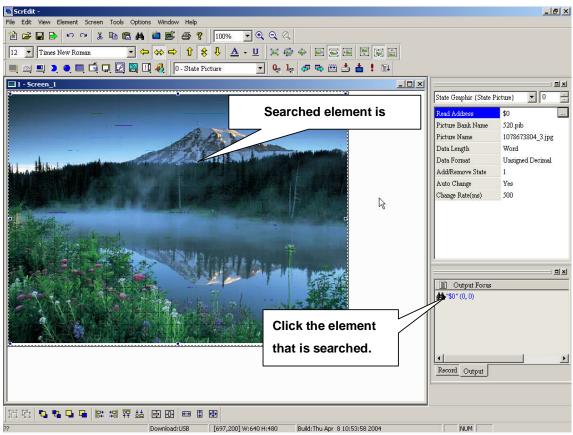
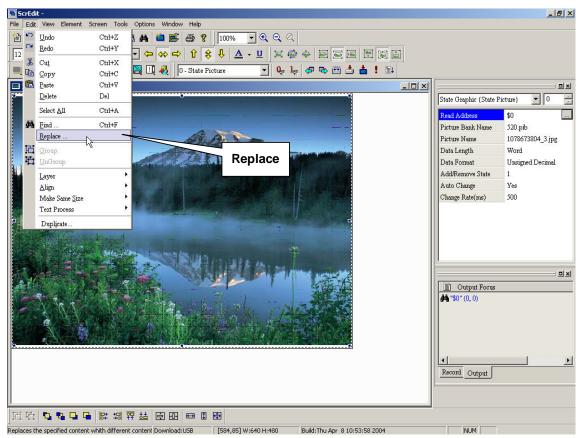


Fig. 2-4-16 Searched element is selected

#### 9. Replace

Replace ... : It is used to replace text, read address and write address in current screen or all screens. The data type could be bit, word or dword as fig. 2-4-17.





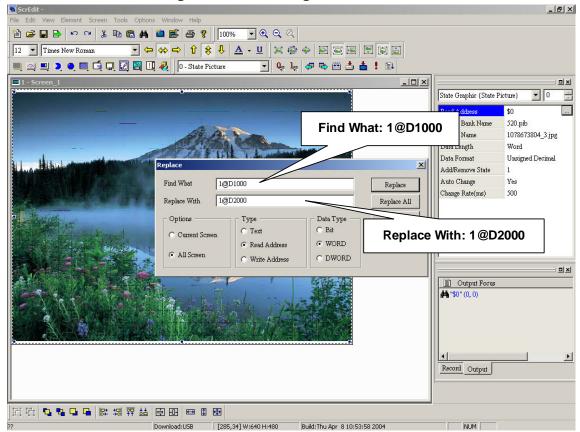


Fig. 2-4-18 Replace example

#### 10. Group

Group

: you can make all the selected elements to a group by

clicking Edit > Group or clicking icon  $\square$  as fig. 2-4-20. After grouping, no matter how many elements it has, it will be regarded as an element to move together but it can't resize.

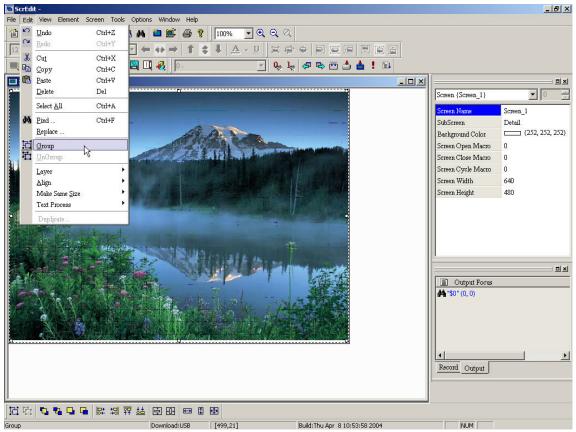
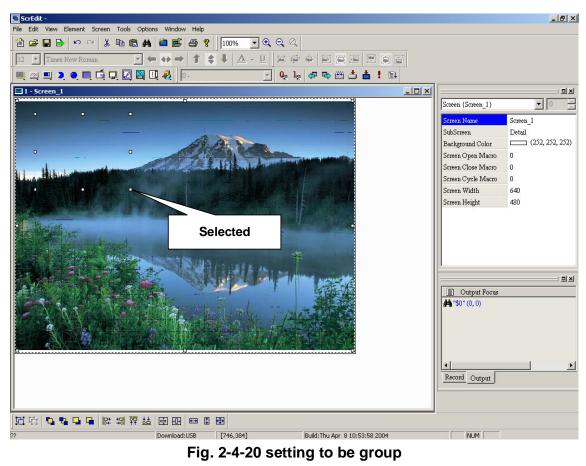


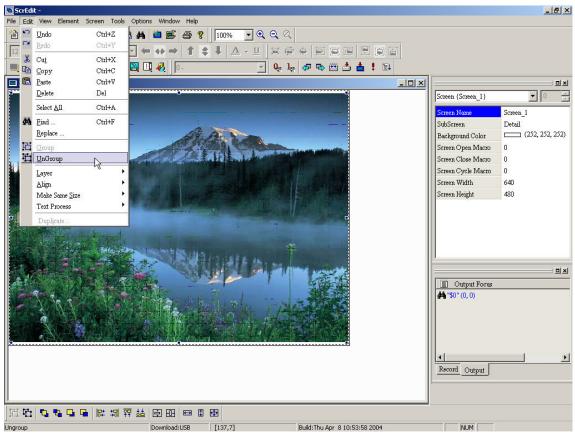
Fig. 2-4-19 Choosing from menu bar



## Ungroup

UnGroup : To ungroup element as fig. 2-4-21by clicking Edit >

Ungroup as fig. 2-4-21 or clicking button 🔛 directly as fig. 2-4-22.





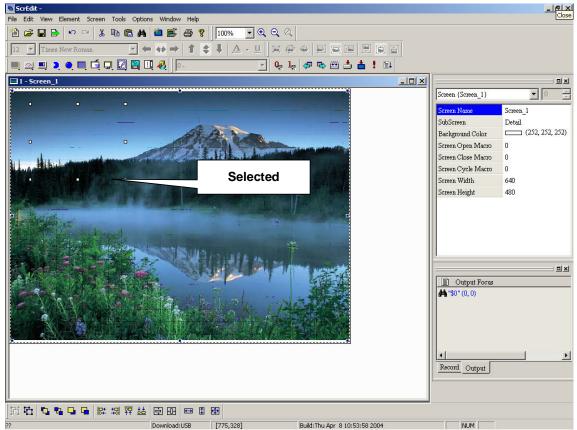


Fig. 2-4-22 Ungroup

Layer

Layer : It is used to set element layer and layer will be different with creation time. Different layer will affect covered space. You can arrange

layer by clicking Edit > Layer as fig. 2-4-23 or clicking button

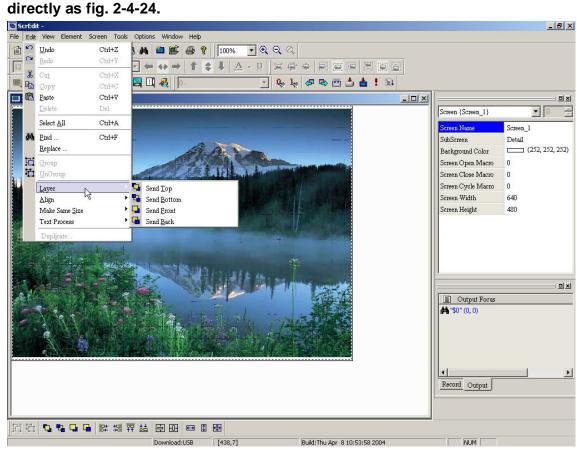


Fig. 2-4-23 Choosing from menu bar

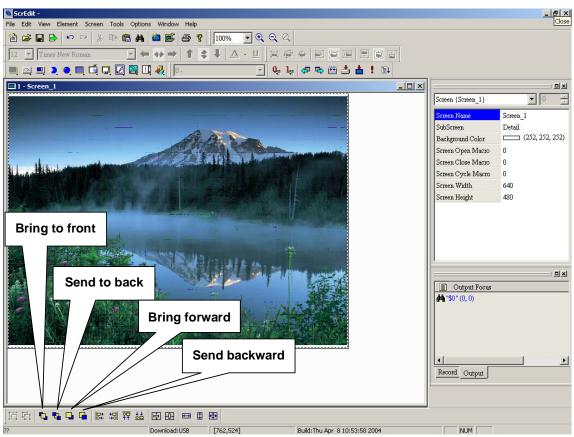
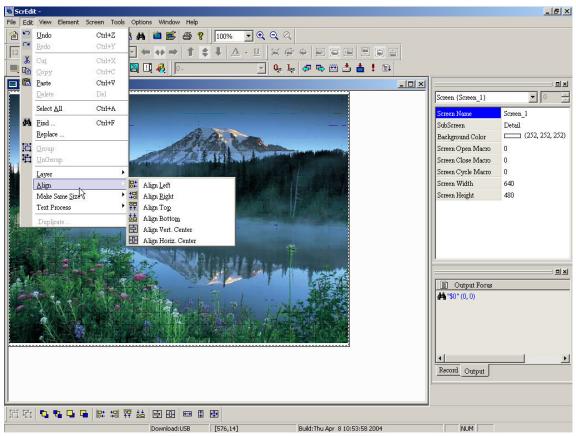


Fig. 2-4-24 Layer arrangement

#### Align

align.





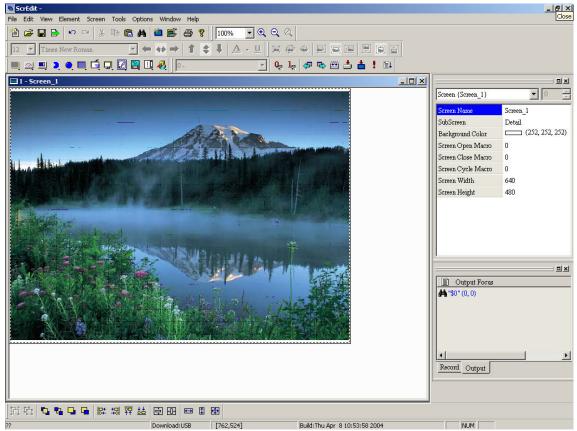


Fig. 2-4-26 Align result

#### Make Same Size

Make Same Size : you can make elements the same size by clicking Edit > Make Same Size as fig. 2-4-27 or clicking icon as fig. 2-4-28 directly.

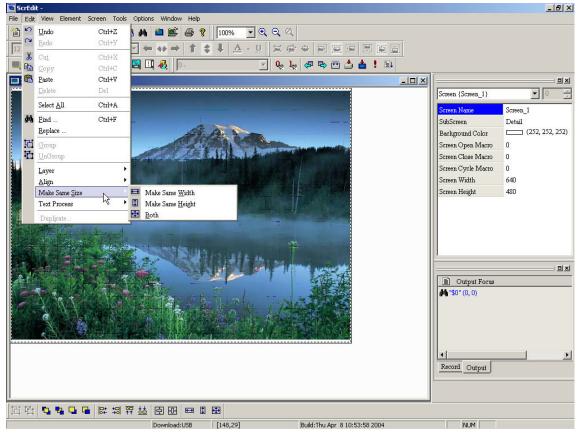


Fig. 2-4-27 Make same size

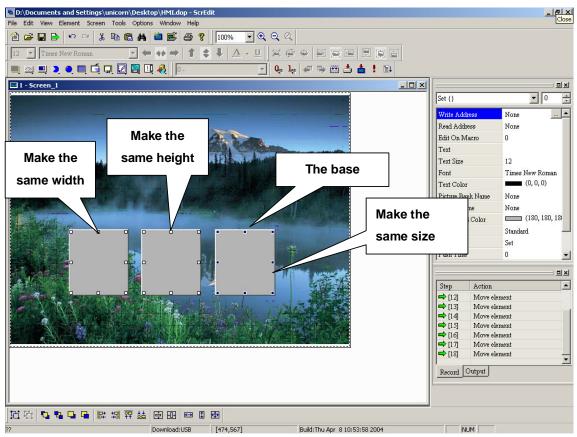


Fig. 2-4-28 Result of make same size

#### Text process

Text Process : it is used to edit text. There will be sefore those text processes that you used. Besides, you can also set by text toolbar.

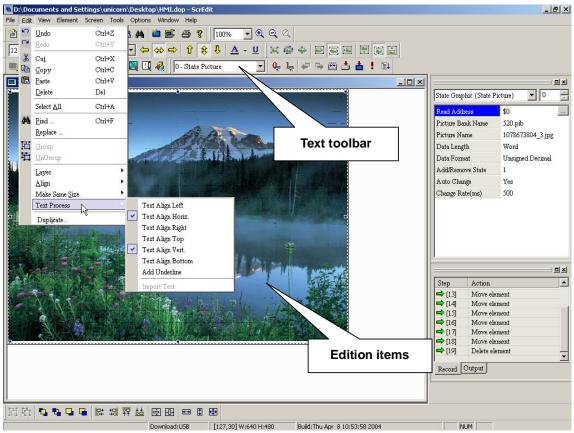


Fig. 2-4-29 Text process

#### Duplicate

Duplicate... : Copy one or more elements at the same time. You can fill copy number in columns (X) and rows (Y) to get the total copy numbers (X\*Y). The minimum copy number should be more than 2 because the original element is one of the total copy numbers. If you only want to copy in columns or rows, you can enable and disable them with checking. The spacing is the interval among each element. The address increment is used to place the element you copy by horizontal or vertical. The unit can be word or bit. Refer to Fig 2-4-31 and Fig. 2-4-32 for example.

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2	÷
2	÷
2	
C Y-Direction	
Cano	el
	2

Fig. 2-3-30 Multiple duplicate

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□ 1 - 5creen_1		
	Set {}	• 0 ÷
	Write Address	None
Duplicate X	Read Address	None
• • • • • • • • • • • • • • • • • • •	Edit On Macro	0
Columns 3	Text	
Rows 3	Text Size Font	12 Times New Roman
	Text Color	(0, 0, 0)
Spacing (pixels)	Picture Bank Name	None
Horizontal 2 📑	Picture Name	None
Vertical 2 :	Foreground Color	(180, 180, 18
	Style	Standard
🔽 Address Increment	Function Push Time	Set
C X-Direction C Y-Direction		미치
OK Cancel	Step Action	<b>_</b> _
	➡ [18] Move ele	
THE STANDER CARTER AND A COMPANY AN	➡ [19] Delete ele	
	➡ [20] Create ele ➡ [21] Move ele	Construction of the second
	🖨 [22] Move ele	
	➡ [23] Move ele	ement 🚽
	Record Output	
?? Download:USB [367,28] W:77 H:69 Build:Thu Apr 8 10:53:58 2004	NUM	

Fig. 2-4-31 Multiple duplicate example

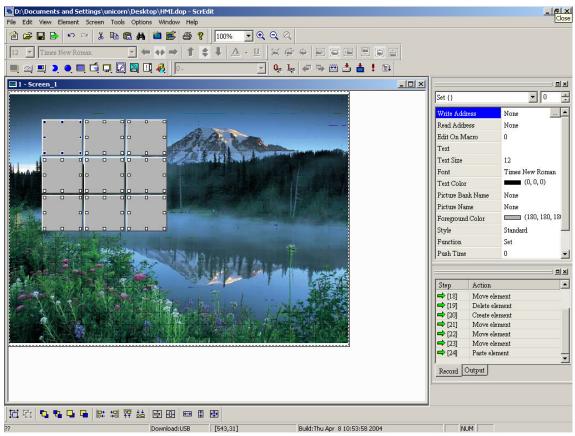


Fig. 2-4-32 Multiple duplicate example

#### 2-3-3 View

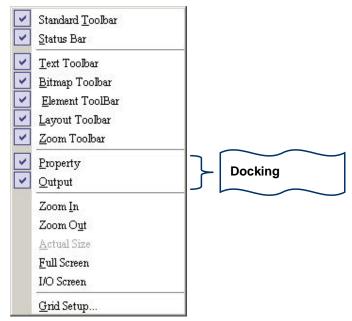


Fig. 2-5-1 View options

You can decide what toolbars/docking windows to display or not. Once you click it, it will have icon  $\checkmark$  in front of it and display on screen. You can also arrange these toolbars/docking windows by yourself.

			_ 8
	A.	A	
		Zoom X	
	with the second of the Carlot Carlot	100% - Q Q Q	
SLAMAN BERTHING		Property 🛛	
		Screen {Screen_1}	
		Screen Name Screen_1	
and the second second	Output	SubScreen Detail	
	Step Action Step I16 Move element	▲ Background Color (252, 252, 252)	
	Image: Provide all the second sec	Screen Open Macro 0	
	[18] Move element	Screen Close Macro 0 Screen Cycle Macro 0	
and a second		Screen Width 640	
	➡ [21] Move element	Screen Height 480	
Carlos in 12			
	→ [23] Iviove element → [24] Paste element		
	Record Output		
Build			
Build	y & k & a & t		
0 -	y Q, 1, @ > 世 <b>4 4</b> 时 13 砰 站 白 19	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	

Fig. 2-5-2 Docking windows

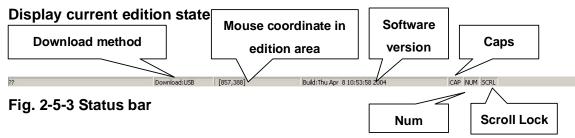
## 1. Standard toolbar

1a 🚅						
Statistics and St						
lcon	Function	Description				
1	New	Create new application				
<b>2</b>	Open	Open old application				
	Save	Save edition application				
	Export	Export an application to BMP format				
×)	Undo	Undo an action (some can't be undo)				
C.	Redo	Redo an action				
Ж	Cut	Cut selected elements				
8	Сору	Copy selected elements				
<b>6</b>	Paste	Paste the element you copy or cut				
<b>#</b> %	Find	Find specific text, write address or read address				
	New screen	Create new screen				
Ē	Open	Open old screen				
	screen					
Da.		Preview print screen				
	preview					
6	Print	Print current application				
8	About	Screen editor version				
•	screen					

12 🖻	<b>₽</b> ► ∾ ∾	x 🖻 🛱 🚧 🧰 🖻 💽 🚭 💡
lcon	Function	Description
	editor	

#### Table 2-5-1 Standard toolbar

#### 2. Status bar



### 3. Text toolbar

Text Format		
12 💌 Times New Roman	n 💌	
lcon	Function	Description
12 💌	Text size	Display and change text size
Times New Roman	Font	Font
<del>4</del>	Align left	Align text to left
<b>4</b> ¢	Center to page horizontall y	The space at the right/left sides of text will be the same
⇒	Align right	Align text to right
Û	Align top	Align text to top
\$	Center to page vertically	The space at the top/bottom sides of text will be the same
Û	Align bottom	Align text to bottom
<u>A</u> -	Text color	Change text color
<u>u</u>	Underline	Add line under text

#### Table 2-5-2 Text toolbar

## 4. Bitmap toolbar

<b>a</b>		<u>.</u>			
Icon Function		n	Description		
(III)		Enlarge a Figure		gure	Enlarge selected Figure to element size
-		Actua	al Figur	e size	e Resize the selected element to actual Figure size
		Align	to left	side	Align selected element to left side

	📼 🖭 🔛	
Icon	Function	Description
r	Center to page	The space at the right/left sides of text will
<u>—</u>	horizontally	be the same
•	Align to right side	Align selected element to right side
	Align to top side	Align selected element to top side
	Center to page vertically	The space at the top/bottom sides of text will be the same
	Align to bottom side	Align selected element to bottom side

Table 2-5-4 Bitmap toolbar

## 5. Element toolbar

Toolbar		드 🕽 🔵 🔲 🖆 🗔 🔯 🔛 🥀					
lcon	Function			D	Description		
	Button	Set			System Date <u>T</u> ime		
		🔳 Reset			Password Table Setup		
		🔲 Maint	ained		Enter Password		
		🔳 Mome	ntary		Contrast Brightness		
		🔲 Multis	tate		Low Security		
		🔲 Set Va	lue	۲	System Menu		
		🔳 Set Co	nstant				
		🔲 Increm	ent				
		🔲 Decrei	nent				
		🔲 Goto S	Screen				
		🔲 Previo	us Main Screen	1			
<u></u>	Meter	🗖 Meter	(1)				
		🖸 Meter	3233				
		🖸 Meter	535				
<b>_</b>	Bar	L Norma	1				
		<u> </u>	335				
	Pie			-			
2		<ul> <li>Pie(1)</li> <li>Pie(2)</li> </ul>					
		> Pie(2)					
		<ul> <li>Pie(3)</li> <li>Pie(4)</li> </ul>					
	Indicator	Pie(4)		_			
	maicator	1000 A 1000 A 100 A	tate Indicator				
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Toolbar		💷 🔰 🔍 📺 🖆 🛄 🖉 🛄 🥀					
Icon	Function	Description					
	Data	Numeric Display					
	display	Character Display					
		Date Display					
		Time Display					
		Day-of-week Display					
		Prestored Message					
		Moving Sign					
Ć.	Graph	State Graphic					
_	display	Animated Graphic					
<b>"</b>	Input	Numeric Entry					
		Character Entry					
	Curve	Trend Graph					
		X-Y Chart					
E.	Sampling						
	Gamping	Historical Trend Graph Historical Data Table					
		Historical Data Table Historical Event Table					
	Alarm						
	Aldrin	Alarm <u>H</u> istory Table					
		<u>A</u> ctive Alarm List					
	<u> </u>	Alarm Frequence Table					
♣	Graphic	Line					
		E Rectangle					
		O Circle					
		C Polygon					
		2 Arc					
		A Text					
		Scale					
		Table					

## Table 2-5-5 Elements

# 6. Planning toolbar

# A. Upper-level planning toolbar

🔽 🖸 🚍 🖓 🗣 🗮 🏄 🚦						
lcon	Function	Description				
<b></b>	Current text	Text on selected element				
	Current status	Current status				
₽	Previous windows	Select previous windows				
<b>₽</b>	Next windows	Select the next windows				
(fff)	Compile	Compile current element				
*	Download screen data and	Download screen data and recipe				

	recipe	
<b>±</b>	Download screen data	Download screen data
1	On-line simulation	Test edition file at PC side and it needs to connect to PLC.
Et	Off-line simulation	Test edition file at PC side and it doesn't need to connect to PLC.

Table 2-5-6	Та	ble	<b>≥ 2</b> ∙	-5-6	3
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# b. Lower-level planning toolbar

	Function	Description	
	Group	Make all selected elements a group	
Ч <u>н</u>	Ungroup	Ungroup elements	
<b>~</b>	Bring to front	Bring the selected element to front	
2	Send to back	Send the selected element to back	
<b>L</b>	Bring forward	Bring the selected element forward	
	Send backward	Send the selected element backward	
<b>0</b> +	Align left	Align the selected element to left side	
*미	Align right	Align the selected element to right side	
<b>₽</b> ₽	Align top	Align the selected element to top side	
<u>5</u>	Align bottom	Align the selected element to bottom side	
	Center to page vertically	The space at the top/bottom sides of text will be the same	
+D+	Center to page horizontally	The space at the right/left sides of text will be the same ∘	
↔	Make same width	Make the selected elements to be the same width with based element	
1	Make same height	Make the selected elements to be the same height with based element	
<b>•</b>	Make same size	Make the selected elements to be the same size with based element	

Table 2-5-7 Lower-level planning toolbar

## C. Zoom toolbar

75% 💌	]ଇ୍ର୍ର୍	
Icon Function		Description
200% 🔻	Zoom	Let you set a zoom level, including 25%, 50%, 75%, 100%,
	level	150%, 200% and 300%

€.	Zoom in	Let you change the magnification level, including 150%, 200% and 300%.
Q		Let you reduce the magnification level, including 25%, 50% and 75%.
2	1:1	Let you change element size to actual size.

Table 2-5-8 Zoom toolbar

## 7. Properties table

Refer to chapter 3-1 for detail.

Set {}	• 0 ÷		
Write Address	None		
Read Address	None		
Edit On Macro	0		
Text			
Text Size	12		
Font	Times New Roman		
Text Color	(0, 0, 0)		
Twinkle	No		
Picture Bank Name	None		
Picture Name	None		
Transparent Effect	No		
Transparent Color	(0, 0, 0)		
Foreground Color	(180, 180, 180)		
Style	Standard		
Function	Set		
Push Time	0		
User Security Level	0		

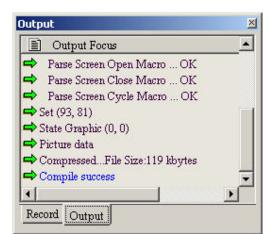
Fig. 2-5-4 Element property table

## 8. Output window

Recording edition actions for tracing error address.

Output		×
Step	Action	
➡ [1] ➡ [2]	Create element	
<b>⇔</b> [2]	Change element order	
Record	Output	;
<u>[lacoid</u> ]		

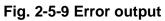
Fig. 2-5-6 Output window





×	Output 🛛
	📄 Output Focus
	Parse Background Macro Error (-104 Element address input error
1000	
-	
	Record Output

Fig. 2-5-8 Output result

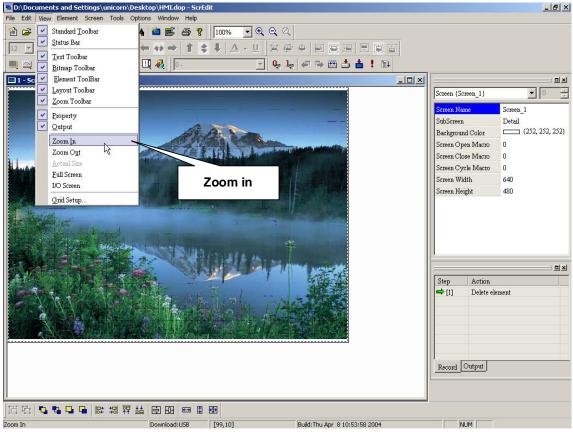


## 9. Zoom in

Zoom In 

Et you change the magnification level, including

150%, 200% and 300%. Refer to Fig. 2-5-10, Fig. 2-5-11, Fig. 2-5-12 and Fig. 2-5-13 for detail.





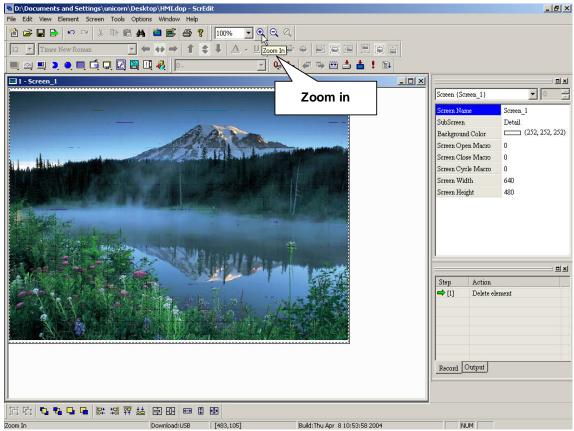
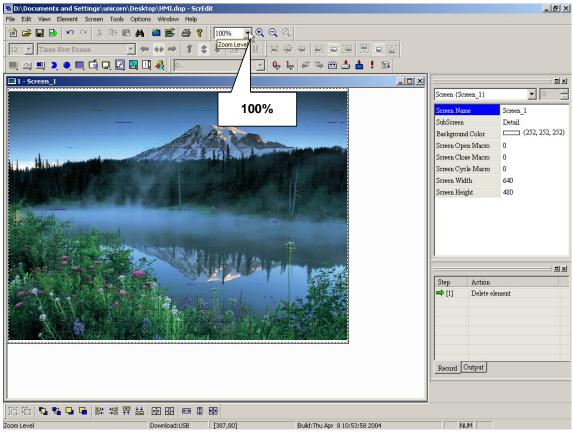


Fig. 2-5-11 Choosing from toolbar





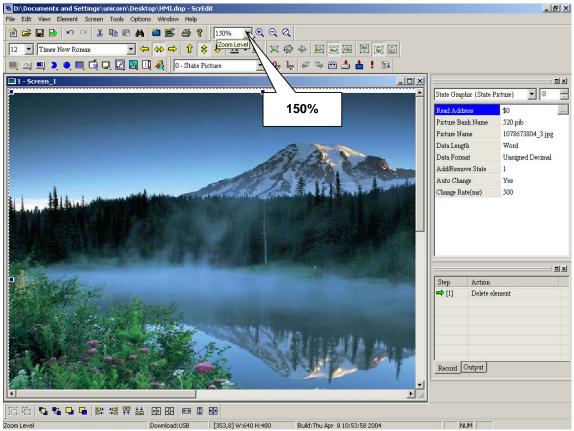
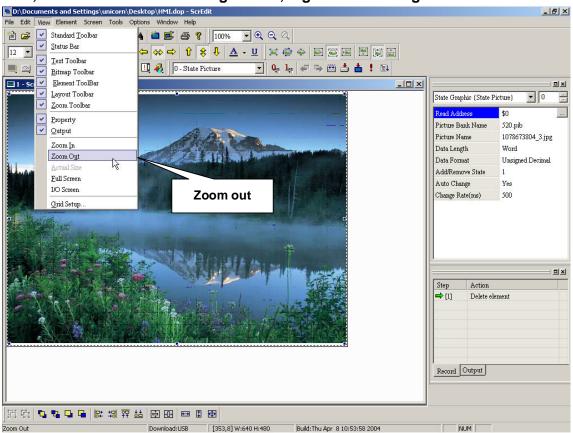


Fig. 2-5-13 Zoom level = 150%

#### 10. Zoom out

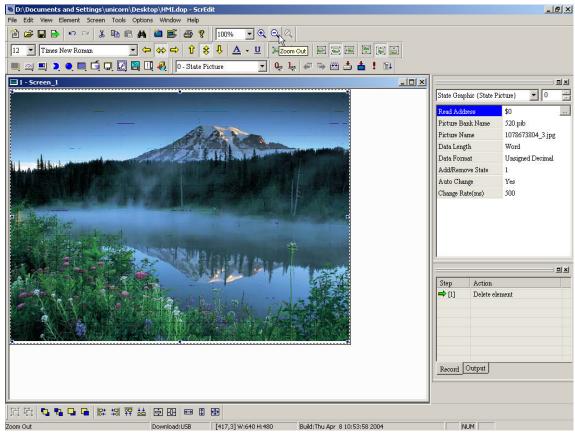
Zoom Out 

Let you reduce the magnification level, including



25%, 50% and 75%. Refer to Fig. 2-5-14, Fig. 2-5-15 and Fig. 2-5-16 for detail.

Fig. 2-5-14 Choosing from menu bar





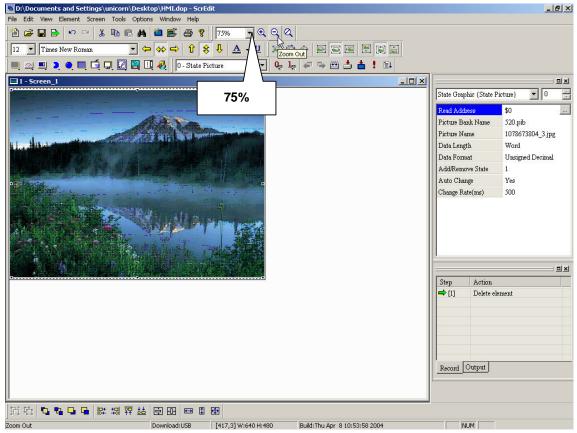


Fig. 2-5-16 After zoon out

#### 11. Actual size

Actual Size Let you change element size to actual size.

No matter zoom in or zoom out, the zoom level could be 20%, 50%, 75%, 100%,

150%, 200% and 300%. You can also zoom in/out by clicking icon 🖭 or 🔍 directly or selecting directly as Fig. 2-5-17.

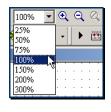


Fig. 2-5-17

#### 12. Full screen

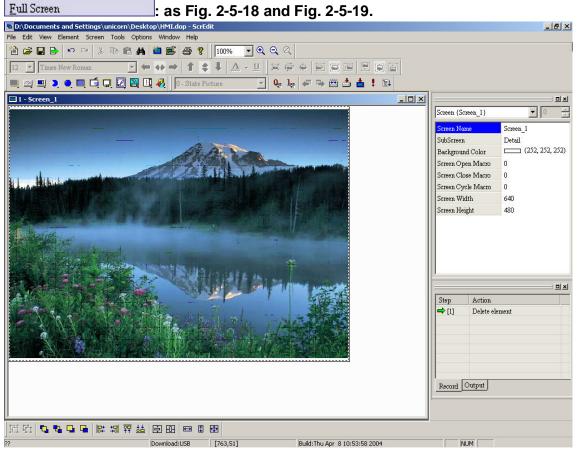


Fig. 2-5-18 Before full screen



Fig. 2-5-19 Full screen (you can exit by pressing Esc or left button of mouse) I/O screen

I/O Screen : as Fig. 2-5-20 and Fig. 2-5-21.

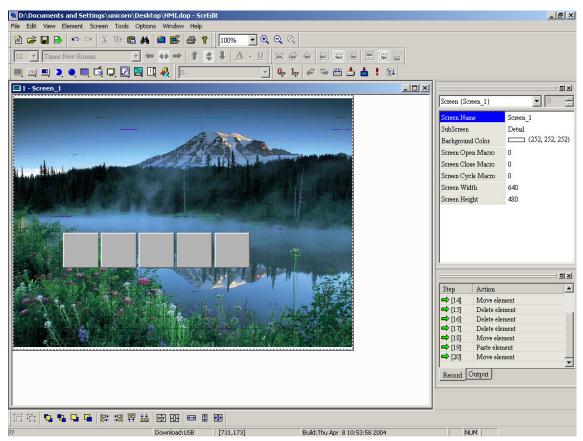
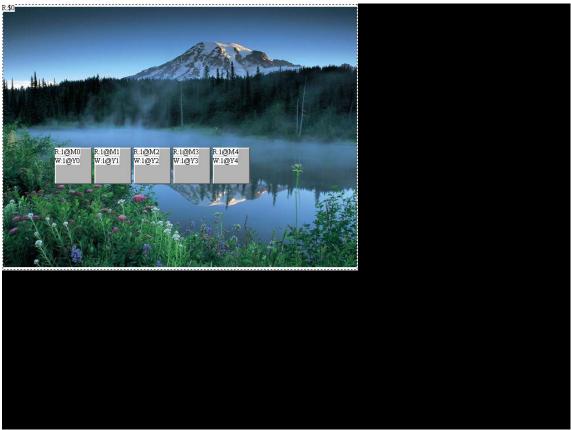
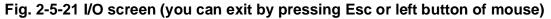


Fig. 2-5-20 Before I/O screen





## Grid setup

<u>Grid Setup...</u>: helps user to align elements easily. The grid interval can be set as Fig. 2-5-22.

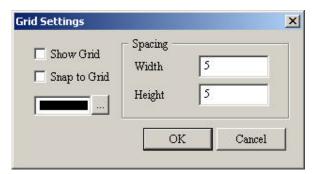


Fig. 2-5-22 Grid setup dialog box

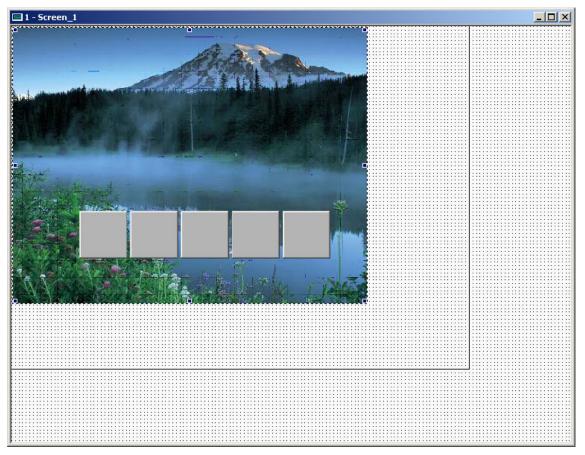


Fig. 2-5-23 Show grid

# 2-3-4 Elements

	<u>B</u> utton	•
12	<u>M</u> eter	۲
	Bar	•
0	<u>P</u> ie	+
•	Indicator	٠
	<u>D</u> ata Display	۲
Ó	Grap <u>h</u> Display	•
	In <u>p</u> ut	٠
	Curve	٠
	Sampling	۲
!	<u>A</u> larm	•
R	<u>G</u> raphic	•

Fig. 2-6-1 Element options

Screen editor provides 11 types of elements and there are lots styles for each type. These 11 types include button, meter, bar, pie, indication, data display, graph display, input, curve, sampling, alarm, graphic, etc. You can select your element from menu bar and drag the size you need as Fig. 2-6-2 and Fig. 2-6-3.

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·		·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	2	·	·	·	·	·	·	·	·	·	·	·	·	·	•
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•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
·	•	·	·	·	·	·	·	·	·	·	·	•	·	·	•	·	•	·	·	·	·	·	·	•	•	·	·	·	·	·	·	·	•
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•																																	

Fig. 2-6-2 Drag mouse to set element size

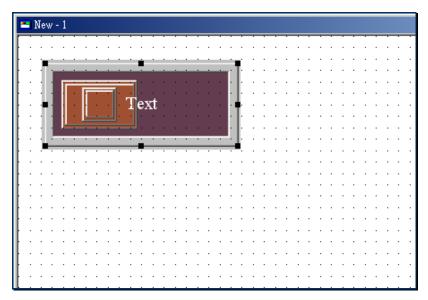
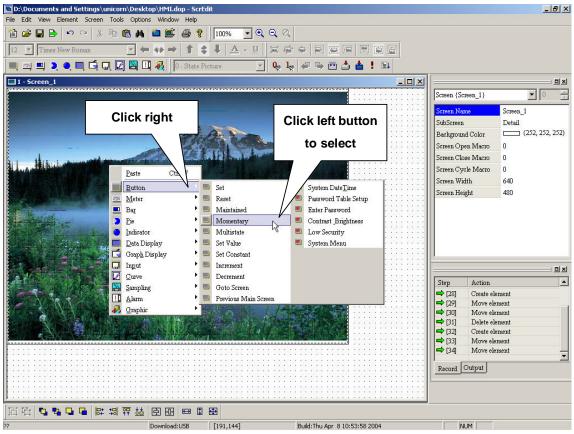


Fig. 2-6-3 Element display

Another method to establish element:

You can also select your element by clicking right-button of mouse in work area. Place your mouse pointer in work area and click right-button to get pop-up menu. At this time, you can get the element by clicking left-button. Then you only need to drag the size you need and set properties in properties table as fig. 2-6-4, fig. 2-6-5, fig. 2-6-6 and fig. 2-6-7. Refer to chapter 3 for properties of each element.



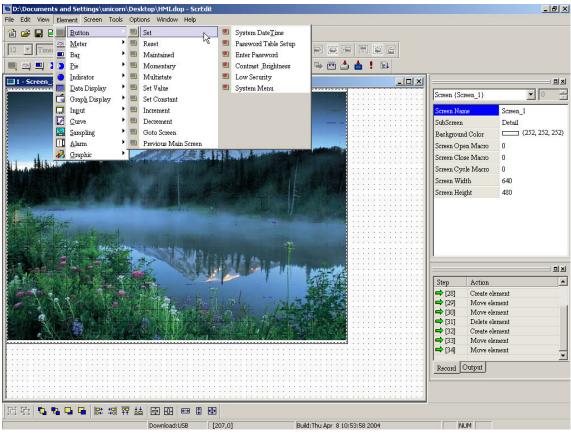


Fig. 2-6-4 Select element from pop-up menu



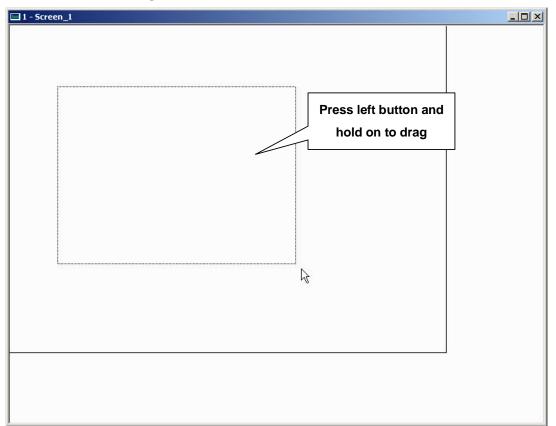


Fig. 2-6-6

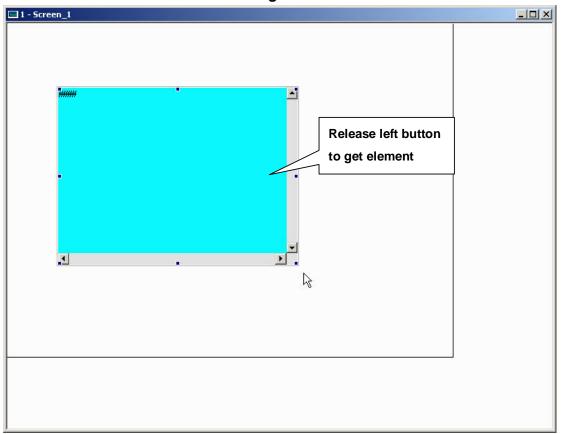


Fig. 2-6-7

**Element movement** 

Mouse operation is the same as windows<sup>®</sup>. When mouse pointer becomes to  $\bigoplus$ , it can be moved by pressing left button and hold on to move as Fig. 2-6-8, Fig. 2-6-9 and Fig. 2-6-10.

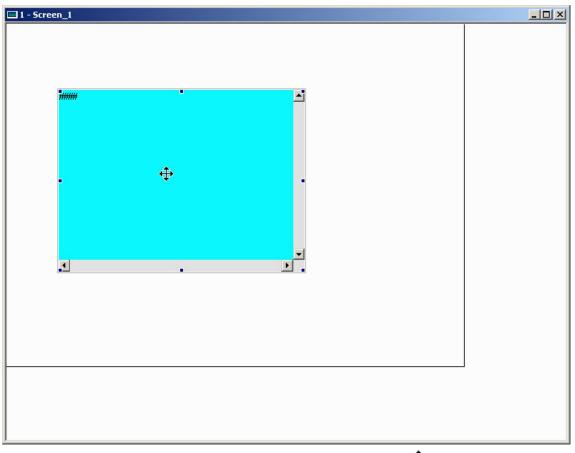


Fig. 2-6-8 Pointer will be changed to  $\clubsuit$ 

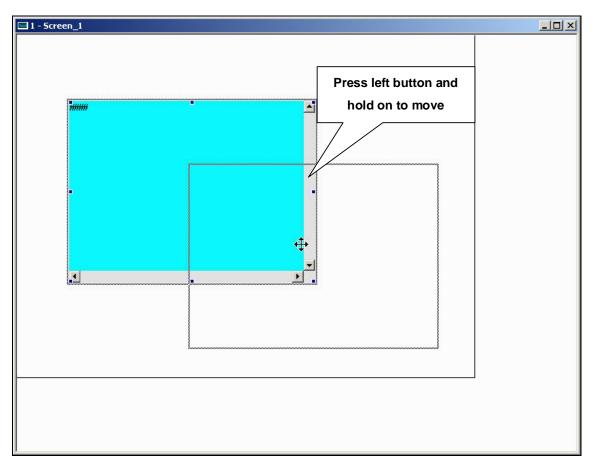
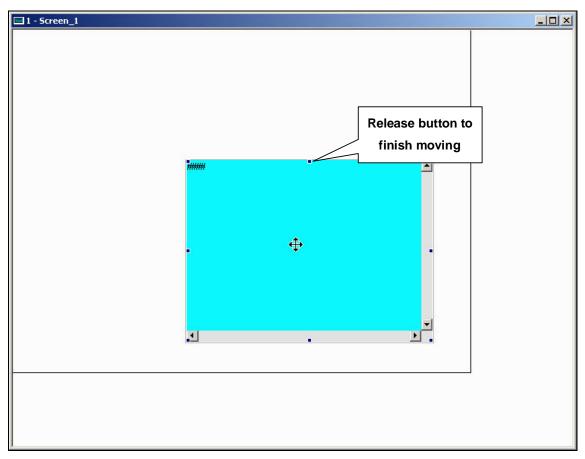


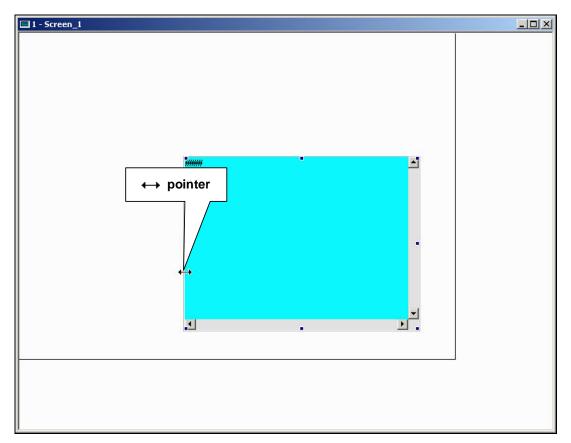
Fig. 2-6-9



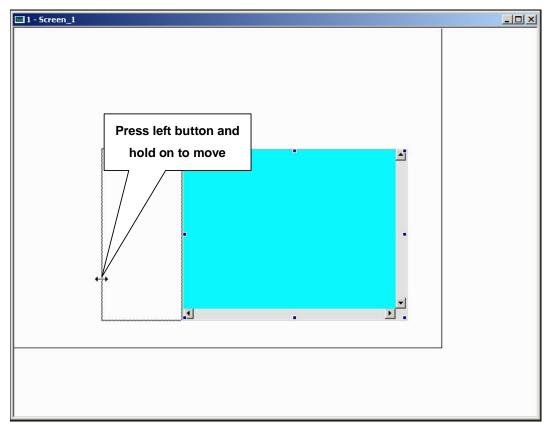


Modify element width

You can modify element size by pressing left button and hold on to move when mouse pointer changes to  $\leftrightarrow$  as Fig. 2-6-11, Fig. 2-6-12 and Fig. 2-6-13.







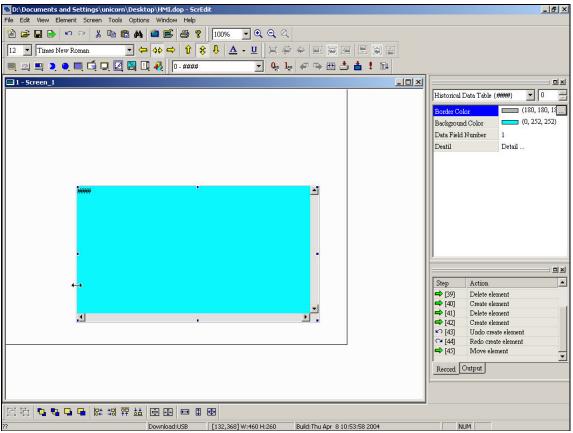


Fig. 2-6-13 Release to finish modifying width

Modify element height

You can modify element height by pressing left button and hold on to move when mouse pointer changes to 1 as Fig. 2-6-14, Fig. 2-6-15 and Fig. 2-6-16.

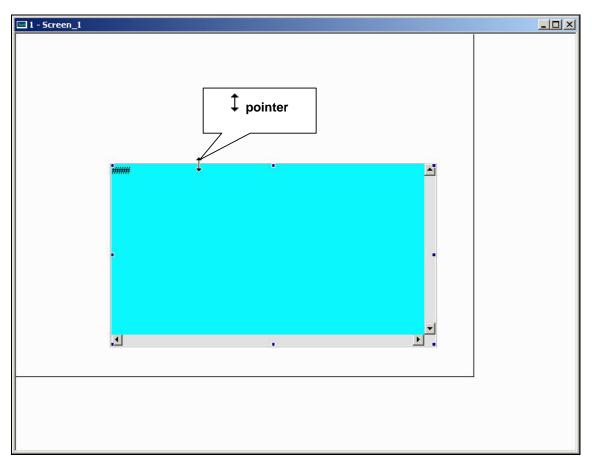


Fig. 2-6-14

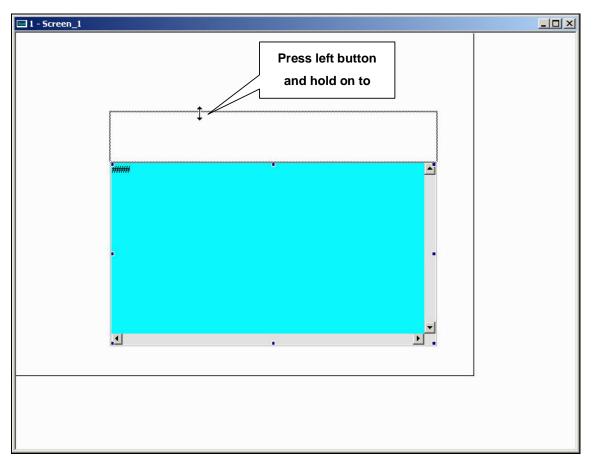
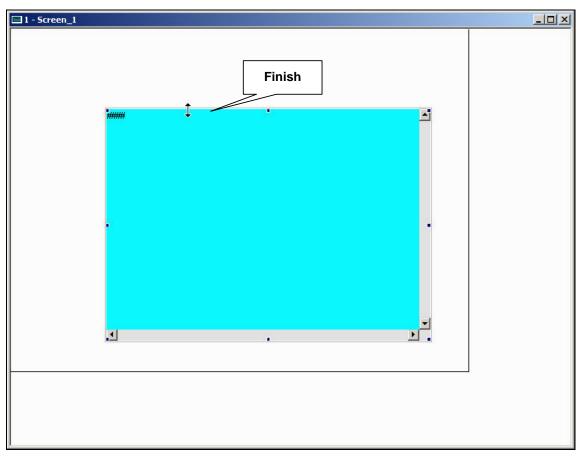


Fig. 2-6-15





Modify width and height simultaneously (Method 1)

You can modify element height by pressing left button and hold on to move when mouse pointer changes to  $\checkmark$  as Fig. 2-6-17, Fig. 2-6-18 and Fig. 2-6-19.

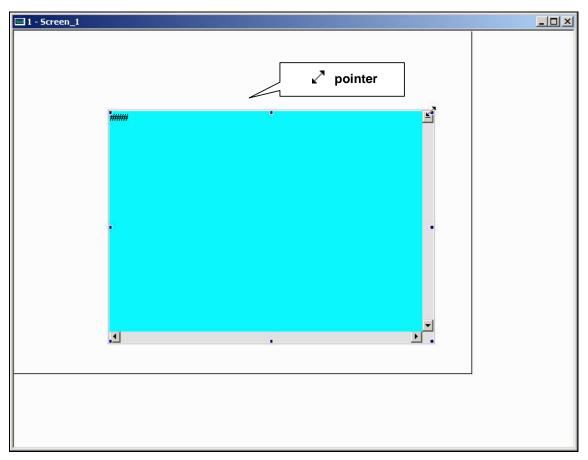


Fig. 2-6-17

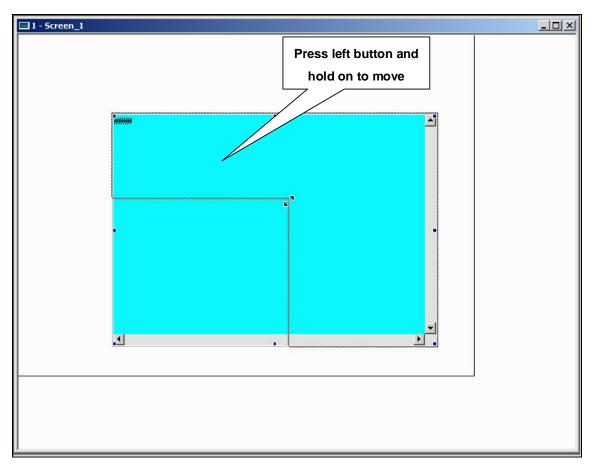
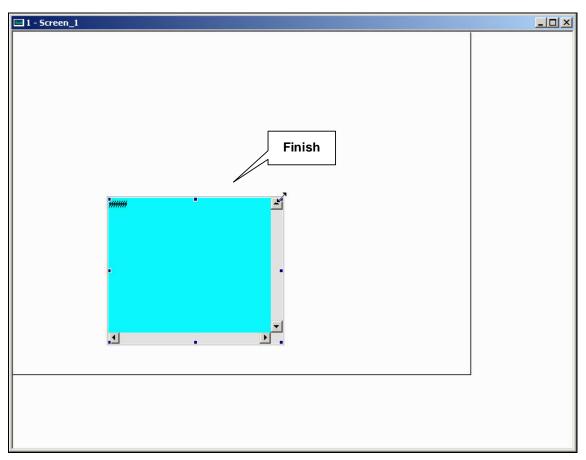


Fig. 2-6-18





Modify width and height simultaneously (Method 2)

You can modify element height by pressing left button and hold on to move when mouse pointer changes to  $\sqrt{2}$  as Fig. 2-6-20, Fig. 2-6-21 and Fig. 2-6-22.

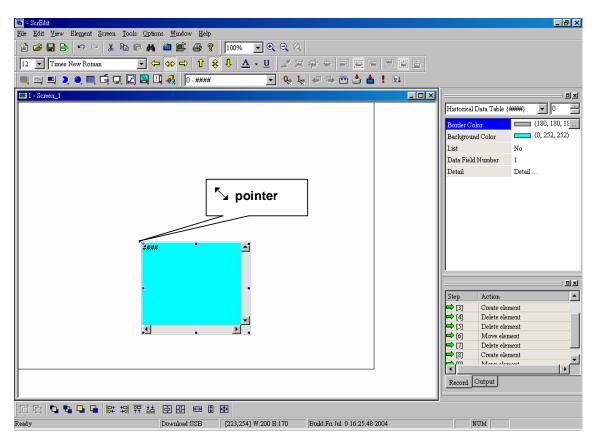


Fig. 2-6-20

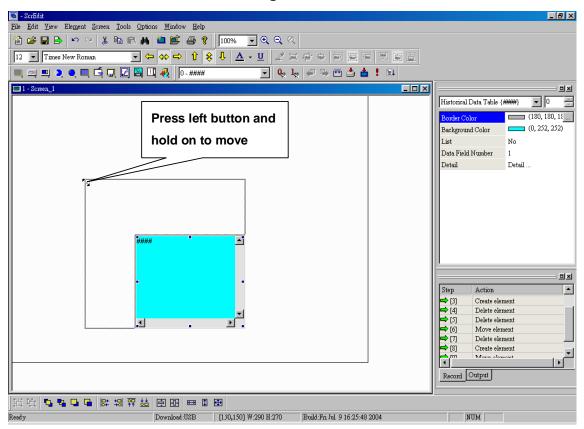


Fig. 2-6-21

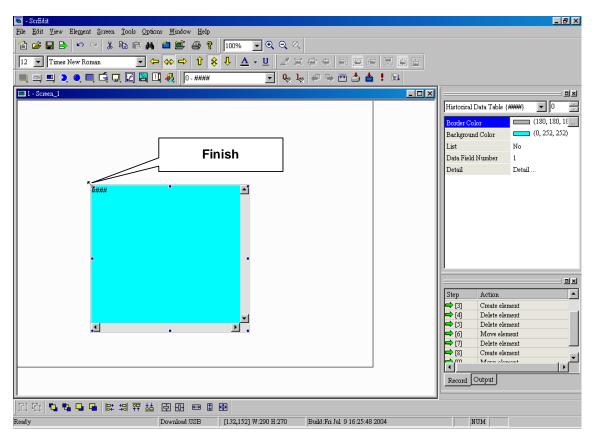


Fig. 2-6-22

#### Input characters

You can start to input any characters that windows® accepts at blink  $\,|\,$ 

pointer when mouse pointer is  $\square$  as Fig. 2-6-23 and Fig. 2-6-24.

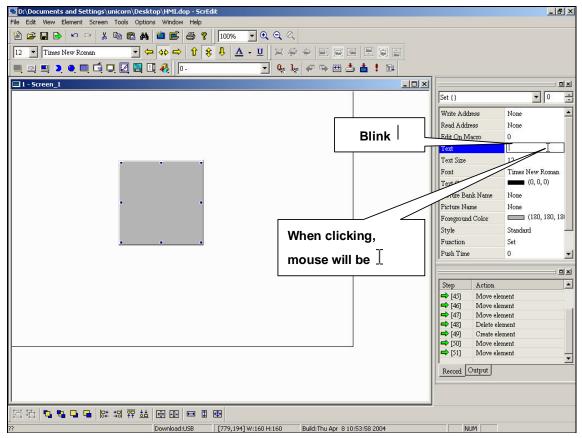


Fig. 2-6-23

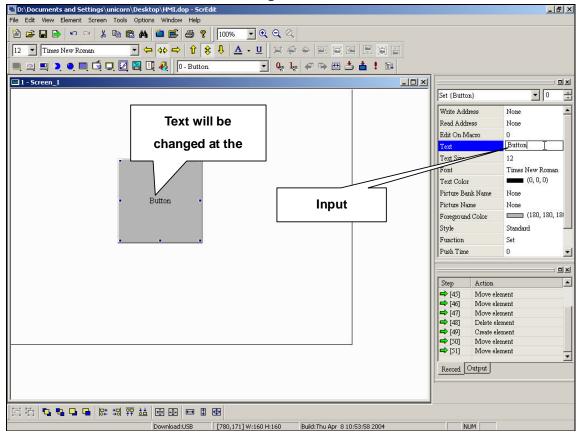


Fig. 2-6-24

## Right button of the mouse

You will find that there is different function in different place when clicking right-button as Fig. 2-6-25, Fig. 2-6-26 and Fig. 2-6-27.

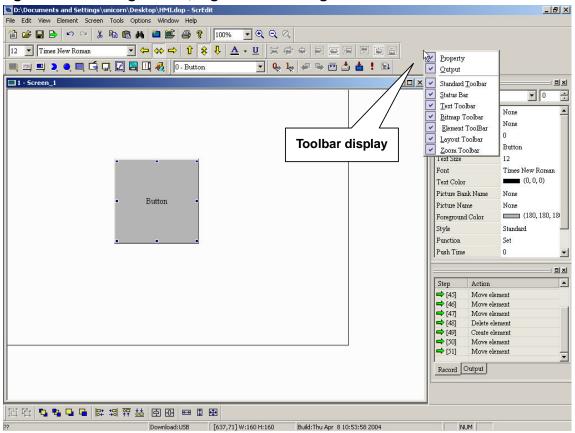


Fig. 2-6-25

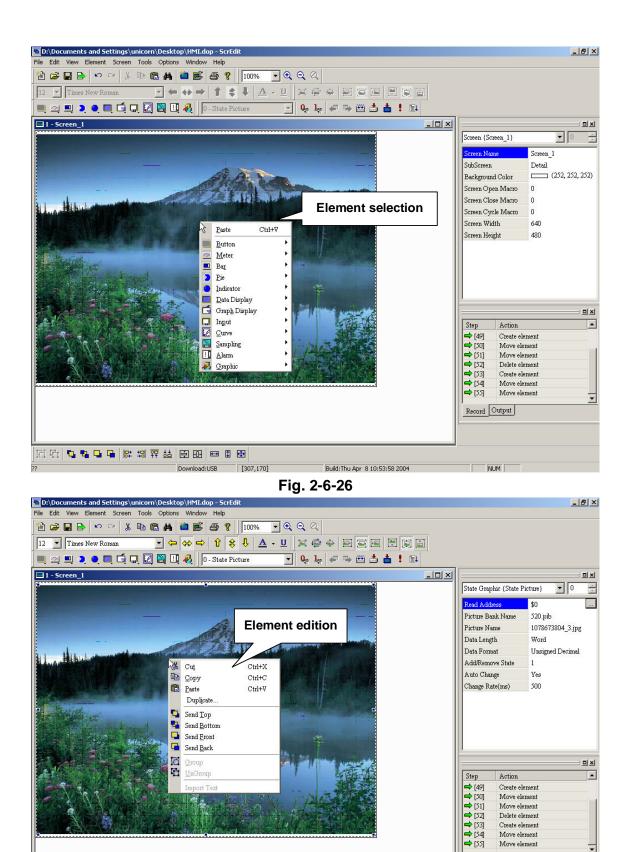


Fig. 2-6-27

Download:USB [249,144] W:640 H:480 Build:Thu Apr 8 10:53:58 2004 NUM

Move element Move element Delete element Create element Move element Move element

Record Output

# 2-3-5 Screen

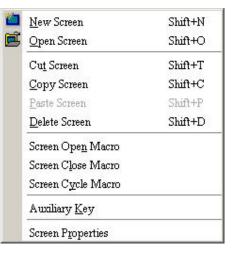


Fig. 2-7-1 Screen options

If you press close box as Fig. 2-7-2, it will hide current screen without exiting. In general application, it will exit current screen by clicking close box and remind user to save before exiting. But in screen editor, it only hide current screen NOT exit.

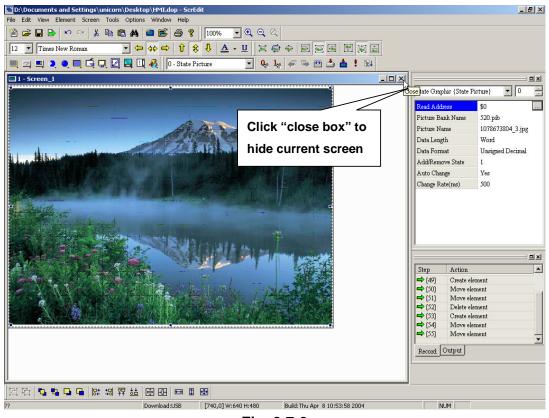
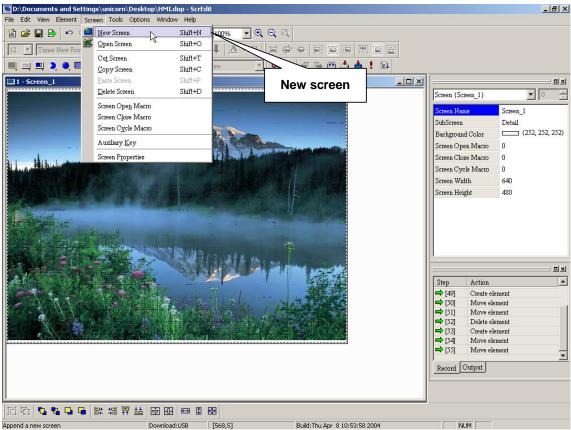


Fig. 2-7-2

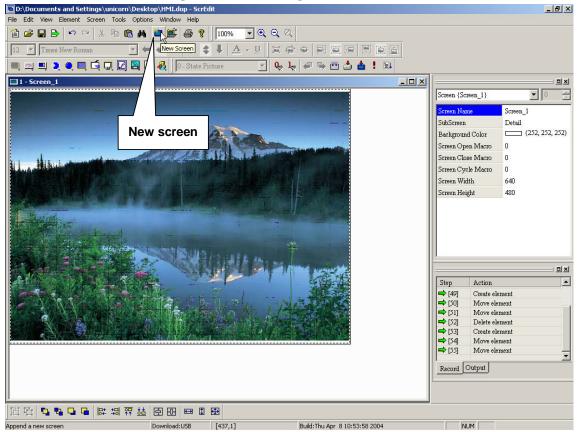
## 1. New screen

You can click the New screen icon <a>Imstyle</a> as Fig.2-7-4, or choose Screen > New screen as Fig.2-4-3, or use keyboard shortcuts by pressing Shift+N. And setting

#### in dialog box as Fig. 2-7-5.







## Fig. 2-7-4 Choosing from toolbar

				Input screen nan
Screen Name	Screen_2			
Screen ID	2			
	Ē	ОК	Can	

Fig. 2-7-5 Example for new screen dialog box

#### 2. Open Screen

Open the screen by clicking the Open screen icon 📕 as Fig.2-7-7, or choose

Screen > Open screen as Fig.2-7-6, or use keyboard shortcuts by pressing Shift + O. When choosing screen, you can preview screen as Fig. 2-7-8.

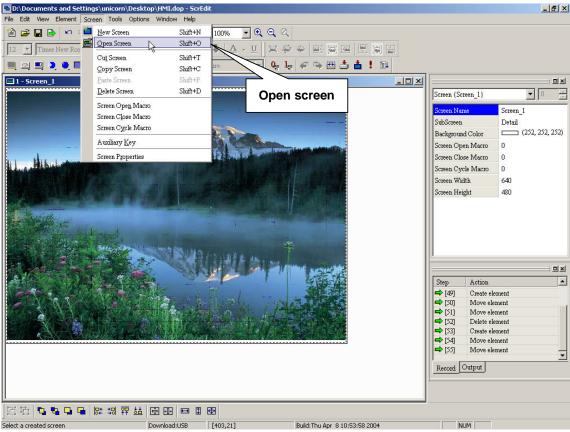
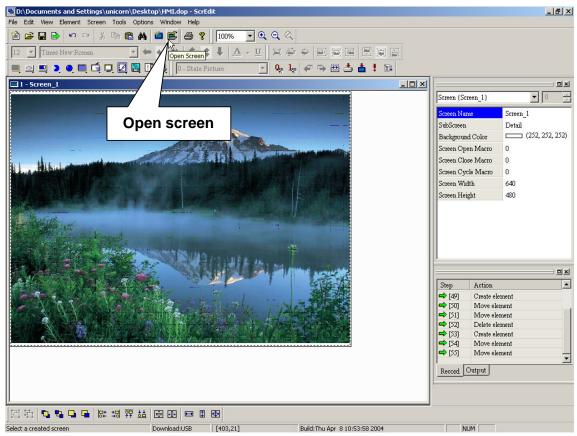


Fig. 2-7-6 Choosing from menu bar





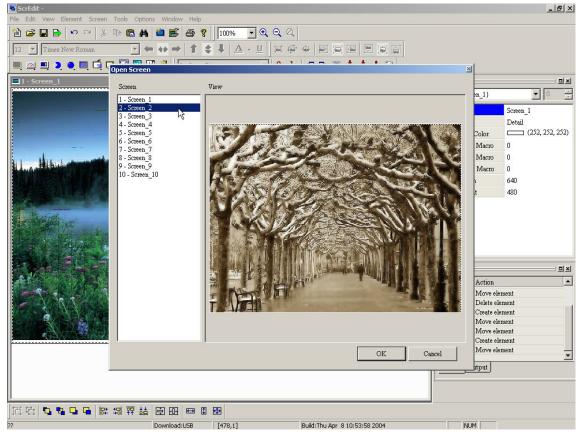
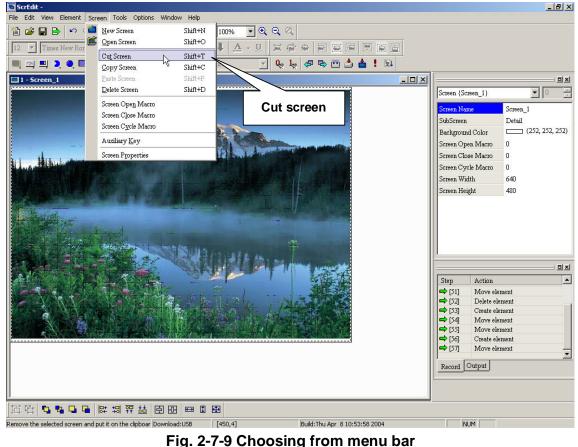


Fig. 2-7-8 Open screen dialog box

#### 3. Cut screen

It is used to cut whole screen. You can execute by choosing Screen > cut screen as Fig.2-7-9, or use keyboard shortcuts by pressing Shift + T. (Note: You can't undo the action of cut screen. It is the same as delete screen that screen will be lost but it can be pasted to get the same screen.)



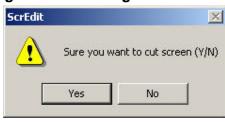


Fig. 2-7-10 Cut screen message

## 4. Copy screen

You can copy whole screen by clicking Screen > copy screen as Fig.2-7-11, or use keyboard shortcuts by pressing Shift + C.

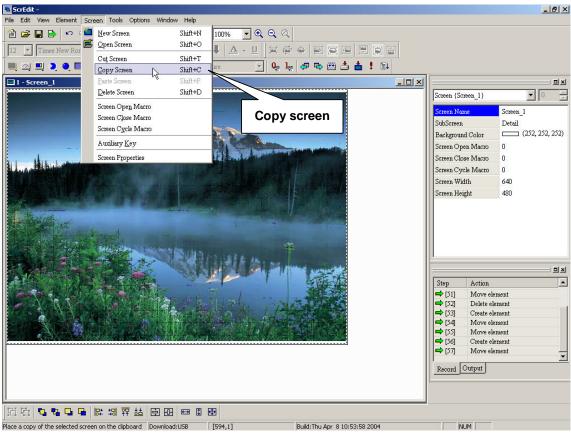


Fig. 2-7-11

## 5. Paste screen

You can paste screen by clicking Screen > paste screen as Fig.2-7-12, or use keyboard shortcuts by pressing Shift + P. All screen setting will be the same as original screen after pasting but screen name will be given automatically.

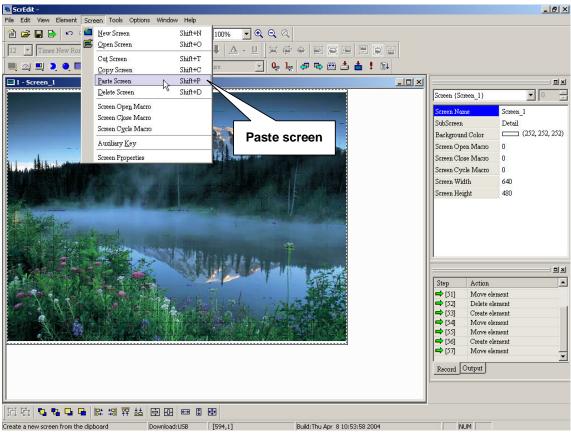


Fig. 2-7-12

## 6. Delete screen

You can delete screen by clicking Screen > delete screen as Fig.2-7-13, or use keyboard shortcuts by pressing Shift + D. (Note: After executing delete screen, it can't be undo. Please consider it carefully before deleting screen.)

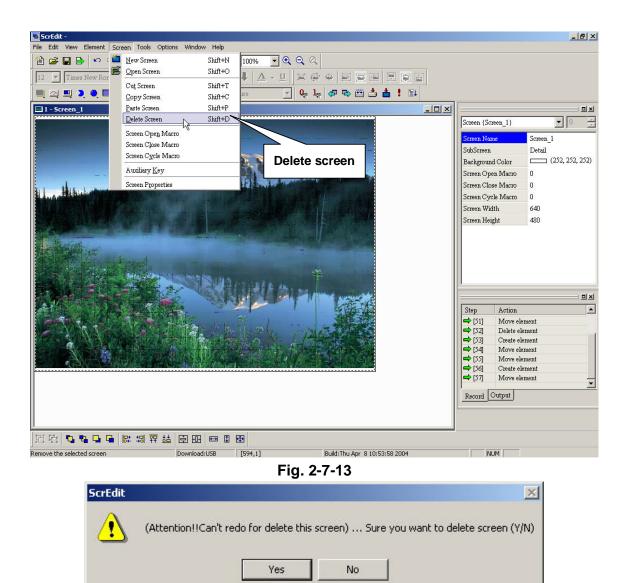


Fig. 2-7-14 Delete message

## 7. Screen Open Macro

The Macro that will be executed automatically once opening screen. (refer to chapter 4 for detail)

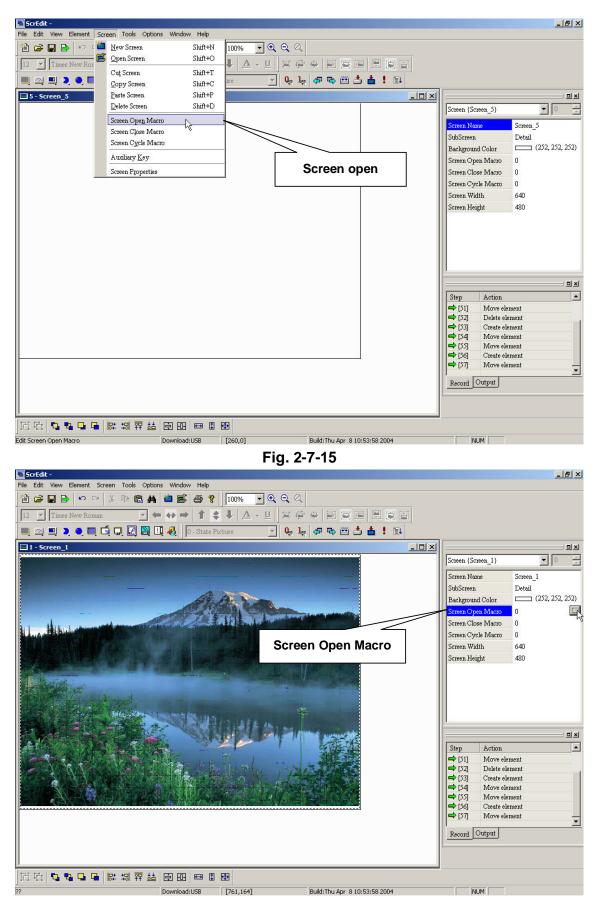


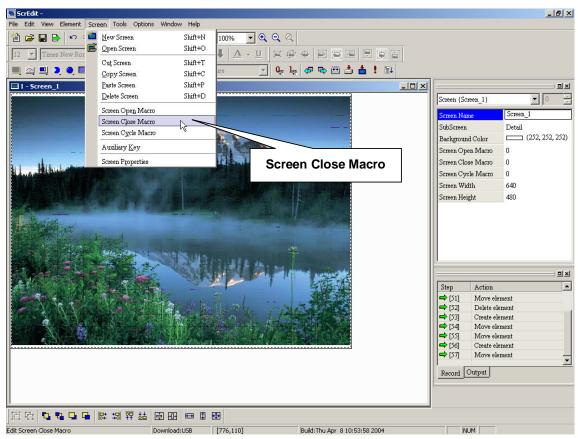
Fig. 2-7-16 Choosing from docking windows

ScrEdit -		_ <u>-</u>
File Edit View Element Screen Tools Options Window Help	<b>.</b>	
12 Tim Macro List		×
	Macro Command	<u>دا</u>
1 - Screen 3	File Edit Command Help	
4 5	_ ] 📽 🖬   ☆ ֆ び 🗟 🗙   #	creen_1}
6		ame Screen_1
7	☐ Double Word ☐ Signed	n Detail
8		nd Color (252, 252, 252)
9	Command  Arithmetic  ADD	pen Macro 0
	Variable I Data transfer MUL	vcle Macro 0
	Variable 2 Data Conversion > DIV	idth 640
13	Variable 3 Comparsion MOD	eight 480
14	Variable 4 Bit Setting	
15	Communication	
16 17	Misc	
20		
21		Action
22		Move element
23		Delete element Create element
24 25		Move element
26		Move element Create element
27		Move element
		Record Output
		Record Output
	li li	
□ [1] [1] [1] [1] [1] [1] [1] [1] [1] [1]		
?? Download:U58 [776,110]	Build:Thu Apr 8 10:53:58 2004	NUM

Fig. 2-7-17 Macro edition

## 8. Screen Close Macro

The Macro that will be executed automatically once closing screen. (refer to chapter 4 for detail)





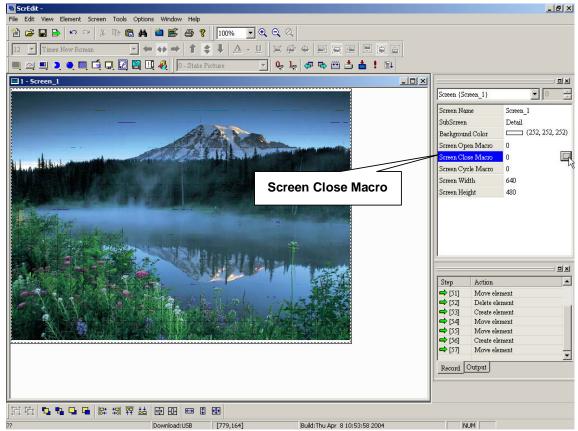


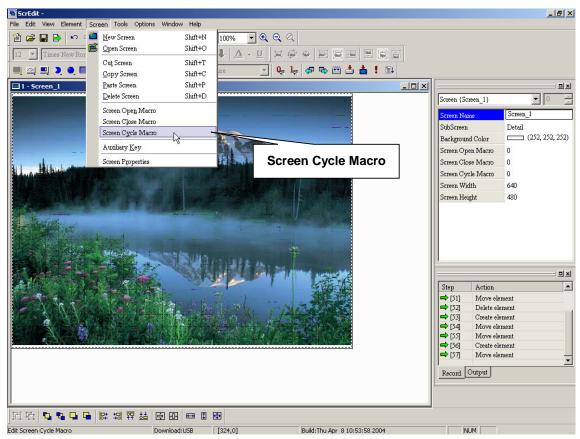
Fig. 2-7-19 Choosing from docking windows

ScrEdit -	_ 8 ×
File Edit View Element Screen Tools Options Window Help	
<sup>1</sup> 2 <sup>2</sup> 2 <sup>2</sup> 4 <sup>2</sup> 4 <sup>2</sup> 4 <sup>2</sup> 4 <sup>2</sup> 4 <sup>2</sup> 4 <sup>2</sup>	
12 🝸 Times New Roman 💽 🗢 🏕 🕈 🕇 📚 🖡 📥 - 🙂 🖉 🤤 🚔 🗐 🖉 🗑	
🔲 🖄 🖳 🕽 🌒 🗖 🛛 Macro List	×
1 - Screen_1	
2 Macro Command ? X 3 File Edit Command Help	<b>•</b> 0 ÷
	Screen 1
	Detail
6	(252, 252, 252)
- 7 Double Word Signed	0
8 9 Command P Arithmetic +	
10 Variable 1 Logical >	640
11 Data transfer	480
Flow Control	
14   Variable /4   Bit Setting     15   Communication   INITCOM	
16 Misc → ADDSUM	
17 XORSUM PUTCHARS	
18 19	
	- [A
	lement lement
22	lement
$\frac{23}{24}$	lement
25	lement
26	lement 💌
27	<b>_</b>
「 「 「 「 」 」 「 」 「 」 「 」 「 」 「 」 「 」 「	
Download:U58         [324,0]         Build:Thu Apr 8 10:53:58 2004         NUM	

Fig. 2-7-20 Editing Macro

### 9. Screen Cycle Macro

The Macro that will be constantly executed once displaying screen. (Macro will be executed by cycle time setting) (refer to chapter 4 for detail)





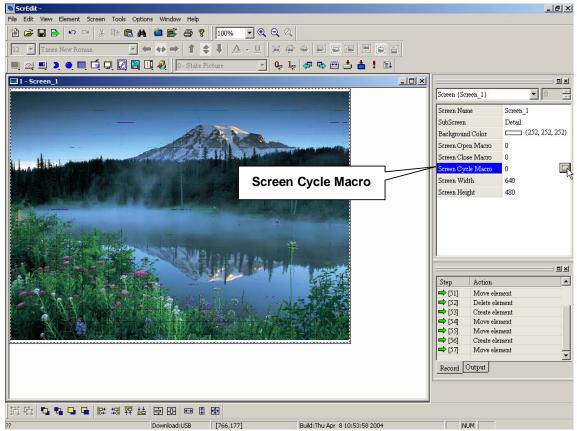


Fig. 2-7-22 Choosing from docking windows

ScrEdit -		_ @ ×
File Edit View Element Screen Tools Options Window Help		
	<b>Q Q</b>	
12     Times New Roman		
🔲 💯 🖳 🍳 🔲 🛛 Macro List	×	1
1 - Screen_1		=
2 3	Macro Command	• 0 -
4		Screen_1
5	🛎 🖬   û ↓ Ŭ 🗟 X   #	Detail
6		(252, 252, 252)
- 7	🗖 Double Word 🗖 Signed	0
		0
9 10	Command Arithmetic Logical	0
	Variable 1 Data transfer	640
	Variable 2 Data Conversion	480
13	Variable 3         Comparison         IF ==         IF <=           Flow Control         IF !=         IF AND == 0	
14	Variable 4 Bit Setting IF > IF AND == 0	
15	Communication   IF >= IF == ON	
16	Misc IF < IF == OFF	<u> </u>
17		
18		<b>_</b>
20		
		lement
22		lement
23		lement
24		lement lement
25		lement
26 27		
21		<u>1</u>
1911日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日		
?? Download:USB [779,74]	Build:Thu Apr 8 10:53:58 2004 NUM	

Fig. 2-7-23 Macro edition

## 10. Auxiliary key

It can use auxiliary key for each screen as Fig. 2-7-24, Fig. 2-7-25 and Fig. 2-7-26.

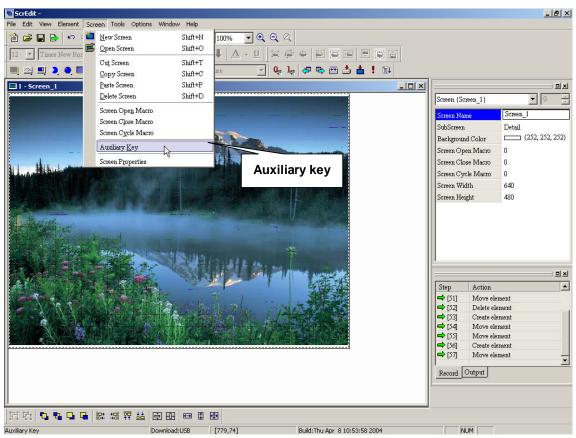


Fig. 2-7-24 Choosing from menu bar

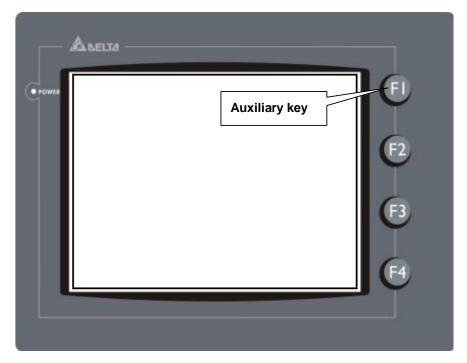


Fig. 2-7-25 Auxiliary key

None	▲	
Set		
Reset		
Maintained		
Momentary		
Multistate		
Set Value		
Set Constant		
Increment		
Decrement		
Goto Screen		
Previous Main Screen		
System Date&Time		
Password Table Setup		
Enter Password	12	ок
Contract & Decktores		on
Contrast & Brightness		
Low Security		ancel

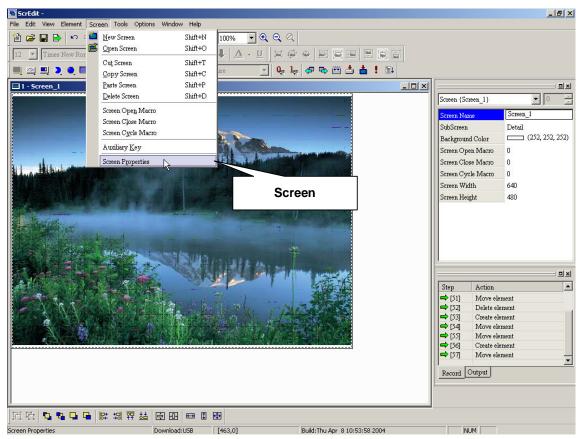
Fig. 2-7-26 Settings for auxiliary key

## The number of auxiliary key for each model to use:

DOP Model name	Number of auxiliary
	key
DOP-A57GSTD	4
DOP-A57CSTD	4
DOP-A75CSTD	5
DOP-A10TCTD	6

### 11. Screen property

In this setting, you can decide to set current screen to sub-screen or not. It also can set sub-screen size and delay time of clock Macro as Fig. 2-7-29.





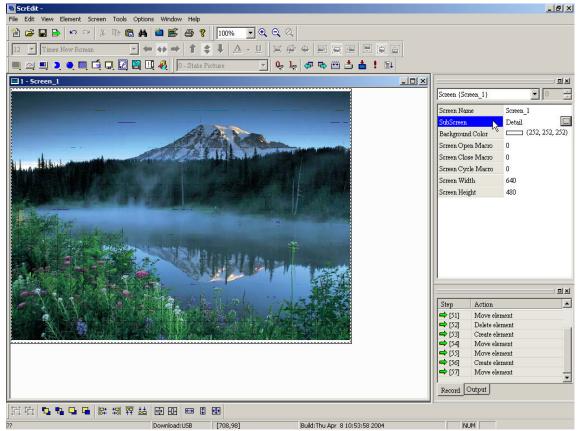


Fig. 2-7-28 Choosing from docking windows

en Properties			_	Sub-s	creen se	tt
Screen Number						
Screen Settings						
This screen is a sub-screer	You can s	set followin	g items	s by che	ecking	
Width 640		C Shown o		play cente	er	
Height 480		€ Shown a	Х	0		
			Y	0		
🦳 Need a base screen			Delay		-	
		1	for m	acro		
Clock Macro Delay	100	•	ms			
		ОК	1	Canc	. 1	
		40		Canc	ei	

Fig. 2-7-29 Screen property setting

2-3-6 Tools

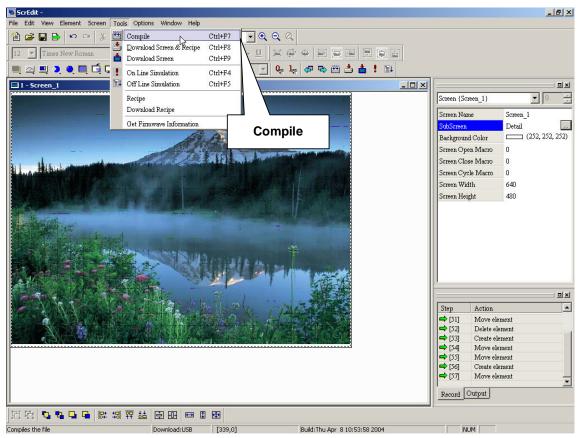
	Compile	Ctrl+F7
	Download Screen & Recipe	Ctrl+F8
<b>t</b>	Download Screen	Ctrl+F9
1	On Line Simulation	Ctrl+F4
≣↓	Off Line Simulation	Ctrl+F5
	Recipe	
	Download Recipe	
	Get Firmware Information	

Fig. 2-8-1 Tools options

### 1. Compile

It is used to compile edition screen to the format for HMI. If this application is a new application, it will remind user to save before compiling. If this application has saved or it is an old application, it will compile directly. It will output message, including error, to output field during compiling and get object file finally. But if there is error, it won't get object result. You can execute it by

clicking tools > compile or clicking icon directly or using keyboard shortcuts by pressing Ctrl + F7. Refer to example in Fig. 2-8-4 and Fig. 2-8-5.





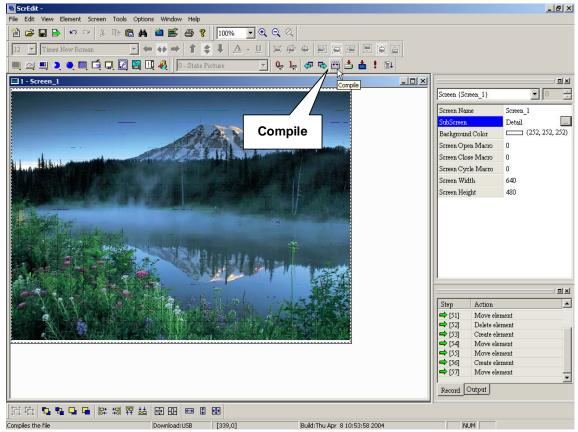


Fig. 2-8-3 Choosing from toolbar

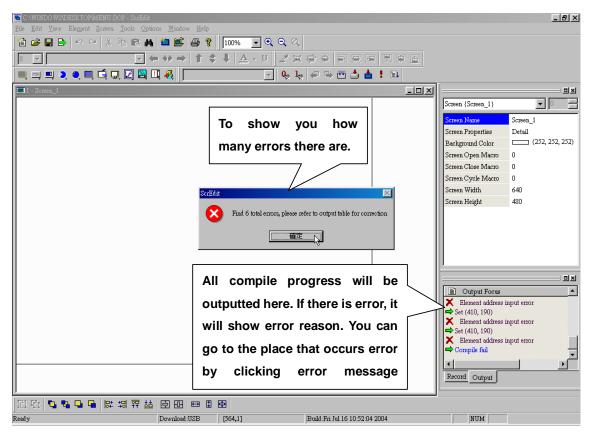


Fig. 2-8-4 Compile example

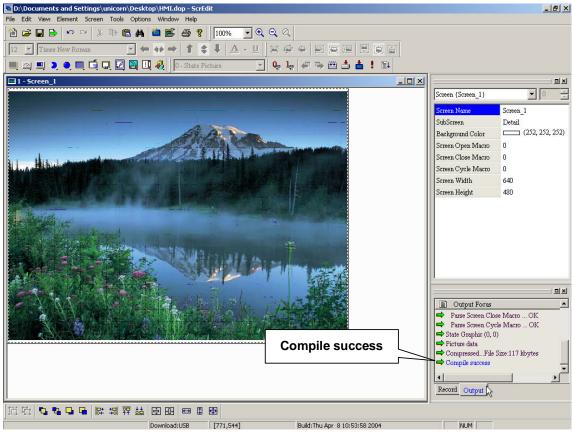


Fig. 2-8-5

2. Download screen data and recipe

You can download screen data and recipe by clicking Tools > Download screen

data and recipe as Fig. 2-8-7 or clicking icon directly as Fig. 2-8-8 or using keyboard shortcuts by pressing Ctrl + F8. If PC can't connect to HMI, it will give you error message as Fig. 2-8-10 and Fig. 2-8-11.

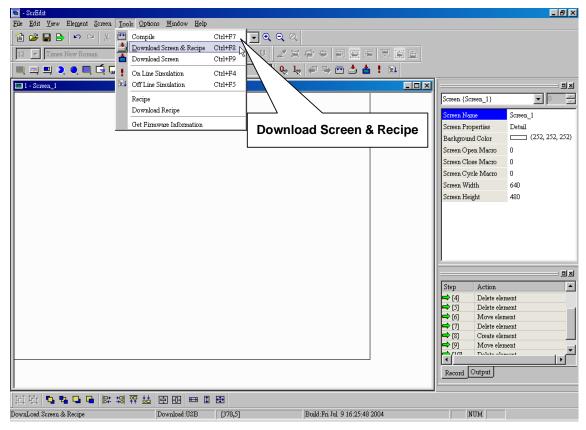
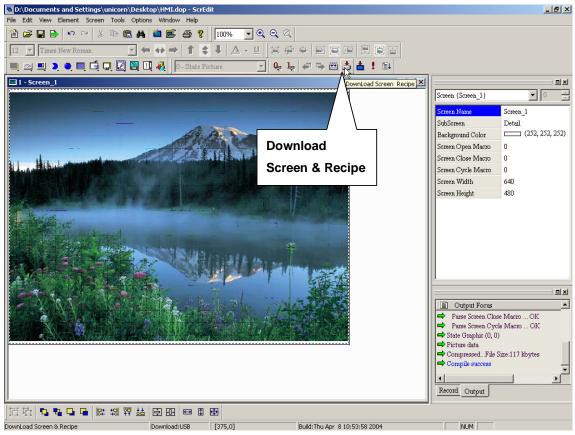


Fig. 2-8-7 Choosing from menu bar





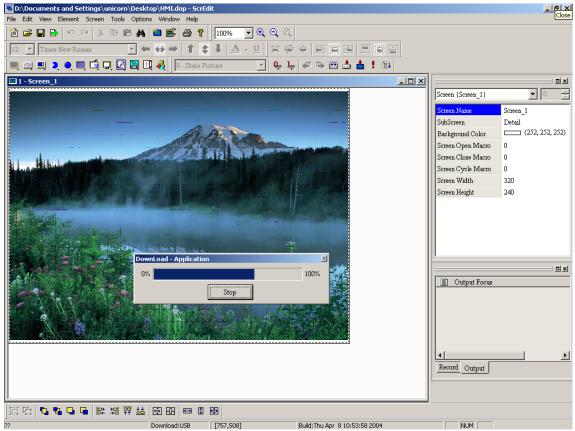
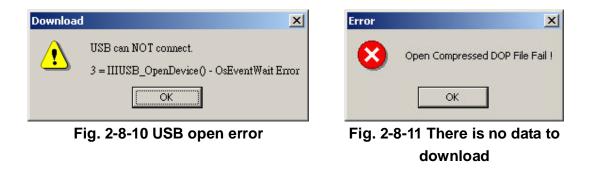


Fig. 2-8-9 Start to download (the progress will be from 0 to 100)



#### 3. Download screen data

It is only used to download screen data. You can execute it by clicking Tools >

Download screen data as Fig. 2-8-12 or clicking icon directly as Fig. 2-8-13 or using keyboard shortcuts by pressing Ctrl + F9.

📧 - ScrEdit			
<u>File Edit View Element Screen Tools</u>	s <u>O</u> ptions <u>W</u> indow <u>H</u> elp		
Image: Image	Options Window Help Compile Compile Curl+F7 Download Screen & Recipe Curl+F8 On Line Simulation Ctrl+F4 Off Line Simulation Ctrl+F5 Recipe Download Recipe Get Firmware Information	Download Screen	Screen (Screen_1)       Screen Name       Screen Properties       Detail       Background Color       C52, 252, 252)       Screen Open Macro       0       Screen Close Macro       Screen Width       640       Screen Height       480
또 또 및 및 및 및 () (주 13) 후 Download Screen	祥 站 [라 대 대 13] (460,16) Download.USB (460,16)	Build-Fri Jul 9 16:25:48 2004	Step     Action       Id     Delste element       Id     Delste element       Id     Delste element       Id     To Delste element       Id     Delste element

Fig. 2-8-12 Choosing from menu bar

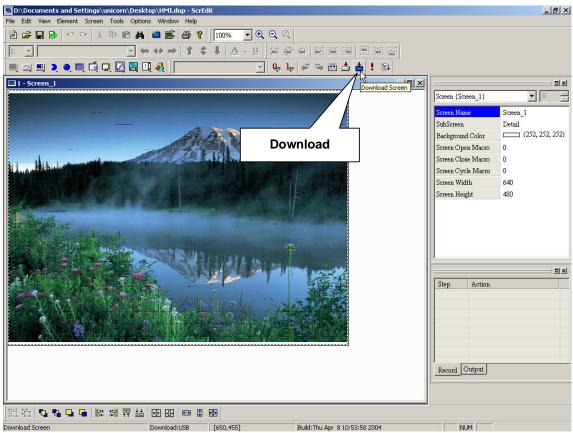


Fig. 2-8-13 Choosing from toolbar

## 4. Online simulation

It is used to simulate DOP series HMI by computer but PC should connect to PLC first to drive PLC by PC simulation. Therefore, you can't execute online simulation without connecting PLC. But you can execute offline simulation without connecting PLC. You can execute by clicking Tools > Online simulation

as Fig. 2-8-14 or clicking icon 🧾 directly or using keyboard shortcuts by

pressing Ctrl + F4. You can see simulation display in Fig. 2-8-16.

📧 - ScrEdit			_ @ ×
<u>File Edit View Element Screen Tools Opt</u>	tions <u>W</u> indow <u>H</u> elp		
Down	aload Screen & Recipe Ctrl+F8 aload Screen Ctrl+F9 ine Simulation Ctrl+F4		
□ 1 - Screen_1 □ Off Li	ine Simulation Ctrl+F5		<b>_</b>
	e aload Recipe 'imware Information	Online	Screen {Screen_1}         Screen Name       Screen_1         Screen Properties       Detail         Background Color       (252, 252, 252)         Screen Open Macro       0         Screen Cycle Macro       0         Screen Width       640         Screen Height       480
			Step Action  (4) Delete element  (5) Delete element  (6) Move element  (7) Delete element  (8) Create element  (9) Move element  (9) Move element  (1) Delete element  (1) Record Output
] #□, #□;   <b>"u" "d" u" u" u"</b>    64 →61 ## oc On-line Simulation	Download:USB [447,29]	Build:Fri Jul 9 16:25:48 2004	NUM
ON THE SEMICICUM	[20#10at.050 ] [447,29]	Dubu.111001 9 10:20:40 2004	



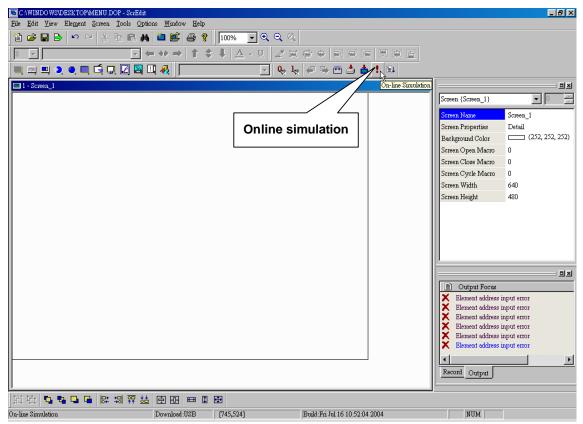






Fig. 2-8-16 Online simulation display

5. Offline simulation

It is used to test the correction of screen, read/write address and Macro without connecting PLC. You can execute by clicking Tools > Offline simulation as Fig. 2-8-17 or clicking icon as Fig. 2-8-18 or using keyboard shortcuts by pressing Ctrl + F5. The execution display will be Fig. 2-8-16.

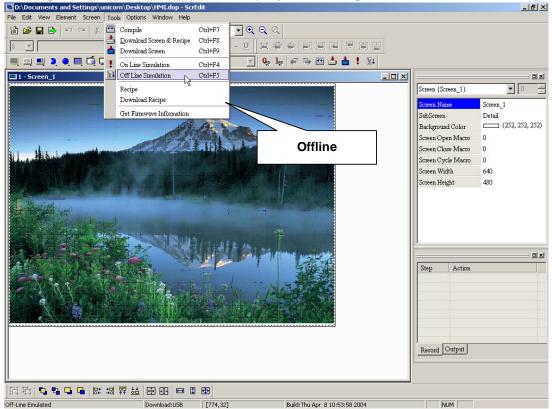


Fig. 2-8-17 Choosing from menu bar

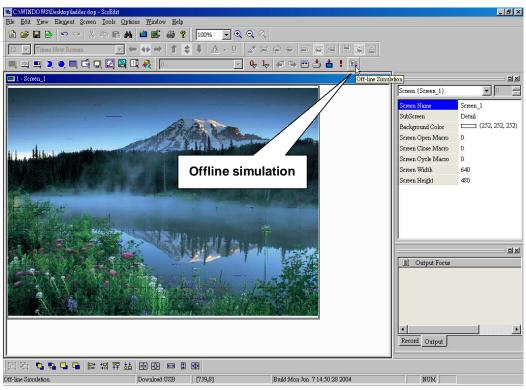


Fig. 2-8-18 Choosing from toolbar

## 6. Recipe

Recipe provides controller a convenient parameter input method. You can transmit the designated parameter to controller by using HMI recipe after finishing editing recipe. Recipe can be set and modified by recipe dialog box and it can save and use independently without application. Therefore, recipes can be used for all brand models. Before using recipe, you should enable first as Fig. 2-8-20.

🖷 - SerEdit				_ 8 ×
<u>File Edit View Element Screen Tools Options</u>				
12     Times New Roman     Image: Download S       Image: Download S     Image: Download S       Image: Download S     Image: Download S	nulation Ctrl+F4			
Recipe Download F		Recipe	Screen (Screen_1) Screen Properties Background Color Screen Open Macro Screen Close Macro Screen Close Macro Screen Width Screen Height	Creen_1     Detail     (252, 252, 252)     0     0     0     640     480
	클 - [] (명 (197,45)	Build Fri Jul 9 16 25:48 2004	Step     Action       [4]     Delete elen       [5]     Delete elen       [6]     Move elen       [7]     Delete elen       [8]     Create elen       [9]     Move elen       [10]     Delete elen       [11]     Delete elen       [22]     Transaction	nent
East Recipe	ownload:USB [397,45]	Build Pri Jul 9 16:25:48 2004	INUM	

Fig. 2-8-19 Choosing from menu bar

WORD 1 0 0 0	WORD 2 0 0	WORD 3 0	WORD 4	WORD 5	Open
0		0		98	
	0		0	0	-
0		0	0	0	Save
0	0	0	0	0	
0	0	0	0	0	Reset
0	0	0	0	0	
0	0	0	0	0	Clear
0	0	0	0	0	Clear
0	0	0	0	0	
0	0	0	0	0	Print
0	0	0	0	0	
					OK
	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0           0         0         0         0	0         0

Fig. 2-8-20 Recipe setting dialog box

In Fig. 2-8-20, there are 10 groups and the length for each group is 10 WORDs. You can transmit one group to PLC designated address by HMI recipe parameter.

## 7. Download recipe

Downloads recipe to HMI. What you need to do is click Tools > Download recipe to download recipe to HMI. The general extension file is rcp.

Open		<u>? ×</u>
Look in:	🗹 Desktop 💽 🖛 🛍 📸 💷 -	
History Desktop	My Documents My Computer My Network Places NewRcp.rcp	
My Documents		
My Network P	File name:     Image: Ima	Open Cancel

Fig. 2-8-21 Recipe setting dialog box

## 8. Recipe edition

Before using this function, you should check to enable this function as ✓ Enable Recipe . If you don't enable this function, you can't do this function even you download recipe data.

	Address	None			
Address: after you click			🔲, you v	vill get input	dialog box as
Fig. 2-8-22 to input start a	address.	(Note: only	/ PLC inp	ut format it a	ccepts)

• PLC Device (Word)	Link		Ī	.ink1		•
PLC Device (Bit) Internal Memory (Word)	Devic		e [2	ζ		¥
⊂ Internal Memory (Bit) ⊂ Constant	Addr/ Tag	Value	Γ			<u>~</u>
	В	C	D	E	F	←
	6	7	8	9	A	CE
C 10 C 10U C 16	1	2	3	4	5	1
PLC Station Number	1 0		+	1.24	1	-

Fig. 2-8-22 Input start address of recipe

Address	None	 Length 🚺	Group	0	Input
					Open
					Save
					Reset
					Clear
					Print

Length: it is used to set the recipe length. The unit is word and it should be set to more than 0. Otherwise, you will get following dialog box as Fig. 2-8-23.



Fig. 2-8-23

Group: it is used to set group number of recipe. It is convenient for user to use recipe by switching. The group number should be set to more than 0. Otherwise, you will get following dialog box as Fig. 2-8-24.



Fig. 2-8-24

Apply: after setting length and group number, you can click "Apply" to execute. The total recipe size should be less than 64K due to memory limit. (Length X groups should be less than 64 X 1024) If one of them is 0 or exceeds limit, you will get warning as Fig. 2-8-23, Fig. 2-8-24 and Fig. 2-8-25.



Fig. 2-8-25

Open: you can load recipe by clicking "Open". The start address isn't saved in the file; therefore all brands' PLC can use the same recipe.

Open					? ×
Look in:	🚮 Desktop		•	+ 🗈 💣	<b></b>
History Desktop My Documents	My Documen My Compute My Network	r Places			
My Computer	File name:	1		-	Open
My Network P	Files of type:	Recipe File(*.rcp)			Cancel

Fig. 2-8-26

Save: When saving file, the start address won't be saved. This is for user to use the same file in the different PLC brand.

Save As		<u>? ×</u>
Save in:	🖸 Desktop 💽 🔶 🛅 🕶	
History History Desktop My Documents My Computer	My Documents My Computer My Network Places NewRcp.rcp	
My Network P		Save
	Save as type: Recipe File(*.rcp)	ancel

Fig. 2-8-27

Reset: let edition screen reset to the open status. Refer to Fig. 2-8-28 and Fig. 2-8-29 for example.

Address 1@Y0			Length .	5 0	roup 5	Input
No	WORD 1	WORD 2	WORD 3	WORD 4	WORD 5	Open
1	1	2	3	4	5	
2	6	7	8	9	10	Save
3	11	12	13	14	15	
4	16	17	18	19	20	Reset
5	21	22	23	24	25	-
						Clear
						Print
						ОК
						Cance

Fig. 2-8-28 Edition screen

Address	None	 Length 0	Group 0	Input
				Open
				Save
				Reset
				Clear
				Print
				ОК
				Cancel

### Fig. 2-8-29 Screen after reset

Clear: no matter what screen you edit, all data will be cleared to 0 after pressing "Clear", refer to Fig. 2-8-30 and Fig. 2-8-31 for example.

Address 1@Y0			ss 1@Y0 Length 5 Group 5			Input
No	WORD 1	WORD 2	WORD 3	WORD 4	WORD 5	Open
1	1	2	3	4	5	
2	6	7	8	9	10	Save
3	11	12	13	14	15	
4	16	17	18	19	20	Reset
5	21	22	23	24	25	
						Clear
						Print
						[
						OK
						Cance

Fig. 2-8-30 Edition screen

Address None			hress None Length 5 Group 5			Input
No	WORD 1	WORD 2	WORD 3	WORD 4	WORD 5	Open
1	0	0	0	0	0	
2	0	0	0	0	0	Save
3	0	0	0	0	0	
4	0	0	0	0	0	Reset
5	0	0	0	0	0	
						Clear
						Print
						-
						ОК
						Cancel

Fig. 2-8-31 Screen after clear

Print: it will print edition screen for user to use.

OK: After inputting, you can click OK to save for transmitting or modifying. (You should input address before exiting as Fig. 2-8-32)

Addre	ss None		Length 🗗	4	Group 4	Input
₹o	WORD 1	WORD 2	WORD 3	WORD 4		Open
	0	0	116	n	-	
2	17	0	ScrEdit	×	<u>د</u>	Save
3	5120	151				
4	2444	0	Fail	to input address		Reset
						Clear
			<u> </u>	锭		
						Print
						ок

Fig. 2-8-32 If you don't set address, this warning dialog will display Cancel: It will force to exit after clicking "Cancel" without saving anything. Therefore, please consider carefully before clicking it.

## 2-3-7 Options

<u>M</u> odel Parameter	
<u>A</u> larm Setup	
History Setup	
<u>T</u> ag Table	
<u>P</u> icture Bank	
<u>T</u> ext Bank	
Submacro	
Initial Macro	
<u>B</u> ackground Macro	
<u>C</u> lock Macro	
<u>E</u> nvironment	

Fig. 2-9-1 Options menu

1. Model parameter

You can execute it by clicking Options > Model parameter as Fig. 2-9-2. There are general and communication for setting. In general setting, you can set application name, HMI type, PLC type, default start screen, system control area, system status, download setting and priority, etc. In communication setting, you can set default PLC ID and communication setting. Refer to following

#### figures for detail.

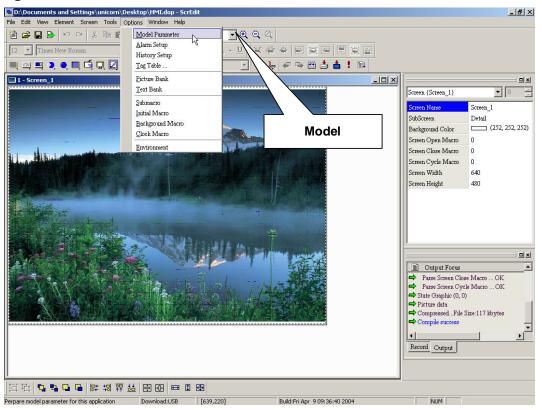


Fig. 2-9-2

#### **General setting**

Standard	Control Block
Application Name	Address 1@D0
нмі	Size 0
HMI DOP-A75CSTD 256 Colors	Status Block Address 1@D10
Product Delta Type Delta DVP PLC	Upload/Download USB 1.1 C PC COM Port COM1
HMI Station	Start up Screen 1 - Screen_1
Security	Default Format Unsigned Decimal 💌
Password 123456	78 Startup Delay Time 0 (s)
Starting Level 0	Clock Macro Delay 100 (ms

Fig. 2-9-3

Application name: it is also file name.

HMI type: DOP series provides different functions for different HMI.



Fig. 2-9-4 HMI type

Controller: it is used to set controller you use.

er	
Delta	•
Delta DVP PLC	
	Delta

Fig. 2-9-5 PLC setting

The highest priority password: it is used to set highest priority password (there are 8 levels for setting software password)

Default start-up priority: it is used to set start-up priority, the highest level is 7 and the lowest level is 0.

System control area – start address: it is used to set the start address of system control.

System control area – length: address length will be different by the function. (for example, the length is less than 8 Words when using recipe function). Refer to chapter 4 for important HMI parameters.

System status area – start address: it is used to set the start address of system status area and it needs to input PLC register address. The register address is a continuous data block and the length is 6 words. Refer to chapter 4 for important parameters of system status area.

Download setting – USB1.1: it uses USB1.1 to download.

Download setting – PC communication port: it uses PC communication port to download.

COM1	▲
COM2	
COM3	
COM4	-

Fig. 2-9-6 PC communication port

Delay time for start-up: it is used to set delay time for waiting to start-up PLC. The range is 0-255 seconds.

Delay time for clock macro: it is used to set delay time for executing clock macro. The range is 100~999ms.

Communication parameter setting

	Link Name	Controller	
1	Base Port	Delta DVP PL	
		Add	Delete Modify
COM Po	at COM2 🔽	PLC Station	1 *
PLC Sett	ings	Interface	RS232 💌
Passwor	12345678	Data Bits	7 Bits 💌
	Delay Time 0 👘 ms	Stop Bits	1 Bits 💌
Comm. I	,	Baud Rate	9600 💌
Comm. I			

Fig. 2-9-7

Connection setting: it is used to set COM port that used to connect PLC. (DOP series can support two different controllers simultaneously.)

Num.	Link Name	Controller
1	Base Port	Delta DVP PLC
		Add Delete Modify

Fig. 2-9-8

Communication port: it is used to set COM port (COM 1 or COM 2) for connecting HMI.

COM1	
COM2	

#### Fig. 2-9-9

PLC setting – password: it is used to set PLC password.

PLC setting - delay time for communication: it is used to set delay time for communication. The range is 0 to 255 ms.

Optimization for reading: it is used to enable optimization function. Refer to the right lower corner at Fig. 2-9-3.

Default PLC ID: If PLC doesn't set station number, it will use this default setting. The range is 0 to 255.

Communication interface: there are RS232, RS422 and RS485 for your selection. The default is RS232.



Data bit: there are 7 Bits or 8 Bits for your selection.

7 Bits	
7 15105	
8 Bits	



Stop bit: there are 1 Bits or 2 Bits for your selection.



Fig. 2-9-12

Communication baud rate: there are 4800, 9600, 19200, 38400, 57600 or 115200 for your selection.

4800	
9600	
19200	
38400	
57600	
115200	
Eia	2012



Parity bit: there are None, Odd and Even for your selection.

None	
Odd	
Even	
Eia	2011

Fig. 2-9-14

2. Alarm setup

You can set alarm by clicking Options > Alarm setup as Fig. 2-9-15. The alarm setup should set with element settings. If condition occurs in specific address during executing HMI after setting, HMI will display warning dialog box automatically. In alarm settings, there are append, delete, modify, OK, cancel and close as Fig. 2-9-16. You can set alarm properties after clicking "append" as

### Fig. 2-9-17.

D:\Documents and Settings\unicorn\De	sktop\HMI.dop - ScrEdit			_ 8 ×
File Edit View Element Screen Tools Op	tions Window Help			
🎽 🖨 🖬 🕒 🗠 🔺 🖌 🖿 🖡	Model Parameter	<u>-</u> @ @ @		
12 Times New Roman	Alarm Setup History Setup			
💻 🖂 🖳 🕽 🍋 🛄 🖆 🛄 🔯	Tag Table			
🗖 1 - Screen_1	Picture Bank		ī [	
	Text Bank		Screen {Screen_1}	• 0 *
	Submacro	Alarm setup	Screen Name	Screen 1
	Initial Macro		SubScreen	Detail
	Background Macro		Background Color	(252, 252, 252)
	Clock Macro	Contraction of the second seco	Screen Open Macro	0
a star a summer and an and	Environment		Screen Close Macro	0
And and a state of the second s		al and a start have a start	Screen Cycle Macro	0
			Screen Width	640
			Screen Height	480
		****		
2 total 2 mar 1 as 20		and and Alland an art at		믜푀
			Output Focus	_
			Parse Screen Clos     Parse Screen Cyo     State Graphic (0, 0)     Picture data     CompressedFile 5     Compile success     I     Record Output	ile Macro OK )
<u> </u>  近近  <b>5, 5, 5, 6</b> 월 <b>6</b> 課 調 評 설			J	
J Set up alarm monitoring and edit alaram messages	Download:USB [483,1]	1] Build:Fri Apr 9 09:36:40 2004	NUM	

# Fig. 2-9-15 Choosing from menu bar

Addre Alarm	ss of None Sc Block Number of Record	an Time (second) rds in History Bu		Append Delete Modify
Nu	Read Address	Alaram Pr	Message Context	
				OK

Fig. 2-9-16 Alarm setup

Append: append an alarm.

Context —	16	
vIessage	Message	
Color		
Trigger Moo	de 🖲 On 🔿 Off	
		ОК
	1 - Screen 1 💌	

#### Fig. 2-9-17 Alarm property

Message: The message used for alarm.

Display color: The color used for alarm.

Trigger Mode: it is used to set On/Off for alarm.

Alarm screen: the screen used for alarm.

Delete: delete the selected address.

Modify: modify the selected address properties.

Scan time (sec.): Setting time to scan.

Number of records in history buffer: when number of records exceeds the setting, it will delete the first record and insert the new record into the last address. For example, if the number of records in history buffer is set to 100. When you want to insert the 101th record, the first record will be deleted and the second record will become to the third record, the third record will become to the forth record...and the 100<sup>th</sup> record will become to 99<sup>th</sup> record. Therefore, the new record will become to 100<sup>th</sup> record.

Retentive: enable to save data in SRAM when power loss. (the power supply for SRAM when power loss is battery)

Non-volatile: Enable to save data in SRAM when power is turned off or not. (The power of SRAM is battery when power is turned off.)

3. History setup: History buffer setting should be used with sample function. Refer to chapter 3 for detail.

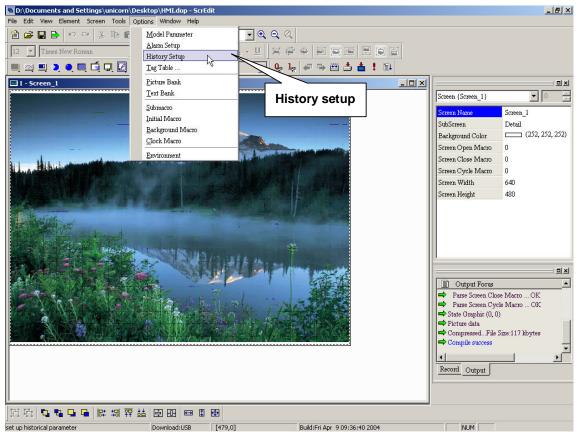


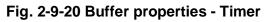
Fig. 2-9-18

Append: add a history data.

Nu	Read Address	Data Type	Sample Cycle	Sample Number	Trigger Source	Record Dat	Append
1	1@D0	1	100	10	Timer	No	Delete
							Modify
						F	ОК

Fig. 2-9-19 History setup 2-133

Buffer Properties		×
Read Address	1@D0	Trigger Timer PLC
Data Length (Word) Cycle (ms) Sample Number	1 100 10	
☐ Stamp Time and I ☐ Auto Stop ☐ Non-Volatile	Date	OK Cancel



Buffer Properties		×
Read Address	1@D0	Trigger C Timer C PLC
Data Length (Word) Cycle (ms) Sample Number	1  100 100 10	
<ul> <li>Stamp Time and Date</li> <li>Auto Stop</li> <li>Non-Volatile</li> </ul>		OK Cancel

Fig. 2-9-21 Buffer properties - PLC

Read address: it is used to set the address for reading.

Size: it is used to set the number of continuous word. The range is 1~8.

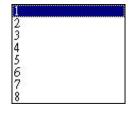


Fig. 2-9-22 Buffer properties - size

Sample cycle: it is used to set the interval to read address. If it is triggered by PLC, this item will be invalid. The range is 0 to 10000.

Sample point: when record number of points exceeds the setting, it will delete the first record and insert the new record into the last address. For example, if the number of records in history buffer is set to 100. When you want to insert the 101th record, the first record will be deleted and the second record will become to the third record, the third record will become to the forth record...and the 100<sup>th</sup> record will become to 99<sup>th</sup> record. Therefore, the new record will become to 100<sup>th</sup> record.

Record date and time: to enable this function or not.

Auto stop: continue to record when data is full or not.

Non-volatile: to set retention data in SRAM or not when power loss

Trigger source: trigged by Timer or PLC

OK: save settings and exit

Cancel: exit without saving

Delete: delete a history data in buffer

Modify: modify history data in buffer

#### 4. Tag table

It is used for specific character to replace specific address. For example, if you use "OS" to replace PLC's address 1@Y0. You can only write OS to replace address 1@Y0 later.

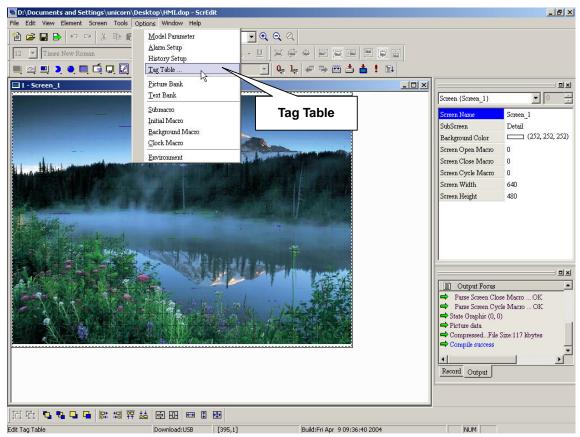


Fig. 2-9-23 Choosing from menu bar

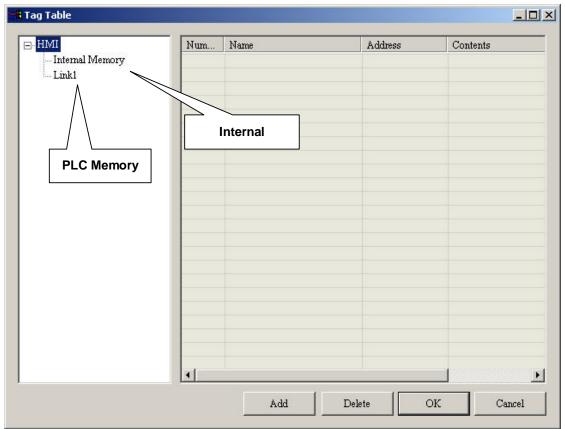


Fig. 2-9-24 Tag table settings

#### 6. Picture Bank

User can download different pictures from picture bank to rich screen. The formats can be BMP or JPG pictures.

D:\Documents and Settings\unicorn\De	sktop\HMI.dop - ScrEdit				_ 8 ×
File Edit View Element Screen Tools Op	ions Window Help				
Image: Second	Model Parameter Alarm Setup History Setup Tag Table	- Q. Q. Q. · U   E @ & E E E   ! · Y <b>Q. L.</b> @ & E E E   !			
I - Screen 1  Tag Table  HMI Internal Memory Linkl	Picture Bank Text Bank Submacro Initial Macro Background Macro Clock Macro Environment	Picture Bank	X	Screen {Screen_1}         Screen Name         SubScreen         Backgound Color         Screen Open Macro         Screen Close Macro         Screen Cycle Macro         Screen Width         Screen Height         Parse Screen Close         Compile success         I         Record       Output	le Macro OK
Picture Bank	Download:USB [372.0]	Build:Fri Apr 9 09:36:40	2004	NUM	

Fig. 2-9-25 Select from menu bar

icture Bank 1 1 🕅 🕅 🖬 🕞 🍽 🕹 🗙   .	V A A A	<u>  </u>
Picture Bank Name		
DELTA1.pib		
Picture Contexts		
Name	Resolution	Picture width X picture height X
🔤 about delta.JPG	452x48x256	
🔤 about delta-1.JPG	556x402x256	
🔤 AC driver.JPG	575x311x256	
🔤 AC SERVO JPG	627x362x256	
NC servo-1.JPG	96x164x256	About Detta
ACDRIVER-2.JPG	73x112x256	
🔤 ASDA.JPG	482x361x256	
🔤 asis.JPG	457x324x256	
NASMT.JPG	466x356x256	
🔤 company profile.JPG	510x455x256	
🔤 delta.JPG	595x408x256	
🔤 DTATemperature.JPG	571x400x256	
Europe.JPG	557x298x256	
🔤 golbal delta.JPG	529x297x256	
🔤 golbal delta-1 JPG	447x50x256	
HMI-1.JPG	516x360x256	
🔤 IFD.JPG	551x310x256	
🔤 system DEMO.JPG	427x46x256	
🔤 Water lilies.JPG	800x600x256	
🔤 TP04.JPG	523x406x256	
NEXT.JPG	98x33x256	
🔤 F series.JPG	455x350x256	
🔤 L2 series.JPG	443x309x256	
🔤 L series.JPG	434x317x256	
🔤 M series.JPG	414x307x256	
🔤 production-1.JPG	560x311x256	
an i ma	لغر <u>الغريمة منا</u>	

Fig. 2-9-26 Picture bank

Select Picture	<u>?</u> ×
Look in: 🔄 My Documents	. ← 🗈 💣 🖩 -
image HMI.bmp	
SnagIt Catalog	
Select pictu	ire
File name: abcd.bmp	
	Select old picture bank or Cane create new picture bank
Files of type: All Files(*.bmp;*.jpg;*.gif;*.ico)	
	Preview
	56 Colors
	6 Grayscale color
abcd.b	
	0x16M
Name	abcd.bmp

#### 

DELTA1.pib		-	
Picture Contexts			
Name	Resolution		
ACDRIVER-2.JPG	73x112x256		
🔤 ASDA.JPG	482x361x256		
🚘 asis.JPG	457x324x256		
🔤 ASMT.JPG	466x356x256		
🔤 company profile.JPG	510x455x256		
🖬 delta.JPG	595x408x256		
NTATemperature.JPG	571x400x256		
Europe.JPG	557x298x256		
🔤 golbal delta.JPG	529x297x256		
🔤 golbal delta-1 .JPG	447x50x256		
HMI-1.JPG	516x360x256		
🔤 IFD.JPG	551x310x256		
🔤 system DEMO.JPG	427x46x256		
🔤 Water lilies.JPG	800x600x256		
🔤 TP04.JPG	523x406x256		
NEXT.JPG	98x33x256		
🔤 F series.JPG	455x350x256		
🔤 L2 series JPG	443x309x256		
🔤 L series.JPG	434x317x256		
🔤 M series JPG	414x307x256		
🔤 production-1.JPG	560x311x256		
🔤 S series.JPG	419x328x256		
🔤 V series.JPG	394x294x256		
🔤 usa.JPG	417x327x256		
🔤 B series.JPG	395x323x256		
🔤 abcd.bmp	640x480x256	_	



- IX

### Fig. 2-9-27

1	create new picture bank
	delete picture bank
	save modified picture into picture bank
	import picture into picture bank
	export picture from picture bank
×	delete picture from picture bank
Α.	Inverse color
A	convert to 256 grayscale color
A	mirror horizontal
A	mirror vertical
1 martin	actual size
	extension

## 7. Text bank

Input common text into text bank and import text from text bank as necessary.

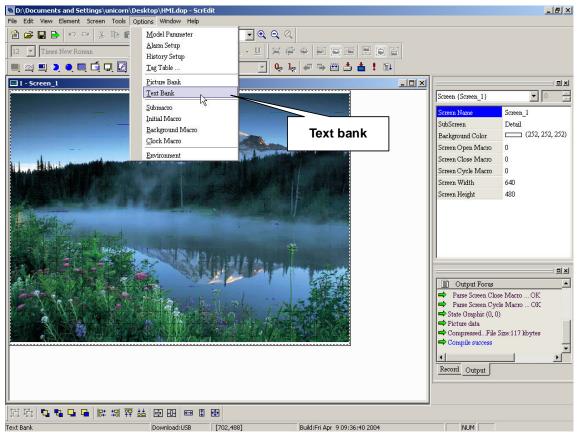
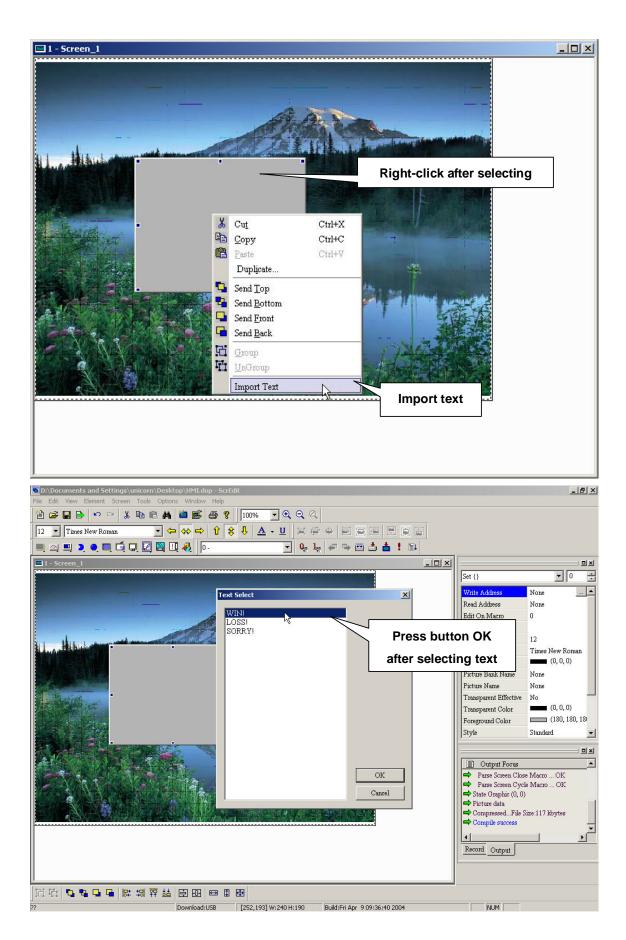


Fig. 2-9-28 Choosing from menu bar

Number	Message Contents	Append
)	WIN!	
1	LOSS!	Delete
2	SORRY!	Open
		Save
		OK
		Cancel

Fig. 2-9-29 Text bank edition



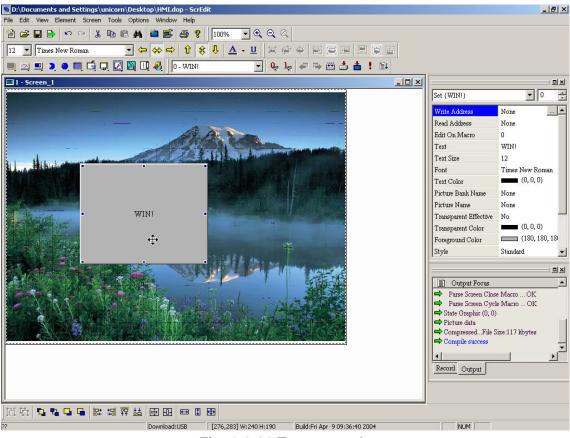


Fig. 2-9-30 Text example

#### 8. Sub-macro

It is used to edit sub-macro and be called by other Macro. Refer to chapter 4 for detail.

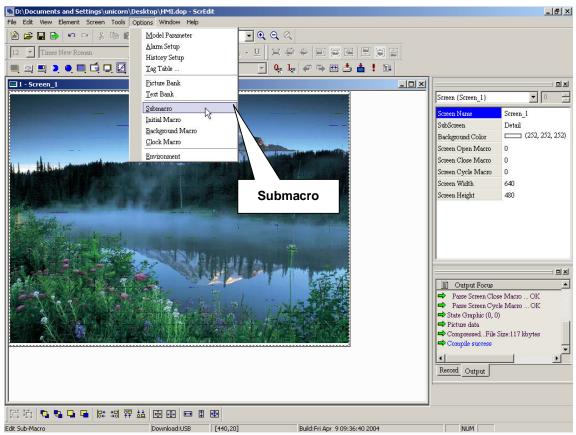


Fig. 2-9-31 Choosing from menu bar

1	Sub-macro (1)	<u> </u>
2	Sub-macro (2)	
3	Sub-macro (3)	
4	Sub-macro (4)	
5	Sub-macro (5)	
6	Sub-macro (6)	
7	Sub-macro (7)	
8	Sub-macro (8)	
9	Sub-macro (9)	
10	Sub-macro (10)	
11	Sub-macro (11)	
12	Sub-macro (12)	
13	Sub-macro (13)	
14	Sub marm (11)	<u> </u>

Fig. 2-9-32 Sub-macro

### 9. Initial macro

Edits initial macro. It will be executed automatically after HMI is power on. Refer to chapter 4 for detail.

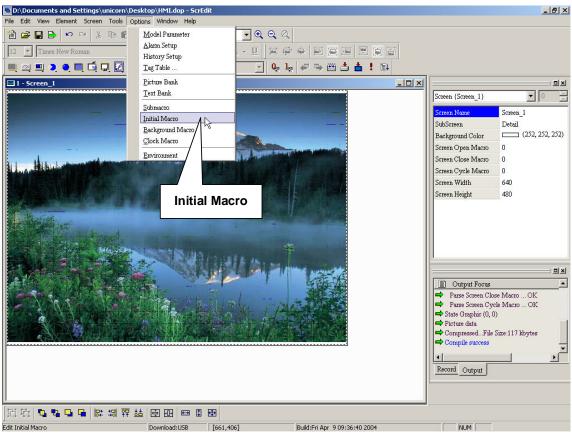


Fig. 2-9-33 Select initial macro from menu macro

10. Background Macro

Edits Background Macro, refer to chapter 4 for detail.

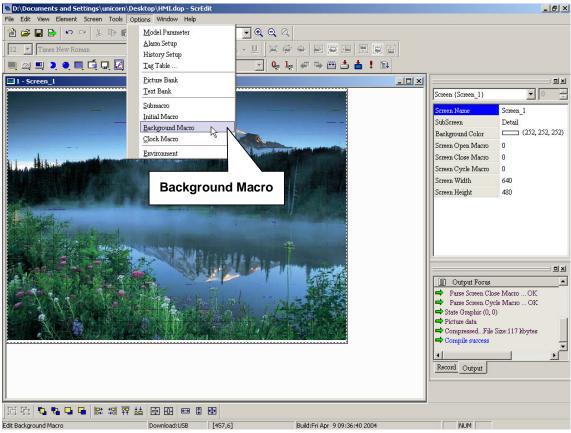


Fig. 2-9-34 Choosing from menu bar

### 11. Clock Macro

After HMI is turned power on, it will execute clock macro by clock setting time. Refer to chapter 4 for detail.

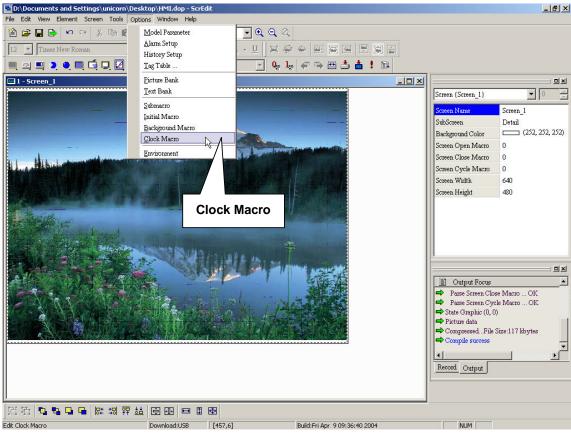


Fig. 2-9-35 Choosing from menu bar

12. Environment setting

Setting Environment of Screen editor.

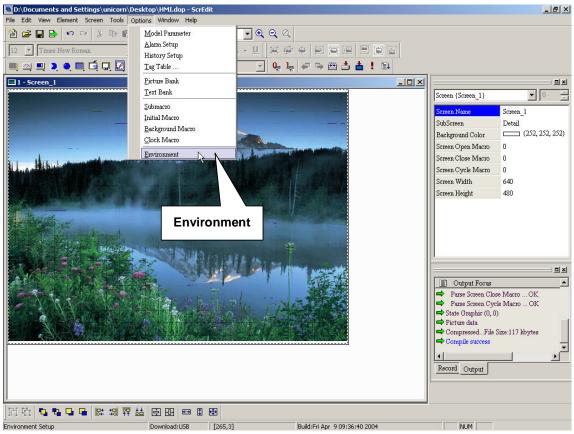


Fig. 2-9-36 Choosing from menu bar

/stem Path				
Ndelta'screen editor'ScrE	litApp			
utput Path				
delta\screen editor\ScrE	ditApp\Out			
Options				90
ToolBars/Windows -	Language			
🔽 Text Bar	English			<u> </u>
🔽 Bitmap Bar	- Upload/E	)onwload —		
🔽 Zoom Bar	• USB			
🔽 Layout Bar	25002688	2022) 	COM1	w.
✓ Properties				
✓ Output Bar	T Auto Se	rving Time l	Interval	0 <u>+</u> (M)
		176		
		pen for Next E	жесше Арри	cation
Download Buffer Size	•	Upload H	Buffer Size —	
COM 4096	Bytes	COM	4096	Bytes
USB 8192	Bytes	USB	8192	Bytes
		22		91
			ОК	Cancel

Fig. 2-9-37 Environment settings

System path: it is used to save execution files and .DLL files. Unless necessary, do not modify this path. It may cause execution error or can't find file.

Output path: it is used to save all files generated after compiling. All files that generated from online simulation, offline simulation, upload file, download file, etc. will be saved here. Unless necessary, do not modify this path. It may cause execution error or can't find file.

**Options:** 

Toolbars/windows: it is used to check to use toolbars.

Language: there are three languages, including traditional Chinese, simplified Chinese and English.

Upload/download setting: it is used to set USB or COM port for upload/download.

Auto save: it is used to set time to save file automatically. The unit is minutes (M).

Auto open: it is used to enable to open last file you edit when open Screen Edit.

# 2-3-8 Windows

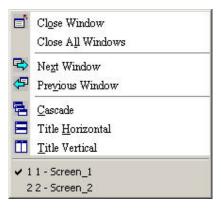


Fig. 2-10-1 Windows options

#### 1. Close window

It is used to hide current window, NOT exit current window. If you want to display the hidden window, you should use Screen > Open screen.

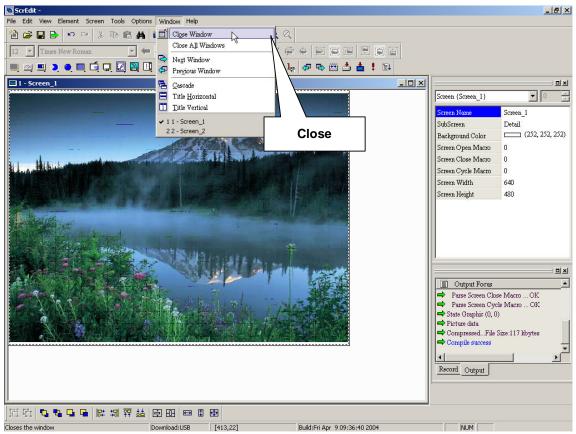
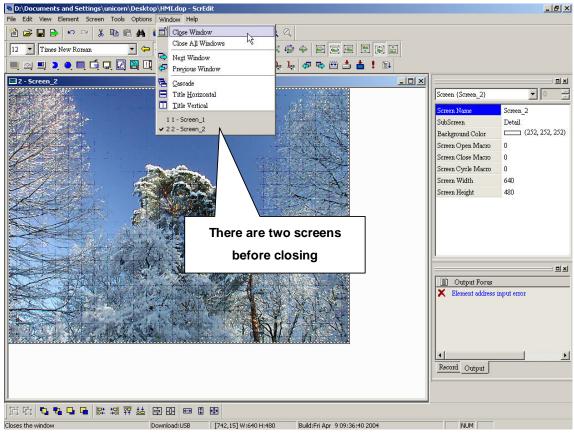


Fig. 2-10-2 Choosing from menu bar





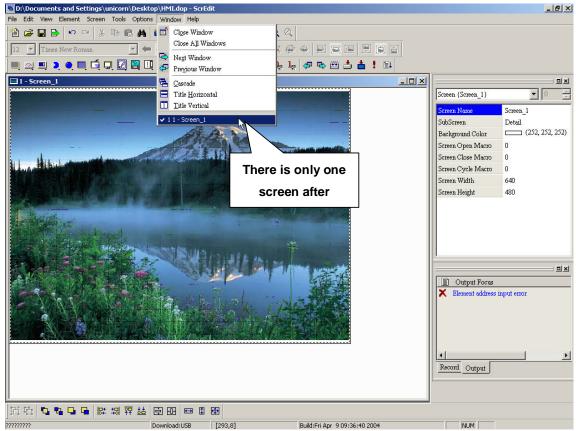


Fig. 2-10-4 Example for closing window – step 2

#### 2. Close all windows

It is used to hide all windows, not exit all windows. If you want to display the hidden window, you should use Screen > Open screen.

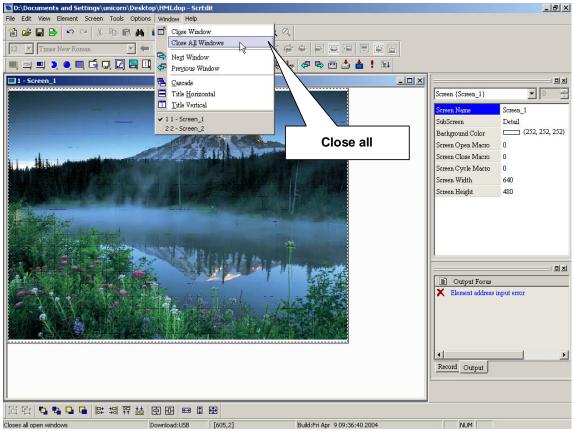
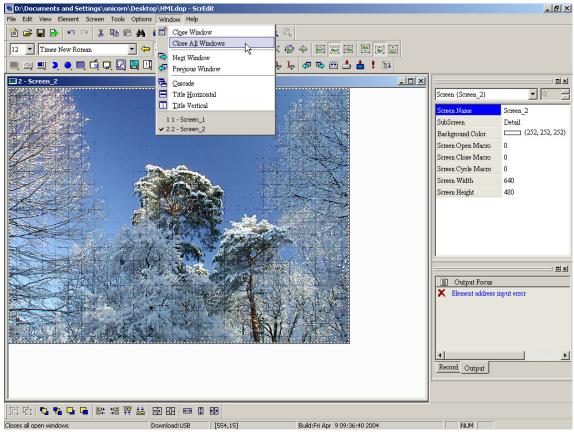


Fig. 2-10-5 Choosing from menu bar





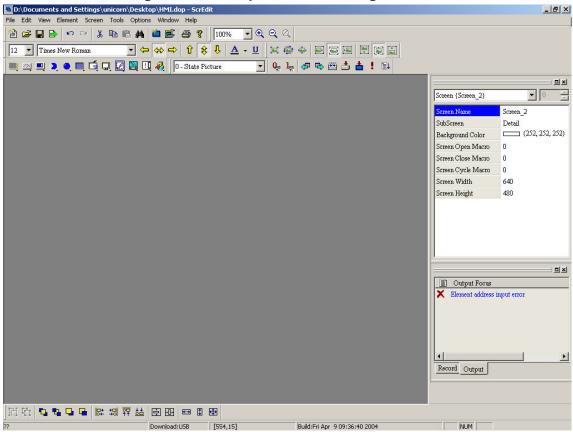


Fig. 2-10-7 Example after closing windows

#### 3. Next window

It is used to switch current window to the next window. If current window is the last window, it can't switch.

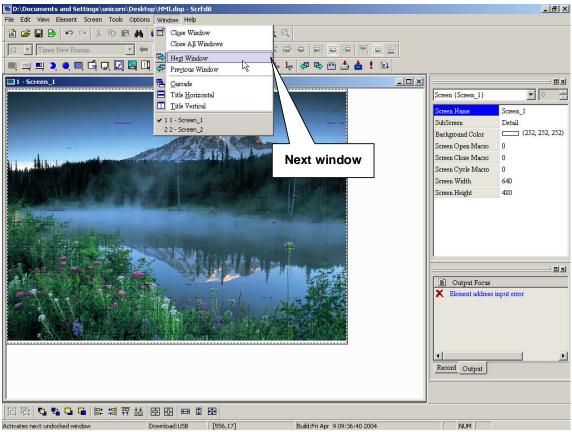
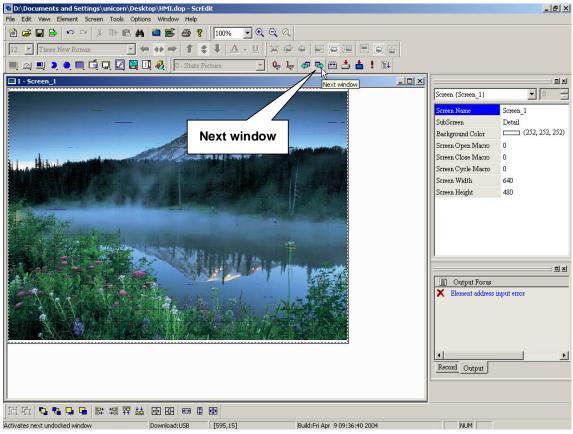


Fig. 2-10-8 Choosing from menu bar





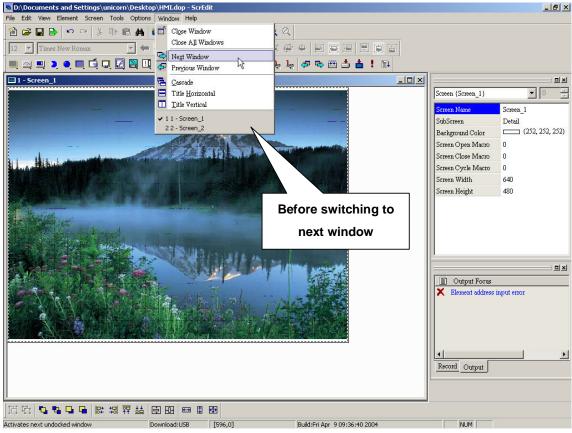


Fig. 2-10-10

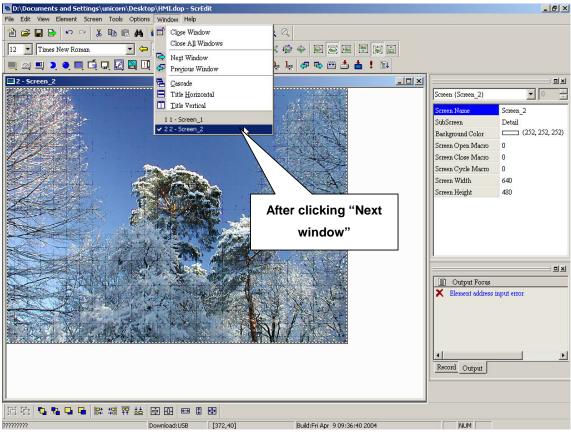
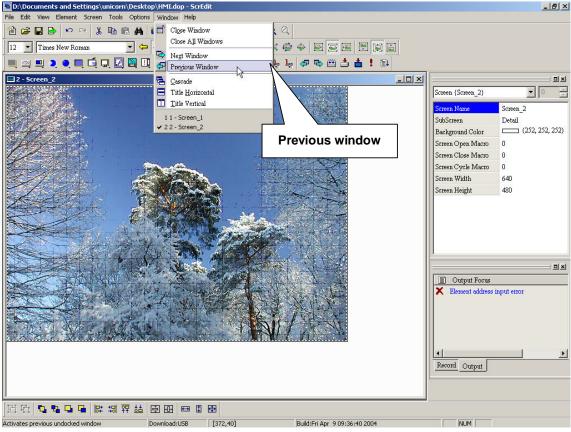


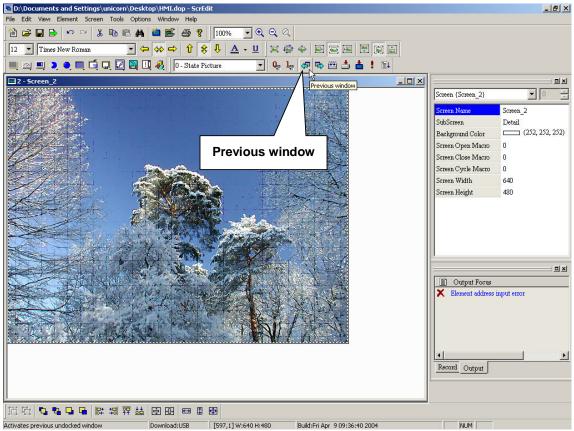
Fig. 2-10-11

#### 4. Previous window

It is used to switch current window to the previous window. If previous window is the last window, it can't switch.









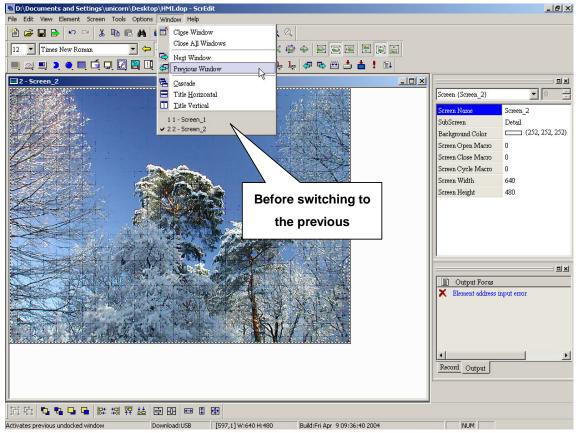


Fig. 2-10-14

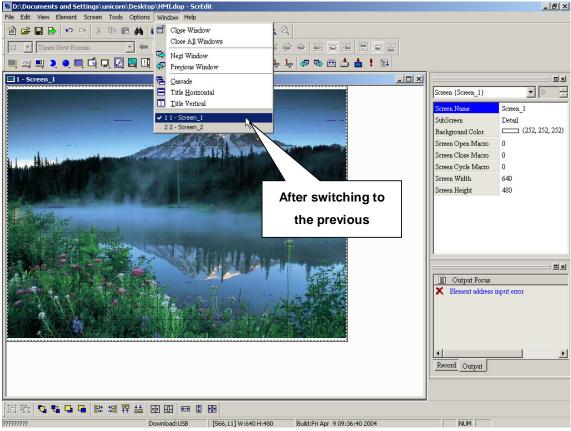


Fig. 2-10-15

#### 5. Cascade

Opened screens are arranged in an overlapped pattern as Fig. 2-10-17 and Fig. 2-10-18.

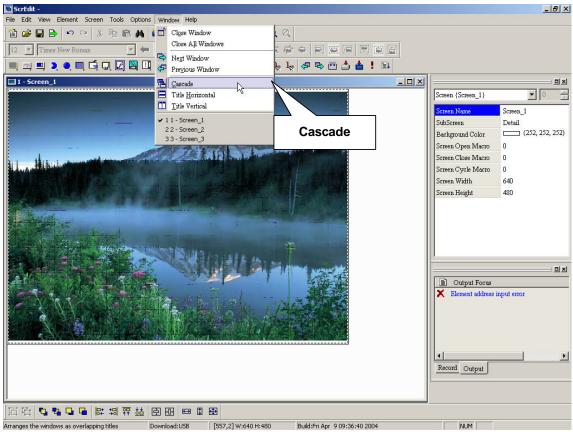
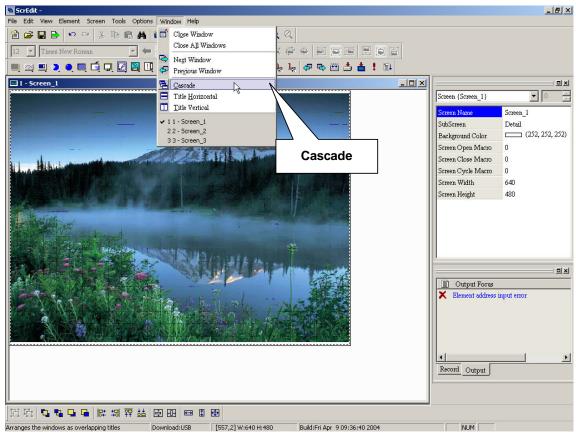


Fig. 2-10-16 Choosing from menu bar





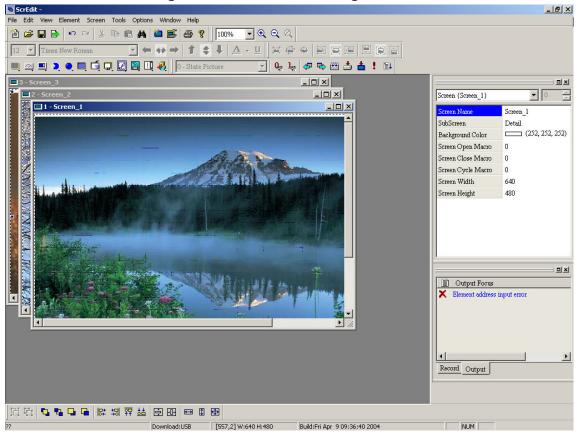


Fig. 2-10-18 After choosing Cascade

#### 6. Title Horizontal

Opened screens are arranged from top to bottom as Fig. 2-10-20 and Fig. 2-10-21.

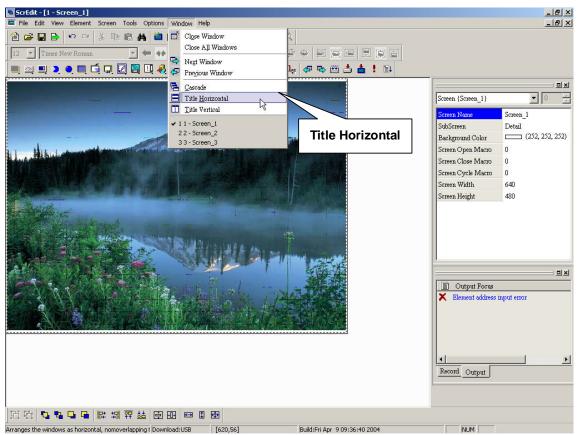
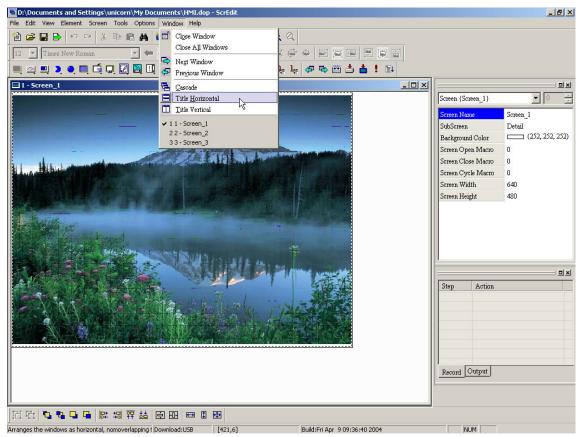


Fig. 2-10-19 Choosing from menu bar





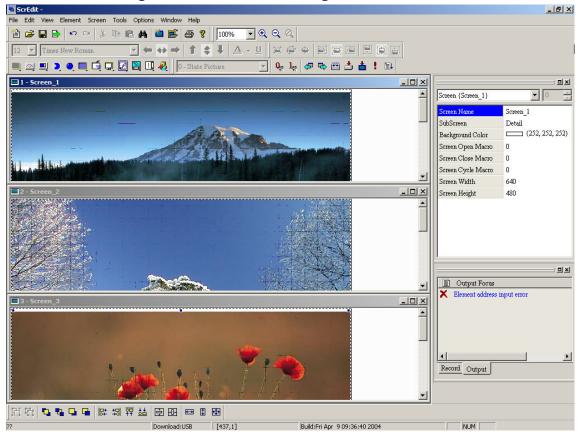


Fig. 2-10-21 After choosing "Title Horizontal"

#### 7. Title Vertical

Opened screens are arranged from left to right as Fig. 2-10-24.

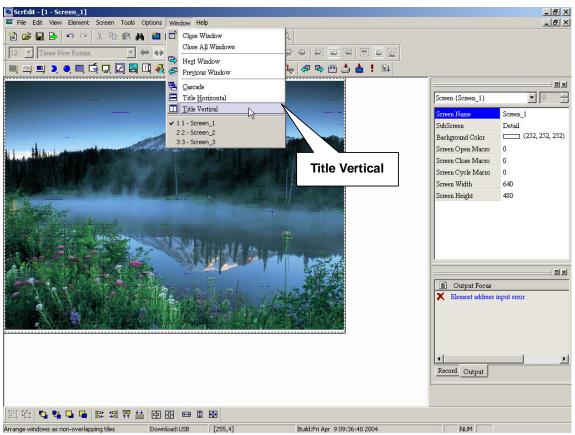
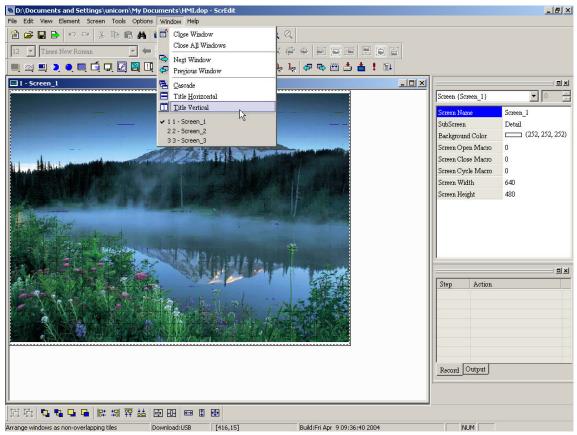


Fig. 2-10-22 Choosing from menu bar





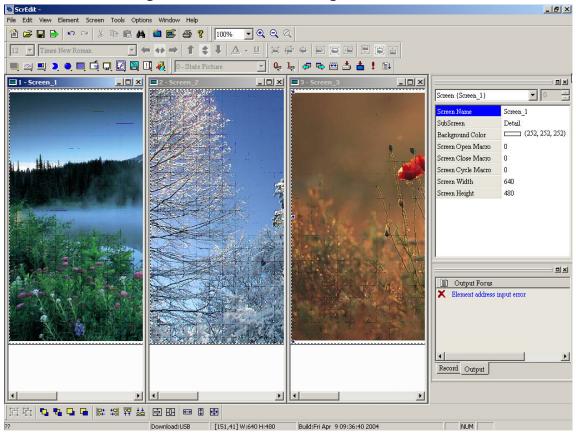


Fig. 2-10-24 After choosing "Title vertical"

#### 8. Windows summary

All opened screens will display at the bottom of "Windows" pull-down menu. Clicking file name directly to switch them.

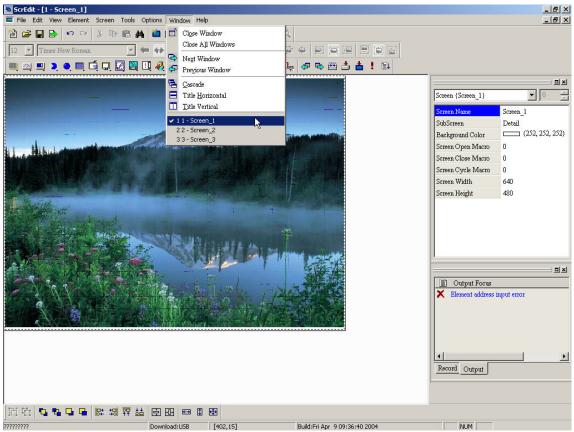
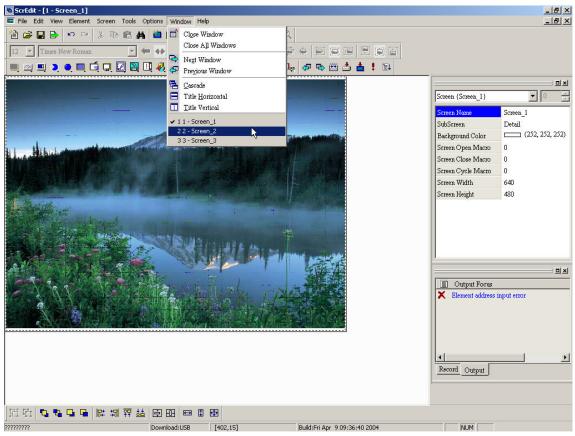


Fig. 2-10-25 Choosing from menu bar





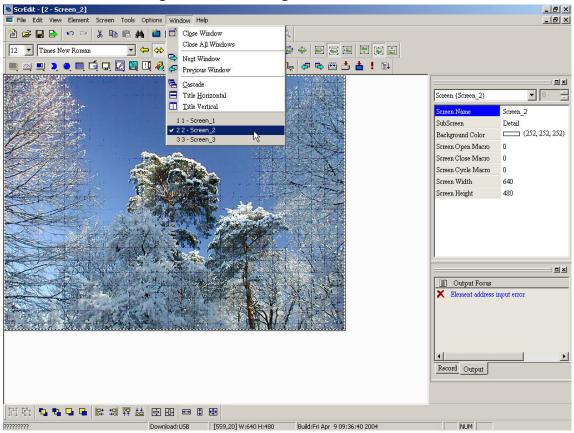
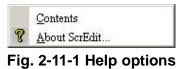


Fig. 2-10-27 Screen\_2 window

# 2-3-9 Help



1. Contents

Display Delta HMI online help topics.

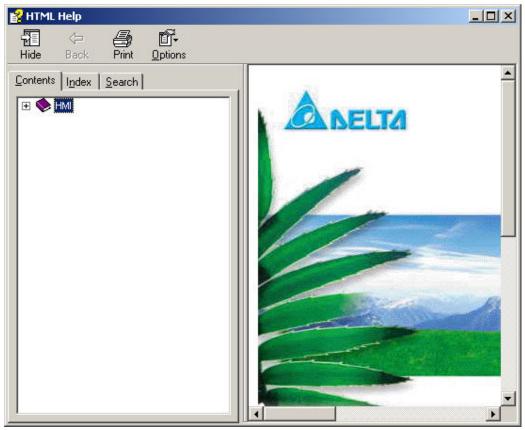


Fig. 2-11-2 Online help

### 2. About Screen Editor

Displays Screen Editor version information.



Fig. 2-11-3

# **Chapter 3 Element Function**

This chapter is for you to know the special function of Screen editor each element to meet different requirement before design.

# 3-1 How to Choose Element

There are three methods for choosing element before edition:

- 1. Right-click in the work area to get pop-up menu as Fig. 3-1-1.
- 2. Choosing from menu bar as Fig. 3-1-2.
- 3. Choosing from toolbar as Fig. 3-1-3.

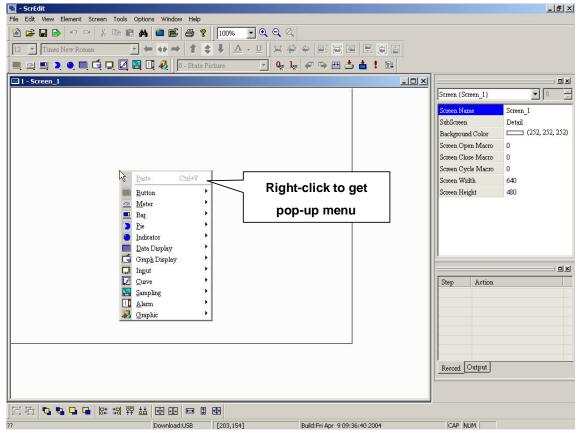


Fig. 3-1-1

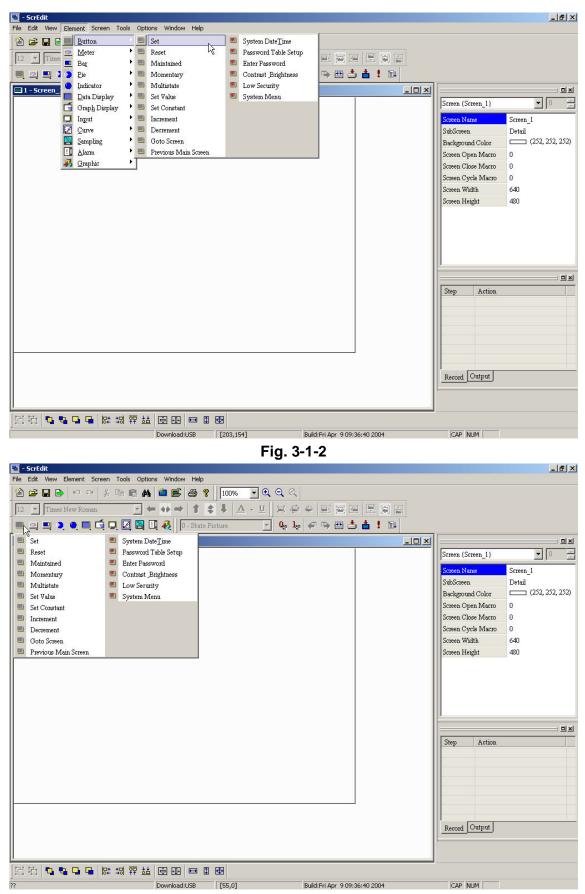


Fig. 3-1-3 Choosing from toolbar

After selecting element, left-click and drag on work area to get the new element as shown in the following.

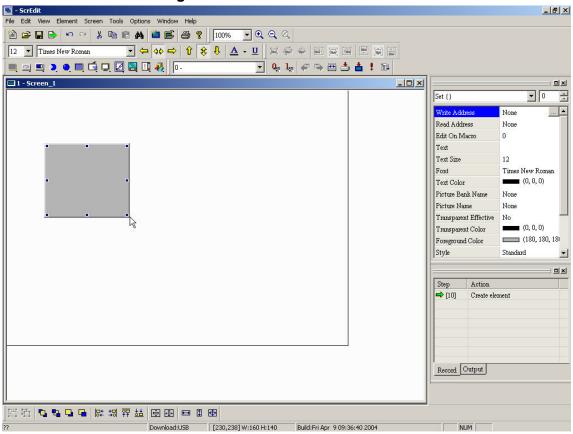


Fig. 3-1-4

# **3-2 Button Element**



Fig. 3-2-1 Button options

Button type	Macro	Read	Write	Function
Set Button	ON	Yes	Yes	After pressing button, the state of the setting address will be set to ON. The state will be always ON even if release or press again. If there is ON Macro, it will be executed simultaneously.
Reset Button	OFF	Yes	Yes	After pressing button, the state of setting address will be set to OFF. The state will be always OFF even if release or press again. If there is OFF Macro, it will be executed simultaneously.
Maintained	ON OFF	Yes	Yes	After pressing button, the state of setting address will be set to ON. The state will be OFF when releasing and be ON when pressing again. If there is ON / OFF Macro, it will be executed simultaneously.
Momentary	ON OFF	Yes	Yes	After pressing button, the state of setting address will be set to ON and executes ON Macro. It will still be ON when releasing. But when you press again, it will be OFF and executes OFF Macro. It will still be OFF when releasing.
Multistate	No	Yes	Yes	There are 1-256 multi-states for setting. You can set the execution sequence to the next state or the previous state. If setting to the next state, the state after state 2 will be state 3. If setting to the previous state, the state after state 2 will be state 1.
Set value	No	No	Yes	After pressing button, You will get "Numeric keypad" pop-up dialog box in HMI to input value. HMI will transmit this value to the write address of element after pressing Enter.
Set constant	No	No	Yes	After pressing button, HMI will transmit the specific value to write address of element.
Increment	No	Yes	Yes	After pressing button, HMI will add the setting constant to write address of element.
Decrement	No	Yes	Yes	After pressing button, HMI will delete the setting constant to write address of element.
Goto Screen	No	No	No	After pressing button, it will switch to the screen you designated.
Previous Main Screen	No	No	No	After pressing button, it will back to previous main screen.

Table 3-2-1

# **3-2-1 General Buttons**

After pressing these buttons, HMI will transmit ON/OFF signal to PLC. There are four types: Set button, Reset button, Maintained and Momentary.

💽 - ScrEdit				_ 8 ×
File Edit View Element Screen Tools Options Window H	elp			
A C C C C C C C C C C C C C C C C C C C	🦻 👔 🕈	र् 🔍 🔍 State:	next state or	
State is 0 and		<b>▼the</b>	previous state	
input text will be				
shown after 0.	Property Set {}		Input text	Action Create element
	Write Address Read Address Edit On Macro	None None O		
Click element to	Text Text Size Font	12 Times New Roman	Choosing differe	
	Text Color	(0, 0, 0)		
display property	Picture Bank Name Picture Name	None		
	Transparent Effective	No		
	Transparent Color	(0, 0, 0)		
	Foreground Color	(180, 180, 180)		
	Style	Standard		
	Function	Set		a different
There are four styles for	Push Time	0	You can choos	e aifferent
There are four styles for	User Secirity Level	0	function by rec	nuirement
selection as following	1		Tunction by rec	Juirement
	9 FFI (45)		Record	Dutput
Terra second s		-		manual procession
?? Download:USB	[146,168] W:160	H:140 Build:Fri Apr 9 09:	36:40 2004 N	UM

Fig. 3-2-2 Button properties

#### **Button properties:** Write Address Read Address None None the : address for executing as following figure. Input ? × г Туре Link1 -Link C PLC Device (Word) PLC Device (Bit) Device Type X • C Internal Memory (Word) Addr/Value C Internal Memory (Bit) -Tag C Constant В C D E F ← 6 1 8 9 A CE C 10 C 10U C 16 1 2 3 4 5 ₊ PLC Station Number 0 + Ŧ 1 -🔽 Default 0 None Input address

2. Style Standard , Foreground Color (180, 180, 180) : user can

select button style and foreground color as following figure.

	Staro Staro Raise Rour	dard ed Standard	Raised					
	Invis	ible	-	sible button)				
		В	utton style					
3.	Edit On Macro	0	Edit Off Macro	0	: edits			
ა.		refer to chapter	,	- C	: eaits			
	,	·····						
4.	Text		Text Size	12	,			
	Font	Times New Roman	Text Color	(0, 0, 0)	: sets text,			
	text size, font a	nd text color by t	he setting that w	indows provid	es.			
				1235				
5.	Picture Bank Name	None	, Picture Name	None	: to be			
	rich screen with	n the pictures fro	m picture bank.	Refer to chapte	er 2 for detail.			
6.	Function	Maintained	, madifica butta	n oborootor di				
0.	re-build button.		: modifies butto	on character un				
			tained					
		Set						
		Reset Main	tained					
			entary					
		But	ton character					
	-	pressing, the b		•				
		r pressing, the		•				
	C. Maintained: after pressing, the button will be ON and it is still							
	ON when releasing. But it will be OFF when pressing again. D. Momentary: When pressing the button and hold, this button will							
	•	it will be OFF	•		button will			
7.	Push Time		: the button w		ftor prossing			
1.		ting time to avoid		ה שב מכנועם מ	nter pressing			

8. User Security Level 0 : sets the user priority. Only the priority is higher than the setting can use it.

Example:



State 0: text effect for OFF state



State 1: text effect for ON state



**ON/OFF** button application

## 3-2-2 Multistate

The state number will be different by the unit. There are 1-256 states for unit WORD, 16 states for unit LSB and 2 states for unit Bit. The unit of read/write address will be different by the value unit. If value unit is WORD or LSB, the unit of read/write address will be WORD. If value unit is Bit, the unit of read/write address will be Bit. It will read by the sequence setting (next state or previous state) and write the new value to write address.

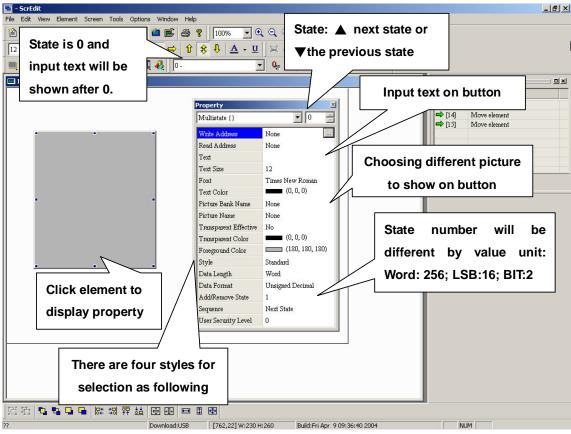
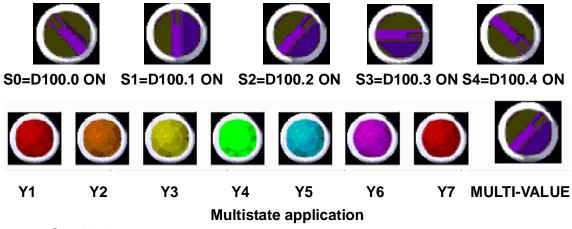


Fig. 3-2-3 Multistate settings

Μι	ıltistate properti	es:				
1.	Write Address	None ,	Read Address	None	:	the
	address for exe	ecuting multistate as	s following figure	е.		

		Input	<u>? × </u>
		└ <sup>Type</sup>	
		C PLC Device (Word)	Link Link1
		PLC Device (Bit)	Device Type X
		C Internal Memory (Word)	Addr/Value
		C Internal Memory (Bit)	
		C Constant	
			B C D E F ←
		- PLC Station Number	
			0 : + - /
		In	put address
2.	Text		Text Size 12
۷.	Font	Times New Roman	,
	text Size, fort a		he setting that windows provides.
3.	Picture Bank Name	None	Picture Name None : to be
0.	rich screen wit	h the pictures from	m picture bank. Refer to chapter 2 for detail.
		····· P·····	···· • • • • • • • • • • • • • • • • •
4.	Style	Standard	Foreground Color (180, 180, 180) : user can
	select element	style and foregro	und color as following figure.
	Stan	udard 💌	
	Stan Rais	ed	Raised
	Rou Invis	uu1	(Invisible button)
		ele	ement style
5.	Push Time	0	: the element will be active after pressing
	longer than set	ting time to avoid	I mis-operation.
		12	
6.	User Security Level		: set the user priority. Only the priority is
	higher than set	ting can use it.	
		12	I
7.	Add/Remove State		: state number of multistate. There are 1-256
	states for unit \	NORD, 16 states 1	for LSB and 2 states for Bit.
8.	Sequence	Next State	: sets next state order (previous state/next
0.	state).		. Sers Herr State Older (Previous State/Next
F٧	ample:		
ĽΧ	-	n unit is I CD (D4)	00.0—D100.1D100.3-D100.4)
	vvne		00.0



## 3-2-3 Set Value

After pressing button, you will get pop-up box to input value on HMI. When pressing Enter, HMI will send the value to PLC corresponding register. User can set the maximum and minimum to input and set to trigger before or after inputting.

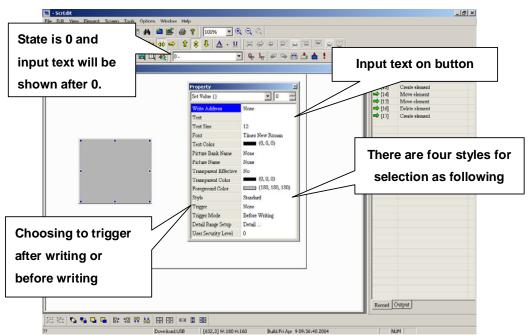


Fig. 3-2-4 Set value properties

🛯 🕰 🔍 🔍 🛄 🗔 💭 🔯 🛄 🥀 🛛 💷 11 - Screen_1	_ 4, 1, 2	Set Value ()	
Data format	Value unit	Wole Address Text Text Size Font Text Color Picture Dank Name Picture Name Transparent Effective Transparent Color	None 12 Times New Roman (0, 0, 0) None No (0, 0, 0) (180, 180, 180
Input range (maximum/minimum)	Dula Format Unaigned Decimal  Mazanom  Mazanom  Mazinom  9999  Integral Digits  4  Min 0  Fractional Digits  0  Maz  9999	Foreground Color Style Trigger Trigger Mode <u>Detail Range Setup</u> User Security Level	Standard None Before Writing Detail 0
	OK Canol	Step Action (13) Create els Clicks he	

Fig. 3-2-5 Set value settings

## Set value properties:

1. Write Address None , Read Address None : the

address for executing set value as following figure.

		Input			? ×		
		Type C PLC Device (Word) C PLC Device (Bit) C Internal Memory (Word C Internal Memory (Bit)	Device Type	Link1 X			
		C 10 C 10U C PLC Station Number     1   Image: C 10 C	16 16 1 2 3 0 : + •	E F 9 A 4 5 - 1 None			
		Ir	put address	_			
	Text		Text Siz	e	12		_
•	Font	Times New Roman	Text Color		(0, 0, 0)	: sets te	•xt.
	text size, font	and text color by	,	at win	ndows provi		.,
	Picture Bank Name	None	Picture Name		None	: to	be
	rich coroon wi	th the nictures fr	m nicture has		for to ohon		

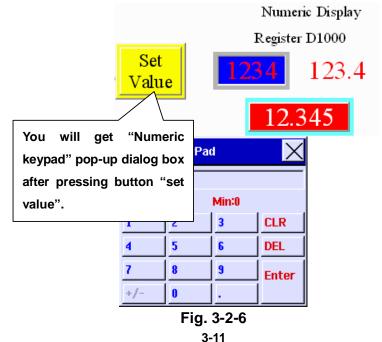
4. Style Foreground Color (180, 180, 180) Standard : user can select element style and foreground color as following figure. Standard Standar Raised Standard Raised Round Round (Invisible button) Invisible **Element style** 5. Trigger None Trigger Mode Before Writing : User can use this setting to trigger PLC after writing or before writing. Note: this function can only trigger PLC to be ON. If it needs to trigger again, you should set the address to be OFF by yourself. 6. User Security Level 0 : sets the user priority. Only the priority is higher than setting can use it. Data Length Word -Unsigned Decimal 🔳 : sets the Data Format 7. value unit and format.

8. Minimum 0 , Maximum 99999 : sets the input value range.

9. Integral Digits 4 , Fractional Digits 0 : sets input value format.

Set value properties:

After pressing button, you will get "Numeric keypad" dialog box on HMI to input value to PLC corresponding register D1000.



## 3-2-4 Set Constant

After pressing button, HMI will transmit constant to PLC corresponding register as following figure.

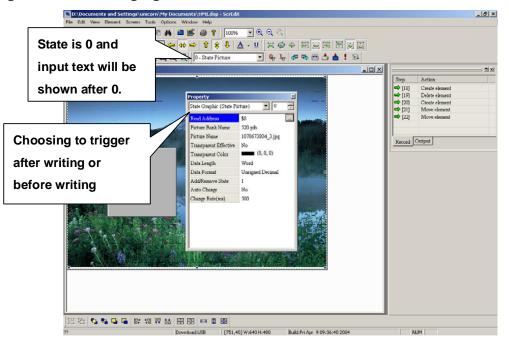


Fig. 3-2-7 Set constant properties

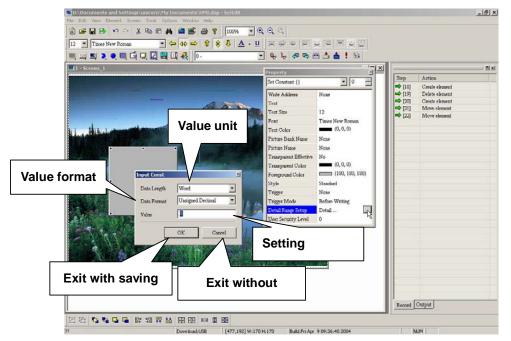


Fig. 3-2-8 set constant properties

#### Set constant properties:

1. Write Address None , Read Address None : the

address for executing "set constant" as following figure.

🔿 PLC Device (Word)	Link		Ī	.ink1		-
<ul> <li>PLC Device (Bit)</li> <li>Internal Memory (Word)</li> </ul>	Devic Addr/		Ē	<		
C Internal Memory (Bit) Constant	Tag		Γ			Ŧ
	В	c	D	E	F	-
	6	7	8	9	Α	CE
C 10 C 100 C 16		2	3	4	5	1
PLC Station Number			+	100	1	•

# Input address

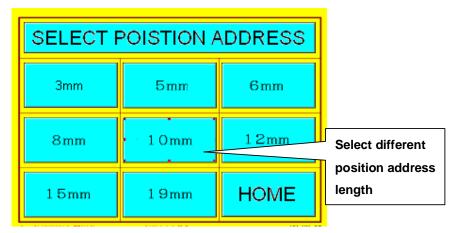
2.	Text		, Text Size	12	,
	Font	Times New Roman	, Text Color	(0, 0, 0)	sets text,
	text size, font a	nd text color by t	he setting that wi	ndows provides.	
3.	Picture Bank Name	None	, Picture Name	None	: to be
	rich screen with	h the pictures fro	m picture bank. R	efer to chapter 2	for detail.
		(100)			
4.	Style	Standard	, Foreground Color	(180, 180, 180)	user can
	select element	style and foregro	und color as follo	wing figure.	
	Stan				
	Raise	Stopdard	Round		
	Invis	,	·	ble button)	
		ele	ement style		
_	Triana	1287	-	Defen Weiting	
5.	Trigger	None	, Trigger Mode	Before Writing	: User
5.	can use this se	None etting to trigger P	, Trigger Mode LC after writing o	r before writing.	Note: this
5.	can use this se function can o	None etting to trigger P nly trigger PLC	, <sup>Trigger Mode</sup> LC after writing o to be ON. If it ne	r before writing.	Note: this
5.	can use this se function can o	None etting to trigger P	, <sup>Trigger Mode</sup> LC after writing o to be ON. If it ne	r before writing.	Note: this
•	can use this se function can o should set the a	None etting to trigger P nly trigger PLC address to be OF	, <sup>Trigger Mode</sup> LC after writing o to be ON. If it ne F by yourself.	r before writing. eeds to trigger a	Note: this again, you
5.	can use this se function can o should set the a User Security Level	None etting to trigger P nly trigger PLC address to be OF	, <sup>Trigger Mode</sup> LC after writing o to be ON. If it ne	r before writing. eeds to trigger a	Note: this again, you
•	can use this se function can o should set the a	None etting to trigger P nly trigger PLC address to be OF	, <sup>Trigger Mode</sup> LC after writing o to be ON. If it ne F by yourself.	r before writing. eeds to trigger a	Note: this again, you
•	can use this se function can o should set the a User Security Level higher than set	None etting to trigger P nly trigger PLC address to be OF 0 ting can use it.	, Trigger Mode LC after writing o to be ON. If it ne F by yourself. : sets the user p	r before writing. eeds to trigger a riority. Only the	Note: this again, you
•	can use this se function can o should set the a User Security Level	None etting to trigger P nly trigger PLC address to be OF 0 ting can use it.	, Trigger Mode LC after writing o to be ON. If it ne F by yourself. : sets the user p	r before writing. eeds to trigger a	Note: this again, you

value unit and format.

8.	Value	0	: user can pres	set the constant.
----	-------	---	-----------------	-------------------

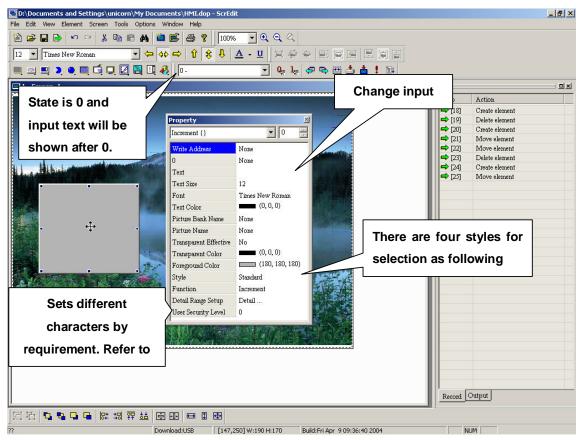
## Example:

After pressing button, HMI will transmit constant to PLC corresponding register D1000.



## **3-2-5 Increment/Decrement**

After pressing button, HMI will increase/decrease PLC value and write the result into PLC corresponding register. If the value after operation exceeds maximum, maximum will be saved into address as following figure.





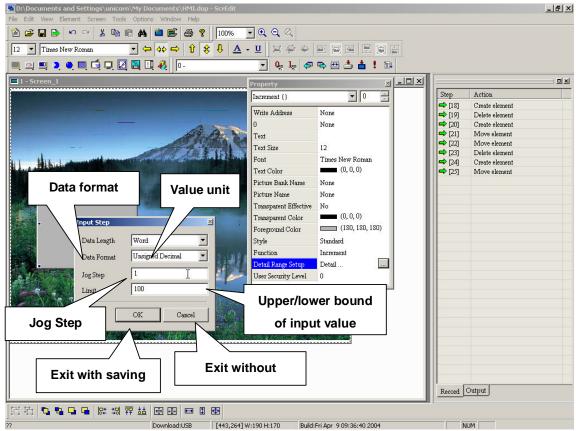


Fig. 3-2-10 Increment/Decrement settings

## Increment/Decrement properties:

1. Write Address None , Read Address None : the

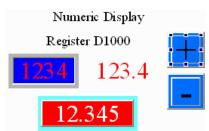
address for increment/decrement as following figure.

		Input	<u>? ×</u>			
		Type	Link Link1			
		C PLC Device (Word)				
		PLC Device (Bit)	Device Type X			
		C Internal Memory (Word)	Addr/Value			
		C Constant	Tag			
		Constan	B C D E F +			
			6 7 8 9 A CE			
		PLC Station Number				
			None			
		Inp	out address			
2.	Text		, Text Size 12			
	Font	Times New Roman	Text Color (0, 0, 0) : sets text,			
	text size, font a	nd text color by t	he setting that windows provides.			
3.	Picture Bank Name	None	, Picture Name None : to be			
	rich screen with	h the pictures from	m picture bank. Refer to chapter 2 for detail.			
4.	Style	Standard	Foreground Color (180, 180, 180) : user can			
	select element	style and foregro	und color as following figure.			
	Stan	dard 🔻				
	Stan	dard				
	Raise Rou	nd Standard R	Round (Invisible button)			
	Invis		(Invisible button)			
		123 125	ement style			
5.	Function	Increment	: Changes element character directly			
	without re-build	ling element as fo	ollowing figure.			
		Incren Decre:				
			ient character			
c	User Security Level	02				
6.	Oper Decimity Devel		: sets the user priority. Only the priority is			

higher than setting can use it.

Example:

### Adjust D1000 value by pressing buttons +/-



## 3-2-6 Goto Screen

After pressing button, HMI will change screen to designated screen directly.

There are two types for selection:

- 1. Change screen: pressing button to change HMI to specific screen.
- 2. Back to previous screen: pressing button to change HMI to previous screen.

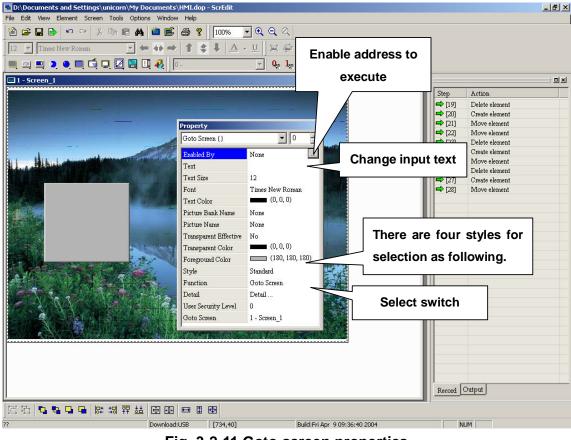


Fig. 3-2-11 Goto screen properties

#### **Properties:**

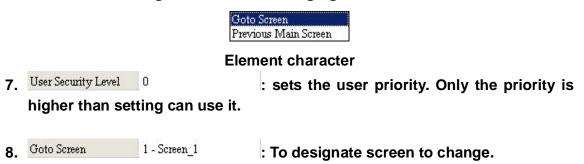
1. Enabled By None

: Setting the address to execute as

following figure.

		Input	<u>? × </u>
		[ Type]	
		C PLC Device (Word)	Link Link1
		PLC Device (Bit)	Device Type X
		C Internal Memory (Word)	
		C Internal Memory (Bit)	Addr/Value
			Tag
		C Constant	
			6 7 8 9 A CE
		C 10 C 10U C 16	
		PLC Station Number	
		1 - Default	None
			••
		Input a	address
2.	Text		, Text Size 12
	Font	Times New Roman Text	t Color (0, 0, 0) : sets text,
	text size. font a	nd text color by the s	setting that windows provides.
-	Dutil	Dutuil	
3.	Detail		o lower user priority after changing
	screen as follow	wing figure.	
		Detail	
			he Goto Screen Button
		is only valid in Sub-S	creen)
			vill be set to Low Security
		after changing screen	
		OI	KCancel
		Goto scre	en options
4.	Picture Bank Name	None Pi	cture Name None : to be
	rich screen with	,	cture bank. Refer to chapter 2 for detail.
	Hen Scicen with	in the pictures from pi	icture bank. Refer to chapter 2 for detail.
	12772	22 2 2	
5.	Style	Standard , Fore	ground Color (180, 180, 180) : user can
	select element	style and foreground	color as following figure.
	Stan	ıdard 🔻	
	Stan		$\bigcirc$
	Rais Rou	Standard Raised	(Round)
	Invis		(Invisible button)
6.	Function	Goto Screen	Changes element character directly
э.			

without re-building element as following figure.



Example: change to designated screen by different button

Welcome to Delta Total Solution System							
Delta Electro Our Mission: With Innovation, we a providing energy to improve the qu	h continuous re committed to officient products						
About Delta	Goble Delta	Product					
Basic Element	Basic Element Graph Display Trend Display						
http://www.deltaww.com							

# **3-2-7 System Function Button**



System button options

Button type	Macro	Read	Write	Function
System Date & Time	No	No	No	Setting HMI system time and date (year-month-day, hours:minutes:seconds)
Password table setup	No	No	No	Setting all password priority
Enter password	No	No	No	HMI provides passwords function
Contrast & Brightness	No	No	No	Adjust HMI contrast/brightness
Low security	No	No		After pressing button, HMI will the password to the lowest level (Level is

				0).
System menu	No	No	No	After pressing button, HMI will change screen to system menu.

Table 3-2-2 System function button

System function button

There are 6 settings for system function and they are System Date & Time, Password table setup, Enter password, Contrast & Brightness, Low security and back to system menu.

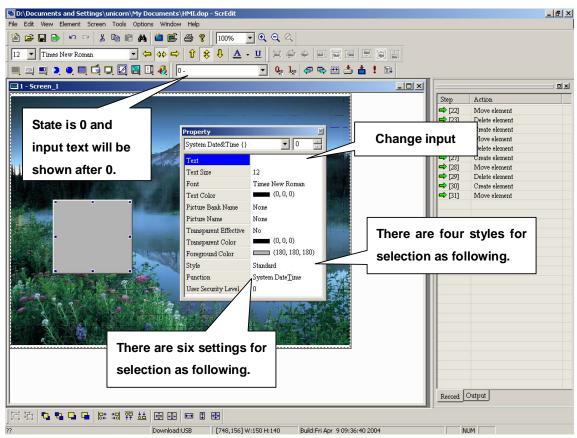
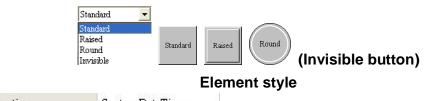


Fig. 3-2-12 System function properties

## **Properties:**

1. Text Text Size 12 (0, 0, 0) Text Color Font Times New Roman : sets text, text size, font and text color by the setting that windows provides. 2. Picture Bank Name None Picture Name None to be rich screen with the pictures from picture bank. Refer to chapter 2 for detail. 3. Style (180, 180, 180) Standard Foreground Color : user can select element style and foreground color as following figure.



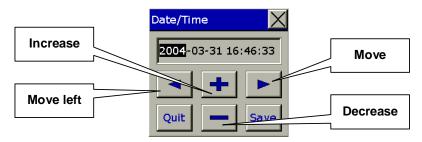
4. Function System DateTime : Changes element character directly without re-building element as following figure.



System element settings

a. System Date & Time

Provides a button for user to set system data and time of HMI. You only need to press SYS button to enter HMI system setting screen as following figure.



System setting windows of HMI system

b. Password table setup

After pressing button, open level will depend on user priority. After downloading to HMI, you can't open this password table if your password level is lower than setting level. If you can open password table, you can change the password that level is lower than yours and you can't change or see those password that is higher than yours.

Pass	Password Table						
1	2	3		10000000         0           11111111         1			
4	5	6	•	22222222 2 33333333 3 44444444 4			
7	8	9	•	55555555555555555555555555555555555555			
CLR	0	ENT		77777777 7 Save & Quit			

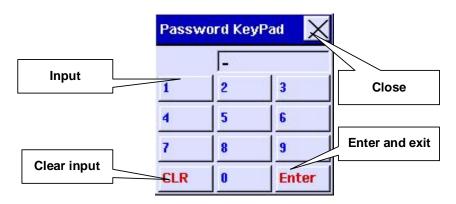
Password table 3-21

Pass	swo	rd Tabl	e		$\times$
1	2	3		00000000 11111111	0
4	5	6	Y	22222222 33333333 4444444	2 3 4
7	8	9		55555555 #########	5 #
CLR	0	ENT	•	######## Save & Qu	# it

Password table for level 5

c. Enter password

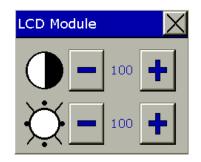
This button provides password enter interface. It will open corresponding priority by inputting password. The higher level you input, the higher priority you have.



Enter password window

d. Contrast & Brightness

This button provides HMI contrast and brightness adjustment. After pressing button, you will get following pop-up window for you to adjust as following figure.



**Contrast & Brightness setting window** 

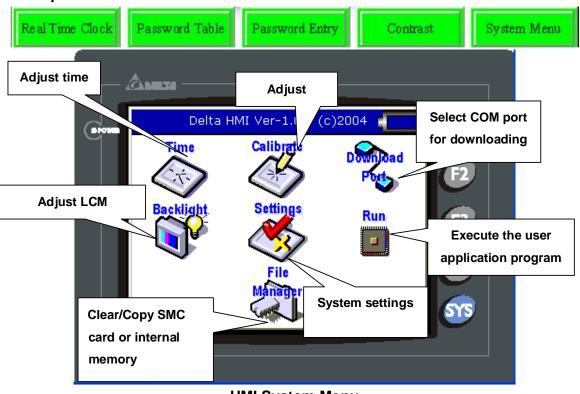
e. Low security

This button will set user priority to the lowest (Level 0). You can use setting at exiting different screen to protect control system parameter not to be modified, mis-operation to cause system error. (it also provides this function when changing screen)

f. System menu

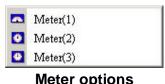
After pressing button, HMI will back to system menu. User can back to operation screen by pressing "Exit" or re-startup.

5. User Security Level 0 : uses to set the operation priority. Only the priority higher than setting can use it. Example:



**HMI System Menu** 

# 3-3 Meter



Meter type		Function				
Meter (1)		It is used to distinguish if the meter of specific address				
Meter (2)		exceeds high limit or less than low limit with different				
Meter (3)		colors. The settings are max./min. value, high/low limit, the color of meter and scale and division number.				

You can select your meter appearance with settings, such as the color and range of low limit, the color and range of high limit, the stitch color, division number, background color, etc. After setting, HMI will calculate the proportion automatically and fill your designated color into low limit, normal region and high limit.

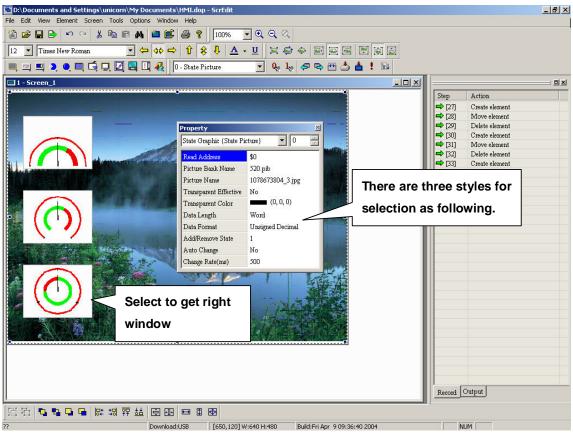


Fig. 3-3-1 Meter properties

CAWINDOWSYDESKTOPYMENU.DOP - Scredit File Edit View Element Screen Tools Options Window Help			_ 8 ×
En Eur Tea animu Samu Teas Chan Trace Teab	100% <b>- Q Q</b>		
12 Times New Roman Value	Value unit		
		▶  ≛ ≛ ! ☷	
format	Setup	Click to get left	· · · · · · · · · · · · · · · · · · ·
	Data Length Word	window	None
Max./Min.	Data Format Unsigned Dec		12
for	Minimum Value	Font	Times New Roman
	Maximum Value 100	Integer and Text Color Border Colo	r (0, 0, 0) r (180, 180, 18
	Display Target	fraction	
Enable range	Value 0	number of	Sunken Detail
limit setting	Color	Integer Num Fraction Nu	iber 4
	Ranges	Low Region	Color (0, 252, 0)
	Low range limits 0	High Region	Color (252, 0, 0)
Upper/lower bound	Hight range limits 100	When target and high	ab/low limit is
	Variable target/range limits	variable.	
	OK	Target address is read	d address + 3
		High limit address is	read address +
		2	
   [11] 다.	لما ا	-	
Ready		Fri Jul 16 10:52:04 2004	IM

Fig. 3-3-2 Meter settings

## **Properties:**

1.	Read Address	None	: Select address to execute meter function.
1.	Kead Address	INONE Input Type C PLC Device (Word) PLC Device (Bit) C Internal Memory (Word) C Internal Memory (Bit) C Constant C 10 C 10U C 1	$\begin{array}{c c} \hline & \hline \\ \hline \\ Link & \hline \\ Link & \hline \\ \hline \\ \hline \\ Device Type & X \\ \hline \\ Addn/Value \\ \hline \\ Tag \\ \hline \\ \hline \\ \hline \\ B \\ \hline \\ C \\ D \\ E \\ \hline \\ \hline$
		PLC Station Number	
		Inp	put address
2.	Text		, Text Size 12
	Font	Times New Roman	, Text Color (0, 0, 0) : sets text,
	text size, font a	nd text color by th	the setting that windows provides.
3.	Picture Bank Name	None	, Picture Name None : to be

rich screen with the pictures from picture bank. Refer to chapter 2 for detail.

4.	Style	Standard	Foreground Color	(180, 180, 180)	: user o	an
----	-------	----------	------------------	-----------------	----------	----

select element style and foreground color as following figure.

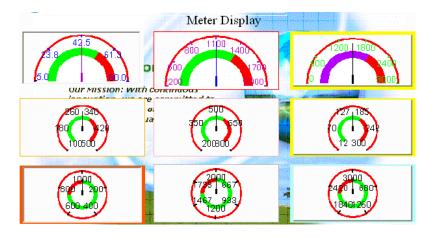
	Standard Raised
	Standard Raised Sunken
	Meter border Style
5.	Integral Digits 4 , Fractional Digits 0 : sets the integral and fractional
	digits number.
6.	High Region Color         (252, 0, 0)         Low Region Color         (0, 252, 0)         : sets
	color for high/low limit region.
7.	Stitch Color (0, 0, 0) : sets stitch color.
8.	Scale Color (0, 0, 0) , Scale Number 3 : sets
	scale color and scale number.
9.	Data Length Word T, Data Format Unsigned Decimal T: sets value
	unit and format as following figure.
	Word     BCD       Bit     Signed Decimal       Word     Unsigned Decimal       LSB     Hexadecimal
10.	Minimum 0 Maximum 99999 : set the
10.	Minimum       0       ,       Miaximum       9999       : set the         max. / min. value for inputting.
11.	▼ Target Value 0 Color
	:Setting the target value for inputting
12.	Ranges , Low Range Limit 0 Hight Range Limit 100 :
	setting range limit.
13.	□ Variable target/range limits : setting target and high/low limit to variable or

Target setting:1.constant (low limit=9999), 2. variable = the content of Dn+3 (=D1003)

low limit setting: 1. constant (low limit=0), 2. variable = the content of Dn+1 (=D1001)

high limit setting:1.constant (low limit=2500),2.variable = the content of Dn+2 (=D1002)

Example:



3-4 Bar

		■ <u>N</u> ormal ■ <u>D</u> eviation
Bar type	lcon	Function
Normal		To display the value of specific address by bar graph.
bar		You can know its quantity by the increment and
		decrement of square measure. It will use different color
Deviation		to mark if the value is less than low limit or higher than
bar		high limit. You can set max./min., the value and color of
		low/high limit, foreground/background color, etc.

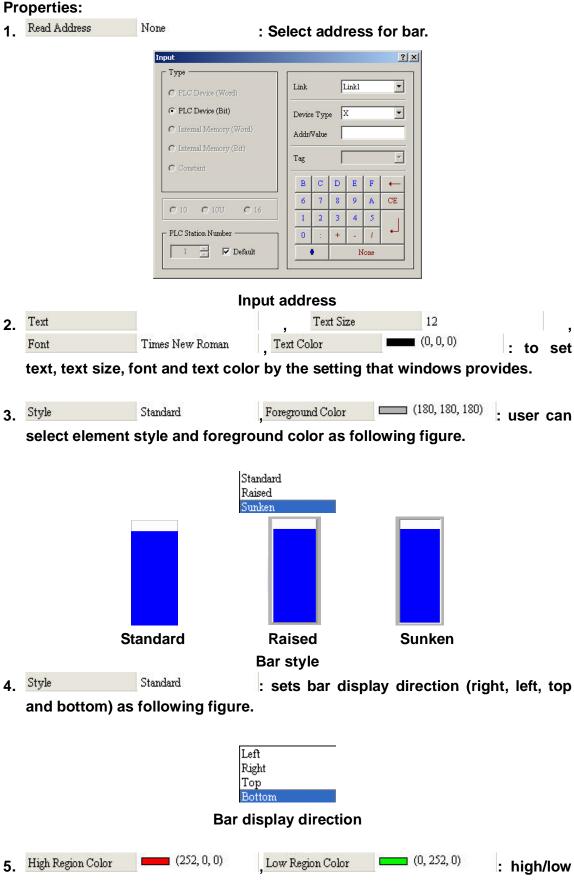
Table 3-4-1

There are two types of bar graph:

- 1. Normal bar: HMI will convert the value of PLC corresponding register to normal graph to show on HMI screen.
- 2. Deviation bar: HMI will read the value of PLC corresponding register to compare to standard value. Then, convert deviation to deviation bar to show on HMI screen.

# 3-4-1 Normal Bar

D:\Documents and Settings\unicorn\My Documents	\HMI.dop - ScrEdit			
File Edit View Element Screen Tools Options Window	VICTOR REPORT	1000		
Times New Roman		]QQQ ⊻   ⊑ ∰ ⊕   E   E   E		
	]•]•]•]•]. D-	┙҇҄҄҂҂҇Ҍ҄Ҽѽ		
Click to get				
property window				Step Action
	Property	<u> </u>	Change	input text
	&Normal {}		Change	ement
	Read Address Text	None		→ [30]     Nove element       → [37]     Delete element
		12		➡ [38]     Delete element       ➡ [39]     Delete element
		Times New Roman (252, 252, 0)	I	➡ [40]     Create element       ➡ [41]     Create element
	Border Color	(180, 180, 180)		
	Foreground Color Background Color	(0, 0, 252) (252, 252, 252)	I	
There are four styles for		Standard		
		Right Detail	There	are four
selection as following.	Low Region Color High Region Color	(0, 108, 0)	display	formats for
		NAME	uispidy	
			I	
		/high region	I	
	LOWA	/ingit region	I	
			I	
				Record Output
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?? Download				NUM
	FIG 3-4	1 DAY AYAAAYH		
	-	-1 Bar properti	es	
<b>画 C. Product/Office Document/參展資料/2004/語態展</b> File Edit View Element Screen Tools Options Windo	示\7.5&10.4 demo.dop -	· ·	es	_ # X
SC:Product/Office Document/参展資料/2004/靜態展 File Edit View Element Screen Icols Options Windo	示\7.5&10.4 demo.dop - <sup>w</sup> <u>H</u> elp	- ScrEdit	es	• <b>7</b> X
Ele Edit Yiew Element Screen Iools Options Windo	示\7.5&10.4 demo.dop - <sup>w</sup> <u>H</u> elp	Value unit		- 7 X
Eile Edit Yiew Element Screen Iools Options Windo	示\7.5&10.4 demo.dop - w <u>H</u> elp  ③ ? 100% <u>•</u>	ScrEdit		
Ele Edit View Element Screen Tools Options Windo	₩ Help	- SerEdit		; _] X
File Edit Yiew Element Screen Iools Options Windo	示\7.5&10.4 demo dop → 目的 日本 日本 日本 日本 日本 日本 日本 日本 日本 日本	- ScrEdit Value unit		
Ele Edit Yew Element Screen Tools Options Windo File Edit Yew Roman 12 Times New Roman 21 - Basic Element function Basis Max./Min. 21	示\7.5&10.4 demo dop - ● ● ● ● ● ● ● ● ● ● ● ● ●	ScrEdit		ENormal () 0 Read Address \$1200
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Edit Yew Element Screen Tools Options Windo         Image: Screen Tools Options Options Windo         Image: Screen Tools Options Optio	示V7.5&10.4 demo dop ● Help ● ? 100% ◆ ▲ ▲ · Setup Data Leng IY and Oata Form Minimum	ScrEdit Value unit		et left (22, 22, 0)
Ele Edit Yew Element Screen Tools Options Windo File Edit Yew Roman 12 Times New Roman 21 - Basic Element function Basis Max./Min. 21	示V7.5&10.4 demo dop ● Help ● ? 100% ◆ ▲ ▲ · Setup Data Leng IY and Oata Form Minimum	SerEdit		EX left Foreground Color (0, 0, 252)
Edit Yew Element Screen Tools Options Windo         Image: Screen Tools Options Windo	Tr. 7. 5. & 10. 4 demo dop → Help Tr. 100% → Setup Data Leng IY and Data Form Minimum Display □ Tage	ScrEdit Value unit Value unit Value Value Value Value 1000		Et left Border Cont Border Cont Et left
Ele Edit Yew Element Screen Tools Options Windo Ele Edit Yew Roman 12 Times New Roman 21 - Basic Element function=4 Bas Max./Min. value range 100 Delta Electronics Gro 100 55 minuous	Try 7.5&10.4 demo dop       Help       Image: Setup	ScrEdit Value unit Value unit Value Value Value Value 1000		Et left Border Colo Border Colo Border Colo Background Color Style Display Format Top
Edit Yew Element Screen Tools Options Windo         Image: Screen Tools Options Windo	Tr. 7. 5. & 10. 4 demo dop → Help Tr. 100% → Setup Data Leng IY and Data Form Minimum Display □ Tage	ScrEdit Value unit Value unit Value Value Value Value 1000		et left Border Con Border Con Background Color Style Standard
Edit Yew       Element Screen       Tools       Options       Window         12       Times New Roman       Value         2       2       2       Value         2       3       1       Value         2       3       1       Value         2       3       1       Value         2       3       1       Value         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         10       1       1       1         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10 <t< th=""><th>Try 7.5 &amp; 10.4 demo dop         Help         ●</th><th>ScrEdit Value unit Value unit Value unit Value Value Value Value 1000 et</th><th>Click to g</th><th>Et left Border Colo Border Colo Border Colo Background Color Style Display Format Detail Low Region Color (0, 108, 0)</th></t<>	Try 7.5 & 10.4 demo dop         Help         ●	ScrEdit Value unit Value unit Value unit Value Value Value Value 1000 et	Click to g	Et left Border Colo Border Colo Border Colo Background Color Style Display Format Detail Low Region Color (0, 108, 0)
Edit Yew       Element Screen       Tools       Options       Window         12       Times New Roman       Value         2       2       2       Value         2       3       1       Value         2       3       1       Value         2       3       1       Value         2       3       1       Value         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         2       1       1       1         10       1       1       1         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10         100       1       10       10 <t< th=""><th>TY 7.5&amp;10.4 demo dop → Help</th><th>ScrEdit Value unit Value unit Value Kh Word Kh Word Kh Word Kh Word Kh Unit Kh Word Kh Word Kh ISigned Decimal Kh Unit Kh ISigned Decimal Kh ISigned Tar</th><th>Click to g</th><th>et left Border Con Berder Con Background Color Background Color Display Format Low Region Color Display Format Color Display Format Color Detail Low Region Color Color Detail Color</th></t<>	TY 7.5&10.4 demo dop → Help	ScrEdit Value unit Value unit Value Kh Word Kh Word Kh Word Kh Word Kh Unit Kh Word Kh Word Kh ISigned Decimal Kh Unit Kh ISigned Decimal Kh ISigned Tar	Click to g	et left Border Con Berder Con Background Color Background Color Display Format Low Region Color Display Format Color Display Format Color Detail Low Region Color Color Detail Color
Edit Yew Element Screen Tools Options Windo         I2       Times New Roman         Value         I2       Bas         Max./Min.         value range         I00       50         50       50         25       25	Try 7.5 & 10.4 demo dop         Help         ●	ScrEdit Value unit Value unit Value Kh Word Kh Word Kh Word Kh Word Kh Unit Kh Word Kh Word Kh ISigned Decimal Kh Unit Kh ISigned Decimal Kh ISigned Tar	Click to g	Et left Border Color Border Color Border Color Border Color Border Color Border Color Border Color Border Color Classified and the set of the set
Eldit Yew       Element Screen Tools Options       Window         12       Times New Roman       Value         21       Bas       Value         21       Bas       Max./Min.         Value       Value         21       Bas         Max./Min.       Value         00       50         75       Enable range         50       0	Tr.Y. 5.&10.4 demo dop       ★ Help       ● 100% <th>ScrEdit Value unit Value unit Value unit Value  Personal  Personal</th> <th>Click to g Click to g get and high get address</th> <th>et left Border Con Berder Con Background Color Style Display Format Low Region Color Detail Low Region Color Color Detail Color Detail Color Col</th>	ScrEdit Value unit Value unit Value unit Value  Personal  Personal	Click to g Click to g get and high get address	et left Border Con Berder Con Background Color Style Display Format Low Region Color Detail Low Region Color Color Detail Color Detail Color Col
Edit Yew Element Screen Tools Options Windo   12   Times New Roman   21   21   Bas   Max./Min.   value range   100<	TV7.5&10.4 demo.dop → Help TV7.5&10.4 demo.dop → Help Setup Data Lenge TV and Data Lenge TV and Data Lenge TV and Data Lenge TV ata Form Minimum Display Targe Value Color V Range Low range Hight ran V ata Set	ScrEdit Value unit Value unit Value unit Value  Personal  Personal	Click to g Click to g get and high get address	Et left Exact Address Exact Addres Exact Addre
Edit Yew Element Screen Tools Options Windo   In provide the second sec	Tr. 7. 5. ± 10. 4 demo. dop - Help Setup Data Leng Ty and Setup Data Leng Ty ang Value Color V Rang Low rang Hight ran V Varial V Varial V Varial V Varial V Varial V Varive V Varive V Varial V Varial V Varial V Varial V Varive V Va	ScrEdit Value unit Value unit Value unit Value Value Value 0 Value 0 Value 1000 et	Click to g Click to g get and high get address	Example 1       Image: Strange 1         Example 2       Strange 2         Example
Edit Yew Element Screen Tools Options Windo   12   Times New Roman   21   21   Bas   Max./Min.   value range   100   51   52   53   54   55   56   56   57   58   59   50   50   50   51   52   53   54   54   55   56   57   58   59   50   50   50   51   52   54   55   56   57   58   57   58   59   50	TV7.5&10.4 demo.dop → Help TV7.5&10.4 demo.dop → Help Setup Data Lenge TV and Data Lenge TV and Data Lenge TV and Data Lenge TV ata Form Minimum Display Targe Value Color V Range Low range Hight ran V ata Set	ScrEdit Value unit Value unit Value unit Value Value Value 0 Value 0 Value 1000 et	Click to g Click to g get and high get address	EXPormal ()  Read Address  Standard  Display Format Dotal Low Region Color  (0, 108, 0)  A/low limit is variable.  is read address + 3
Edit Yew Element Screen Tools Options Windo   12   Times New Roman   21   21   Bas   Max./Min.   value range   100   51   52   53   54   55   56   56   57   58   59   50   50   50   51   52   53   54   54   55   56   57   58   59   50   50   50   51   52   54   55   56   57   58   57   58   59   50	TV7.5&10.4 demo.dop → Help TV7.5&10.4 demo.dop → Help Setup Data Lenge TV and Data Lenge TV and Data Lenge TV and Data Lenge TV ata Form Minimum Display Targe Value Color V Range Low range Hight ran V ata Set	ScrEdit Value unit Value unit Value unit Value Value Value 0 Value 0 Value 1000 et	Click to g Click to g get and high get address	Address Addres
Edit Yew Element Screen Tools Options Windo   12   Times New Roman   21   21   Bas   Max./Min.   value range   100   51   52   53   54   55   56   56   57   58   59   50   50   50   51   52   53   54   54   55   56   57   58   59   50   50   50   51   52   54   55   56   57   58   57   58   59   50	TV7.5&10.4 demo.dop → Help TV7.5&10.4 demo.dop → Help Setup Data Lenge TV and Data Lenge TV and Data Lenge TV and Data Lenge TV ata Form Minimum Display Targe Value Color V Range Low range Hight ran V ata Set	ScrEdit Value unit Value unit Value unit Value Value Value 0 Value 0 Value 1000 et	Click to g Click to g get and high get address	Address Addres



#### Fig. 3-4-2 Normal bar settings

region color setting.

6.	Data Length	Word	,	Data Format	Unsigned Decimal	l <u>-</u>	setting
	data unit and	d format as	following f	igure.			
		B	Yord it Yord SB	ECD BCD Signed Deci Unsigned D Hexadecima	ecimal		
7.	Minimum max./min. va	0	,	Maximum	9999	:	setting
		Value	0		Color		
8.	<ul><li>Target</li><li>Setting the</li></ul>	,	1	ing	,	1	
9.	Ranges	Low Range Lin	uit 0		Hight Range Limit	100	
	setting rang	e limit.					

10. Variable target/range limits : setting target and high/low limit to variable or constant.

Target setting: 1. constant (low limit=9999), 2. variable = the content of Dn+3 (=D1003)

low limit setting: 1. constant (low limit=0), 2. variable = the content of Dn+1 (=D1001)

high limit setting: 1. constant (low limit=2500), 2. variable = the content of Dn+2 (=D1002)

3-4-2 Deviation Bar

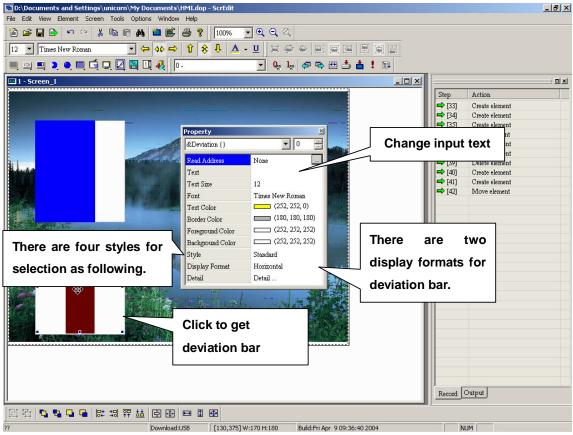


Fig. 3-4-3 Deviation properties

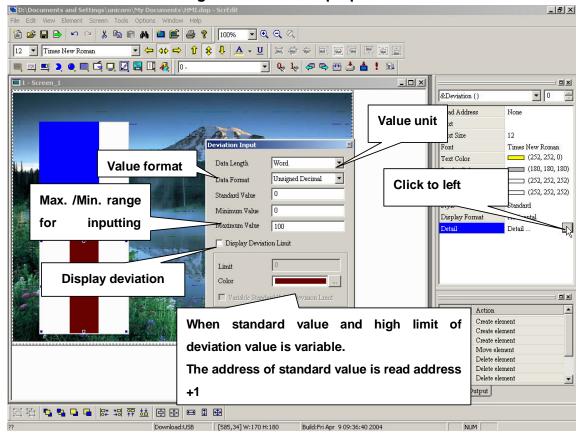


Fig. 3-4-4 Deviation bar settings

### **Properties:**

1.	Read Address	None	: Select address f	or deviation k	oar.
		Input		? ×	
		[ Type			
		C PLC Device (Word)	Link Link1		
		PLC Device (Bit)	Device Type X		
		C Internal Memory (Word)	Addr/Value		
		C Internal Memory (Bit)			
		C Constant	Tag	<u> </u>	
			BCDEF		
		a Alexandra contractor	6789A	CE	
		C 10 C 10U C 16	1 2 3 4 5		
		PLC Station Number	0 : + - /	╡╺┛╽╽╽	
		1 🚎 🔽 Default	None		
		l n n			
		inp	out address		
2.	Text		Text Size	12	
	Font	Times New Roman	Text Color	(0, 0, 0)	: setting
	text, text size, fo	ont and text color	by the setting that	at windows p	-
				-	
3.	Style	Standard	Foreground Color	(180, 180, 180	)) : user can
	select element	style and foregrou	und color as follow	wing figure.	
			udard		
		Rais Sun			
	ſ				
	St	andard	Raised	Sunken	
		2020/07 02295	tion bar style		
4.	Display Format	Horizontal	: Display	bar action	n direction
	(Horizontal/vert	ical) as following	figure.		
		Horizo Vertica			

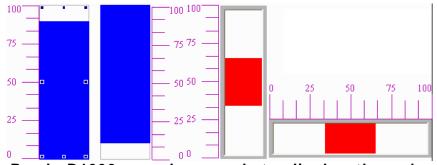
display format

5.	Data Length	Word	, ▼	Data Forma	t Unsigne	d Decimal	•	setting
	value unit an	[	as following <sup>Word</sup> Bit Word	Figure. BCD BCD Signed Du Unsigned				
6.	Minimum display rang	0	raph.	Hexadeci			·	setting
7.	Standard Value	0		, Col		7 Deviation Lin		, ,
				,		1		

□ Variable Standard Value/Deviaion Limit: setting target and high limit of deviation value.

1. constant (following example=0), 2. variable = compare the content of Dn (=D1000) and standard value Dn+1(D1001). When difference is higher than deviation high limit Dn+2(D1002), it will use different color to display.

**Example:** 



Read: D1000, use bar graph to display the value of PLC corresponding register=Dn

# 3-5 Pie Graph

•	Pie(1)
3	Pie(2)
•	Pie(3)
3	Pie(4)

Button type	lcon	Function
Pie (1)		To display the value of specific address by pie graph. You can
Pie (2)	2	know its quantity by the increment and decrement of area
Pie (3)	<b>~</b>	measure. It will use different color to mark if the value is less
Pie (4)	3	than lower bound or higher than upper bound. You can set
		max./min., the value and color of low/high region,
		foreground/background color, etc.

There are four types for selection and you can use the settings, includes color setting, max., min., high limit, low limit, etc. to design. The value will be changed by the reading address.

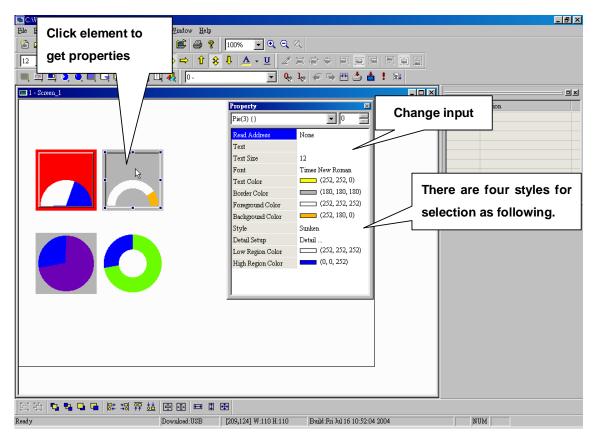


Fig. 3-5-1 Pie graph properties

CAWINDOWSYDESKTOPYMENU DOP - ScrEdit File Edit View Element Screen Iools Options Window Help			_ 8 ×
Les Les Mit	1009		
12 V Times New Roman V 🗘 🍫 🗘 🗘	🔋 Value unit 🖕 📻 🧮		
💻 🗷 🔍 🔍 🛄 Value format 📃	╧┉╼╖╭┍┙╚╶╧	<u>≜ !</u> ⊒.	
1 - Screen_1	Setup F		
	Data Length Word		None
Max./Min.	Data Format Unsigned Decimal	Click to get left	
value for	Minimum Value	Font	12 Times New Roman
	Maximum Value 100	Text Color	(252, 252, 0)
	Display	Border Color Foreground Color	(180, 180, 180)
	Target	Background Color	(2) (2) (2) (0, 0)
Enable range	Value 0 Color	Style Detail Setup	Sunken 📃 🔜
		Low Region Color	(252, 252, 252) <sup>°</sup>
	□ Ranger	High Region Color	(0, 0, 252)
	Low range limits		· · · )
Limit for inputting	Hight range limits Wh	nen target and high/low	w limit is
	□ Variable target/range limits va	riable.	
		rget address is read add	ress + 3
		-	
		gh limit address is read	address +
	2		
[더 다] 다 다 다 다 나 해 꺾 챔 白 팬 🖶 🛙 여			
Ready Download:USB	[688,140] W:110 H:110 Build:Fri Jul 16 10:52	:04 2004 NUM	

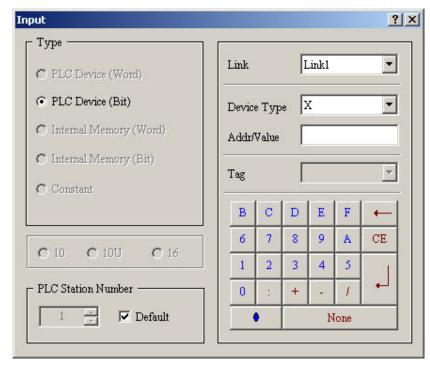
Fig. 3-5-2 Pie graph settings

### **Properties**

1. Read Address None

: the address for pie graph as following

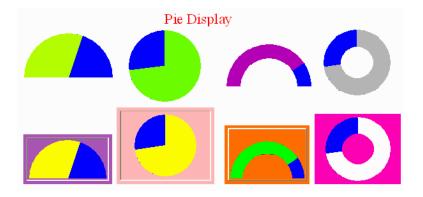
picture.



## Input address

2.	Text		, Text Size	12		,
	Font	Times New Roman	, Text Color	(U	, 0, 0)	: to set
	text, text size, fo	ont and text color	by the setti	ng that win	dows prov	ides.
		LONG 26 100 11				
3.	Style	Standard	, Foreground Color	: (1	80, 180, 180)	: user can
	select element	style and foregrou	und color as	following	igure.	
					2004 (00 (20 (20 ))) III	
4.	High Region Color	(252, 0, 0)	, Low Region Colo	r 🗖 (0	, 252, 0)	: High/low
	region color set	tting.				
5.	Data Length Wo	ard 💌	Data Format	Unsigned Decir	nal 🔽. c	ets data
5.		,			3	
	unit and format	as following figu	re.			
Wo Bit						
Wo	201	gned Decimal nsigned Decimal				
LSE	B He	exadecimal				
6.	Minimum 0		Maximum	9999	: s	ets
	max./min. value					
	max./mm. value	, <u> </u>				
7.	🔽 Ranges , Low Re	ange Limit 0	, Hight	Range Limit 🛛	100	: sets
	range limit.					
	range mint.					
8.	Variable target/range	limits · setting ta	rget and hig	h/low limit	to variable	or
0.	constant.	. Setting ta	iget and hig			
		1. constant (low li	mit=9999). 2	. variable =	the conte	nt of Dn+3
	(=D1001)					
	<b>( )</b>	g: 1. constant (lo	w limit=0). 2	. variable =	the conter	nt of Dn+2
	(=D1002)		· · // –			-
	. ,	ng: 1. constant (le	ow limit=250	0), 2. varial	ole = the co	ontent of
	Dn+1 (=D1003)	•				

Example:



# **3-6 Indicator**

		<ul> <li><u>M</u>ultistate Indicator</li> <li><u>R</u>ange Indicator</li> </ul>
Indicator type	lcon	Function
Multistate indicator	۲	To display the state of PLC corresponding contact (ON or OFF) or register
Range indicator	•	To display the state of comparison result (compare PLC corresponding contact (ON or OFF) or register with low limit of range)

There are two indicators for selection:

- Multistate indicator: provides a method to display PLC corresponding contact (ON or OFF) or register. State number will be different by unit setting. (Value: 256 states, LSB: 16 states, BIT: 2 states) The content of indicator could be text or figure.
- 2. Range indicator: compare PLC corresponding contact (ON or OFF) or register with low limit of range. Then, display the corresponding state of comparison result on HMI screen.

## 3-6-1 State Indicator

State indicator provides a method to indicate specific address. It will send state changes message to user no matter it is Bit, LSB or WORD. If this address is an important pointer or important message or important alarm, state indicator, it can be used to inform user immediately by changing display state method or different text setting. Or even changes by different states to let user get more information and user can also handle the corresponding state immediately.

D:\Documents and Settings\unicorn\My Documents\HMI.dop -	ScrEdit			_ 8 ×
File Edit View Element Screen Tools Options Window Help		0		
ĨÈ ☞ 및 ┣ ♥ º ¼ № € ₩ № € ⊕ ?	100% 💽 🍳 🔍		States: ▲next	
A State of the second				
	• Q.	1. 🖓 🗣 🖽 🏜 🏜	state or ▼	
1 - 5cr				
State is 0 and input	Property	×	Step	Action
	&Multistate Indicator {}		[8] ➡ [9]	Move element
text will be shown		None		Move element
	Text	Ivone	Change input te	lement
	-	12	Change input to	ement
A DECEMBER OF THE OWNER OWNER OF THE OWNER	Font	Times New Roman	□ 🖨 [14]	Move element
and the second se	Text Color	(0, 0, 0)	<b>→</b> [15]	Move element
	Picture Bank Name	Delta.pib		Move element Move element
	Picture Name	P3.jpg		MOVE SIGNEIN
	Transparent Effective	No	Value unit	
	Transparent Color	(0, 0, 0)		
	Foreground Color	(180, 180, 180)		
	Data Type	Bit	Value forma	t
		Unsigned Decimal		
Select to get right	Add/Remove State	2		
Select to get right	111 J	Cha	ngo stato	
properties table.	Risk. The	Glia	ange state	
	and the not	Sa Sta		
			Record	Dutput
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?? Download:USB	[127,126] W:140 H:110	Build:Fri Apr 9 09:36:40 2	004 NI	JM

Fig. 3-6-1 Indicator properties

### **Properties:**

- 1. Read Address None
- : Setting the address to execute state

indicator as follows.

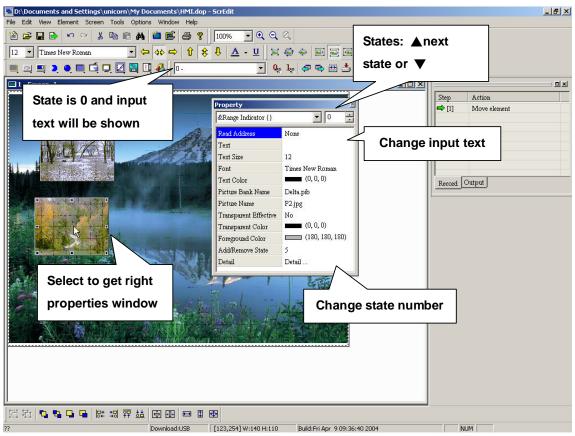
Гуре —	Link		I	.ink1		+
<ul> <li>PLC Device (Word)</li> <li>PLC Device (Bit)</li> <li>Internal Memory (Word)</li> </ul>	Devic Addr/		ie [2	ζ		¥
C Internal Memory (Bit) Constant	Tag		Γ			-
	В	C	D	E	F	-
	6	7	8	9	A	CE
C 10 C 10U C 16	1	2	3	4	5	1
PLC Station Number	0		+	14	1	•
1 🔄 🔽 Default		,		N	lone	

## Input address

2.	Text		, Text Size	12	,
	Font	Times New Roman	, Text Color	(0, 0, 0)	: sets text,
	text size, font a	and text color by t	he setting that w	vindows provide	S.
3.	Picture Bank Name rich screen wit	None h the pictures fro	, Picture Name m picture bank.	None Refer to chapter	: to be 2 for detail.
4.	Foreground Color as following fig	ure.	: user can selec	t element foregr	ound color
5.		ord , ▼, t as following figu		signed Decimal 🗾	sets value
		Word Bit Word LSB	BCD Signed Decimal Unsigned Decimal Hexadecimal		
Ex	ample:		a a contrative constraint		
(					

# 3-6-2 Range Indicators

Compares PLC corresponding contact (ON or OFF) or register with low limit of range. Then, display the corresponding state of comparison result on HMI screen.





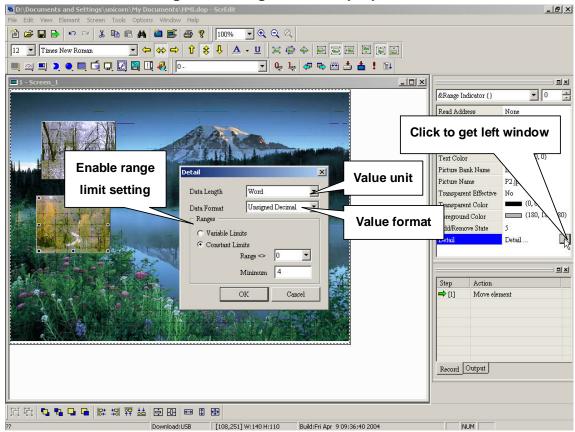


Fig. 3-6-3 Range indicator settings

## **Properties:**

1. Read Address None

: Select address to execute range indicator

as following figure.

I	nput			<u>s</u>	<u>?  × </u>
	Type C PLC Device (Word) PLC Device (Bit) C Internal Memory (Word) C Internal Memory (Bit) C Constant	Link Device Ty Addr/Value Tag	_	×	
		B C	DE	F ←	-
	C 10 C 10U C 16	67	8 9 3 4	A CE	-
	- PLC Station Number		3 4 + -		
	1 Default			lone	-
ut addres Text Font	Times New Roman	, Text Size , Text Color be setting th		∎ (0, 0, 0)	, : sets text, ides
Picture Bank I	-	, Picture Name	None	E.	: to be
Foreground Co	/190_190_190	-		-	eground color
Data Length	n Word 💌,	Data Format	Unsigned I	Decimal	: value
		wing figure.			

6. Add/Remove State 1 : State number will be different by unit setting. (Value: 256 states, LSB: 16 states, BIT: 2 states)

7 Constant Limits C Variable Limits Range <> 0 V Mini	$\frac{4}{1}$ : The low
---	-------------------------

limit of each state range settings. It can be 1: constant or 2: variety (low limit of each state range is Dn+1,2,3...(state number-1)

## Example:

Consider that state number of range indicator is 5 and the value range =4

<b>D1000</b>	D1000	<b>D1000</b>	D1000
Range (constant) 0=400	1=300	2=200	3=1000
Range (variable) Dn+1	Dn+2	Dn+3	Dn+4

# 3-7 Data Display

Numeric Display
Character Display
Date Display
Time Display
Day-of-week Display
Prestored Message
Moving Sign

Button type	lcon	Function
Numeric display		Display value of specific address
Character display		Display character of specific address
Date display		Display HMI date
Time display		Display HMI time
Day-of-week		Display HMI day-of-week
display		
Prestored message		Display message by state
Moving sign		Display message by state with moving sign

# 3-7-1 Numeric Display

To display the value of PLC corresponding register with numeric on HMI screen directly.

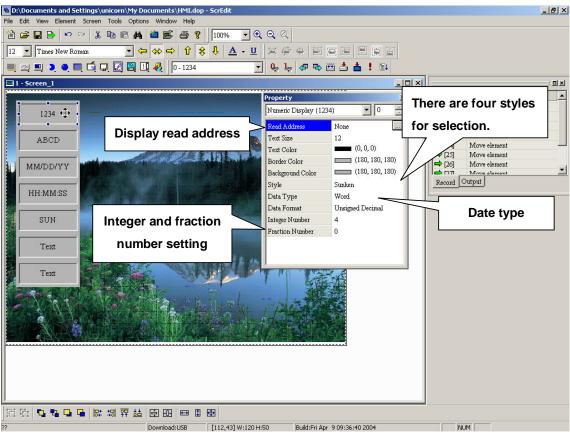


Fig. 3-7-1 Numeric display properties

## 3-7-2 Character Display

HMI reads the ASCII of PLC corresponding register and convert them to character to display on screen. (The max. length is 28 words)

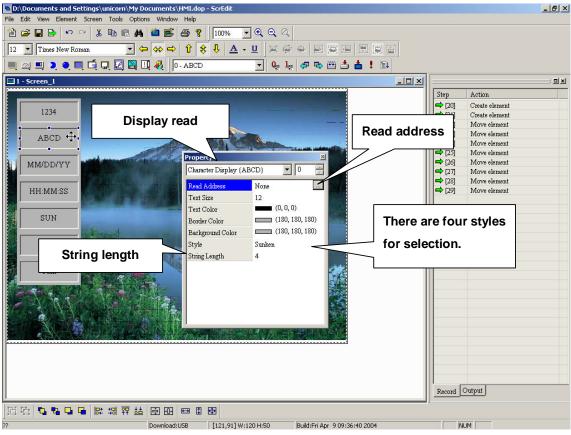


Fig. 3-7-2 Character display properties

## 3-7-3 Date Display

To display HMI system date. It provides display format for selection.

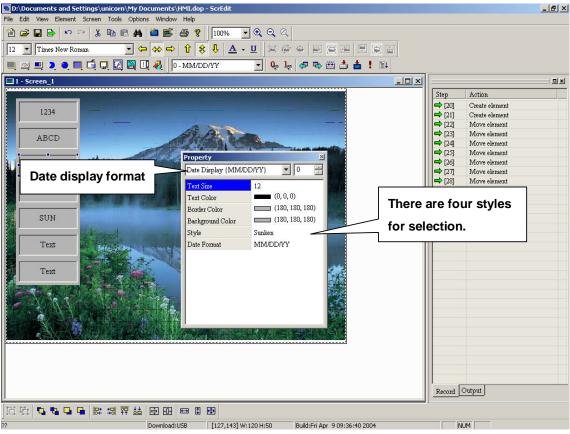


Fig. 3-7-3 Date display settings

## 3-7-4 Time Display

Displays HMI system time. It provides display formats for selection.

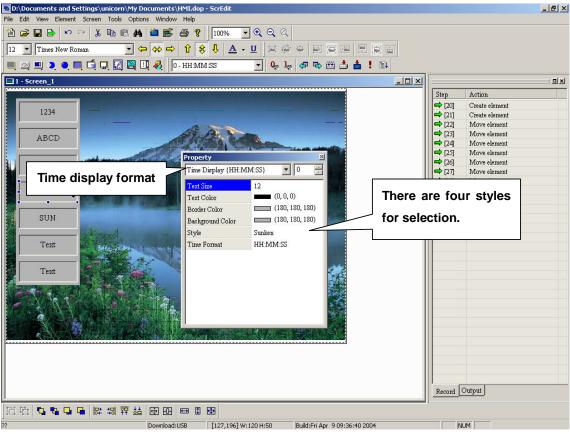


Fig. 3-7-4 Time display setting

## 3-7-5 Day-of-week Display

It provides to display HMI system date.

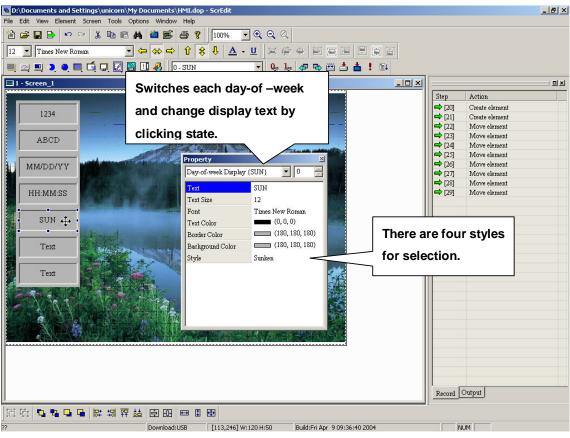


Fig. 3-7-5 Day-of-week display settings

### **3-7-6 Prestore Message**

Display the state content of PLC corresponding contact or register directly. You can set state number and text for each state.

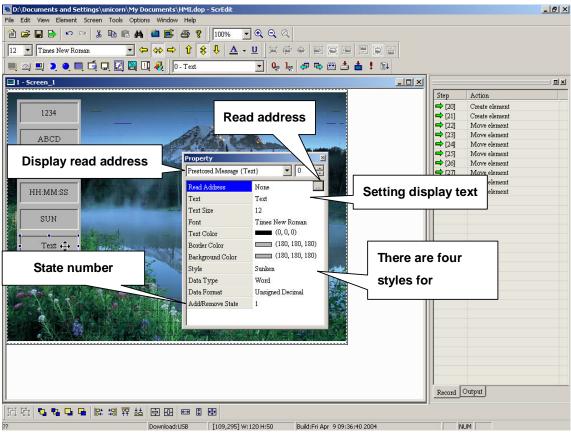


Fig. 3-7-6 Prestore message settings

## 3-7-7 Moving Sign Display

Display the state content of PLC corresponding contact or register by moving sign. You can set the movement point and interval time.

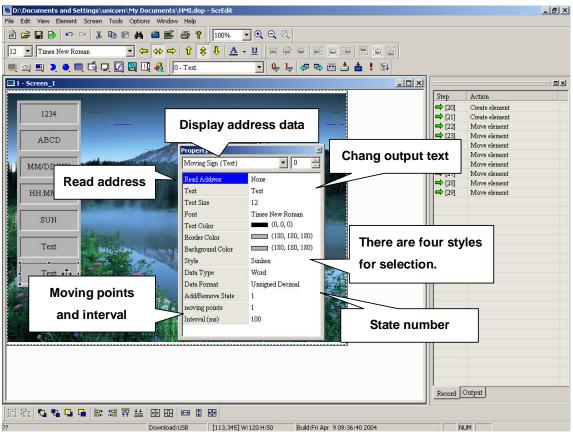


Fig. 3-7-7 Moving sign settings

# 3-8 Graph Display

<b>1</b>	State Graphic <u>A</u> nimated Graphic		
	Button type	lcon	Function
	State graphic 📑		When HMI connects to PLC, it is used to display many pictures controlled by PLC on HMI screen. PLC also control its state to display different pictures by state.
	Animated graphic	8	When HMI connects to PLC, it is used to display a picture controlled by PLC on HMI screen. PLC can also control its X and Y direction to move by yourself and display different pictures.

### 3-8-1 State Graphic

When HMI connects to PLC, it is used to display many pictures controlled by PLC on HMI screen. PLC also control its state to display different pictures by state.

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Image New Roman       Image New Roman	File Edit View Element Screen Tools Options Window	Help				
Image picture       Image picture       Image picture       Image picture         Picture Bank Mana       1078673304.3 jpg       State number       Delete element         Picture Bank Mana       1078673304.3 jpg       State number       Delete element         Picture Bank Mana       1078673304.3 jpg       State number       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1078673304.3 jpg       Transparent Effective No       Delete element         Picture Bank Mana       1080.0 Distaret Distaret No       Distaret element       Distaret element         Picture Bank Mana       500       Distaret el	🎦 😅 🖬 🕒 🗠 🐃 👗 🛍 📾 🛤 🛍 🖼	🖨 💡 🚺 100% 🔄	<b>-</b> ର୍ ର୍ ର୍			
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Read address       Image: Content image:						
Read address       Property       Image and the second image and		Read ad	dress data			
Property       Image: State Graphic (State Fixture)       Image: State Gr	Read address					
State Graphic (State Picture)       0         Change picture       \$0         Picture Bank Name       \$20 pbi         Transparant Effective       No         Transparant Effective       No         Change rate       1         Picture       No         Change rate       No         Change rate       No         Change rate       No         Change Rate(nor)       \$300         Picture       Picture         Picture       No         Change Rate(nor)       \$300         Picture       Picture         Picture       Picture         Picture       Picture         Picture       Picture         Picture       Picture         Picture       Picture         Picture	Read address	Property	X MAR			
Read Address       \$0         Picture Bank Name       \$20, pb         Picture Name       1078673004_3 jpg         Transparent Effective       No         Transparent Color	LI MILL COMPANY	State Graphic (State Pi	icture} 🔻 🛛 🚽			
Picture Bank Name       520. pb       State number       Cheate element         Picture Name       1078673804_3.jpg       No       Change rate         Transparent Effective       No       Change rate         Data Format       Unsigned Decimal       AddRemove State       1         Auto Change       No       Change rate       Image decimal         Change Rate(me)       500       Image decimal       Image decimal         Recoid Output       Image decimal       Image decimal       Image decimal         Recoid Output       Image decimal       Image decimal       Image decimal         Recoid Output       Image decimal       Image decimal       Image decimal         Image decimal       Image decimal       Image decimal       Image decimal         AddRemove State       1       Image decimal       Image decimal         Image decimal       Image decimal       Image decimal			,			Create element
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Tansparent Effective       No         Transparent Color	Change nieture					Delete element
Transparent Color (0,0,0)   Data Length Word   Data Format Unsigned Docimal   Add/Renvove State i   Auto Change No   Change Rate(ms) 500	Change picture		2000/00/00/00/00/00/00/00/00/00/00/00/00			·
Data Length Data Length Data Format AddRemove State AddRemove State Rr:\$0 Change Rate(ms) 500 Change Rate(ms) 500			- C.P. and a second sec			
Date Format Uusigned Decimal AddRemove State 1 Auto Change No Change Rate(ne) 500 Change Rate(ne) 500 Record Cutput			(0, 0, 0)	1		
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	?? Download:U	JSB [214,395] W	/:640 H:480 Build:Fri Apr 9 09	9:36:40 2004	N	IUM

Fig. 3-8-1 State graphic

#### **Properties:**

1. Read Address None : Select address for executing state graphic. ? × Input Type -Link1 -Link C PLC Device (Word) • PLC Device (Bit) X • Device Type C Internal Memory (Word) Addr/Value C Internal Memory (Bit) -Tag C Constant в C Ε D F ← 6 7 8 9 A CE C 10 C 10U C 16 1 2 3 5 4 + PLC Station Number 0 + I --✓ Default 0 1 None

### Input address

2.	Picture Bank Name	None	, Picture Name	None	: to be
	rich screen wi	th the pictures f	from picture bar	nk. Refer to cha	apter 2 for detail.
3.	Data Length 🛛 🛛	Vord	🕶 , Data Format	Unsigned Decimal	: setting
	value unit and	format as follo	wing figure.		
		Word Bit	BCD BCD		
		Word LSB	Signed Deci Unsigned D Hexadecima	ecimal	
		a.			
4.	Add/Remove State		state numb : 6 states for LSB	• •	phic. There are
	1-230 States It			anu z states i	
5.	Auto Change	No	, Change Rate(ms)	) 500	:
	changes rate	of each state se	tting.		
Fx	ample:				
	•	signated read ad	ddress = D100.		
Th	e memory con	tent and each st	ate should be a	s follows.	
	10 D			$\square$ $\square$	
- 1	114CP 1114	) 🔍 🔊	() ··· ])	(C)	<b>1</b>

# 3-8-2 Animated Graphic

When HMI connects to PLC, it is used to display a picture controlled by PLC on HMI screen. PLC can also control its X and Y direction to move by yourself and display different pictures.

D:\Documents and Settings\unicorn\My Do				_ 8 ×
File Edit View Element Screen Tools Option				
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	Read address	Step	Action	
	Reau aduless	➡ [24]	Move element	
		⇒ [25]	Move element	
	Property 🛛	➡ [26]	Move element	
		➡ [27]	Move element	
Read address	&Animated Graphic {}	🛋 [28]	Move element	
Read address	Read Address None	🔿 [29]	Move element	
	Picture Bank Name None	🗢 [30]	Delete element	
		<b>a</b> [31]	Create element	
	Picture Name None	➡ [32]	Create element	
	Transparent Effective No	<b>a</b> [33]	Delete element	
	Transparent Color (0, 0, 0)			
	Clear Picture Yes			
	Data Length Word			
	Data Format Unsigned Decimal			
A State State - 1	Add/Remove State 1 State numbe	-		
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77	Download:USB [91,273] W:120 H:120 Build:Fri Apr 9 09:36:40 2004	0	JUM	

Fig. 3-8-2 Animate graphic settings

#### **Properties:**

- 1. Write Address None
- : the address to execute animate graphic as

following figure.

Туре —	Link		F	.ink1		
🔿 PLC Device (Word)			1			
• PLC Device (Bit)	Devic	е Тур	e Z	<		•
🔿 Internal Ivlemory (Word)	Addr/		Ē			_
🔿 Internal Memory (Bit)	Tor		Ē			-
🔿 Constant	Tag		1			194
	В	C	D	E	F	+
	6	7	8	9	А	CE
C 10 C 10U C 16	1	2	3	4	5	1
PLC Station Number	0	-	+	121	1	-
1 🕂 🔽 Default		,		N	Ione	

#### Input address

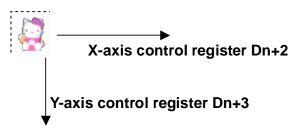
2.	Picture Bank Name	None	Picture Name	None	: to be
			,		

rich screen with the pictures from picture bank. Refer to chapter 2 for detail.

3.	Data Length	Word	▼.	Data Format	Unsigned Decimal	: sets the
	value unit an	d format.				
		Word Bit Word LSB		BCD BCD Signed De Unsigned Hexadecin	Decimal	
4.	Clear Picture	Yes	:	To clear pr	revious picture	when changing
	state.					
5.	Add/Remove State	1	:	state numl	ber of state grap	ohic. There are
	1-256 states	for unit WOR	D, 16 sta	ates for LSI	B and 2 states f	or Bit.
Ex	ample:					
Co	nsider that de	esignated add	dress =C	0100,		

each state and memory content should be as follows.

State control register Dn+1



# 3-9 Input

<b>L</b>	Numeric Entry
	Character Entry

Button type	lcon	Function
Numeric	l	To display the numeric of PLC corresponding
Entry		contact (ON or OFF) or register
Character		To display the character of PLC corresponding
Entry	╏╦┫	contact (ON or OFF) or register

It provides you to input read/write address to display/input value. Read/write address can be the same or different.

### **3-9-1Numeric Entry**

D:\Documents and Settings\unicorn\My Documents\			Ð×
File Edit View Element Screen Tools Options Window			
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1 - Screen_1			믜×
		Step Action	
		➡ [28] Move element	
		[29] Move element ement	
	Property 🗵		
	&Numeric Entry {#####}	There are three ement	
	Write Address None	ement	
	Read Address None	styles for ement	
	Text Size 12		
	Text Color (0, 0, 0)	selection as ement	
Read address	Border Color (180, 180, 180)		
	Background Color (180, 180, 180)		
	Style Raised		
	Trigger None		
****	Trigger Mode Before Writing Trig	ger type setting	
	0 Detail	ger type setting	
	User Security Level 0		
	Later Strate 1 John Strategy		
		Record Output	
[11] 12] 12 12 12 12 12 12 12 12 12 12 12 12 12			
?? Download:I	ISB [142,147] W:140 H:120 Build:Fri Apr 9 09:36:40 2	104 NUM	

Fig. 3-9-1Numeric entry properties

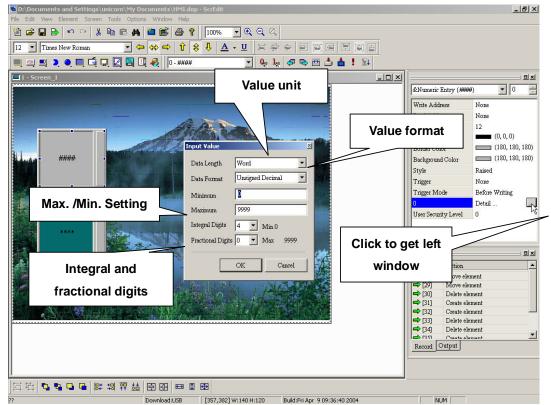


Fig. 3-9-2 Numeric entry settings

#### **Properties:**

	opernes.												
1.	Write Addr	ess	None	,	Read A	ddress	5		None				: the
	address	s used t	o execute n	umeric	entr	у.							
		Input									?	X	
		_ Туре											
		C PL	C Device (Word)			Link		Ī	.ink1		•		
		@ PL	C Device (Bit)			Desia	. т	e [2	7		Ţ		
			temal Memory (W	Tandh		Device	: ryp	е ј^ Г	•		1000		
			100			Addr/	Value						
		C In	ternal Ivlemory (B	it)		Tag		Г			-		
		C Cd	onstant		-			<u>.</u>					
						В	C	D	E	F	+		
		8 1947 19	-			6	7	8	9	A	CE		
		C 10	0 C 10U	C 16		Ĩ	2	3	4	5	SI.		
		C PLC :	Station Number —		٦	0		+	-	1	•		
				efault	3				N	one		2	
		Ľ										1	
-	out addre	ess			<b>m</b> . a				10				
2.	Text		Times New Dee	, ,	Text Si				12	. (N (	0)		,
	Font	fonte	Times New Ror	,	Text C		. 46 a					مامم	: sets text,
	lext Size	e, iont a	and text cold	or by th	ie sei	ung	j tha		maa	ws	provi	ues	
3.	Style		Standard		Foregr	ound (	olor			1 (180	), 180, 1	180)	: user can
0.		lement	style and fo	,				follo	owin	g fi	qure.		
Sta	ndard		,	•						•	-		
	ised		-										
Su	nken		_										
;	####		####	Γ	###	##							
Sta	andard	-	Raised	,	Sun	ken							
Nu	meric er	ntry sty	le										
		-											
4.	Trigger		None	,	Trigg	er Mo	de		Bef	ore Wi	iting		: User

can use this setting to trigger PLC after or before writing. Note: this function can only trigger PLC to be ON. If it needs to trigger again, you should set the address to be OFF by yourself.

5. User Security Level 0 : sets the user priority. Only the priority is higher than setting can use it.

6.	Data Length	Word ,	Data Format	Unsigned Decimal	: sets the
	value unit ar	nd format.			
7.	Minimum	0,	Maximum	9999	: Min./Max.
	value setting	<b>]</b> .			
8.	Integral Digits	4 <b>T</b> , Fractional Digits	0 🗾: integ	gral and fraction	al digitals

number setting.

Example:

After pressing button, you will get pop-up box as follows to input value to PLC corresponding register D1000.

	D201	D	202	D203
You will get following dialog box after	####	£ ##	###	####
	Numeri	c keyPa	d	$\times$
		<u>0</u>		
You can input value	Max:0		Min:0	
	1	2	3	CLR
	4	5	6	DEL
	7	8	9	Enter
	+/-	0		

### 3-9-2 Character Entry

HMI reads the ASCII of PLC corresponding register and convert them to character to display on screen. (The max. length is 28 words)

D:\Documents and Settings\unicorn\My Documents\HMI.dop - ScrEdit	
File Edit View Element Screen Tools Options Window Help	
🖆 🖨 🕒 🗠 🔏 🛍 💼 🛤 🟙 🗭 🞒 🎖 🛛 100% 💽 🗨 🔍	
12 🔽 Times New Roman 🔽 🗢 💠 🗘 😫 🖡 🛕 - 😃 🗐 🖷 🖷 🗐 🗑	
📃 🖄 🖳 克 💭 🛱 🛄 🦓 🗓 ***** 💽 🗞 😓 🕾 🖽 📩 🛔 🖢	
1 - Screen_1	
	Step Action
	➡ [28] Move element
	➡ [29] Move element
Property	[30] Delete element
&Character Entry {****}	➡ [31] Create element
	➡ [32] Create element
Write Address None	
##### Read Address None	te element
Text Size 12 There are th	ree te element
Text Color (0, 0, 0)	re element
Border Color (180, 180) styles for se	election.
Background Color (0, 108, 108)	
Style Raised	
Characters Length 4	
Trigger None	
Trigger Mode Before Writing Character leng	ath
User Security Level 0	gui
	Record Output
??         Download:USB         [117,304] W:140 H:120         Build:Fri Apr. 9 09:36:40 2004	NUM

Fig. 3-9-3 Character entry properties

### **Properties:**

1. Write Address None , Read Address None : the address for character entry.

<b>PLC</b> Device (Word)	Link		Ī	.ink1		•
PLC Device (Bit)	Device Type		e [2	e X		
Internal Memory (Word)	Addr/	Value	Γ			
🖱 Internal Memory (Bit)			Г			~
Constant					<u>114</u>	
	В	C	D	E	F	+
	6	7	8	9	А	CE
C 10 C 10U C 16	1	2	3	4	5	1
PLC Station Number	0		+	14	1	•
1 🔄 🔽 Default				N	lone	-

### Input address

2.	Text		, Text Size	12	,
	Font	Times New Roman	Text Color	(0, 0, 0)	: sets text,
	text size, font a	and text color by	the setting that v	windows provide:	s.
2	Style	Standard	Foreground Color	(180, 180, 180)	
3.			ound color as fol	and the second s	: user can
		, ,		0.0	
		Stan	dard		
		Rais			
		Sunk	en		
	****	*****	****	* ** ** ** **	
	Standa	rd	Raised	Sunke	n
Cł	naracter Entry st	tyle			
4.	User Security Level	0	: sets the user	priority. Only the	priority is

higher than setting can use it.

Example:

After pressing button, you will get ASCII-KEY on HMI screen. You can input ASCII code of character. (D1000~Dn, n: character length)

ASCII-I	KEY	chara buttor	oressing cter entry n, you will get ring dialog box.			
A	В	С	D	E	ALT	
F	G	н	I	J	CLR	
к	L	м	N	0	DEL	
Р	Q	R	S	т	Entra	
U	V	w	x	Y	Enter	

ASCII-KEY dialog box

# 3-10 Curve

		Image: Trend Graph       Image: X-Y Chart				
Curve type	lcon	Function				
Trend graph		To display the value change of setting address by trend graph. The trend graph can only display the change of Y-axis.				
X-Y Chart	N	To display the value change of setting address by trend graph. The trend graph can display the change of X-axis and Y-axis.				

1

1 ......

The first step for setting curve is setting the curve number in "curve field total" (range is 1-4). Then, setting read address, curve width, color and value style to finish setting.

## 3-10-1 Trend Graph

HMI will convert a series value of PLC corresponding register to trend graph on screen. For example, consider that there are 100 sampling points and four curves. There will be 100 X 4 = 400 points. Take Delta PLC for example, consider that read address is D0, it will read 400 word (D0~D399) after triggering. Setting Y-axis of curve 1 is D0~D99, Y-axis of curve 2 is D100~D199, Y-axis of curve 3 is D200~D299 and Y-axis of curve 4 is D300~D399. If there is value that exceeds maximum value, it will be displayed with maximum value. If there is value that less than minimum value, it will be displayed with minimum value. After setting, you should set control address to trigger read data of trend graph, trend graph drawing and clear curve. Refer to chapter 5 for control setting.

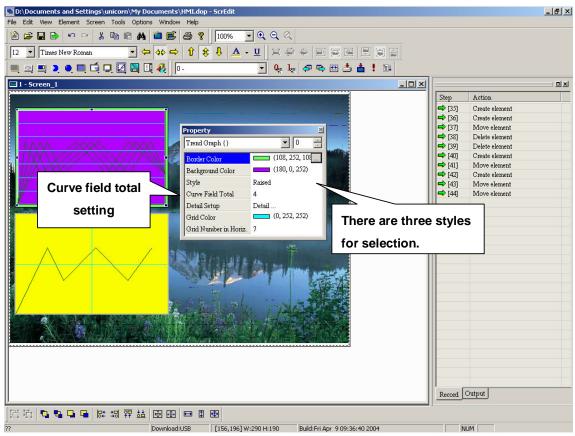


Fig. 3-10-1 Trend graph properties

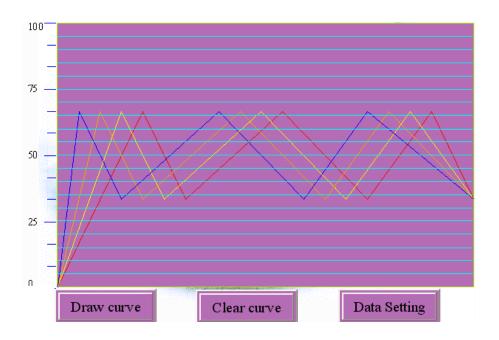
D:\Documents and Settings\unicorn\My Documents\HMLdop - Sci	Edit		_ 8 ×
File Edit View Element Screen Tools Options Window Help			
12 😂 🖬 🕒 🗠 🐇 🛤 📾 👭 🕍 🎒 🕄 💷	<u>10% - Q</u> Q Q		
12 $\checkmark$ Times New Roman $\checkmark$ $\Leftrightarrow$ $\diamond \diamond$ $\uparrow$ $\diamondsuit$ $\diamondsuit$	A • U   = = = = = = = = = =		
💻 🛯 🔍 🔍 💭 🖆 💭 🛃 🛄 🥀 🛛 🚥	- 4, 1, 4 🕫 🖏 📩 📥 !	24	
□ 1 - Screen_1		Click to get lef	t
r		Olick to get lei	• 0 <del>~</del>
· · · · · · · · · · · · · · · · · · ·	Curve Detail	dialog box	(108, 252, 108)
	Data		(180, 0, 252)
A	Sample Number 10	Style	Raise
	Read Format Unsigned Decimal 🔻	Curve Field	
	Read Address None	Detail Setup	
	Read Address	Grid Color	(0, 252, 252)
	Sample Flag 1	Grid Numbe	r in Horiz. 7
· · · · · · · · · · · · · · · · · · ·	Curve1 Curve2 Curve3 Curve4		
	Minimum 0		
	Maximum 100		
	Curve Width		
	Curve Color		
			Action Create element
	OK Cancel		Create element
			Move element
		<b>⇒</b> [38]	Delete element
	and the second second second second		Delete element
			Create element Move element
			Create alamant
		Record O	itput
	1 <sup></sup>		
	H3.61] W:290 H:190 Build:Fri Apr. 9 09:36:40 200	4 NU	1

Fig. 3-10-2 Trend graph setting

#### Trend graph properties:

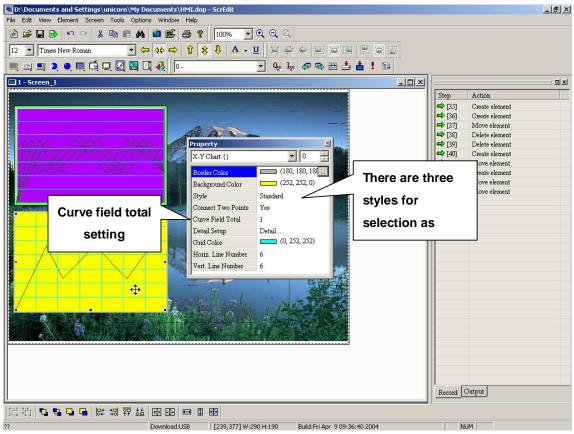
	- <b>5</b> - P - P		1. 575571755	1000 and 100	
1.	Border Color	(108, 252, 108)	Style	Standard ,	
	Foreground Color	(180, 180, 180)	: user can sele	ct element border co	olor, style
	and foreground	d color as followi			
		Stand	dard		
		Raise	ed		
		Sunk	en		
				4	
	$X \times X$	$\times \land$		$M \times / /$	
	1				
		<u> </u>		ý.	
	Standa	rd	Raised	Sunken	
Tre	end graph style				
2.	Sample Number	10	· Sets the reading	ng sample number f	for trigger.
					or anggon
	After reading to	o get trend graph	, it will stop sam	ipling.	
3.	Data Format Ur	nsigned Decimal 📃 🗾	Selects value u	nit by PLC.	
				•	
4.	Read Address	None	: reads address	cotting	
4.			. leaus audiess	s setting.	
		-			
5.	Sample Flag	1	: Sets trigger ar	nd clear flag. When	sample
	flag is triggered	d, it will start to re	ead data and dra	aw curve.	
6.	Curvel Curve2 Cu	arve3 Curve4 : Sets o	curve detail setti	ings (number is fror	n 1 to 4)
-	Minimum 0		Maximum 99	999 - NA	/N/!
7.	Winmum 10	,		: 101	ax./Min.
	setting of Y-axi	s. If Max./Min. is	higher/lower tha	in the settings, it wi	ll use the
	setting to displ	ay.			
8.	Curve Width	1	Curve Color		setting
0.			,		Journa
	curve width (1-	8) and curve colo	or.		

Example:



#### 3-10-2 X-Y Chart

HMI will convert a series value of PLC corresponding register to X-Y chart on screen. For example, consider that there are 100 sampling points and four curves. There will be 100 X 4 X 2= 800 points. Take Delta PLC for example, consider that X-axis address is D0 and Y-axis address is D500, it will read 800 words (D0~D399 and D500~D899) after triggering. Setting X-axis of curve 1 is D0~D99, Y-axis of curve 1 is D500~D599, X-axis of curve 2 is D100~D199 and Y-axis of curve 2 is D600~D699, X-axis of curve 3 is D200~D299 and Y-axis of curve 3 is D700~D799, X-axis of curve 4 is D300~D399 and Y-axis of curve 4 is D800~D899. If there is value that exceeds maximum value, it will be displayed with maximum value. If there is value that less than minimum value, it will be displayed with minimum value. After setting, you should set control address to trigger read data of curve graph, X-Y chart drawing and clear curve. Refer to chapter 5 for control setting.





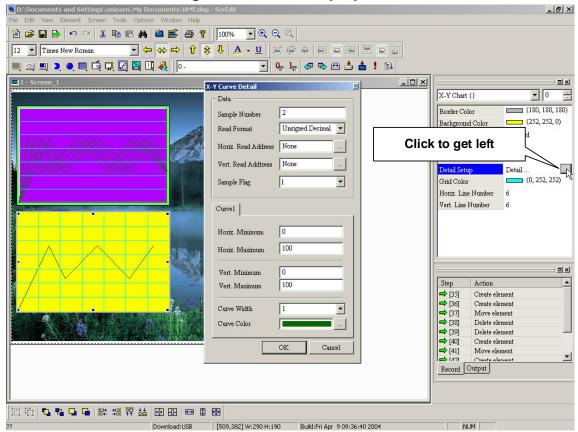


Fig. 3-10-4 X-Y Chart settings

-**4** i 

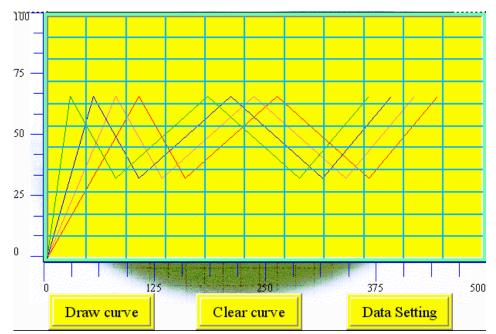
Pre	operties:								
1.	Border Color	(108, 25)	2, 108)	Style		Standard		,	
	Foreground Color	(180, 180	0, 180)	user can	select	t element	border	color,	style
	and foreground	color as fo	llowin	g figure.					-
			Standa						
			Raised						
			Sunker	1					
				×.	$\times$		~	$\rtimes$	
	Standa	rd		Raised		:	Sunken	l	
X-`	Y Chart style								
2.	Sample Flag	1	-	Sets trig	ner and	l clear fla	a Whe	n sam	nle
	flag is triggoros	l it will stor					gi mio	li ouiii	
	flag is triggered	i, it will Star	t to rea	au uata ar	iu urav	v curve.			
3.	Data Format Un	signed Decimal	<u> </u>	Selects va	llue un	it by PLC	-		
4.	Horiz. Read Address	None		Vert. Read A	Addtress	None		: sets	the
			,					. 3013	the
	read address.								
5.	Sample Flag	1		Sets trig	ger and	d clear fla	ig. Whe	n sam	ple
	flag is triggered	l, it will star	t to rea	ad data ar	nd drav	v curve.			
6.	Curvel Curve2 Cur	we3 Curve4	Sets cı	urve detai	l settin	igs (numt	oer is fr	om 1 t	o 4)
7.	Horiz. Minimum	0		Horiz. Maxim	um [1	100			
			,				,		
	Vert. Minimum	0	,	Vert. Maxim	um	100		Max./I	Min.
	setting of X-axis	s/Y-axis. If I	Max./M	in. is hiał	ner/low	er than th	ne settii	nas. it	will

gs, y use the setting to display.

8.	Curve Width	1	•	Curve Color	setting
-			,		J

curve width (1-8) and curve color.

#### Example:



# 3-11 Sampling



Displays history data by table or graph for user to read easily. Therefore, the properties setting can be set when there is history buffer setting. After setting, you need to set control address to trigger to read history data and draw graph. Refer to chapter 5 for control setting.

Nu	Read Address	Data Type	Sample Cycle	Sample Number	Trigger Source	Record Dat	Append
1	1@D0	1	100	10	Timer	No	Delete
							Modify
							ОК
•				6			Cancel

Fig. 3-11-1Hisotry setup

Buffer Properties		×
Read Address Data Length (Word) Cycle (ms) Sample Number	None 1 100 10	Trigger © Timer © PLC
<ul><li>☐ Stamp Time and</li><li>☐ Auto Stop</li><li>☐ Non-Volatile</li></ul>	OK Cancel	

Fig. 3-11-2 Buffer properties

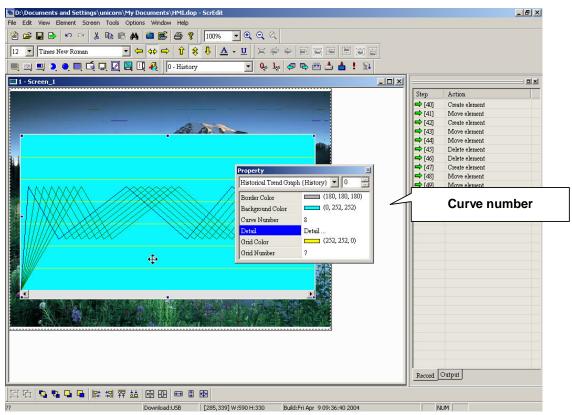
- a. Read address: sets PLC corresponding address for reading by buffer #1 to #12. For example, D1000 is the start address.
- b. Size (word) and total: value unit and sample times. When you set 8 for Size (word), it means that 8 words = D1000, D1001, D1002, D1003,...., D1007. Total is the max. sample

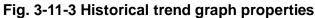
times.

- c. Stamp time and data: to record time and data when sampling.
- d. Auto stop: to stop sampling when sample times exceeds total or not. For example, if total is 5000 now and you set not to auto stop. If it is 5001 times, the 5001 data will be saved in the first data. The first data will be overwritten.
- e. Trigger: to select trigger by HMI or PLC. When you set to trigger by PLC, refer to chapter 5 for setting.
- f. Cycle: it is the sample cycle for triggering and the unit for cycle is second.
- g. Non-volatile: sets to save data in history buffer after power is off.

### **3-11-1 Historical Trend Graph**

Converts history data to trend graph to display on HMI screen with series curves.





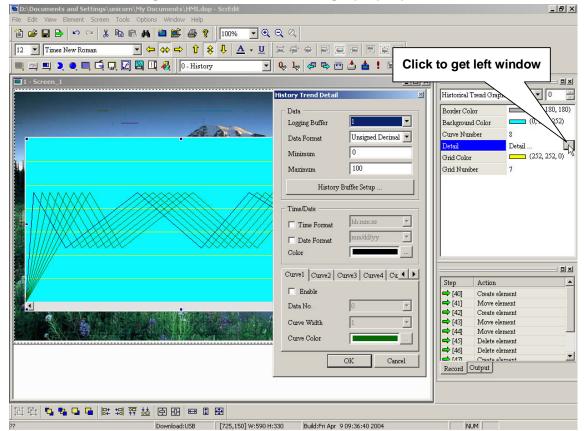
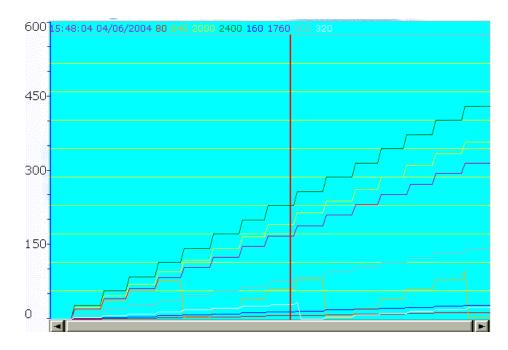


Fig. 3-11-4 Historical trend graph settings

**Properties:** 

1.	Border Color	(108, 252, 108)	, Foreground Color	(180, 180, 180)	: sets
	border color an	d foreground col	or.		
2.	Logging Buffer	1 .	sets PLC cor	responding address	s for
	reading by buff	er #1 to #12. Use	r can enter to	set by clicking butt	on
	History Buf	Fer Setup	or from menu	bar Options > Histo	ory setup.
3.	Data Format Uns	signed Decimal 📃	Selects value	unit by PLC.	
				-	
4.	Minimum 0		Maximum	99999	Max./Min.
	sotting of X-2vi	, «/V-avie If Max /	lin is higher	lower than the setti	
	use the setting		ini. is ingriei/	iower than the setti	ngs, it will
	Ū				
5.	🗖 Time Format	hh:mm:ss 🔄	🗖 Date Format	mm/dd/yy	
	Color		oto timo/data	format when displa	wina
			sets time/uate		iyiiig
	simultaneously.				
6.	Curvel Curve2 Cur	we3 Curve4 : Sets c	urve detail se	ettings (number is fr	om 1 to 4)
7.	Data No.	0 .	Sets the read	ling sample number	for trigger.
	After reading to	get trend graph,	, it will stop sa	ampling.	
8.	Curve Width	1	Curve Color		: sets
	curve width (1 t	o 8) and color.			
Ex	ample:				
	-				



## 3-11-2 Historical Data Table

Converts history data to data table to display on HMI screen. The buffer number will correspond to data no.

CAWINDOWSDesktopMadı File Edit <u>V</u> iew Element	<u>Screen Tools Options Window H</u> elp		<u>_ 문 ×</u>
12 💽 Times New Roma	m	■ e e e e e e e e e e e e e e e e e e e	Click to get left
💻 🚬 🖳 🎝 🧶 🜉	i 🗔 🔀 🗮 🛄 👯 🛛 0 - ####		
	Select buffer	Logging Buffer	Historical Data Table {#####}
		History Buffer Setup	Background Color (0, 252, 2) Data Field Number 1 Detail Detail
		Time/Date	
		Color Datai	
		Data Length	
		Data Format  Data No. Display Color	Output Focus
		Int. Digits Min Value Frac. Digits Max Value	
<u>(</u>		C Leading Zero	
i ti 🖕 🗣 🗣 🗣	· 타 섬 휴 휴 등 판 등 표 표		Record Output
ad y	Download:USB [992,63	6] W:640 H:480 Build:Mon Jun 7 14:50:28 2004	NUM

Fig. 3-11-5 Historical data table properties

### **Properties:**

 1.
 Border Color
 (108, 252, 108)
 Foreground Color
 (180, 180, 180)
 : sets

border color and foreground color.

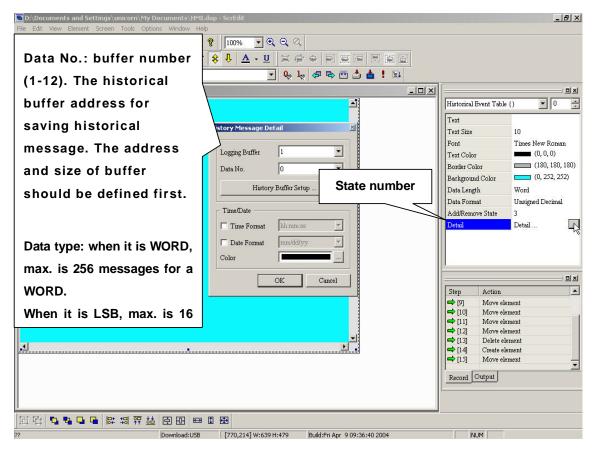
2.	Logging Buffer 1 : sets PLC corresponding address for								
	reading by buffer #1 to #12. User can enter to set by clicking button								
	History Buffer Setup or from menu bar Options > History setup.								
3.	Data Format Unsigned Decimal Selects value unit by PLC.								
4.	Minimum 0 Maximum 9999 : Max./Min.								
	setting of X-axis/Y-axis. If Max./Min. is higher/lower than the settings, it will use the setting to display.								
5.	Time Format hh:mm:ss , Date Format mm/dd/yy								
	Color sets time/date format when displaying								
	simultaneously.								
6.	Curve1 Curve2 Curve3 Curve4 : Sets curve detail settings (number is from 1 to 4)								
7.	Data No. 0 Sets the reading sample number for trigger.								
	After reading to get trend graph, it will stop sampling.								
8.	Integral Digits 4 , Fractional Digits 0 : sets integral digits and fractional								
	number.								

Example:

			200000000000000000000000000000000000000		And the second		A CONTRACTOR OF			
15:59:43 04/06/2004	100	100	100	100	100	100	100	100		
15:59:43 04/06/2004	100	100	100	100	100	100	100	100		
15:59:43 04/06/2004	100	100	100	100	100	100	100	100		
15:59:43 04/06/2004	100	100	100	100	100	100	100	100		
15:59:44 04/06/2004	100	100	100	100	100	100	100	100		
15:59:44 04/06/2004	100	100	100	100	100	100	100	100		
15:59:44 04/06/2004	100	100	100	100	100	100	100	100		
15:59:44 04/06/2004	110	110	110	110	110	110	110	110		
15:59:44 04/06/2004	110	110	110	110	110	110	110	110		
15:59:44 04/06/2004	110	110	110	110	110	110	110	110		
15:59:45 04/06/2004	110	110	110	110	110	110	110	110		
15:59:45 04/06/2004	110	110	110	110	110	110	110	110		
15:59:45 04/06/2004	110	110	110	110	110	110	110	110		
15:59:45 04/06/2004	110	110	110	110	110	110	110	110		
15:59:45 04/06/2004	120	120	120	120	120	120	120	120		
15:59:45 04/06/2004	120	120	120	120	120	120	120	120		
15:59:45 04/06/2004	120	120	120	120	120	120	120	120		
15:59:45 04/06/2004	120	120	120	120	120	120	120	120		
15:59:46 04/06/2004	120	120	120	120	120	120	120	120		
15:59:46 04/06/2004	120	120	120	120	120	120	120	120		
<b>▲</b>										

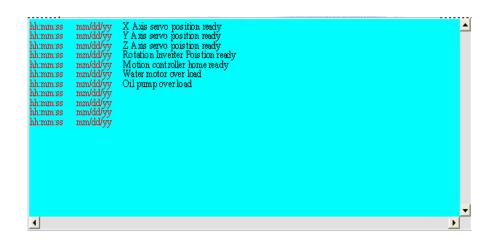
#### **3-11-3 Historical Event Table**

Converts data of PLC corresponding register to character to display on screen with event table. You can set display message, color and HMI will display message on screen after reading data.



## Fig. 3-11-6 Historical event table properties

Pro	perties	:							
1.	Text			,	Text Size	12		,	
	Font		Times New Roman		Text Color	-	∎ (0, 0, 0)	: sets text,	
	text size	e, font a	nd text color by	y th	ne settings that	t winc	dows provid	es.	
2.	Border Cole	or	(108, 252, 108	3)	Foreground Color		<b>⊒</b> (180, 180, 180)	: sets	
	border	color an	d foreground c	olo	or.				
3.	Data Fon	mat Uns	rigned Decimal 💦 👱	- , A	Add/Remove State	3	:	sets state	
	number	of histo	rical event. Th	ere	e are 1-256 stat	es foi	r unit WORD	), 16 states	
	for LSB	and 2 s	tates for Bit.						
4.	Data No.		0	· .	Sets the readin	ig sar	nple numbe	r for trigger.	
	After re	ading to			it will stop sam				
5.	Logging B	uffer	1	] <u>:</u>	sets PLC corre	spon	ding addres	s for	
	reading by buffer #1 to #12. User can enter to set by clicking button								
		History Buf	fer Setup	۱.	r from menu ba	ar On	tions > Hist	orv setun	
				- 0				ory octup.	
6.	Time Time	Format	hh.mm.ss 💽	],	🗖 Date Format	mm/dd	/yy 💌		
	Color			: s	ets time/date fo	ormat	when displ	aying	
	simulta	neously.							
Exa	ample:								
D1	000=0		o position ready						
D1	000=1		vo position readý						
	000=2		vo poistion ready						
	000=3		/enter Poistion ready						
	000=4		ntroller home ready						
	000=5		or over load						
D1	000=6	Oilpump	overload						



# 3-12 Alarm



Alarm type	lcon	Function
Alarm history table		HMI will read relative bit data of designated PLC register in fixed time and convert the corresponding contact to alarm message to display on screen. It will record all alarm messages to be alarm history table.
Active alarm list		HMI only displays the current alarm setting of corresponding PLC data (unit is bit) on screen.
Alarm frequency table	!	HMI accumulates and displays alarm messages times on screen.

Before setting alarm, you should set the PLC corresponding address, total numbers of alarm record and records' size first.

### 3-12-1 Alarm History Table

HMI will read relative bit data of designated PLC register in fixed time and convert the corresponding contact to alarm message to display on screen. It will record all alarm messages to be alarm history table.

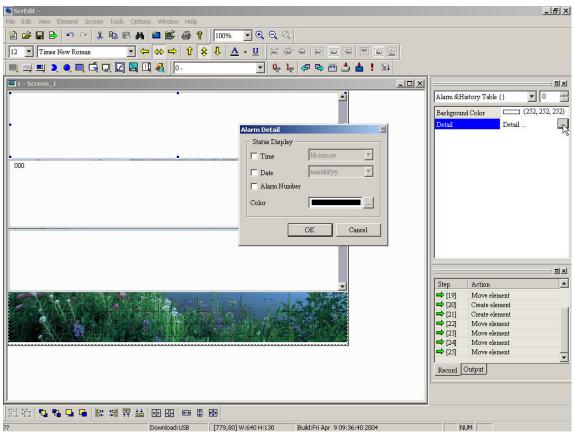


Fig. 3-12-1 Alarm History Table

HMI only displays the current alarm setting of corresponding contact of PLC bit data on screen.

<sup>3-12-2</sup> Active Alarm List

ScrEdit -		_ & ×
File Edit View Element Screen Tools Options Window Help		
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1 - Screen_1		
	<u> </u>	&Active Alarm List {}
		Background Color (168, 252, 0) Detail Detail
Alarm D		
hh:mm:ss_mm/dd/vv_000	s Display	
Ti Ti		
	ate mm/dd/yy 💌	
	arm Number	
Color		
	OK Cancel	
		<u> </u>
	<b>T</b>	Step Action
		➡ [19] Move element
		➡ [20] Create element     ➡ [21] Create element
		⇒ [21] Create element
		➡ [23] Move element
		➡         [24]         Move element           ➡         [25]         Move element
		Record Output
		1
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7? Download:USB [782,173]	W:640 H:130 Build:Fri Apr 9 09:36:40 2004	

Fig. 3-12-2 Active alarm list

# 3-12-3 Alarm Frequency Table

HMI accumulates and displays alarm messages times on screen.

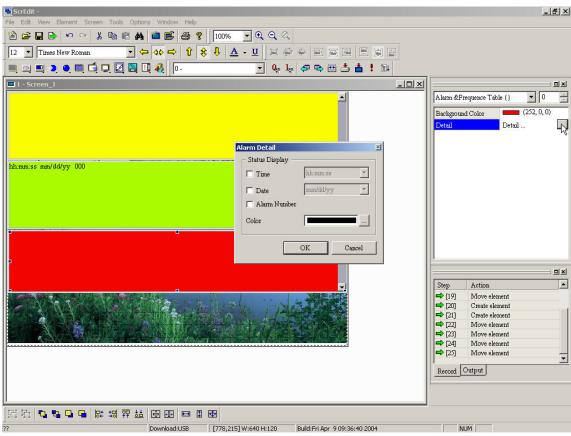


Fig. 3-12-3 Alarm frequency table

# 3-13 Graphics

Maybe you need some graphics that are not provided; you can create your graph by combining from following basic graphics.

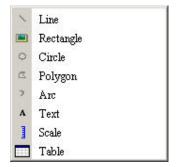
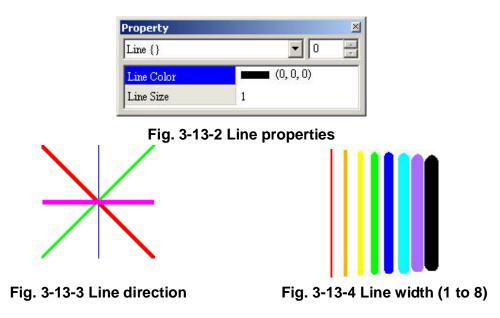


Fig. 3-13-1 Graphics options

### 3-13-1 Line

Right-click and hold on to drag to the length you need and release to get the line. When selecting this line, you will get a rectangle range for you to move and adjust. You can set Line color and size in property table.



### 3-13-2 Rectangle

Right-click and hold on to drag the size you need and release to get the rectangle to import picture from picture bank. You can set its border size and foreground color.

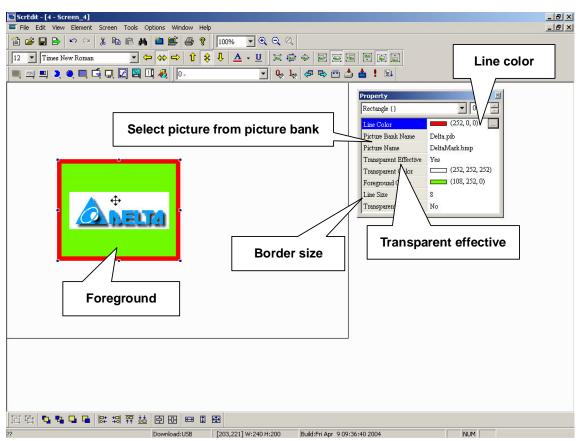


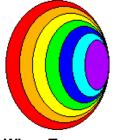
Fig. 3-13-5 Rectangle properties

## 3-13-3 Circle

Property		
Circle {}	0	
Line Color	(0, 0, 0)	
Foreground Color	(252, 252, 252)	
Line Size	1	
Transparent	No	

#### Fig. 3-13-6 Circle properties

Uses rectangle size to form a circle. If length = width, that will be a circle. Otherwise, that will be an ellipse. You can set color. The part that is out of circle and in the rectangle will be transparent.



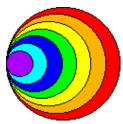


Fig. 3-13-7 When Transparent is "No"

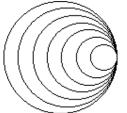


Fig. 3-13-8 When Transparent is "No"

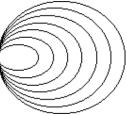
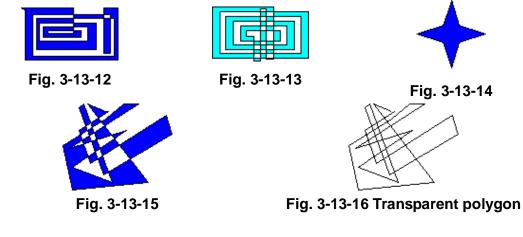


Fig. 3-13-9 When Transparent is "Yes" Fig. 3-13-10 When Transparent is "Yes" 3-13-4 Polygon

Left-click to set each point of polygon. After setting all points, you can right-click to get a polygon. You can set its size and change shape. The part that is out of polygon and in the rectangle will be transparent. Polygon also can be transparent by set "Yes" to transparent in polygon properties. Once there is something under polygon, it will be displayed due to transparent polygon.

Property	×
Polygon {}	• 0 =
Line Color	(0, 0, 0)
Foreground Color	(252, 252, 252)
Line Size	1
Transparent	No

Fig. 3-13-11Polygon properties

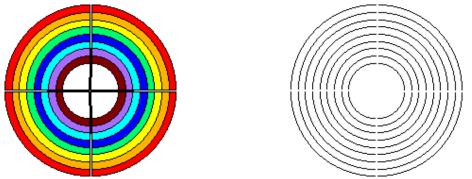


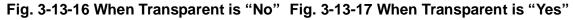
#### 3-13-5 Arc

Right-click and hold on to drag to the size you need and release to get the arc. If transparent is "Yes" in property table, it will be arc or it will be a sector. The part that is out of arc and in the rectangle will be transparent. You can also change rectangle to change sector shape and arc size.

Arc {}	• 0
Line Color	(0, 0, 0)
Foreground Color	(252, 252, 252)
Line Size	1
Transparent	No







### 3-13-6 Text

To plan a rectangle to input the text you need. You can fill rectangle with foreground color. (transparent should be "No")

Property		
Text (Numeric Display	r} 🔽 🛛	
Text	Numeric Display	Input text
Text Size	14	
Font	Times New Roman	
Text Color	(0, 0, 0)	
Foreground Color	(252, 252, 252)	
Transparent	Yes	

Fig. 3-13-18 Text property

## 3-13-7 Scale

To get a scale by setting scale direction, main scale number, subscale number, display scale or not, color, etc.

Property	×
Scale {Text}	• 0 =
Text Size	12
Line Color	(0, 0, 0)
Style	Standard
Display Mark	Yes
Main Scale	5
Detail Setup	Detail
Grid Color	(0, 0, 252)
SubScale Number	1

Fig. 3-13-19 Scale properties

🖥 ScrEdit - [4 - Screen_4]		_ 8 ×		
File Edit View Element Screen Tools Options Window Help				
🎦 😅 🖬 🕒 👓 💈 🗈 🛍 🚜 🛍 🎬 🎒 🦹 100% 💽 Q. Q. 🤇	2			
12 Times New Roman $\checkmark$ $\Leftrightarrow$ $\phi \phi \Rightarrow$ $\hat{\Upsilon}$ $\Leftrightarrow$ $\hat{\Psi} \Delta - \underline{U}$				
🔲 💷 🔍 🔍 🧰 🖆 🛄 🛃 🛄 🤣 🛛 - Text 💽 🗞	1. (P P) 🖽 📥 🖠 💷			
	400 200			
	Property     ⊠       180     Scale (Text)     ▼			
	Text Size 12			
	160-160 12 Line Color (0, 0, 0)			
	300 Style Rotation 270			
Value format	140 Display Mark Yes			
	Alue unit Detail Scale 11 Detail Scale Detail			
Data Length Word	Grid Color (252, 108, 252)			
Max. value Data Format Unsigned Decimal	200 100 SubScale Number 1			
Minimum 0				
160 80	Min. Click to get left			
Integral Digits 4 V Min 0				
NFractional Digits 0 ▼ Max 9999	window			
80 40	40 -			
OK Cancel				
	20			
Integral/fractional				
digits number				
7? [Download:USB [648,191] W:410 H:30	Build:Fri Apr 9 09:36:40 2004 NUM			
Eim 2 42 00 G	a a la prepartica			

Fig. 3-13-20 Scale properties

## 3-13-8 Table

You can change cells size, appearance and cells color. You can use table with other element to get completely table.

CAWINDOWSADESKTOPMENU DOP-SwiEdit					
				k 🖆 🥔 🖱 📥	
□ - Screen_1					
				· · · · · · · · · · · · · · · · · · ·	Table ()
					Background Color (252, 252, 252)
	1	2	3	4	Detail Setup Detail
					Border Color (0, 0, 0)
					Grid Color (0, 0, 0)
					Number of Rows 5
A					Number of Columns 5
					Settings 🛛
					Header
В					Row Header Color
				Ī	Col Header Color
					Rows Color
C					
					Columns Color
					🔽 Row Header 🗖 Columns Header
					Cell Setting
D					
					Sep. Rows Evenly Sep. Col Evenly
-					
					Enter
- [] [] [] <b>다 다 다</b>	j · · · · · · · · · · · · · · · · · · ·				
Ready			740,248] W:640 H:480	Build:Fri Jul 16 10:52:04	2004 CAP NUM

Fig. 3-13-21 Table example

Row header: Sets color for row header

Column header: Sets color for column header

Row interlacing: Sets color for row interlacing

Column interlacing: Sets color for column interlacing

Row header interlacing: Sets color for row header interlacing

Column header interlacing: Sets color for column header interlacing

Sep. row evently: Make multiple rows the same size.

Sep. column evently: Make multiple columns the same size.

## **Chapter 4 Macro**

It is convenient for HMI users to operate with Macro. After editing Macro, user can test the Macro correction by on-line simulation or off-line simulation before downloading to HMI. The lines number for each macro is 512 lines and 128 words (max.) for writing comments or strings in a line. The sub-macro number is 512 sub-macros (number is 1-512). See figure 4-1 and figure 4-2.

1	thermograph	•	
2	material 1		
3	material 2		
4	div		
5	mod		
6	or		
7	and		
8	xor		
9	shl		
10	sh r		
11	bmov		
12	swap		
13	xchg		
1.4	may OK Car	rce1	
	OK	ncel	
1.4 ub-Mac 500	OK Ca	ncel X	
ub-Mac	OK Car ro Sub-macro (500)	ncel	
ub-Mac 500	OK Ca	ncel	
ub-Mac 500 501	OK         Cat           cro         Sub-macro (500)           Sub-macro (501)         Sub-macro (502)	ncel X	
ub-Mac 500 501 502	OK         Car           Control         Sub-macro (500)           Sub-macro (501)         Sub-macro (502)           Sub-macro (503)         Sub-macro (503)	× ncel ×	
ub-Mac 500 501 502 503	OK         Cat           cro         Sub-macro (500)           Sub-macro (501)         Sub-macro (502)	× ncel ×	
ub-Mac 500 501 502 503 504	OK         Cat           Control         Cat           Sub-macro (500)         Sub-macro (501)           Sub-macro (501)         Sub-macro (502)           Sub-macro (503)         Sub-macro (503)           Sub-macro (504)         Sub-macro (505)	× ncel ×	
ub-Mac 500 501 502 503 504 505	OK         Car           Control         Car           Sub-macro (500)         Sub-macro (501)           Sub-macro (502)         Sub-macro (502)           Sub-macro (503)         Sub-macro (503)           Sub-macro (504)         Sub-macro (504)	× ncel ×	
ub-Mac 500 501 502 503 504 505 506	OK         Car           Control         Car           Sub-macro (500)         Sub-macro (501)           Sub-macro (501)         Sub-macro (502)           Sub-macro (502)         Sub-macro (503)           Sub-macro (503)         Sub-macro (504)           Sub-macro (505)         Sub-macro (505)           Sub-macro (506)         Sub-macro (506)	× ncel ×	
ub-Mac 500 501 502 503 504 505 506 507	OK         Car           DK         Car           DK         Car           Sub-macro (500)         Sub-macro (501)           Sub-macro (501)         Sub-macro (502)           Sub-macro (502)         Sub-macro (503)           Sub-macro (503)         Sub-macro (503)           Sub-macro (504)         Sub-macro (505)           Sub-macro (506)         Sub-macro (507)	rcel	

511

512

Sub-macro (511)

OK

final submacro

#### Figure 4-1

You can comment each macro by sub-macro function for convenient management, maintain and operation. The initial name of all sub-macro is Sub-macro (n) (n is from 1 to 512).

#### Figure 4-2

The left-most field in the left window is sub-macro number. There are 512 sub-macros for edition. You can write "CALL n (n is from 1 to 512)" to use sub-macro.

-

Cancel

## 4-1 Macro Type

🔄 CAWINDOWS\Desktop\HMI.dop - ScrEdit			_ 8 ×
File Edit View Element Screen Tools Option	or <u>W</u> indow <u>H</u> elp		
12 🗭 💭 🗭 🕬 🖓 👋 15 🕅 1 - Screen_1	Model Parameter Alarm Setup History Setup Tag Table Dicture Bank Text Bank Submacro		Screen (Screen_1)
	Jutial Macro Background Macro Clock Macro Environment		Screen_1           SubScreen         Detail           Background Color         (252, 252, 252)           Screen Open Marco         0           Screen Cycle Marco         0
			<b>D</b> X
			Step Action
		-1	
1			Record Output
[[[[[]]]]]]]]]]]]]]]]]]]]]]]]]]]]]]]]			**************************************
	Download:USB [192,0]	Build:Fri Feb 13 10:29:06 2004	NUM

Fig. 4-1-1 Choosing Macro from menu bar

Macro name	Number	Explanation
Screen open	1	There is a screen open macro for each screen. Therefore,
Macro		there are n screen open macros for n screen.
Screen close	1	There is a screen close macro for each screen. Therefore,
Macro		there are n screen close macros for n screen.
Screen Cycle	1	There is a screen cycle macro for each screen. Therefore,
Macro		there are n screen cycle macros for n screen
Initial Macro	1	There is only an initial Macro in a program.
Background	1	There is only an initial Macro in a program.
Macro		
Clock Macro	1	There is only an initial Macro in a program.
On Macro	1	You can have an ON Macro for each specific button.
Off Macro	1	You can have an OFF Macro for each specific button.
Sub-macro	512	There are only 512 sub-macros for a program.

Table 4-1-1

## ■ Screen Open Macro

You can have a screen open Macro for each screen. Screen open Macro will only be executed ONCE when you open screen (or change to that screen) and finish

execution ONCE. The screen element will be displayed after finishing executing screen open screen. Therefore, you should be careful to design for screen open Macro to avoid dead loop (program can't be ended) to cause system delay or even can't execute screen's elements. It is not recommended to write too long macro unless necessary. Please pay attention for loop usage and test Macro with on-line/off-line simulation before downloading to HMI.

#### Screen Close Macro

You can have a screen close Macro for each screen. Screen close Macro will only be executed ONCE when you close screen and finish execution ONCE. The screen open macro of new screen will be only executed after finishing screen close Macro. Therefore, you should also be careful for dead loop (program can't be ended) to avoid unexpected error.

#### Screen Cycle Macro

You can have a screen cycle Macro for each screen. Screen cycle Macro will only be executed ONCE when you change screen and the macro will be executed continuously until changing screen, program or stopping machine. Therefore, It is not recommended to write too long macro unless necessary.

#### Initial Macro

There is only an initial Macro in a program or a machine. It is executed in the beginning of program. You can preset value to omit step-by-step settings and also control initial setting to avoid unexpected problem by unknown initial value. If you need to have any special setting in PLC special address, you can use initial macro to set it. It can save much time with well-designed initial macro.

### Background Macro

There is only an initial Macro in a program or a machine. It will be executed continuously like background. But it is only executed some commands ONCE, not finish executing ONCE. If there is other executed Macro, such as cycle macro, it won't have any influences. They will be executed almost at the same time (In fact, it is executed one by one. The execution time is very close and almost at the same time). You don't need to write loop for continuous execution. And even you write END command for Macro, it will still execute Macro again.

#### Clock Macro

There is only an initial Macro in a program or a machine. It will be executed continuously, finish execution ONCE and executed again like cycle macro. Therefore, It is not recommended to write too long macro unless necessary.

#### ON Macro

You can have an ON Macro for each specific button (bit). It is set to be ON to start Macro by this button setting. So it is called ON Macro. This Macro is also executed ONCE and finished executing ONCE. It will be started again when this button is set to be ON again. The ON Macro will be only started when the button is set to be ON and pressed button to be ON.

#### OFF Macro

You can have an OFF Macro for each specific button (bit). It is set to be OFF to start Macro by this button setting. So it is called OFF Macro. This Macro is also executed ONCE and finished executing ONCE. It will be started again when this button is set to be OFF again. The OFF Macro will be only started when the button is set to be OFF and pressed button to be OFF.

#### Sub-macro

There are 512 sub-macros for editing. The sub-macro likes subroutine in program. User can write repeated action/function in sub-macro to save macro editing time and easy maintain. For example, if there are 10 sub-macros use one specific function, you can write it to be a sub-macro. Considers that the function is written to be sub-macro 1, you only need to write "CALL 1" in Macro to use it. Even if you need to modify this sub-macro, you only need to modify this sub-macro can be named by its function for easy management.

## 4-2 Macro Edition

After choosing desired Macro from menu bar, you can start editing by clicking any line as Fig. 4-2-1. The Macro window will be different by clicking position and the left number is line number.

CAWINDOWS/Desktop/HMI dop - ScrEdit File Edit Yiew Element Screen Tools Options	Window Help	X
	🖻 🖪 🔗 👔 100% 💽 Q, Q, 💷 🔤 🖳 🔍 🖳 🧟 🗮 🛃 🥀	
8 💌 🛛 🖉 Macro List		×
I - Screen 1		
2		
4	Macro Command	320
5	<u>File E</u> dit <u>Command</u> <u>H</u> elp	240
6	🚔 🖬 🕆 歩 び 🗃 🗙   #	Screen_1
7		Detail
8	Double Word 🔲 Signed	lor (252, 252, 252)
10		acro 0
11	Command D	acro 0
12	Variable 1	acro 0
13	Variable 2	
14	Variable 3	
16	Variable 4	
17		
18		
19		
20		ction
22		
23		
24		
25		
20		•
	Record	Output
[[[]]] [] [] [] [] [] [] [] [] [] [] []		
Ready	mload:USB [766,402] Build:Fri Feb 13 10:29:06 2004 [1	NUM

Fig. 4-2-1 Start editing Macro

There are 512 lines (number is from 1 to 512) for editing Macro. (refer to Fig. 4-2-3) If there is any blank line in the program, the blank lines will be set to comment lines after updating as Fig. 4-2-4.



Fig. 4-2-2 Toolbar

CAWINDO WS/Desktop/temp dop - ScrEdit	X
Ele Edit Yew Element Screen Iools Options Window Help	
1 - Screen_1 488	
489	
490 491	Screen_1
491	Detail
/03	(252, 252, 252)
494 Macro Command File Edit Comma	
495	
490	
497	640
498 E Double Wor	1 🔽 Signed 480
500	
500 Command P	
502 Variable 1	
503 Variable 2	
S04 Variable 3	
505 506	
507	
508	
509	
510	
511	
512	
<u> </u>	Kscold Carba
패럽 및 및 및 별 방 채 뀨 팩 탑 팬 📼 🖽	
?? [Download:USB [250,15]	Build:Wed Apr 14 15:08:40 2004 NUM

Fig. 4-2-3 The last line of Macro

CAWINDOWS/Desktop/temp.dop - ScrEdit		_ & ×
File Edit View Element Screen Tools Options Window Help		
		<del>v</del> il
□ □ □ <b>○</b> ■ <b>○</b> ■ □ <b>○</b> ■ <b>□ ○</b> ■ □ <b>○</b> ■ □ <b>□ □ □ □ □ □ □ □ □ </b>		×
3 #	-	
4 #		Screen 1
5 \$2 = \$3 - \$4	2	Detail
7	Macro Command	(252, 252, 252)
8	File Edit Command Help	0
9	🚔 🖬 🕆 🕫 Ö 🖻 🗙 🗯	0
10	F\$2=\$3-\$4	0
11		640
12	Double Word Signed	480
14	Command 🕑 SUB	
15	Variable 1 \$2	
16		
17	Variable 2         \$3           Variable 3         \$4	
18		<b>_</b>
20	Variable 4 Var4	
21		
22		
23		
24		
25		
27		•
,	Record Output	
四亞 🗗 🗗 🖬 🖬 🛤 🖽 🖽 🖽 🖽	<b>⊕</b>	
?? Download:USB	[250,15] [Build:Wed Apr 14 15:08:40 2004 [NUM]	

Fig. 4-2-4 Blank line will be comment line

When you start editing Macro, you can get edition window as Fig. 4-2-5 by clicking any lines in the Macro. You can edit with command window by clicking command from menu bar. Refer following for edition method.

facro Command	? ×
File <u>E</u> dit <u>C</u> ommand <u>H</u> elp	
🖻 🔒 🗘 🤑 🖸 🔒 🗙 🛛 #	
🗖 Double Word 🗖 Signed	
Command 🕨	
Variable 1	18
Variable 2	
Variable 3	



## ■ File

acro Command	?
ile <u>E</u> dit <u>C</u> ommand <u>H</u> elp	
Open Macro File Save Macro to File	
Close	
📘 Double Word 📃 Sig	ned
Command 🕨	
Variable 1	1
Variable 2	
Variable 2 Variable 3	

Fig. 4-2-6 File

### Open Macro

We provide open old macro for convenient edition macro. User can open old Macro when using any brand PLC to save Macro edition time without re-input. Refer to Fig. 4-2-7 for open Macro.

Open					<u>?</u> ×
Look in:	🔁 My Documents		•	+ 🗈 💣	
History Desktop My Documents My Computer	2 3 4 My Pictures rcp ScreenEdit SnagIt Catalog				
	File name:				Open
My Network P	Files of type:	Macro File(*.mro)		•	Cancel

Fig. 4-2-7 Open Macro

### Save Macro

In the same way, we also provide "save as" function for user to modify old macro and save macro as other macro to backup or save time to input.

Save As						? ×
Save in:	😋 My Documer	nts	•	+ 🗈 💣	•	
History Desktop My Documents My Computer	2 3 4 My Pictures rcp ScreenEdit SnagIt Catalo	g				
	File name:			•		Gave
My Network P	Save as type:	Macro File(*.mro)		•		ancel

Fig. 4-2-8 "Save as" Macro

### Close Macro

You can close macro by clicking this item or pressing ESC key.

## Edition

You can edit with edition options. If it is PLC address, it will be in bracket to distinguish with internal memory.

Macro Co	mmand		? ×
<u>File</u> <u>E</u> d	lit Command	l <u>H</u> elp	
	Previous Next Update Insert Delete Comment	▶ 🖹 🗙   #	
Va	ariable 1		
Ve	miable 2		
Va	ariable 3		
Va	ariable 4		

Fig. 4-2-9 Edition

Previous

#### Previous

Moving selected line to the upper line and upper line will move backward a line as Fig. 4-2-10 and Fig. 4-2-11.

CAWINDOWSDeshoptempdop-ScrEdit File Edit Yiew Element Screen Jools Options Window Help	X
[18] 28 🖬 🕒 19 이 등 19 19 19 19 19 19 19 19 19 19 19 19 19	
	1
<b>1</b> 1 - Screen_1 <b>2</b> \$2 = \$3 - \$4	
3 54=55*56 4	
5 Mecro Command	Screen_1 Detail
6 Ede Edit Command Help 7 (⊉ Previous ) ⊉ × #	(252, 252, 252)
8 Next V	0
10 Insert Signed	0
11 Delete	640
12 13 Variable 1 \$4	480
14 Variable 2	
15 16 Variable 3 β5	
17 Variable 4 Var4	
18	미치
20	
21 22	
23	
24 25	
26	
27 27 Keton Curpur J	
Download:USB         [250,15]         Build:Wed Apr 14 15:08:40 2004         NUM	

Fig. 4-2-10 Step 1 of moving forward

CAWINDOWSDesktop/s File Edit View Elemen	emp dop - SciEdit t Screen Tools Options Window Help	_ 8 ×
	○ 》 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	<u>×</u>
I - Screen_1	2     \$4 = \$5 * \$6       3     \$2 = \$3 - \$4       4     5       6     File Edit Command Help       7     6       9     10       10     10       11     12       13     14       14     \$5       16     \$6	Image: Screen_1           Detail           Detail           Image: Screen_1           Detail           Detail           Detail           Detail           Detail           Detail           Detail           Detail           Detail           Detail
王 · ··································	17     18     Yarabite d.     Yarabite d.       19     20     21       20     21       22     23       24     25       26     27	

Fig. 4-2-11 Step 2 of moving forward

# Next

Moving selected line to the lower line and lower line will move forward a line as Fig. 4-2-12 and Fig. 4-2-13.

CAWINDOWSDesktop/temp.dop - ScrEdit	_ # ×
Ele Edit Yew Element Screen Iools Options Mindow Help	
□         □         1         \$1 = \$3 + \$3           □         1         \$1 = \$5 + \$6	미치
3 \$2 = \$3 - \$4	
4 5 Mesro Command 21 ×	Screen_1
6 File Edit Command Help	Detail
7 😝 Previous 👂 🔁 🗙 #	(252, 252, 252)
8 9 [\$4 Update \5	0
10 Insert Signed	0
11 Delete manual	640
	480
14 variable 1 jp+	
Δ         Variable 2         §5           16         Variable 3         §6	
16         Variable 3         β6           17         Variable 4         Var4	
18	
19	
20 21	
22	
23	
24 25	
26	
Escon Lonbar,	
西西 🖬 🖫 🖷 🛤 🤀 🗰 📾 📾 📾	
Pownload:USB         [250,15]         Build:Wed Apr 14 15:08:40 2004         NUM	

Fig. 4-2-12 Step 1 of moving backward

CAWINDOWS/Desktop/ter File Edit View Element	ampdop-Sorfäda 1 Sersen Jools Options Window Help	_ <u>8 ×</u>
I - Screen_1	2       \$2 - \$3 - \$4         3       34 - \$53 - \$4         4       5         6       File Edit Command Help         7       10         10       □ Double Word □ Signed         11       □	
	16     Variable 3     \$6       17     Variable 4     Var4       18     19     20       20     21       22     23       23     24       25     26	
百克 <b>克 電 </b>	27         ····································	

Fig. 4-2-13 Step 2 of moving backward

# Update

Updates current line of macro. If you didn't press "update" after edition, it won't be modified. That is used to give the user a chance to modify or not. Therefore, if you forget to update after edition, you should input again. Refer to Fig. 4-2-14 and Fig. 4-2-15 for detail.

	_ 5 ×
Image: State of the state	Screen_1 Detail (252, 252, 252) 0 0
10     1       11     12       12     Command I Signed       13     Variable 1       14     Variable 2       15     Variable 3       16     Variable 4       17     Variable 4       18       19       20       21	640 480
23       24       25       26       27       27       第二日前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前前	

Fig. 4-2-14 Step 1 of update

🕤 C \WINDO WS\Desktop\tem		_ # ×
	Screen Icols Options Window Help · A Ba C A a C A C A	
)» <u> </u>	Maaro List	
	Mann Litt         X           1         \$1 = \$3 + \$3	
🖬 1 - Screen_1	2 \$2=\$3-\$4 3 \$4=\$5/\$6	
	4	
	5 Macro Command	Screen_1 Detail
	6 Ele Edit Command Help	(252, 252, 252)
		0
	9	0
	10 Double Word T Signed	0
	11 12 Command D	640 480
	13 Variable 1	
	14 Traible 2	
	15 Variable 2 Variable 3	
	17 Variable 4	
	18	
	19 20	크치
	21	
	22	
	23	
	24 25	
	26	
	27	
	Keong Dauban	
· [] [] [] [] [] [] [] [] [] [] [] [] [] [	· · · · · · · · · · · · · · · · · · ·	
??	Download:USB [250,15] Build: Wed Apr 14 15:08:40 2004 [NUM]	

Fig. 4-2-15 Step 2 of update

### Insert

## Insert

Inserts a line before selected line. Refer to Fig. 4-2-16 and Fig. 4-2-17.

CAWINDOWS/Desktop/temp.dop - ScrEdit File Edit View Element Screen Tools Or	otions Window Help			X
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 🗃 🖻 🖨 ?   100% ← ↔ → ↑ ± ↓ A	Reco Command File Edit Command Help	× ×	
5 6 7 8 9 10 11 12 13 14 15 16 17		Image: System of the system		Streen_1 Detail (252, 252, 252, 252) 0 0 6 40 420
18 19 20 21 21 22 23 24 25 26 27 26 27			Kecota Confeat	
?? ??	Download:USB [250,15]	Build:Wed Apr 14 15:08:40 2004	NUM	

Fig. 4-2-16 Step 1 of insert

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12 🗃 🖬 🕒 🗠 🖓 ha 🖬 🗛		2 @	
	→ → ↑ ★ L A → U S		
Macro List			×
I - Screen_1         2         \$5 = \$6 % \$7           3         \$2 = \$3 - \$4		Macro Command	?×
4 \$4=\$5/\$6		<u>File Edit Command H</u> elp	
5		🖙 🖬 🕆 🤑 ଓ 🛃 🗙 🗰	Screen_1 Detail
6		\$5 = \$6 % \$7 Insert	(252, 252, 252)
8		Double Word Signed	0
9			0
10		Command 🕨 MOD	0
11 12		Variable 1 \$5	640
12		Variable 2 \$6	480
14		Variable 3 \$7	
15		Variable 4 Var4	
16			
18			
19			
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21			
23			
24			
25			
26 27			-
1-27		Kec	
百五 🗳 📽 🗖 🖷 🛤 🛗 🛱	Ē. 🗗 🖽		
77	Download:USB [250,15]	Build:Wed Apr 14 15:08:40 2004	NUM

Fig. 4-2-17 Step 2 of insert

# Delete

Deletes selected line. If there are lines after this delete line, they will be moved

forward. Refer to Fig. 4-2-18 and Fig. 4-2-19
---

CAWINDOWSDesktopAte File Edit <u>Vi</u> ew Element	mp.dop-SerEdii Screen Tools Options Window Help			_ # ×
	- % 🖻 🖻 🛤 👛 🖻 🎒 💡 100% 💽 🔍	Q. Q.		
8 -				
p — p	🔀 Maero List		×	
📕 🖾 🖬 🌶 🙆			<u> </u>	
💶 1 - Screen_1	2 \$5 = \$6 % \$7			<b></b>
	3 \$2 = \$3 - \$4 4 \$4 = \$5 / \$6	Macro Command File Edit Command Help	?×	
	5			Screen_1
	6			Detail
	7	\$5 = \$6 % \$7		(252, 252, 252)
	8	🗖 Double Word 🗖 Signed		0
	9			0
	10	Command 🗈 MOD		0 640
	12	Variable 1 \$5		480
	13	Variable 2 \$6		
	14	Variable 3 \$7		
	15	Variable 4. Var4		
	16			
	17 18			
	19			미치
	20			
	21			
	22			
	23			
	24 25			
	26			
	27			
4			Cecora Loubar	
J				
	■ ☞ 蝸 秤 益 直 哑 🖽 🖽 🕀			
??	Download:USB [250,15]	Build:Wed Apr 14 15:08:40 2004	NUM	

Fig. 4-2-18 Step 1 of delete

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	• +> =>   † ± L   A - U   🖼			
□ □ □ □ 0 0 0 Macro List			<u>×</u>	
2 \$2=\$3-\$4				ㅋㅋ
3 \$4 = \$5 / \$6		acro Command ile <u>E</u> dit <u>C</u> ommand <u>H</u> elp	<u>?×</u>	• 0 -
5		📽 🖬 🕆 🕂 Ư 🖨 🗙 #		Screen_1
6		Delete		Detail (252, 252, 252)
8		Double Word 🗖 Signed		0
9		Command 🕨		0
11		Variable 1	_	640
12		Variable 2		480
14		Variable 3		
15		Variable 4. Var4		
17	_			
18				
20			F	
21 22				
22 23				
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25				
27			Kecon Carpar	
			Tatola [ Salpar]	
西西 🗳 🗣 🖬 🖷 🛤 🛱 👪				
??	Download:USB [250,15]	Build:Wed Apr 14 15:08:40 2004	NUM	

Fig. 4-2-19 Step 2 of delete

Comment

You can give comments for any lines to read/modify macro easily. You can choose from menu bar or toolbar. Refer to Fig. 4-2-20 and Fig. 4-2-21.

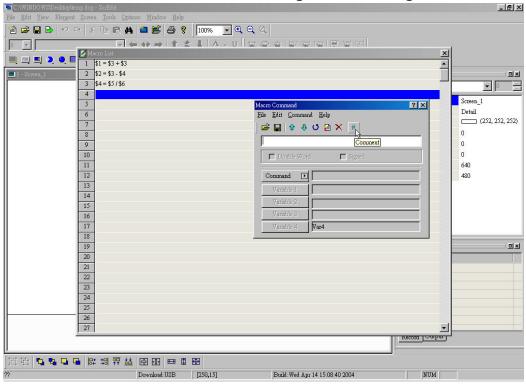


Fig. 4-2-20 Step 1 of comment

CAWINDOWS/Desktop/temp.dop - ScrEdit File Edit View Element Screen Tools Options	Window Help		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
□ □ □ □ ○ ● □ 1 \$1 = \$3 + \$3			×
■ 1 - Screen_1 2 \$2 = \$3 - \$4 3 #\$4 = \$5 / \$6			
4	Macro Command	<u>? ×</u>	
5	File Edit Comma		Screen_1 Detail
7		Ŭ ₽ X #	(252, 252, 252)
8	W Double Wor	Comment d 🔽 Signed	0
10			0
11 12		COMMENT	640
13	Variable 1 Variable 2	\$4 \$4=\$5/\$6	
14	Variable 3	\$6	
16	Variable 4	Var4	
17 18			
19			IX
20			
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25			
20			
			arbar
/ [四 년] 🗳 🗣 🖵 🖬 🛤 🛱 👪 🖻			
?? ??	ownload:USB [250,15] Build:Wed Ap	n 14 15:08:40 2004	M

Fig. 4-2-21 Step 2 of comment

Command

You can write command by clicking button "Command" or choosing from menu

bar.

CAWINDOWS/Desktop/temp.dop File Edit <u>V</u> iew Element Screen		<u>_8×</u>
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8 🔻		
🔲 🖂 🛄 🤰 🔍 🖪 🚺	oro Liit	
1 - Screen_1 2	Macro Command	
3	Eile Edit Command Help	• 0 -
4	Logical ##	Screen 1
6	Data transfer	Detail
7	Data Conversion	(252, 252, 252)
8	Comparsion  Flow Control	0
9	Comma Bit Setting	0
11	Varia Communication  Others	640
12	Varia Uthers	480
13	Variable 4 Var4	
14		
16		
17		
18		<b>_</b>
20		
21		
22 23		
23		
25		
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27		
西西 💁 🗣 🖬 🛤	: \$\$ 羿 益 弓 亚 🖴 🛛 🔁	
n	Download:USB [250,15] Build:Wed Apr 14 15:08:40 2004 [NUM]	

Fig. 4-2-22 Choosing from menu bar

Arithmetic	•
Logical	×
Data transfer	•
Data Conversion	•
Comparsion	×
Flow Control	۲
Bit Setting	•
Communication	•
Others	

ADD	
SUB	
MUL	
DIV	
MOD	

## Fig. 4-2-24 Arithmetic

## Fig. 4-2-23 Commands options

OD	MOV
OR	BMOV
AND	FILL
XOR SHL	CHR
SHL SHR	GETX
SHK	SETY
Fig. 4-2-25 Logical	 Fig. 4-2-26 Data mov

#### Fig. 4-2-26 Data move

BCD	XCHG
BIN	MAX
W2D	MIN
B2W	A2H
W2B	H2A
SWAP	

#### Fig. 4-2-27 Data transfer

-	GOTO	
	LABEL	
	CALL	
	RET	
	FOR	
	NEXT	
	END	

IF=	IF <=
IF !=	IFAND = 0
IF >	IF AND != 0
IF >=	IF = ON
IF <	IF = OFF

Fig. 4-2-28 Comparison

SETB	
CLRB	
INVB	

#### Fig. 4-2-30 Bit setting

#### Time Tick GETLASTERROR Comment Delay GETSYSTEMTIME

#### Fig. 4-2-32 Others

### Fig. 4-2-29 Flow control

INITCOM ADDSUM XORSUM PUTCHARS GETCHARS SELECTCOM

Fig. 4-2-31 Communication

## Help

It is on-line help as Fig. 4-2-33.

C.\WINDOWS\Desktop\temp dop - ScrEdit File Edit View Element Screen Tools (	ptions Window Help			_ 8 ×
🖹 🚅 🖬 🕒 🗠 🖂 🗼 🛍 💼	👫 🧰 🛱 🤗 🚺 100% 💽 🗨			
Macro List	<b>↔ ↔ ↑ ☆ Ⅰ</b> ▲ , ∪		×	
1 - Screen_1 2 3		Macro Command File Edit Command Help	<u>?×</u>	
4		🖉 🖬 🕆 🤑 🕻 Macro Contents		Screen_1
6				Detail
7 8		Double Word 🗖 Signed		0
9		Command 💌		0
11		Variable 1 Variable 2		640
12		Variable 3		480
14		Variable 4		
16				
17				
19				<b>_</b>
20 21				
22 23				
24				
25				
27			<b>.</b>	
			Kecora Carpar	
近 近 🗳 🗣 🗣 🗣 🛤 韓	₩ Ē 🕀 🖴 🛛 🔁		-	
??	Download:USB [250,15]	Build: Wed Apr 14 15:08:40 2004	I NUM	

Fig. 4-2-33 Help options

🛃 HTML Help	
Hide Back Print Options	
Contents Index Search	Macro Command
☐ Macro ① Macro Command	Arithmetic
	Bit Setting
	Comparison
	Data Conversion
	Data Transfer
	Flow Control
	Logic -
	Other

Fig. 4-2-34 On-line HELP

Key in

Some users are used to write Macro by key in. You can also key in by yourself and program will auto check the correction. You will get warning if there is any errors. Refer to following figures for detail. There are no limit spaces between operand and operation symbol for you to key in.

cro-Command e <u>E</u> dit <u>C</u> ommand <u>H</u> e	elp		?
🗳 🔛 🗘 🕂 🗸	🔒 🗙   #		
\$4 = \$5	+	\$6	
🔲 Double Word	🔲 Signed	1	
Command 🕨			ĺ
			_
Variable 1			
Variable 1 Variable 2			

Fig. 4-2-35 Operation

After finishing inputting, program will convert to the best format automatically after updating or pressing Enter. But program didn't verify in this time.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
) 🖻 🖬 🗘 🤄	V 🔁 🗙   #	
\$4 = \$5 + \$6		
🔽 Double Wo	rd 🦵 Signed	
Command 🕑	ADD	
Variable 1	\$4	
Variable 2	\$5	
Variable 3	\$6	
Variable 4	Var4	

Fig. 4-2-36 Convert to the best format

You will get error syntax dialog box once you update.

ScrEdit	×
8	Incorrect syntax
	ОК

Fig. 4-2-37 Incorrect syntax

facro Command	<u>?</u> ×
<u>File E</u> dit <u>C</u> ommand <u>H</u> elp	
🗃 🔒 🕆 🤑 🖸 🔒 🗙 🛛 #	
What are you doing ?	
🗖 Double Word 🗖 Sig	ned
Command P	
Variable 1	
Variable 1	

Fig. 4-2-38 Key in by yourself

If your format is correct with error operand, you will only get error message when compiling.

Macro Command	? ×
<u>File Edit Command H</u> elp	
😂 🔒 🕆 🤑 🗸 🔒 🗶 🗯	
Mo = Y0 - S0	
🗖 Double Word 🗖 Signed	1
Command 🕨	
Variable 1	
Variable 2	
Variable 3	
Variable 4	

Fig. 4-2-39 Format is correct but operand is error

ScrEdit	×
8	Incorrect syntax
	OK

Fig. 4-2-40 there is error when compiling

## 4-3 Macro Operation

### Arithmetic

Operation: there are five operations, ADD, SUB, MUL, DIV and MOD as Fig. 4-3-1. There are three operands for each operation. Each operand can be internal memory or constant (decimal or hexadecimal system) (but it can only be internal memory when outputting). The unit can be Word, Double Word, Signed and Signed Double Word. Refer to following table for detail.

Command	Operand	Data type	Format	Others
ADD	A1, A2, A3	M, C	W, D, S	When the data exceeds the length
SUB	A1, A2, A3	M, C	W, D, S	of designated unit, the data out of
MUL	A1, A2, A3	M, C	W, D, S	range will be discarded.
DIV	A1, A2, A3	M, C	W, D, S	
MOD	A1, A2, A3	M, C	W, D, S	

M- Internal memory, C-Constant, W-Word, D-Double Word, S-Signed

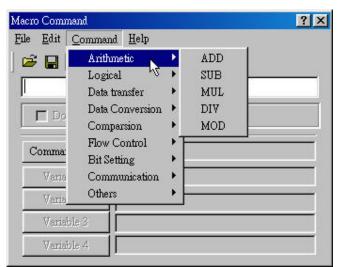


Fig. 4-3-1 Choosing Arithmetic

## ADD

ADD  $\rightarrow$  Add operation, formula: A1=A2+A3. Adds A2 to A3 and save the result

in A1.

Example:

A1(Word)=A2(Word) + A3(Word).

A1(Double Word)=A2(Double Word) + A3(Double Word).

A1(Signed)=A2(Signed) + A3(Signed).

A1(Signed Double Word)=A2(Signed Double Word) + A3(Signed Double Word).

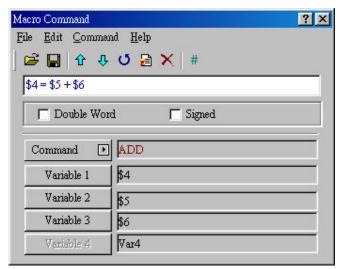


Fig. 4-3-2 Addition

SUB

SUB  $\rightarrow$  subtraction, formula: A1=A2-A3. Subtracts A2 from A3 and you will get the result in A1.

Example:

A1(Word)=A2(Word) - A3(Word).

A1(Double Word)=A2(Double Word) - A3(Double Word).

A1(Signed)=A2(Signed) - A3(Signed).

A1(Signed Double Word)=A2(Signed Double Word) - A3(Signed Double Word).

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
) 🗃 🔛 🗘 🍕	U 🔒 🗙 🛛 #	
\$4 = \$5 - \$6 (DW	Ŋ	
🔽 Double Wo	rd 🦵 Signed	
Command 🖸	ј рив	
Variable 1	\$4	2
Variable 2	\$5	
Variable 3	\$6	
Variable 4	Var4	

Fig. 4-3-3 Subtraction 4-22

MUL

MUL  $\rightarrow$  multiply, formula: A1=A2 \* A3.

Example:

A1(Word)=A2(Word) \* A3(Word).

A1(Double Word)=A2(Double Word) \* A3(Double Word).

A1(Signed)=A2(Signed) \* A3(Signed).

A1(Signed Double Word)=A2(Signed Double Word) \* A3(Signed Double Word).

Macro Command		? ×
<u>File E</u> dit <u>C</u> omma	und <u>H</u> elp	
) 🗃 🔛 🗘 🤄	- U 🔒 🗙   #	
\$4 = \$5 - \$6 (Sign	ed DW)	
Double Wo	rd 🔽 Signed	
Command 💽	ן אַנאַ	
Variable 1	\$4	
Variable 2	\$5	
Variable 3	\$6	
Variable 4	Var4	

Fig. 4-3-4 Multiply

DIV

DIV  $\rightarrow$  division, formula: A1=A2 / A3. A1 is quotient and A3 can't be 0. Example:

A1(Word)=A2(Word) / A3(Word).

A1(Double Word)=A2(Double Word) / A3(Double Word).

A1(Signed)=A2(Signed) / A3(Signed).

A1(Signed Double Word)=A2(Signed Double Word) / A3(Signed Double Word).

Macro Command		? ×
<u>File Edit Comm</u>		
) 🖻 🖬 🗘 🤇	u 🗄 🗙 🕸	
\$4 = \$5 - \$6		
🔽 Double Wo	rd 🦵 Signed	
Command [	ј рив	
Variable 1	\$4	
Variable 2	<b>\$</b> 5	
Variable 3	\$6	
Variable 4	Var4	

Fig. 4-3-5 Division 4-23

MOD

MOD  $\rightarrow$  get the remainder, formula: A1=A2 % A3. A1 is remainder and A3 can't be 0.

Example:

A1(Word)=A2(Word) % A3(Word).

A1(Double Word)=A2(Double Word) % A3(Double Word).

A1(Signed)=A2(Signed) % A3(Signed).

A1(Signed Double Word)=A2(Signed Double Word) % A3(Signed Double Word).

Macro Command		? ×
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🗃 🔂 🤄	- 🖸 🔒 🗙 🛛 #	
\$4 = \$5 % \$6 (D)	<i>N</i> )	
Double Wo	rd 🦵 Signed	
Command 💽		
Variable 1	\$4	
Variable 2	<b>\$</b> 5	
Variable 3	\$6	
Variable 4	Var4	

Fig. 4-3-6 Get remainder

### Logical Operation

There are five operations for logical, including OR, AND, XOR, SHL and SHR as Fig. 4-3-7. There are three operands for each operation. Each operand can be internal memory or constant (decimal or hexadecimal system) (but it only can be internal memory when outputting). The unit can be Word and Double Word. Refer to following table for detail.

Command	Operand	Data type	Format	Others
OR	A1, A2, A3	M, C	W, D	
AND	A1, A2, A3	M, C	W, D	
XOR	A1, A2, A3	M, C	W, D	
SHL	A1, A2, A3	M, C	W, D	
SHR	A1, A2, A3	M, C	W, D	

M- Internal memory, C-Constant, W-Word, D-Double Word.

Macro Comm	nand			? ×
<u>File</u> <u>E</u> dit	<u>C</u> ommand <u>H</u> elp			
🗃 🔛	Arithmetic	•	#	
	Logical 🔪	Þ	OR	
	Data transfer	•	AND	
Do	Data Conversion	F	XOR	
	Comparsion	×.	SHL	
0	Flow Control	×	SHR	
Comma	Bit Setting	١T		
Varia	Communication	۰Ī		
Varia_	Others	•		
Variał	ile 3			
Variał	ile 4			

Fig. 4-3-7 Logical operation

```
■ OR
```

 $OR \rightarrow Iogical OR$ , formula is A1=A2 | A3.

If A2(Word) and A3(Word) perform logical OR and save the result in A1(Word). (unit: bit)

If A2(DWord) and A3(DWord) perform logical OR and save the result in A1(DWord). (unit: bit)

Macro Command		? ×
<u>File Edit Comma</u>	nd <u>H</u> elp	
) 😂 🔛 🗘 🤑	🖸 🔁 🗙   #	
\$4 = \$5   \$6 (DW)		
Double Wo	rd 🗖 Signed	
Command 🕨	OR	
Variable 1	\$4	
Variable 2	\$5	
Variable 3	\$6	
Variable 4	Var4	

А	В	F
0	0	0
0	1	1
1	0	1
1	1	1

Fig. 4-3-9 Boolean operation

Fig. 4-3-8 OR

## AND

AND  $\rightarrow$  logical AND, formula: A1=A2 & A3.

If A2(Word) and A3(Word) perform logical AND and save the result in A1(Word). (unit: bit)

If A2(DWord) and A3(DWord) perform logical AND and save the result in A1(DWord). (unit: bit)

cro Command		?
le <u>E</u> dit <u>C</u> omm	and <u>H</u> elp	
🛎 🔛 🗘 🤾	ን 🖸 🔒 🗙   #	
\$4 = \$5 && \$6 (I	DW)	
Double Wo	ord 🗖 Signed	
		775
Command [	AND	
Variable 1	\$4	10
Variable 2	\$5	
Variable 3	\$6	

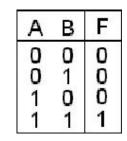




Fig. 4-3-10 AND

XOR

XOR  $\rightarrow$  logical XOR, formula: A1=A2 ^ A3.

If A2(Word) and A3(Word) perform logical XOR and save the result in A1(Word). (unit: bit)

If A2(DWord) and A3(DWord) perform logical XOR and save the result in A1(DWord). (unit: bit)

Macro Command		?×
<u>File E</u> dit <u>C</u> omma	und <u>H</u> elp	
) 😂 🔛 🔂 🤄	- 🖸 🔁 🗙   #	
\$9 = \$8 ^ \$5		
Double Wo	rd 🔲 Signed	
Command 🕑	] XOR	
Variable 1	\$9	
Variable 2	\$8	
Variable 3	\$5	
Variable 4	Var4	

А	В	F
0	0	0
0	1	1
1	0	1
1	1	0

Fig. 4-3-13 Boolean operation

Fig. 4-3-12 XOR

■ SHL

SHL  $\rightarrow$  shift left. Formula: A1=A2 << A3.

Shifts A2 (WORD/DWORD) data to left (bit number is A3). Once you shift a bit left. It will fill 0 to right-most bit at the same time. When A2 is WORD: If A3 is greater than 16, A1 will become 0. When A2 is DWORD: If A3 is greater than 32, A1 will become 0.

Macro Command		?×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🔛 🕆 🤇	u 🗄 🗙 🛱	
\$9 = \$8 << \$5 (D	W)	
Double Wo	rd 🗖 Signed	
Command [	] БНГ	
Variable 1	\$9	
Variable 2	\$8	
Variable 3	\$5	
Variable 4	Var4	

Fig. 4-3-14 SHL

#### ■ SHR

SHR  $\rightarrow$  Shift right, formula: A1=A2 >> A3.

Shifts A2 (WORD/DWORD) data to right (bit number is A3). Once you shift a bit right. It will fill 0 to left-most bit at the same time. Consider that A2 is WORD: If A3 is greater than 16, A1 will become 0. Consider that A2 is DWORD: If A3 is greater than 32, A1 will become 0.

Macro Command		? ×
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🖬 🔂 🤻	U 🔒 🗙 🛛 #	
\$99 = \$88 >> \$5	5 (DW)	
Double Wo	rd 🗖 Signed	
Command [	] <mark>Shr</mark>	
Variable 1	\$99	
Variable 2	\$88	
Variable 3	\$55	
Variable 4	Var4	

Fig. 4-3-15 SHR

### Data move

There are four commands for moving data, including MOV, BMOV, FILL and CHR as Fig. 4-3-16. Refer to following table for detail. (output only can be internal memory)

Command	Operand	Data type	Format	Others
MOV	A1, A2	P, M, C	W, D	Data type for A1 only can be P, M
BMOV	A1, A2, A3	P, M, C	W	Data type for A1 and A2 only can be P, M
FILL	A1, A2, A3	M, C	W	
CHR	A1, A2, A3	M, C	W	A2 is input string

P-PLC, M- Internal memory, C-Constant, W-Word, D-Double Word

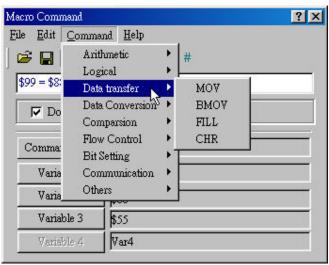


Fig. 4-3-16 Choosing Data move from command

### MOV

Move data from A2 to A1. It can be A1(Word)=A2(Word) or

A1(DWord)=A2(DWord). There is no change with data in A2 after executing MOV command. No matter A1 is PLC address or HMI register, the data will be moved to the other device by communication.

Macro Command		?×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
) 😂 🔛 🔂 🤻	- 🗸 🖹 🗙 🗍 #	
(1@Y0) = (1@Y2	2) (DW)	
Double Wo	rd 🗖 Signed	
Command 💽	] [MOV	
Variable 1	1@Y0	
Variable 2	] [1@Y2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-17 MOV

### BMOV

 $BMOV \rightarrow Block$  move. BMOV (A1, A2, A3) means to move data (number is A3) of data from address A2 to address A1. Data format is word. There is no influence for register A2. If the block length is longer than internal memory or max number of PLC register, there will be error when compiling.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omma	und <u>H</u> elp	
) 😅 🖬   û 🤄	- 🖸 🔁 🗙   #	
BMOV((1@Y100	)), (1@Y200), \$999)	
🗖 Double Wo	rd 🗖 Signed	
Command 🕑	J BMOV	
Variable 1	1@Y100	
Variable 2	] 1@Y200	
Variable 3	\$999	
∀ariable 4	Var4	

Fig. 4-3-18 BMOV

## ■ FILL

FILL  $\rightarrow$  fill the memory. For example, FILL(A1, A2, A3) means fill address A1 with data in register A2 and the data number is A3. There is no influence for register A2. If the block length is longer than internal memory or max number of PLC register, there will be error when compiling.

Macro Command		?×
<u>File E</u> dit <u>C</u> omma	nd <u>H</u> elp	
) 😅 🔛 🗘 🤑	U 🖯 🗶 🖌 🛛	
BMOV((1@Y100	)), (1@Y200), \$999)	
🗖 Double Wo	rd 🗖 Signed	
Command 🕨	BMOV	
Variable 1	1@Y100	2
Variable 2	1@Y200	
Variable 3	\$999	
Variable 4	Var4	

Fig. 4-3-19 FILL

### CHR

CHR  $\rightarrow$  convert text to ASCII code. For example, CHR(A1, "A2") means convert text in address A2 to ASCII and save in A1. The length is 128 words (max.).

Macro Command	? ×	
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🖬 🔂 🤇	ኑ <mark>ଓ 🖯 X</mark>   #	
CHR(\$7, "rtlkjgq	pljdb pmjvpevnrtnh'gnodkxncvwadbv'')	
Double Wo	ord 🔲 Signed	
Command [	CHR	
Variable 1	\$7	
Variable 2	tlkjgqpljdb pmjvpevnrtnh'gnodkxnovwadby	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-20 CHR

## Data conversion

There are 11 types for data conversion, including BCD, BIN, W2D, B2W, W2B, SWAP, XCHG, MAX, MIN, A2H and H2A as Fig. 4-3-21. Refer to following table for detail.

le <u>E</u> dit	<u>C</u> ommand <u>H</u> elp		
2 🖬	Arithmetic		
	Logical	<u>۲</u>	
	Data transfer	•	
T Do	Data Conversion	BCD	XCHG
1 00-	Comparsion	V BIN	MAX
Comma	Flow Control	▶ W2D	MIN
	Bit Setting	▶ B2W	A2H
Varia	Communication	▶ W2B	H2A
Varia	Others	SWAP	
Variab	le 3		

Fig. 4-3-21 Choosing for data conversion

Command	Operand	Data type	Format	Others
BCD	A1, A2	М	W, D	
BIN	A1, A2	М	W, D	
W2D	A1, A2	М	W, S	
B2W	A1, A2, A3	M, C	W	
W2B	A1, A2, A3	M, C	W	
SWAP	A1, A2, A3	M, C	W	
XCHG	A1, A2, A3	M, C	W, D	
MAX	A1, A2, A3	M, C	W, D, S	
MIN	A1, A2, A3	M, C	W, D, S	
A2H	A1, A2	M, C	W	
H2A	A1, A2	M, C	W	

P—PLC, M— Internal memory, C—Constant, W—Word, D—Double Word, S— Signed.

## BCD

 $BCD \rightarrow Binary$  Coded Decimal. Convert BIN to BCD format. For example, A1 = BCD(A2). It converts A2(Integer, Word or DWord) to BCD (Binary Coded Decimal) and save result in A1(BCD, Word or DWord). The effective value of A2 should be integer between 0~9999 or the Dword between 0~99999999.

Macro Command		?×	
<u>File Edit Comma</u>	und <u>H</u> elp		
] 😅 🔛 🔂 🤤	- 🗸 🖻 🗙   #		
\$2 = BCD(\$343)	(DW)		
Double Wo	rd 🗖 Signed		
Command 💽	J BCD		
Variable 1	\$2		
Variable 2	\$343		
Variable 3	Var3		
Variable 4	Var4		

Fig. 4-3-22 BCD

#### BIN

Binary Coded Decimal  $\rightarrow$  BIN. Convert BCD to BIN format. For example, A1 = BIN(A2). It converts A2(BCD, Word or DWord) to BCD (Binary Coded Decimal) and save result in A1(BCD, Word or DWord). The effective value of A2 should be integer between 0~9999 or the dword between 0~99999999.

File Edit Command Help B ■ 1 + U ■ ×   #	
\$2 = BIN(\$343) (DW)	
Double Word	
Command 🕨 BIN	
Variable 1 \$2	
Variable 2 \$343	
Variable 3 Var3	
Variable 4 Var4	

Fig. 4-3-23 BIN

#### ■ W2D

W2D → convert WORD to DOUBLE WORD. For example, A1 = W2D(A2) means converting A2 (Integer, Word) to double word (Integer, DWord) and save the result in A1(Dword, signed or unsigned). The effective value of A2 is the integer (Word  $\frac{1}{2}$  unsigned) between 0~65535 or the integer (Word, signed) between -32768~32767. This function is used to extend data length of 16bit singed word to 32bit Dword.

ero Command e <u>E</u> dit <u>C</u> omm	and <u>H</u> elp	?
ê 🔛 🔂 🤘	ን 🖸 🗟 🗙   #	
\$2 = W2D(\$343)	(Signed )	
🗖 Double Wa	ord 🔽 Signed	
-		
Command [	W2D	
Continuind [		
Variable 1	\$2	
	\$2 \$343	
Variable 1		

Fig. 4-3-24 W2D

#### ■ B2W

B2W  $\rightarrow$  convert BYTE to WORD. For example, A1=B2W(A2, A3) means converting BYTE data (number is A3) from A2 to WORD and save the result in A1(Word). The high byte will be filled with 0. In other words, that each word of A2 is two bytes. These two bytes will be converted to two words to save in A1. For example, \$30=B2W (\$785, \$65534) and consider that the value of \$65534 is 12. That means converting 12 bytes (6 words) to 12 words from \$785 to save in \$30.

Macro Command		? ×	
<u>File E</u> dit <u>C</u> omm	und <u>H</u> elp		
) 😂 🔛 🔂 🕴	· 🗸 🗟 🗙 🛛 #		
\$2 = B2W(\$343,	\$562)		
🗖 Double Wo	nd 🔲 Signed		
Command 💽	] <mark> </mark> B2W		
Variable 1	\$2		
Variable 2	\$343		
Variable 3	\$562		
Variable 4	Var4		

Fig. 4-3-25 B2W

#### ■ W2B

W2B  $\rightarrow$  convert WORD to BYTE format. A1 = W2B(A2, A3) means converting WORD data (number is A3) from low-byte of A2 to BYTE format (discard high-byte of A2) and save the result in A1(Word). For example, \$65=B2W (\*985, \$985), if the value of \$985 is 12 that means read 12 WORDS from low-byte of \*985 and convert these 12 WORDS to 12 BYTES (6 WORDS) to save in \$65.

Macro Command		? ×
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🔛 🗘 🍕	- 🖸 🔒 🗙   #	
\$2 = W2B(\$33, \$	52)	
🗖 Double Wo	rd 🗖 Signed	
Command 💽	] [W2B	
Variable 1	\$2	
Variable 2	\$33	
Variable 3	\$52	
Variable 4	Var4	

Fig. 4-3-26 W2B

SWAP

Swap BYTE data. SWAP(A1, A2, A3) means swapping high-byte and low-byte of A2 (WORD) (number is A3) and save the result in A1.

Macro Command	? ×	
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🖬 🗘 🤻	V 🔁 🗙   #	
SWAP(\$12, \$333	, \$252)	
🗖 Double Wa	rd 🗖 Signed	
Command [	SWAP	
Variable 1	\$12	
Variable 2	\$333	
Variable 3	\$252	
Variable 4	Var4	

Fig. 4-3-27 SWAP

#### XCHG

Exchange data. XCHG(A1, A2, A3) means exchanging A2(Word) and A1(Word). Exchange data number is A3. After execution, A1 and A2 data will be changed.

facro Command		? ×	
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp		
🖻 🔛 🗘 🤄	۶ 🖸 🔁 🗙 🛛 #		
XCHG(\$12, \$33	3, \$252) (DW)		
Double Wo	ord 🗖 Signed		
Command [	хсна		
Variable 1	\$12	2	
Variable 2	\$333		
Variable 3	\$252		
Variable 4	Var4		

Fig. 4-3-28 XCHG

■ MAX

Gets max. value. A1 = MAX(A2, A3) means getting the max. value from A2 and A3 and save the max. value in A1. (format can be Word, Dword, Signed Binary, Unsigned Binary)

Macro Command		?×	
<u>File E</u> dit <u>C</u> omma	nd <u>H</u> elp		
) 😂 🔛 🗘 🤑	U 🔁 🗙   #		
\$212 = MAX(\$3)	333, \$2252) (Signed DW)		
Double Wo	rd 🔽 Signed		
Command 🕨	MAX		
Variable 1	\$212		
Variable 2	\$3333		
Variable 3	\$2252		
Variable 4	Var4		

Fig. 4-3-29 MAX

#### MIN

Gets min. value. A1 = MAX(A2, A3) means getting the min. value from A2 and A3 and save the min. value in A1. (format can be Word, Dword, Signed Binary, Unsigned Binary)

Macro Command		? ×	
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp		
) 🖨 🔛 🔂 🤄	ኑ 🖸 🔒 🗙   #		
\$1212 = MIN(\$1	3333, \$22252) (Signed DW)		
Double Wo	ord 🔽 Signed		
Command [	MIN		
Variable 1	\$1212		
Variable 2	\$13333		
Variable 3	\$22252		
∀ariable 4	Var4	i i i	

Fig. 4-3-30 MIN

#### ■ A2H

Converts 4 ASCII to a four digits integer of hexadecimal system. A1 =A2H(A2) means converting the ASCII of A2 (4 WORDS) to integer and save the result in A1. For example, A2 is @200 and the content are @200=0039H, @201=0033H, @202=0035H and @203=0038H. The result of A1 =A2H(A2) is to save @210 in A1 and the content of @210 =9358H (format is WORD).

Macro Command		?×	
<u>File E</u> dit <u>C</u> omma	nd <u>H</u> elp		
) 😂 🔛 🗘 🤑	U 🔁 🗙 🛛 #	-	
\$1212 = A2H(\$13	3333)		
🗖 Double Wo	rd 🗖 Signed		
Command 💽	А2Н		
Variable 1	\$1212		
Variable 2	\$13333		
Variable 3	Var3		
Variable 4	Var4		

Fig. 4-3-31 A2H

#### ■ H2A

Converts four digits integer of hexadecimal system to 4 ASCII code. A1 =H2A(A2) means converting A2 (1 WORD with hexadecimal) to the ASCII (4 WORDS) and save the result in A1. For example, A2 is @100 and the content is @100=1234H, after calculation, A1 will be @110=0031H, @111=0032H and @112=0033H and @113=0034H (format is WORD).

facro Command		
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🔒 🗘 🤇	ኑ 🖸 🔁 🗙 🛛 #	
\$1212 = H2A(\$1	33)	
Double Wo	nd 🗖 Signed	
Command [	H2A	
Variable 1	\$1212	
Variable 2	\$133	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-32 H2A

#### Comparison

There are ten comparison operands: IF ==, IF !=, IF >, IF >=, IF <, IF <=, IF AND == 0, IF AND != 0, IF == ON and IF == OFF as Fig. 4-3-33. Refer to following table for detail.

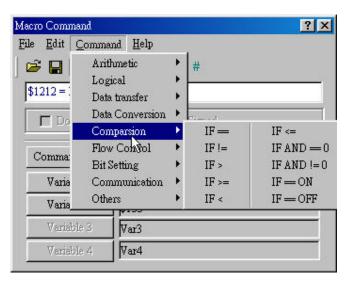


Fig. 4-3-33 Choosing comparison

Command	Operand	Data type	Format	Others
IF ==	A1, A2, A3	M, C	W, D, S	The available format for A3 is only C
IF !=	A1, A2, A3	M, C	W, D, S	The available format for A3 is only C
IF >	A1, A2, A3	M, C	W, D, S	The available format for A3 is only C
IF >=	A1, A2, A3	M, C	W, D, S	The available format for A3 is only C
IF <	A1, A2, A3	M, C	W, D, S	The available format for A3 is only C
IF <=	A1, A2, A3	M, C	W, D, S	The available format for A3 is only C
IF AND == 0	A1, A2, A3	M, C	W, D	The available format for A3 is only C
IF AND != 0	A1, A2, A3	M, C	W, D	The available format for A3 is only C
IF == ON	A1, A2	M, C	В	The available format for A1 is P and C and for A2 is C
IF == OFF	A1, A2	M, C	В	The available format for A1 is P and C and for A2 is C

P—PLC, M—internal memory, C—constant, W—Word, D—Double Word, S— Signed, B—Bit

IF A1==A2 THEN GOTO LABEL A3. When A1 is equal to A2, it will go to LABEL A3. The format can be Signed DW.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🔛 🕆 🤇	5 🖸 🔒 🗙 🛛 #	
IF \$5 == \$133 T	HEN GOTO LABEL 999 (Signed DW)	()
Double Wo	ord 🔽 Signed	
Command [	] [F ==	
Variable 1	\$5	
Variable 2	\$133	
Variable 3	999	
Variable 4	Var4	

Fig. 4-3-34 IF==

#### ■ IF ! =

IF A1!=A2 THEN GOTO LABEL A3. When A1 is not equal to A2, it will go to LABEL A3. The format can be Signed DW.

Macro Command	? ×	
<u>File Edit Comma</u>	und <u>H</u> elp	
) 😅 🔛 🗘 🤑	- 🖸 🔁 🗙   #	
IF \$63 != \$133 T	HEN GOTO LABEL 888	
Double Wo	rd 🦵 Signed	
Command 🕨	)   [F  =	
Variable 1	\$63	
Variable 2	\$133	
Variable 3	888	
Variable 4	Var4	

Fig. 4-3-5-3 IF!=

■ IF >

IF A1>A2 THEN GOTO LABEL A3. When A1 is greater than A2, it will go to LABEL A3. The format can be Signed DW.

Macro Command	iscro Command 🔗 🔀		
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp		
) 🖻 🔚 🗘 🤇	ን 🖸 🔒 🗙   #		
IF \$369 > \$951 T	THEN GOTO LABEL 789 (Signed DW)		
Double Wo	ord 🔽 Signed		
Command [	] [F >	_	
Variable 1	\$369		
Variable 2	\$951		
Variable 3	789		
Variable 4	Var4		

Fig. 4-3-36 IF>

#### ■ IF > =

IF A1>=A2 THEN GOTO LABEL A3. When A1 is greater than or equal to A2, it will go to LABEL A3. The format can be Signed DW.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omma	nd <u>H</u> elp	
) 😅 🔛 🕆 🤑	🖸 🔁 🗙   #	
IF \$369 >= \$951	THEN GOTO LABEL 789 (Signed DW)	
Double Wor	rd 🔽 Signed	
Command 🕨	] [IF >=	
Variable 1	\$369	
Variable 2	\$951	
Variable 3	789	
Variable 4	Var4	

Fig. 4-3-37 IF>=

#### ■ IF <

IF A1<A2 THEN GOTO LABEL A3. When A1 is less than A2, it will go to LABEL A3. The format can be Signed DW.

Macro Command	iscro Command 💦 🔀		
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp		
🖻 🖬 🔂 🤄	ን 🖸 🔒 🗙   #		
IF \$784 < \$963 T	THEN GOTO LABEL 325 (Signed DW)		
Double Wo	ord 🔽 Signed		
Command [	] [F <		
Variable 1	\$784		
Variable 2	\$963		
Variable 3	<b>3</b> 25		
Variable 4	Var4		

Fig. 4-3-38 IF<

#### ■ IF < =

IF A1<=A2 THEN GOTO LABEL A3. When A1 is less than or equal to A2, it will go to LABEL A3. The format can be Signed DW.

Macro Command	? ×
<u>File Edit Comma</u>	und <u>H</u> elp
] 😅 🔛 🕆 🤑	- 🗸 🗟 🗙   #
IF \$7814 <= \$916	53 THEN GOTO LABEL 1325 (Signed DW)
Double Wo	rd 🔽 Signed
Command 💽	] [F <=
Variable 1	\$7814
Variable 2	\$9163
Variable 3	1325
Variable 4	Var4

Fig. 4-3-39 IF<=

#### ■ IF AND = = 0

IF (A1&A2)== 0 THEN GOTO LABEL A3. If one of A1 is False, it will go to LABEL A3. The format can be DW.

Macro Command	? ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp
🖻 🔛 🗘 🤇	ን 🖸 🔁 🗙   #
IF (\$785 && \$14	45) == 0 THEN GOTO LABEL 9632 (DW)
Double Wo	ord 🔲 Signed
1	
Command 🖸	IF AND == 0
Variable 1	\$785
Variable 2	\$145
Variable 3	9632
∀ariable 4	Var4

Fig. 4-3-40 IFAND==0

■ IF AND ! = 0

IF(A1&A2) != 0 THEN GOTO LABEL A3. When all of A1 and A2 are TRUE, it will go to LABEL A3. The format can be DW.

Macro Command	? >
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp
🖻 🔒 🕆 🤇	ኑ 🖸 🖹 🗙 🛛 #
IF (\$785 && \$14	5) != 0 THEN GOTO LABEL 9632 (DW)
Double Wo	ord 🔲 Signed
Command [	IF AND != 0
Variable 1	\$785
Variable 2	\$145
Variable 3	9632
∀ariable 4	Var4

Fig. 4-3-41 IF AND!=0

#### ■ IF = = ON

IF A1==ON THEN GOTO LABEL A2. If A1 is 1 (ON) and it will go to LABEL A2.

Macro Command		
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
) 🖻 🔛 🔂 🕴	V 🔁 🗙   #	
IF \$0.0 == ON T	HEN GOTO LABEL 9865	
🗖 Double Wo	rd 🗖 Signed	
Command 🖸	] <b>IF ==</b> ON	
Variable 1	\$0.0	
Variable 2	9865	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-40 IF==ON

■ IF = = OFF

IF A1==OFF THEN GOTO LABEL A2. If A1 is 0 (OFF) and it will go to LABEL A2.

Macro Command	? ×	
<u>File Edit Comm</u>	and <u>H</u> elp	
) 🖨 🔛 🔂 🍕	۶ 🖸 🔁 🗙 🛛 #	
IF \$0.2 == OFF	THEN GOTO LABEL 9	
📕 🗖 Double Wo	rd 🗖 Signed	
Command D	IF == OFF	
Variable 1	\$0.2	
Variable 2	] p	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-43 IF==OFF

Flow Control

There are seven types for flow control: GOTO, LABEL, CALL, RET, FOR, NEXT and END as Fig. 4-3-6-1. Refer to following table for detail.

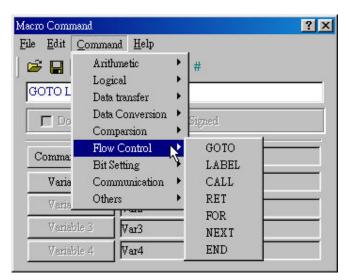


Fig. 4-3-44 Choosing for flow control

Command	Operand	Data type	Format	Others
GOTO	A1	С		
LABEL	A1	С		
CALL	A1	С		
RET	None			
FOR	A1	M, C		
NEXT	None			
END	None			

#### M- internal memory, C- constant

#### ■ GOTO

Branches unconditionally to a specific line such as GOTO LABEL A1. GOTO command will jump to designated label like Label A1. The designated label should be in the program.

Macro Command	?×	
<u>File Edit Comma</u>	und <u>H</u> elp	
) 🖻 🔛 🗘 🤑	U 🗄 🗙 🛛 #	
GOTO LABEL 1	23	
🗖 Double Wo	rd 🔲 Signed	
Command 💽	јјото	
Variable 1	123	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-45 GOTO

A label such as LABEL A1. Please notice that the label can't be repeated in a Macro but a label can be repeated use in different Macros.

Macro Command		? ×
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🖨 🔒 🗘 🤘	ኑ 🖸 🔒 🗙 🛛 #	
LABEL 123		
🗖 Double Wo	ord 🗖 Signed	
Command [	LABEL	
Variable 1	123	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-46 LABEL

# CALL

Calls sub-macro such as CALL A1. You can transfer control to sub-macro by CALL command. It is usually used to control design of specific function or transfer parameter table or complicated operation. It should have RET command at the end of sub-macro to return to the original program to execute the next program. The sub-macro number could be 001~512 and you can name it by yourself. You also can CALL another sub-macro in the sub-macro. But the levels for CALL sub-macro should be less than 6 levels to avoid unexpected error and memory limit.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🗃 🔂 🤄	6 🖸 🔒 🗙   #	
CALL \$1		
Double Wo	rd 🗖 Signed	
Command [	CALL	
Variable 1	\$1	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-47 CALL

#### RET

Return to Macro. This command is only for sub-macro. The corresponding

#### command of RET is CALL.

Macro Command		<u>?×</u>
File Edit Comm		
	↓ <b>Ŭ 🔒 X</b>   #	
RET		
🗖 Double Wa	rd 🗖 Signed	
Command 🖸	RET	
Variable 1	Varl	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-48 RET

#### ■ FOR...NEXT

It is for loop. "FOR" is the start of loop and "NEXT" is the end of loop. It can be nest loop and the max. is 5 levels. The program can be FOR A1. . NEXT, the loop times are decided by A1 (A1 can be constant or variable). When A1=0, the loop won't be executed and it will jump to the next line of NEXT to execute. When A1 >0, loop will be continuous execution for A1 times. You can change A1 value by command, but it can't change loop times. Note: If loop is executed too many times (A1 is too larger), that may be cause CPU malfunctions for the Macro that needed to finish execution ONCE.

Macro Command		? ×
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🖬 🗘 🤇	• 🖸 🔒 🗙   #	
FOR \$45		
Double Wo	rd 🗖 Signed	
Command [	FOR	
Variable 1	\$45	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-49 FOR

#### ■ FOR/NEXT

Repeats a group of statement for specific times. Each "FOR" command should have a "NEXT" command. The max. level is 5 loops such as FOR \$1..., FOR

\$2..., FOR \$3..., FOR \$4..., FOR \$5... NEXT, NEXT, NEXT, NEXT, NEXT,

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm		
] 😂 🔛   🔂 🤻	· 🗸 🗟 🗙 🛛 #	
NEXT		
🗖 Double Wo	rd 📕 Signed	
Command 💽	) NEXT	
Variable 1	Var1	
Variable 2	Var2	
Variable 3	Var3	
∀ariable 4	Var4	

Fig. 4-3-50 NEXT

#### END

Ends the macro. The program after command END won't be executed and it will execute from first line in the next time. Note: END means finishing executing macro.

facro Command		?)
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🔒 🗘 🤘	ን 🖸 🔒 🗙 🛛 #	
END		
Double Wa	ord 🗖 Signed	
Command [	I END	
Variable 1	Vari	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-51 END

# Bit Settings

There are three settings for BIT settings: SETB, CLRB and INVB as Fig. 4-13. Refer to following table for detail.

Macro Comm	nand	<u>? ×</u>
<u>File</u> <u>E</u> dit	Command Help	
) 😂 🔛 SETB (1(	Arithmetic Logical Data transfer Data Conversion Comparsion	# Signed
Comma	Flow Control Bit Setting	SETB
Varia	Communication	CLRB
Varia	Others	▶ INVB
Varia	ole 3 Var3	
Varial	ole 4 Var4	

Fig. 4-3-52 Choosing for bit setting

Command	Operand	Data type	Format	Others
SETB	A1	Р, М	В	
CLRBL	A1	Р, М	В	
INVB	A1	P, M	В	

M—internal memory, P—PLC, B—Bit.

#### SETB

Sets specific bit to be ON. Example: SETB A1.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
) 🖻 🔛 🔂 🤻	- 🗸 🗟 🗙 🛛 #	
SETB (1@Y120)		
🗖 Double Wo	rd 🗖 Signed	
Command 🖸	] <mark>setb</mark>	
Variable 1	1@Y120	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-53 SETB

# CLRB

Sets specific bit to be OFF. Example: CLRB A1.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omma	und <u>H</u> elp	
) 😂 🔚 🗘 🤴	· 🗸 🖯 🗶 🛛 #	
CLRB (1@M33)		
🗖 Double Wo	nd 🗖 Signed	
Command 🕨	] CLRB	
Variable 1	] [1@M33	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-54 CLRB

#### ■ INVB

Sets specific bit to be inverse. Example: INVB A1.

Macro Command		? ×
<u>File Edit Comm</u>	and <u>H</u> elp	
🖻 🔛 🗘 🤻	ب 🖸 🔁 🗙 🛛 #	
INVB (1@S85)		
🗖 Double Wo	rd 🗖 Signed	
Command [	I INVB	
Variable 1	1@S85	
Variable 2	Var2	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-55 INVB

Communication

There are six communications: INITCOM, ADDSUM, XORSUM, PUTCHARS, GETCHARS and SELECTCOM as Fig. 4-3-56. Refer to following table for detail.

Macro Comm	nand	<u>.</u>			? ×
<u>File Edit</u>	Command	Help			
😂 🔚  \$5 = INI   🗖 Do	Arithme Logical Data tra Data Co Compa	nsfer mversion	* * * * *	# iigned	
Comma	Flow Co Bit Sett	- 45.000			
Varia	Commu	mication	N	INITCOM	
Varia Varia	ble 3	, <del>, , , , , ,</del> /ar3		ADDSUM XORSUM PUTCHARS	
Varial	ble 4 🛛 🕅	'ar4		GETCHARS	

Fig. 4-3-56	Choosing for	communication
-------------	--------------	---------------

Command	Operand	Data type	Format	Others
INITCOM	A1~ A2	М	W	
ADDSUM	A1~ A3	М	W	
XORSUM	A1~ A3	М	W	
PUTCHARS	A1~ A4	М	W	
GETCHARS	A1~ A4	М	W	
SELECTCOM	A1	С	0 or 1	0: COM1, 1: COM2

# M— internal memory

#### ■ INITCOM

Initials COM port to setting communication protocol.

Macro Command		? ×	
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp		
🖻 🖬 🗘 🕴	• 🗸 🖯 🛪 🛛		
\$5 = INITCOM(	0, 0, 0, 0, 0, 6, 0)		
🗖 Double Word 🗖 Signed			
Command 💽			
Variable 1	\$5		
Variable 2	0, 0, 0, 0, 0, 6, 0		
Variable 3	Var3		
Variable 4	Var4	i.	

Fig. 4-3-57 INITCOM

COM Port	COM1	-
Interface	RS232	-
Data Bits	7 Bits	-
Parity	None	-
Stop Bits	1 Bits	
Baudrate	300	-
Flow Control	No Flow Control	

Fig. 4-3-58 Variable2 settings in INITCOM (communication protocol)

COMI COM2	RS232 RS422 RS485
Fig. 4-3-59 COM port	Fig. 4-3-60 Communication interface
7 Bits 8 Bits	None Odd Even
Fig. 4-3-61 Data bit	Fig. 4-3-62 parity bit
	4800
1 Bits 2 Bits	14400 19200 28800
Fig. 4-3-63 Stop bit	38400 57600

Fig. 4-3-64 Baud rate

Flow Control: In communication, the transmission speed is faster than receiving speed due to new transmission technology (compress immediately, debug). We need to use flow control to ensure that receiving device can handle all incoming data. Therefore, we have following flow control methods to ensure data security and complete data transmitted between computer and HMI.

- 1. No Flow Control: disable.
- 2. CTS/RTS: Request To Send (RTS) and Clear To Send (CTS). It uses handshaking signal to control receiving and sending data.
- 3. DSR/DTR: It is also hardware flow control. It uses cable to connect between computer and HMI.
- 4. XON/XOFF: it is software flow control. It is only used for 2400bps modem. The control method is to generate control code by software and add it in the transmission data.



#### Fig. 4-3-65 Flow control

#### ADDSUM

It uses addition to calculate checksum. A1=ADDSUM (A2, A3) means A2 is the start address for calculation; A3 is data length and save the result in A1.

Macro Command		<u>?</u> ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🖻 🔛 🗘 🤇	ን 🖸 🔒 🗙 🛛 #	
\$5 = ADDSUM(	\$85, Var3)	
Double Wo	ard 🗖 Signed	
Command [	ADDSUM	
Variable 1	\$5	
Variable 2	\$85	
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-66 ADDSUM

#### ■ XORSUM

It calculates checksum by using XOR. A1=XORSUM (A2, A3) means A2 is the start address of data; A3 is data length and save the result in A1.

cro Command		?
le <u>E</u> dit <u>C</u> omm	and <u>H</u> elp	
🛎 🔛 🔂 🤘	ን 🖸 🔒 🗙 🛛 #	
\$5 = XORSUM(	\$13, \$98)	
🗖 Double Wa	ord 🔽 Signed	
1 100000 110	na 🗖 stêrar	
Command	XORSUM	
Variable 1	\$5	
Variable 1 Variable 2	\$5 \$13	
	-1	

Fig. 4-3-67 XORSUM

#### PUTCHARS

It outputs characters by COM port. A1= PUTCHARS (A2, A3, A4) means A2 is the start address of transmission data, A3 is data length, A4 is the allowance communication time (unit is ms) and the result will be saved in A1.

Macro Command		?×
<u>File Edit Comma</u>	nd <u>H</u> elp	
) 😅 🔛 🗘 🤑	U 🔁 🗙   #	
\$5 = PUTCHARS	5(\$13, \$98, \$3)	
Double Word 🗖 Signed		
Command		
Variable 1	\$5	
Variable 2	\$13	
Variable 3	\$98	
Variable 4	\$3	

Fig. 4-3-68 PUTCHARS

#### GETCHARS

It gets characters by COM port. A1= GETCHARS (A2, A3, A4) means A2 is the start address of transmission data, A3 is data length, A4 is the allowance communication time (unit is ms) and the result will be saved in A1.

Macro Command		<u>?</u> ×
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
😂 🔛   🔂 🕴	- 🖸 🔒 🗙   #	
\$5 = PUTCHAR	5(\$13, \$98, \$3)	
🗖 Double Wa	rd 🔳 Signed	
Command I PUTCHARS		
Variable 1	\$5	
Variable 2	\$13	
Variable 3	\$98	
Variable 4	\$3	

Fig. 4-3-69 GETCHARS

🛃 Initial Macro		
1	*0 = INITCOM(1, 0, 0, 2, 0, 6, 0)	<u> </u>
2		

Fig. 4-3-70 Example 1 of Delta PLC

This example is the initial Delta PLC. After selecting Delta communication protocol, it sets communication as following.

🖉 Ba	lackground Macro	× 0 -
1	CHR(*10, ":01050500FF00F")	•
2	*17 = 0D36H	
3	*18 = AH	
4	CHR(*30, ":010505000000F")	
5	*37 = 0D35H	
6	*38 = AH	
7	CHR(*50, ":010205000010E")	
8	*57 = 0D38H	
9	*58 = AH	
10	INVB 1@S0	
11	LABEL 99	
12	*20 = PUTCHARS(*10, 17, 500)	
13	*21 = GETCHARS(*100, 17, 500)	
14	*20 = PUTCHARS(*30, 17, 500)	
15	*21 = GETCHARS(*100, 17, 500)	
16	GOTO LABEL 99	

Fig. 4-3-71 Example 2 of Delta PLC

Example 2 in Fig. 4-3-71 is the communication macro for background macro. Line 1 to line 3: Let Y0 be ON and write into internal memory \*10. Line 4 to line 6: let Y0 be OFF and write into internal memory \*30. And output ON data in line 12 and output OFF data in line 14. Therefore, you will see Y0 LED will be alternate ON/OFF. From this example, you can know that communication Macro let you have PLC control right when you have PLC communication data. Even if those PLCs or new PLCs that our DOP series doesn't provide, you can control those PLCs by using communication Macro with communication protocol.

#### SELECTCOM

It is used to switch COM port. When you set PLC to NULL in module parameter, you can use two COM ports (0:COM1, 1:COM2) (All communication commands will handle the COM port you use after switching. There is no support or interference among different macro switch.)

Macro Command	? 🗙				
<u>File E</u> dit <u>C</u> omman	ud <u>H</u> elp				
) 🚅 🔛   🕆 🤑	0 🖹 🗙   #				
SELECTCOM(0)	SELECTCOM(0)				
🗖 Double Wor	🗖 Double Word 🗖 Signed				
Command 🕨	Command 💽 SELECTCOM				
Variable 1	þ				
Variable 2	Var2				
Variable 3	Var3				
Variable 4	Var4				

#### Others

There are five functions: TIMETICK, GETLASTERROR, GETSYSTEMTIME, comment and delay as Fig. 4-3-9-1. Refer to following for detail.

Масто Со	mmand	? 🛛
<u>F</u> ile <u>E</u> dit	<u>C</u> ommand <u>H</u> elp	
	Arithmetic Logical Data transfer Data Conversion Comparsion Flow Control	# Signed
Varia	Bit Setting Communication	
Varia Varia Varia	ble 3	<ul> <li>Time Tick</li> <li>GETLASTERROR</li> <li>Comment</li> <li>Delay</li> <li>GETSYSTEMTIME</li> </ul>



Command	Operand	Data type	Format	Others
TIMETICK	A1	M	W, D	
GETLASSERROR	A1	Μ	W	
Comment	A2	S		
Delay	A1	С	W	
GETSYSTEMTIME	A1	Μ	W	
GETHISTORY	A1, A2	M, C, P	W, D	Data can be
GETHISTORT	A1, A2	IVI, C, F	<b>VV</b> , D	stored in PLC

M -- Internal Memory, C -- Constant, S -- String, P -- PLC

#### TIME TICK

Gets system time (CPU time) to write into specific address. Every 1 added means 100ms is added.

facro Command		
<u>File Edit Comma</u>	nd <u>H</u> elp	
🖻 🖬 🗘 🤑	U 🔁 🗙 🛛 #	
\$5 = TIMETICK		
Double Wo	rd 🗖 Signed	
Command 💽	TIMETICK	
Variable 1	\$5	
Variable 2	0, 0, 0, 0, 0, 0, 0	
Variable 3	\$98	
Variable 4	500	

Fig. 4-3-73 TIMETICK

#### ■ GETLASTERROR

Gets last error value. If command is correct, the result of GETLASTERROR will be 0. Even if each Macro is executed simultaneously, the error message won't interfere one another. Refer to chapter 4-4 for error code.

acro Command		?
<u>File E</u> dit <u>C</u> omm	and <u>H</u> elp	
🗃 🔛 🔂 🤘	ን 🖸 🔒 🗙 🛛 #	
\$5 = GETLASTI	ERROR	
Double Wa	ord 🔽 Signed	
1		
Command [	GETLASTERROR	
Variable 1	\$5	
Variable 2	0, 0, 0, 0, 0, 0, 0	
Variable 3	\$98	
Variable 4	500	

Fig. 4-3-74 TIMETICK

# Comment

It helps Macro to be readable. You only need to put "#" in the beginning of line to be comment.

Macro Command	facro Command		
<u>File E</u> dit <u>C</u> omm	und <u>H</u> elp		
🖻 🔚 🕆 🤄	· 🗸 🗟 🗙 🛛 #		
# for loop			
Double Wo	rd 🔽 Signed		
Command 💽	COMMENT		
Variable 1	\$33		
Variable 2	for loop		
Variable 3	\$98		
Variable 4	500		

Fig. 4-3-75 Comment

#### Delay

Delays user setting time by system. It will have system delay due to system multiplexer. Therefore, setting time will be increase due to system busy. Time unit is ms.

Macro Command		? ×
<u>File E</u> dit <u>C</u> omm	und <u>H</u> elp	
] 😂 🔛   🗘 🤻	· 🗸 🗟 🗙   #	
Delay(\$33)		
🗖 Double Wo	rd 🗖 Signed	
Command D	] Delay	
Variable 1	\$33	
Variable 2	Var2	
Variable 3	\$98	
Variable 4	500	

Fig. 4-3-76 Delay

#### GETSYSTEMTIME

It will be used to read system time and save into memory by the order of year, month, day, week, hour, minute and second. In following figure 4-3-77, \$10 = GETSYSTEMTIME. The system time will be saved into memory in order: year --\$10, month -- \$11, day -- \$12, week -- \$13, hour -- \$14, minute -- \$15 and second --\$16.

Macro Command	? 🗙		
<u>F</u> ile <u>E</u> dit <u>C</u> omman	ıd <u>H</u> elp		
🗃 🖬   🕯 🤑	U 🗎 🗙   #		
\$10 = GETSYSTE	MTIME		
🗖 Double Wor	🗖 Double Word 🗖 Signed		
Command 🕨	GETSYSTEMTIME		
Variable 1	\$10		
Variable 2	Var2		
Variable 3	Var3		
Variable 4	Var4		

Fig. 4-3-77 GETSYSTEMTIME

#### GETHISTORY

It is used to read the data in history buffer. Please refer to following example for detail. For example, \$0=GETHISTORY(\$2, \$3, \$5, 1#1@D0, \$7), \$0 is total number that is written successful and the unit is DWORD. It only can be internal memory. \$2 is buffer number and the unit is WORD. It can be internal memory or constant.

The buffer number is from 1 to 12 so the constant only can be 1 to 12. \$3 is start address for sampling and the unit is DWORD. It can be internal memory or constant. \$5 is points for reading and the unit is DWORD. It can be internal memory or constant. 1#1@D0 is the address for storing data and the unit is WORD. It can be internal memory or PLC. \$7 is data type for reading and the unit is WORD. It can be constant and the range is from 0 to 2. (0 is read data only. The length for each buffer is from 1 to 8 WORDs and unit is WORD. 1 is read time only, including year, month, day, hour, minute and second. There are 6 WORDS for them and 1 WORD for each one. 2 is read time and data and unit is WORD. )

Macro Command		
<u>E</u> dit <u>C</u> ommand <u>H</u>	felp	
1 t 4 0 🔒	★   #	
\$0 = GETHISTO	RY(\$2, \$3, \$5, 1#1@D0, \$7)	
Double Wo	rd 🗖 Signed	
Command 🕨	GETHISTORY	
Variable 1	50	
Variable 2 \$2, \$3, \$5, 1#1@D0, \$7		
Variable 3	Var3	
Variable 4	Var4	

Fig. 4-3-78 GETHISTORY

GETHISTORY Arguments	×
Logging Buffer	\$2
Data No.	\$3
Sample Number	\$5
Store Addres	1#1@D0
Memory Type	\$7
	1 1
OK	Cancel

Fig. 4-3-78 GETHISTORY Settings

# 4-4 Error Message

When compiling, it will shows errors in output window for user to find out easily. Some errors will be found out easily in short program. But that will be difficulty for long Macro. To help user to debug, we use error messages to show what's error. But for those logic errors, you should be careful by yourself.

# Error message during edition

■ Code –100: LABEL can't be found There is no such LABEL that GOTO designates.

■ Code –101: recursion occurs

This error message is usually occurred in sub-macro. The ability of a sub-macro to CALL itself is called recursion. No matter it is called directly or indirectly. Basically, recursion can't be adopted for sub-macro. You can use GOTO or FOR (infinite times) to replace it.

■ Code –102 More than 3 nested FOR is used

It is the limit for using nested FOR to avoid insufficient memory. You can use GOTO or IF to replace it.

■ Code –103 Sub-macro doesn't exist

It means there is no sub-macro in the program. For example, CALL 5 means CALL sub-macro 5. If you don't edit sub-macro 5 in the program, you will get error message when editing to avoid unexpected error.

Code –104 Number of NEXT is less than the number of FOR The number of NEXT should be equal to the number of FOR. This error code is used to remind you finding out the missing NEXT.

Code –105 Number of FOR is less than the number of NEXT

The number of FOR should be equal to the number of NEXT. This error code is used to remind you finding out the missing FOR.

■ Code-106 Repeated LABEL

This means that there are repeated LABEL in the same Macro. The program will be confusing with that. That may be caused by careless and you will get error message during editing to avoid unexpected error.

■ Code–107 There is RET in Macro

This means that there is RET command in Macro. RET command should be used for sub-macro to return program. But in Macro, it should use END not RET.

■ Code-108 The length of Macro CHR exceeds setting range 128 bytes This means that the length of macro CHR is out of range.

■ Code–109 Input error PLC

This means the PLC you input is error.

Code-110 Input error recipe

This means the recipe you input is error.

Code–111 The address of recipe exceeds setting range

This means the address of recipe you input is out of range.

# HMI Macro Error Message

You can read error message by Macro. Once there is an error and you execute a correct command before reading error message, the error message will be overwritten. When executing each Macro, each Macro error message won't be influenced by other Macro.

Code–10 GOTO Error There is GOTO error in Macro.

#### ■ Code–11 Stack Overflow

It means that stack is full. That may be cause by using too many sub-macro or execute different macros at the same time. This is to avoid insufficient memory.

#### ■ Code–12 CALL Empty Sub-macro

This is CALL sub-macro error. The sub-macro that is called should not be an empty sub-macro. It is avoid unexpected error.

■ Code–13 Data Read Error

This is PLC data read error. Sometimes this may also cause memory data error.

Code–14 Data Write Error

This is PLC data write error. Sometimes this may also cause memory data error.

■ Code–15 Divisor is 0

This error message means that your devisor is 0 when you do division.

#### HMI Communication Error Message



Fig. 4-4-1

Communication Busy

Error message: Com ? Station ?: Communication Busy ...

Unrecognized Code

Error message: Com ? Station ?: Receive Unknow Code ...

No Response from Controller

Error message: Com ? Station ?: Controller No Response ...

Check Sum Error in HMI

Error message: Com ? Station ?: Check Sum Error in HMI Message ...

Check Sum Error in Controller
Error message: Com ? Station ?: Check Sum Error in Controller Message ...

Incorrect Command Error message: Com %d Station %d: Command Can Not be Executed ...

Incorrect Address

Error message: Com ? Station ?: Address Fault ...

Incorrect Value Error message: Com ? Station ?: Value is Incorrect ...

Controller is Busy Error message: Com ? Station ?: Controller is Busy ...

CTS Signal Fail Error message: Com ? Station ?: CTS Signal Fail ...

No Such Resource Error message: Com ? Station ?: No Such Resource ...

■ No Such Service Error message: Com ? Station ?: No Such Service ...

Retry Again Error message: Com ? Station ?: Must Retry ...

HMI Station Number Error Error message: Com ? Station ?: HMI Station Number Error ...

■ Controller Station Number Error Error message: Com ? Station ?: Controller Station Number Error ...

UART Communication Error
 Error message: Com ? Station ?: UART Communication Error ...

Other Communication Error
 Error message: Com? Station ?: Other Communication Error ...

# **Chapter 5 System Control**

For two-way communication and display screen between DOP series and all brands' PLC, it needs to define the address of HMI control register and state register. The settings are in Options > Model parameter.

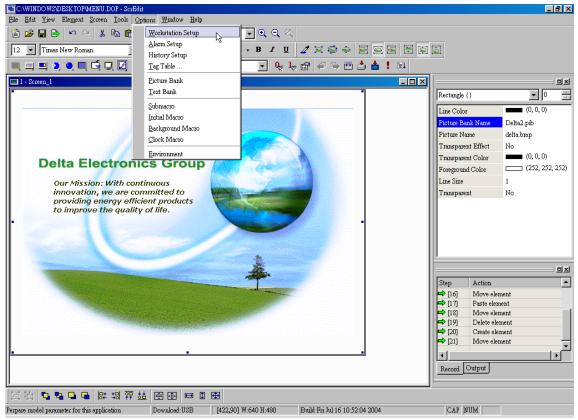


Fig. 5-1 Module parameter settings

C:\WINDOWS\DESKTOP\MENU.DOP - Seri File Edit View Element Screen Tools			
1 2 4 6 6	🗚 🛅 🖻 🎒 🤋 🛛 100% 🖵 🔍 🔍		
12 Times New Roman			
■ 2 ■ 2 0 ■ C ■ C ■ C	General Communication Other Standard Standard Application Name HIMI	Control Block Address 1@D0 Size 0 ¥	stangle () 0 1 ine Color 0, 0, 0) isture Bank Name Delta2.pib isture Name delta bmp
Deita Electron Our Mission: With co innovation, we are o providing energy eff to improve the qual	Base Port Controller	Status Block Address 1@D10 Upload/Download © USB 1.1 © PC COM Port COM1	ransparent Effect     No       ransparent Color     (0,0,0)       oreground Color     (252, 252, 252)       ine Size     1       ransparent     No
	HMI Station 0	Start up Screen     I - Screen_1       Default Format     Unsigned Decimal       Startup Delay Time     0       Clock Macro Delay     100	tep Action   Ition
[[] 1일		OK Cancel	[21] Move element       Record Output
Ready	Download:USB [495,208] W:640 H:480	Build:Fri Jul 16 10:52:04 2004	CAP NUM

Fig. 5-2 Communication settings

# **5-1 Control Area**

The function in system control is the most important in DOP series. You can control HMI from PLC. You can designate the register from system control parameter settings. The register is a continuous data block and its length is from 0 to 8 WORDs. The length will be different by function. For example, it needs at least 8 WORDs for recipe function. Each WORD number explanation is in the following:

Word Number	Register Number
0	Register for designated Screen Number (SNIR)
1	Control Flag Register (CFR)
2	Curve Control Register (CUCR)
3	Control Flag Register for Sampling History Buffer (HBSR)
4	Control Flag Register for Clearing History Buffer (HBCR)
5	Recipe Control Register (RECR)
6	Designated Recipe Number Register (RBIR)
7	Control Flag Register 2 (CFR2)

# Register for Designated Screen Number (SNIR)

Word	Function
0	Designate screen number for switching

This register SNIR (Dn) can be used to designate HMI screen by setting PLC (D0). You can switch HMI screen automatically by changing D0.

# Control Flag Register (CFR)

Bit Number	Function
0	Reserved
1	Turn off back light
2	Turn off buzzer
3	Clear alarm buffer
4	Clear alarm counter
5-7	Reserved
8	Setting user level Bit0
9	Setting user level Bit1
10	Setting user level Bit2
11-15	Reserved

#### Turn off back light

Turns back light On/Off by PLC. When Bit 1 is set to On, it will turn off back light. When Bit 1 is set to Off, it will turn on back light.

#### Turn off buzzer

Turns buzzer On/Off by PLC. When Bit 2 is set to On, it will turn off back light. When Bit 1 is set to Off, it will turn on back light.

#### ■ Clear Control Flag for Alarm Buffer

Controls to clear alarm buffer from PLC. It clears alarm buffer by setting bit3 of control flag to ON/OFF ONCE (about 1 second).

■ Clear Control Flag for Alarm Counter

Controls to clear alarm counter from PLC. It clears alarm counter by setting bit4 of control flag to ON/OFF ONCE (about 1 second).

#### Setting User Level

PLC can set user level of using HMI from Bit 8, Bit 9 and Bit 10. The setting level is from level 0 to level 7. MSB: Bit 10 and LSB: Bit 8.

Curve Control Register (CUCR)

Bit Number	Function
0	Curve sampling flag 1
1	Curve sampling flag 2
2	Curve sampling flag 3
3	Curve sampling flag 4
4-7	Reserved
8	Curve clear flag 1
9	Curve clear flag 2
10	Curve clear flag 3
11	Curve clear flag 4
12-15	Reserved

#### Curve Sampling Control Flag (1-4)

HMI curve sampling is controlled by PLC. When Bit0—Bit3 of this curve sampling control flag is set to ON/OFF ONCE (about 1 second), HMI will sample ONCE by reading continuous data of curve graph and convert to graph to show with curve graph or XY curve graph.

■ Curve Clear Control Flag (1-4)

Clears curve by PLC. When Bit8—Bit11 of this curve clear control flag is set to ON/OFF ONCE (about 1 second).

Control Flag Register for Sampling History Buffer (HBSR) Before setting, you should set the corresponding PLC address for communication. The data in buffer means save sampling data in HMI memory. You should set buffer address and length.

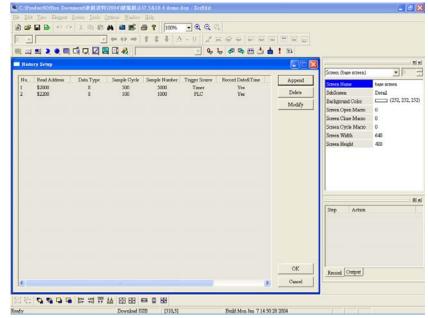


Fig. 5-3 Buffer parameters settings (12 records, max.)

HMI provides 12 records for tracking sampling register of history buffer. Besides HMI time interval settings, sampling or clearing history buffer can be controlled by PLC. Each sample or clear control is controlled by 2 control registers.

Bit Number	Function
0	Control flag for Sampling History Buffer 1
1	Control flag for Sampling History Buffer 2
2	Control flag for Sampling History Buffer 3
3	Control flag for Sampling History Buffer 4
4	Control flag for Sampling History Buffer 5
5	Control flag for Sampling History Buffer 6
6	Control flag for Sampling History Buffer 7
7	Control flag for Sampling History Buffer 8
8	Control flag for Sampling History Buffer 9
9	Control flag for Sampling History Buffer 10
10	Control flag for Sampling History Buffer 11
11	Control flag for Sampling History Buffer 12
12-15	Reserved

Control Flag Register for Clearing History Buffer

Sampling method can be time interval or sample history trend graph by PLC. Once it triggers control flag to be ON (about 1 second), it will sample ONCE. But you should set this flag to be OFF when you need to trigger it again.

[Example] Delta PLC:

- (1) Consider that Control block is D0 and its length is 6.
- (2) The PLC corresponding address of Buffer #1 is D200.
- (3) Data length of buffer #1 is 3 WORDs.

Therefore, PLC save records data in D200-D202 and set Bit 0 of D3 to be ON. When HMI detectes bit 0 is changed from OFF to ON, it will read data from D200-D202 in PLC automatically and save sampling data in HMI battery backup RAM.

#### Clear Register of History Buffer (HBCR)

Bit Number	Function
0	Clear flag of history buffer 1
1	Clear flag of history buffer 2
2	Clear flag of history buffer 3
3	Clear flag of history buffer 4

Bit Number	Function
4	Clear flag of history buffer 5
5	Clear flag of history buffer 6
6	Clear flag of history buffer 7
7	Clear flag of history buffer 8
8	Clear flag of history buffer 9
9	Clear flag of history buffer 10
10	Clear flag of history buffer 11
11	Clear flag of history buffer 12
12-15	Reserved

# Clear signal of history buffer

Clears HMI history trend graph by PLC. Once it triggers control flag to be ON (about 1 second), it will clear buffer ONCE. But you should set this flag to be OFF when you need to trigger it again.

# Recipe Control Register (RECR)

Bit Number	Function
0	Change recipe number
1	Read recipe (PLC $\rightarrow$ HMI)
2	Write recipe (HMI $\rightarrow$ PLC)
3-15	Reserved

#### ■ Control flag for writing recipe

When writing a recipe to PLC, you should write recipe number (N) into control register (RNR) Dn+5 and then set bit #4 of control flag to be ON. But you should set this flag to be OFF when you need to trigger it again.

For example:

# If you want to write recipe number 4 (RCPNo=4) into PLC, the write control bit will be bit 2 of D5 (D5=4).

■ Control flag for changing recipe number

RCPNo is the internal system register used for designating recipe number. You can change RCPNo value by writing recipe number (N) into designated register of recipe number (RBIR) Dn+6 and set bit #0 of control flag in recipe number control register (RECR) to be ON (about 1 second). After setting, RCPNo will be changed to N and display the corresponding recipe data (RCPW0-RCPWm) of recipe number N. But you should set this flag to be OFF when you need to trigger it again.

• Control flag for saving recipe to HMI

When you want to save recipe from PLC to HMI, you should write recipt number into designated register of recipe number (RBIR) Dn+6 and set bit #1 of control flag to be ON (about 1 second). But you should set this flag to be OFF when you need to trigger it again.

For example:

# When you want to save recipe to recipe number 12 (RCPNo=12) from PLC, you should set bit #1 of D5 is ON (D5=2).

Designated Recipe Number Register (RBIR)		
Word	Function	
0	Recipe number	

RCPNo is the internal system register used to control recipe number for displaying or transmit recipe back to HMI. In other words, you can transmit recipt to designated address by changing RCPNo.

# 5-2 State

For two-way communication and display screen between DOP series and all brands' PLC, it needs to input start address of response register in state area. The state area in DOP series is a continuous data block, such as Dm=D10 (length is 7 WORDs = D10-D16). The function and explanation of each WORD are in the following:

Word Number	Register
0	State Regsiter for General Control (GCSR)
1	State Regsiter for Screen Number (SNSR)
2	State Regsiter for Curve Control (CCSR)
3	State Regsiter for Sampling History Buffer (HSSR)
4	State Regsiter for Clearing History Buffer (HCSR)
5	Recipe State Regsiter (RESR)
6	State Regsiter for Recipe Number (RBSR)

# ■ General Control State Register (GCSR)

Bit Number	Function
0	Screen Switch State
1-2	Reserved
3	Clear State of Alarm Buffer
4	Clear State of Alarm Counter
5-7	Reserved

Bit Number	Function
8	User Level (Bit0)
9	User Level (Bit1)
10	User Level (Bit2)
11	User Level (Bit3)
12-15	Reserved

#### Screen Swith State

When Switching screen, the bit will be ON. After finishing switching, the bit will be OFF.

User Level State

When HMI is in communication, the user level are in the following:

```
User level 0 ==>bit8=Off, bit9=Off, bit10=Off
User level 1 ==>bit8=ON, bit9=Off, bit10=Off
User level 2 ==>bit8=Off, bit9=ON, bit10=Off
User level 3 ==>bit8=ON, bit9=ON, bit10=Off
User level 4 ==>bit8=Off, bit9=Off, bit10=ON
User level 5 ==>bit8=Off, bit9=Off, bit10=ON
User level 6 ==>bit8=Off, bit9=ON, bit10=ON
User level 7 ==>bit8=ON, bit9=ON, bit10=ON
User level 8 ==>bit8=Off, bit9=Off, bit10=Off, bit11=ON
```

#### State Register for Screen Number (SNSR)

Word	Function
0	The last screen number you opened

The last screen number you opened

The register SNSR (Dm) is used to save the last screen number you opened. After switching screen, it will send current screen number to save in state register (Dm).

#### ■ State Register of Curve Control (CCSR)

Bit Number	Function
0	Sample state of curve 1
1	Sample state of curve 2
2	Sample state of curve 3
3	Sample state of curve 4
8	Clear state of curve 1
9	Clear state of curve 2
10	Clear state of curve 3

11	Clear state of curve 4
4-7;12-15	Reserved

■ Clear State of Curve

When controlling to clear curve graph or XY curve graph by PLC, clear state contact (D12) Bit08--Bit11 will be set to be ON after clearing. When clear control flag D2 (bit08-11) is OFF, clear state contact will also be OFF.

■ Sample State Contact of Curve Graph

When controlling to sample curve graph or XY curve graph by PLC, sample state contact (D12) Bit0—Bit3 will be set to be ON after sampling. When sample control flag D2 (bit0-3) is OFF, sample state contact will also be OFF.

#### ■ Sample State Register of History Buffer (HSSR)

Bit Number	Function
0	Sample State of History Buffer 1
1	Sample State of History Buffer 2
2	Sample State of History Buffer 3
3	Sample State of History Buffer 4
4	Sample State of History Buffer 5
5	Sample State of History Buffer 6
6	Sample State of History Buffer 7
7	Sample State of History Buffer 8
8	Sample State of History Buffer 9
9	Sample State of History Buffer 10
10	Sample State of History Buffer 11
11	Sample State of History Buffer 12
12-15	Reserved

#### ■ Sample State of Trend Graph

When controlling to sample trend graph by PLC, sample state contact (D3) Bit #0--#11 will be set to be ON after sampling. When sample control flag D13 is OFF, sample state contact of trend graph will also be OFF.

#### ■ Clear State Register of History Buffer (HCSR)

Bit Number	Function
0	Clear State of History Buffer 1
1	Clear State of History Buffer 2
2	Clear State of History Buffer 3
3	Clear State of History Buffer 4

Bit Number	Function
4	Clear State of History Buffer 5
5	Clear State of History Buffer 6
6	Clear State of History Buffer 7
7	Clear State of History Buffer 8
8	Clear State of History Buffer 9
9	Clear State of History Buffer 10
10	Clear State of History Buffer 11
11	Clear State of History Buffer 12
12-15	Reserved

When controlling to clear trend graph by PLC, clear state contact (D14) Bit #0--#11 will be set to be ON after clearing. When clear control flag D4 is OFF, clear state contact of trend graph will also be OFF.

### Recipe State Register (RESR)

Bit Number	Function
0	Change State of Recipe Number
1	Recipe Read State (PLC $\rightarrow$ HMI)
2	Recipe Write State (HMI $\rightarrow$ PLC)
3-15	Reserved

#### State Contact for reading recipe

After transmitting recipe from PLC to HMI, recipe state contact BIT#1 (D6 bit1) will set to be ON automatically. When recipe control flag is OFF (D16 bit1), the state contact for reading recipe (BIT#1) will also be OFF.

State contact for changing recipe number

When control flag of recipe number BIT#0 (D6 bit0) is set to ON, state contact for changing recipe number (RCPNo) BIT#0 (D16 bit0) will be set to ON and it will be OFF after changing.

■ State contact for writing recipe

After transmitting recipe from HMI to PLC, recipe state contact BIT#2 (D16) will set to be ON automatically. When recipe control flag is OFF (D6 bit2), the state contact for reading recipe (BIT#2) will also be OFF.

#### ■ State Register for Recipe Number (RBSR)

Word	Function
0	Current recipe number

When recipe number register RCPNo is changed by PLC or HMI, state register of recipe number (RBSR) (Dm+6) will be updated. Monitoring this recipe number

register for designer to confirm current recipe number.

# **5-3 Internal Memory**

- Internal Register (R/W) : \$
   Word access: \$n (n: 0~65535)
   Bit access: \$n.b (n: 0~65535, b: 0~15)
   There are 65536 16-bit registers (\$0 ~ \$65535) in HMI.
- Non-volatile register (R/W) : \$M
   Word access: \$Mn (n: 0~1023)
   Bit access: \$Mn.b (n: 0~1023, b: 0~15)
   There are 1024 16-bit registers (\$0 ~ \$1023) in HMI.

# Control Register (R): CTRL

Word read: CTRLn (n: 0~ control area size -1) Bit Read: \$CTRL.b (n: 0~ control area size -1, b: 0~15) The control register for HMI to save data after reading from control area of PLC or other device. This control register is read only. The control register size is the same as control area that set during editing screen.

# Recipe Number Register (R/W): RCPNO

It is 16-bit register that used to designate recipe number. The range of recipe number is from 1 to 64K(total recipe numbers). Total recipe number is set when editing recipe.

PLC upload/download is read/write a recipe according to the setting of recipe number register. The recipe length is set during editing recipe.

# Recipe Register (R/W): RCPn

The recipe register is used to save the recipe that download from HMI after finishing screen edition. There are two methods for read/write these registers: Consider that recipe length is L and total recipe number is N,

- 1. Recipe number access: this method is accessed by RCPNO and RCP0~RCP (L-1). For example: if RCPNO=3, HMI will read RCPNO 3 data out and save it in RCP0~RCP (L-1). Then PLC can read RCPNO 3 data from this area. RCP0~RCP (L-1) can be regarded as a common area.
- 2. Absoluted address access: it is used to access the data that data address is greater than RCP (L-1). At this time, the start address of 1<sup>st</sup> recipe is RCP (1XL), the start address of 2<sup>nd</sup> recipe is RCP (2XL) and so on. Therefore, if you want to access the mth word of nth recipe. RCP will be (nxL+m).

RCP0	RCP1 RCF	2	RCP (L		P0=X; (1	<=X<=N)	
		1xL	1xL+1	1xL+2		1xL+(L-1)	RCP0=1
		2xL	2xL+1	2xL+2		2xL+(L-1)	RCP0=2
I		* :					
		NxL	NxL+1	NxL+2		NxL+(L-1)	RCP0=N

# **Appendix A Installation**

# **A-1 Specification**

Model	DOP-A57GSTD	DOP-A57CSTD	DOP-A75CSTD	DOP-A10TCTD	Remark	
<b>Operation System</b>			se Real Time OS			
MCU		32-bit RISC Micro	-controller / 202.8M	Hz		
ROM	NOR F	ash ROM 4 Mbyte	es (System: 1MB / U			
SDRAM	16Mk	oytes	32M	oytes		
Backup Memory (SRAM)		256Kbytes(non-vo	latile internal memo	ory)		
EXT. Memory Card	Smart Medi		898/Me/2000/XP FA	T Compatible)	*	
USB for download		1 CLIE	INT Ver 1.1			
Serial						
communication (UART)		·	COM2: RS-232C/422	2/485		
	5.7" FSTN LCD	5.7" Color STN	7.5" Color STN	10.4" Color TFT		
LCD MODULE			LCD (256 colors)	LCD (256 colors)		
	320 x 240 pixels			640 x 480 pixels		
	CCFL Back Light	CCFL Back Light	2CCFL Back Light	2CCFL Back Light		
Display Size	5.7	"	7.5"	10.4"		
W x H (mm)	(118.2		(158.0 x118.0)	(215.2 x 162.4)		
Viewing Area	(110.2	× 09.4j	(130.0 ×110.0)	(213.2 × 102.4)		
Auxiliary Keys (Touch screen	User defined key *4		User defined key *5	User defined key *6		
width)			"			
Touch Panel Size	6.4		8.2"	11.0"		
RTC			uilt-in			
Lithium Battery			2032 x 1			
Buzzer			85dB	1		
Power			DC +24V	DC +24V		
Consumption	DC +24V (-10%~·	+20%)/ 7.2W max	· /	(-10%~+20%)/15W		
•			max max			
Cooling Method			air circulation			
Water Proof			EMA4			
Operating Temp.	0°℃ to 50°℃					
Storage Temp.	-20℃ to +60℃					
<b>Ambient Humidity</b>	10% ~ 90% RH					
	IEC61131-2 compliant					
Vibration			: 10Hz-57Hz 0.0075r			
Resistance	When vibration is continuous: 10Hz-57Hz 0.0035mm, 57Hz-150Hz 0.5G					
	X, Y, Z directions for 10 times					
(W) x (H) x (D) mm						
External	184.1 x 14	4.1 x 46.9	243.1 x 178.1 x 47	297.1 x 222 x 51.1		
Dimensions						
Weight	65	0g	950g	1420g		

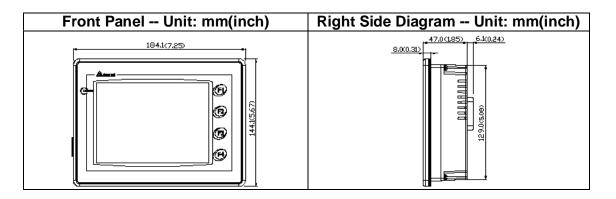
**%** compatible with general Expansion Memory Card (4M~128M) on the market

# **A-2 Dimension**



Vertical View -- Unit: mm(inch)

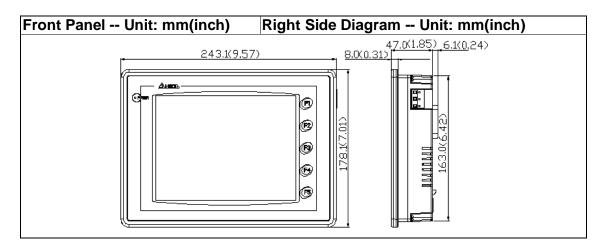




#### ■ DOPA75CSTD

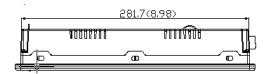
Vertical View -- Unit: mm(inch)

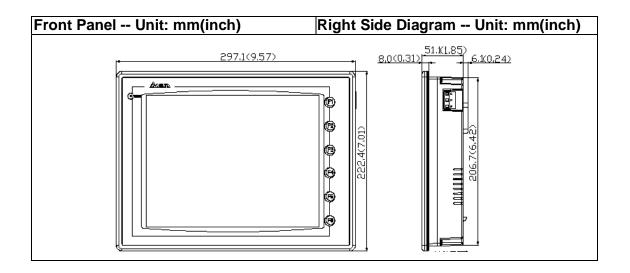
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#### ■ DOP-A10TCTD

Vertical View -- Unit: mm(inch)





# A-3 Profile

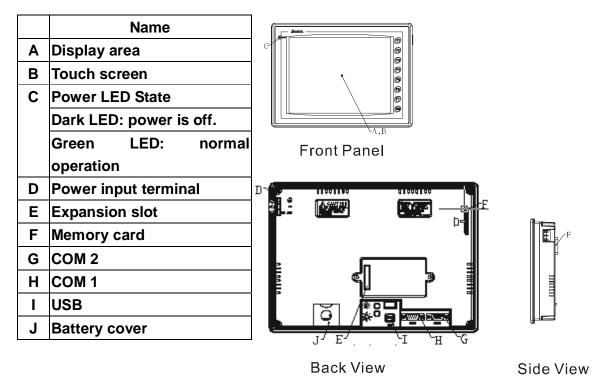
DOP-A57G (C) STD

Α	Display area	
В	Touch screen	
С	Power LED State	
	Dark LED: power is off.	
	Green LED: normal operation	
D	Power input terminal	Front Panel
Е	Expansion slot	
F	Memory card	
G	COM 2	
Н	COM 1	
I	USB	
		Back View Side View

#### DOP-A75CSTD

	Name	
Α	Display area	
В	Touch screen	
С	Power LED State	
	Dark LED: power is off	$\chi_{\Lambda,B}$
	Green LED: normal	Front Panel
	operation	
D	Power input terminal	
Ε	Expansion slot	
F	Memory card	
G	COM 2	
Н	COM 1	Back View Side View
Ι	USB	

#### DOP-A10TCTD

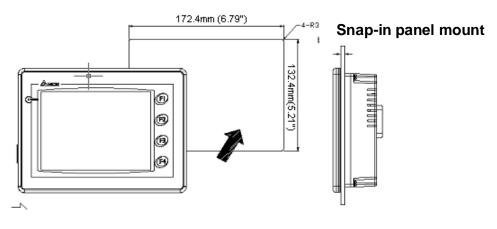


# A-4 Cutout dimension

5.7":172.4mm (6.79") +1mm (0.04") and 132.4mm (5.21")+1mm (0.04") unit: mm

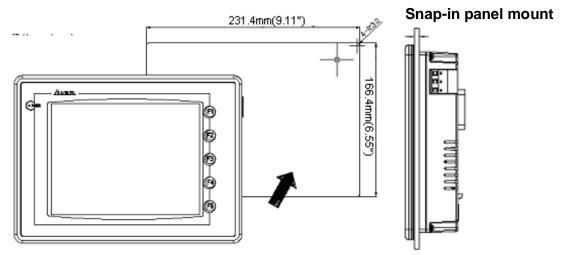
#### (inch)

Panel thickness: 1.6mm (0.06in)~5.0mm (0.20in)

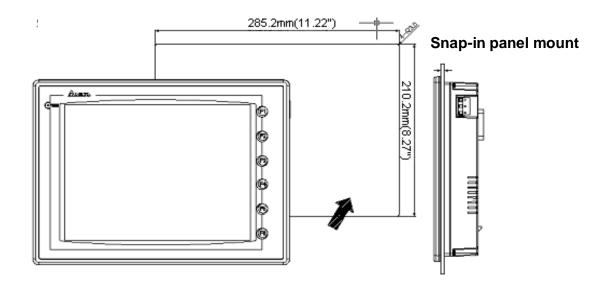


7.5": 231.4mm (9.11")+1mm (0.04") and 166.4mm (6.55")+1mm (0.04") unit: mm (in.)

#### Panel thickness: 1.6mm (0.06in)~5.0mm (0.20in)



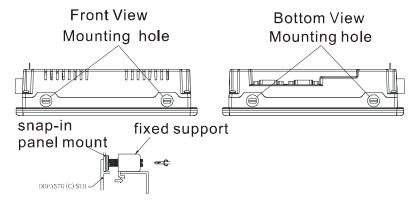
10.4": 285.2mm (11.22")+1mm (0.04") and 210.2mm (8.27")+1mm (0.04") Panel thickness: 1.6mm (0.06in)~5.0mm (0.20in)



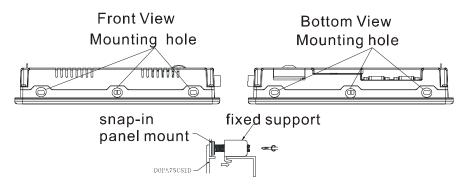
# A-5 Installation

*CAUTION!* If you turn the screw exceeds torque: 0.5N.M, plastic box may be damaged.

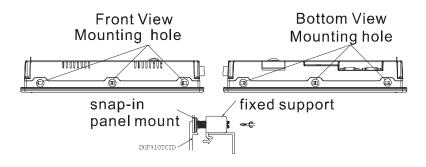
#### 5.7" Panel (DOP-A57GSTD, DOP-A57CSTD)



#### 7.5" Panel (DOP-A75CSTD)



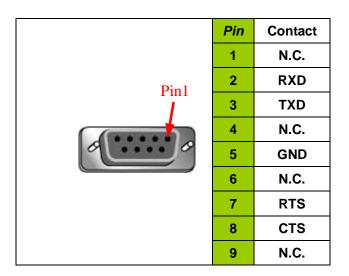
#### 10.4" Panel (DOP-A10TCTD)



# Appendix B Communication

# B-1 Pin definition of serial communication

COM1



COM<sub>2</sub>

	Pin	MODE1	MODE2	MODE3
	PIII	RS-232	RS-422	RS-485
	1	N.C.	RXD-	D-
Pin1	2	RXD	RXD+	D+
	3	TXD	TXD+	D+
	4	N.C.	TXD-	D-
	5	GND	GND	GND
	6	N.C.	RTS-	N.C.
	7	RTS	RTS+	N.C.
	8	CTS	CTS+	N.C.
	9	N.C.	CTS-	N.C.

Note:

- ▲ Mode 3 is for RS-485. Pin 2&3 are D+ and pin 1&4 are D-\_
- It is recommended to have great grounding when using RS-485 & RS-422 for long transmission.
- DO NOT connect Frame Ground (FGND) to GND. Please connect FGND to the outer covering of connector.
- There are relations among transfer rate, distance and baud rate.

# B-2 Cable for download

The cable header used to connect DOP series is 9-pin D-SUB male.



Refer following cable header and jumper for connecting to each device.

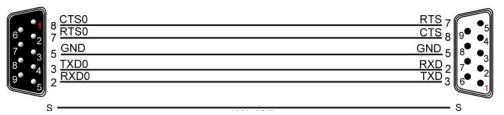
<u>RS-232</u>

DOP series 9 pin D-SUB male (RS-232)	PC 9 pin D-SUB female (RS-232)	PC 9 pin D-SUB female (RS-232)
RXD (2)	(3) TXD	Pin1
TXD (3)	——(2) RXD	Ĩ
GND (5) ——	(5) GND	0 0
RTS (7)	(8) CTS	
CTS (8)	——(7) RTS	



D-SUB 9pin to DOP series(male)

D-SUB 9pin to PC(female)

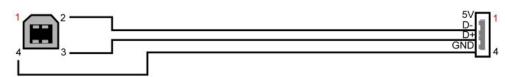


Grounding + Shielding Fig. RS232 TO PC



#### **USB TYPE B to DOP series**

**USB TYPE A to PC** 





# B-3 Communication setting and wiring between HMI and supported controller

ltem	Controller
Delta	<u>Delta Controller</u> For Servo/Inverter/Temperature Controller/PLC (984 RTU mode / ASCII mode)
	DVP PLC
Allen Bradley	<u>MicroLogix</u> PLC
Facon	Facon PLC
Festo	Festo PLC
Hust	HUST_CNC
Коуо	<u>SU/DL</u> Series
LG	Master- <u>K120S</u> /200S
LI YAN	LYPLC EX
Matsushita	FP Series
Mirle	FAMA SC
Mitsubishi	<u>FX / FX2N</u>
Modbus	Modbus (Master) 984 RTU / ASCII mode
Modbus	<u>Modbus (Slave)</u> 984 RTU / ASCII mode
Modicon	TSX Micro
Omron	<u>Omron C</u> Series
0.5	<u>S7 200</u>
Siemens	S7-300 (with PC Adapter)

Item	Controller
Taian	<u>TP02</u>
Yokogawa	ACE PLC

# **Delta Controller**

#### A. HMI factory setting

Baud rate: ASCII: 9600, 7, None, 2.

RTU: 9600, 8. None, 2

Controller station number: 1.

Control area/state area: None.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Pagistar type	Dovice Name	Format	Read/Write range		Data
Register type	<u>Device Name</u>	Format	Word No.	Bit No.	length
Servo communication address	0x00	SERVO-n	n: 0-0600h	0	Word
Inverter communication address	0x01	INVERTER-n	n: 0-2199h	0	Word
TCntrl communication address	0x02	TEMP_CTRL-n	n: 4700h-4800h	0	Word
WORD_DEVICE_X	0x03	PLC_Xn	n: 0-360(octal)	0	Word
WORD_DEVICE_Y	0x04	PLC_Yn	n: 0-360(octal)	0	Word
WORD_DEVICE_M	0x05	PLC_Mn	n: 0-1520,	0	Word
			1536-4080	0	Word
WORD_DEVICE_S	0x06	PLC_Sn	n: 0-1008	0	Word
WORD_DEVICE_T	0x07	PLC_Tn	n: 0-255	0	Word
WORD_DEVICE_C	0x08	PLC_Cn	n: 0-127	0	Word
WORD_DEVICE_D	0x09	PLC_Dn	n: 0-4095,	0	Word
			4096-9999	0	Word
WORD_DEVICE_HC	0x0A	PLC_Cn	n: 232-255	0	Double Word

Note:

A. Above addresses is hexadecimal system. (SERVO: 0-0600, INVERTER: 0-2199, TCNTRL (Temperature controller): 4700-4800.)

B. WORD\_DEVICE\_X/WORD\_DEVICE\_Y/WORD\_DEVICE\_M/WORD\_DEVICE\_S: data length must be 0 or the multiple of 16.

#### 2. Contacts

	Devic		Read/W	rite range
Contact type	e Name	Format	Word No.	<u>Bit No.</u>
Servo communication address	0x80	SERVO-n.b	n: 0-0600h	b: 0-f
Inverter communication address	0x81	INVERTER-n.b	n: 0-2199h	b: 0-f
TCntrl communication	0x82	TEMP_CTRL-n.	n:	b: 0-f
address		b	4700h-4800h	
Servo Digital Input	0x83	SERVO_DI-n	0	n: 1-8
Servo Digital Output	0x84	SERVO_DO-n	0	n: 1-5
PLC X	0x85	PLC_Xn	0	n: 0-377(octal)
PLC Y	0x86	PLC_Yn	0	n: 0-377(octal)
PLC M	0x87	PLC_Mn	0	n: 0-1535
			0	1536-4095
PLC S	0x88	PLC_Sn	0	n: 0-1023
PLC T	0x89	PLC_Tn	0	n: 0-255
PLC C	0x8A	PLC_Cn	0	n: 0-127

Above addresses is hexadecimal system. (SERVO: 0-0600, INVERTER: 0-2199,

TCNTRL(Temperature controller): 4700-4800.)

DI and DO are only for Servo.

Note:

1. For Delta Inverter:

It needs to set communication address for HMI read/write address setting. (hexadecimal system for HMI)

Example 1: in Delta VFD-S type parameter 5-00 1<sup>st</sup> step speed frequency. You need to set INVERTER500 in HMI. (5 is converted to 05 (hexadecimal) and 00 is converted to 00 (hexadecimal). Therefore, you should set INVERTER500 to HMI with discarding the first 0).

Example 2: if you want to set parameter 8-17 (lower bound of DC braking startup frequency of Delta VFD-S type, you should set INVERTER811 in HMI). (8 is converted to 08 (hexadecimal) and 17 is converted to 11 (hexadecimal). Therefore, you should set INVERTER811 to HMI with discarding the first 0)

- 2. For Delta Servo / Delta Temperature Controller:
  - a. HMI Read/Write address setting: you only need to input communication address in SERVO user manual.
  - b. DI and DO are only for Servo.
- **C. Controller Wiring**
- Delta Servo

# RS-232

DOP Series 9 pin D-SUB male (RS-232)	Controller CN3 male (RS-232)	Controller CN3 male (RS-232)
RXD (2)	(2) TX	
TXD (3)	——(4) RX	
GND (5)	(1) GND	Top View

#### **RS-422**

DOP Series 9 pin D-SUB male (RS-422)	Controller CN3 male (RS-422)	Controller CN3 male (RS-422)
RXD+ (2)	(5) TX+	
RXD- (1)——	(6) TX-	
TXD+ (3)	(3) RX+	2 4 6/ Top View
TXD- (4) —	(4) RX-	

#### <u>RS-485</u>

DOP Series	Controller	Controller
9 pin D-SUB male (RS-485)	CN3 male (RS-485)	CN3 male (RS-485)
RXD+ (2) TXD- (3) RXD- (1) TXD- (4)	(3) 485+ (5) 485- (4) 485+ (6) 485- (	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

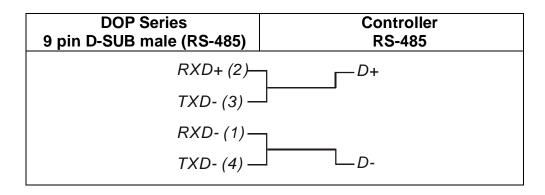
#### Delta Inverter

#### **RS-485**

DOP Series 9 pin D-SUB male (RS-485)	Controller RJ-11 (RS-485)	Controller RJ-11 (RS-485)	
RXD+ (2) TXD- (3)	<i>(4)</i> SG+	1 +EV 2 GND 3 SG- 1-6 4 SG+ Top View	
RXD- (1) TXD- (4)	(3) SG-	Pin 1 and 2 are the power sources for the optional keypad and should not be used while using RS-485 communication.	

#### Temperature Controller

#### <u>RS-485</u>



#### Delta\_PLC

#### A. HMI factory settings

Baud rate: 9600, 7, Even, 2.

Controller station number: 1.

Control area/state area: D0 / D10.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

0						
Register type	<b>Device</b>	Format	Format Read/write range		Communication	
Register type	<u>Name</u>	Format	Word No.	<u>Bit No.</u>	-Base address	
X_Data	0x00	Xn	n: 0-360(octal)	None	0x0400 (W)	
Y_Data	0x01	Yn	n: 0-360(octal)	None	0x0500 (W)	
M_Data	0x02	Mn	n: 0-1520,	None	0x0800 (W)	
			1536-4080		0xB000 (W)	
S_Data	0x03	Sn	n: 0-1008	None	0x0000 (W)	
T_Register	0x04	Tn	n: 0-255	None	0x0600 (W)	
C_Register	0x05	Cn	n: 0-127	None	0x0E00 (W)	
D_Register	0x06	Dn	n: 0-4095,	None	0x1000 (W)	
			4096-9999		0x9000	
HC_Register	0x07	Cn	n: 232-255	None	0x0E00 (DW)	

Note: a. (W) is "Word".

b. (DW) is "Double Word".

c. X\_Data / Y\_Data / M\_Data / S\_Data: it must be 0 or the multiple of 16.

2. Contacts

Contact type	Device	Format	Read/write range		Communication
Contact type	Name	1 onnat	<u>Word No.</u>	Bit No.	-Base address
X_Data	0x80	Xn	None	n: 0-377(octal)	0x0400 (W)
Y_Data	0x81	Yn	None	n: 0-377(octal)	0x0500 (W)
M_Data	0x82	Mn	None	n: 0-1520,	0x0800 (W)
				1536-4080	0xB000 (W)

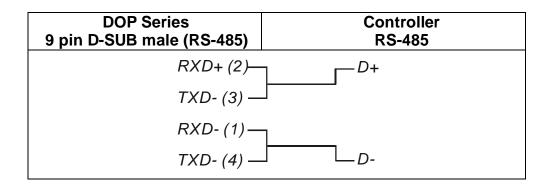
Contact turns	Device	Format	Read/w	rite range	Communication
Contact type	Name	Format	Word No.	Bit No.	-Base address
S_Data	0x83	Sn	None	n: 0-1023	
T_Coil	0x84	Tn	None	n: 0-255	
C_Coil	0x85	Cn	None	n: 0-255	

#### **C.** Controller Wiring

#### <u>RS-232</u>

DOP Series 9 pin D-SUB male (RS-232)	Controller 8 pin Mini DIN male (RS-232)	Controller 8 pin Mini DIN male (RS-232)
RXD (2)	(5) TXD	
TXD (3)	——(4) RXD	
GND (5)	(8) GND	Top View

#### **RS-485**



# AllenBradley--MicroLogixPLC

#### A. HMI factory setting

Baud rate: 19200, 8, none, 1.

PLC station number: 1.

Control area/state area: B3:0/B3:10.

- **B.** Definition of controller Read/Write address
- 1. Registers

#### DELTA

			Read/write range			
Register type	<b>Device</b>	Format		Bit No.		
Register type	<u>Name</u>	Format	Word No.	Low Byte	(High Byte,	
					File No.)	
Output file	0x40	O:n	n: 0-3	0	0	
Input file	0x41	l:n	n: 0-3	0	1	
Status file	0x42	S2:n	n: 0-65	0	2	
Bit file	0x43	B3:n	n: 0-255	0	3	
Timer flag	0x44	T4:n	n: 0-255	0	4	
Timer Preset Value	0x45	T4:n.PRE	n: 0-255	0	4	
Timer Accumulator	0×46	TAIN ACC	m. 0.955	0	4	
Value	0x46	T4:n.ACC	n: 0-255	U	4	
Counter flag	0x47	C5:n	n: 0-255	0	5	
Counter Preset	0x48	C5:n.PRE	n: 0-255	0	5	
Value				U	5	
Counter	0x49	C5:n.ACC	n: 0-255	0	5	
Accumulator Value	0249	C5.11.ACC	II. 0-255	U	5	
Control file	0x4A	R6:n	n: 0-255	0	6	
Control Size of Bit	0x4B	R6:n.LEN	n: 0-255	0	6	
Array	VX4D	RO.II.LEN	11. 0-255	U	Ö	
Control Reserved	0x4C	R6:n.POS	n: 0-255	0	6	
file				U	Ö	
Integer file	0x4D	N7:n	n: 0-255	0	7	

Data Size: Word.

T4, C5 and R6 only read 1 word once.

<u>If reading multiple WORDs once, the communication speed of PLC will be slowly.</u> Note: If last communication data has memorized by PLC(PLC will inquire 0x10 0x05 continuously), communication may be fail. At this time, power off and power up HMI or power off and power up PLC once.

#### 2. Contacts

			Read/write range			
Contact Type	Device	Format		Bit	<u>No.</u>	
	Name	Format	Word No.	LowByte	HighByte	
				Bits	File No.	
Output	0xC0	O:n/b	n: 0-3	b: 0-15	0	
Input	0xC1	l:n/b	n: 0-3	b: 0-15	1	
Status	0xC2	S2:n/b	n: 0-65	b: 0-15	2	
Bit	0xC3	B3:n/b	n: 0-255	b: 0-15	3	
Timer	0xC4	T4:n/b	n: 0-255	b: 0-15	4	
		T4:n/EN	n: 0-255	15		
		T4:n/TT	n: 0-255	14		

			Rea	d/write rar	nge
Contract Turne	Device	Format		Bit No.	
Contact Type	Name	Format	Word No.	LowByte	HighByte
				Bits	File No.
		T4:n/DN	n: 0-255	13	
Timer Preset Value	0xC5	T4:n.PRE/b	n: 0-255	b: 0-15	4
Timer Accumulator Value	0xC6	T4:n.ACC/b	n: 0-255	b: 0-15	4
Counter flag	0xC7	C5:n/b	n: 0-255	b: 0-15	5
		C5:n/CU	n: 0-255	15	
		C5:n/CD	n: 0-255	14	
		C5:n/DN	n: 0-255	13	
		C5:n/OV	n: 0-255	12	
		C5:n/UN	n: 0-255	11	
		C5:n/UA	n: 0-255	10	
Counter Preset Value	0xC8	C5:n.PRE/b	n: 0-255	b: 0-15	5
Counter Accumulator Value	0xC9	C5:n.ACC/b	n: 0-255	b: 0-15	5
Control	0xCA	R6:n/b	n: 0-255	b: 0-15	6
		R6:n/EN	n: 0-255	15	
		R6:n/DN	n: 0-255	13	
		R6:n/ER	n: 0-255	11	
		R6:n/UL	n: 0-255	10	
		R6:n/IN	n: 0-255	9	
		R6:n/FD	n: 0-255	8	
Control Size of Bit Array	0xCB	R6:n.LEN/b	n: 0-255	b: 0-15	6
Control Reserved	0xCC	R6:n.POS/b	n: 0-255	b: 0-15	6
Integer	0xCD	N7:n/b	n: 0-255	b: 0-15	7

# <u>Bit No</u> :

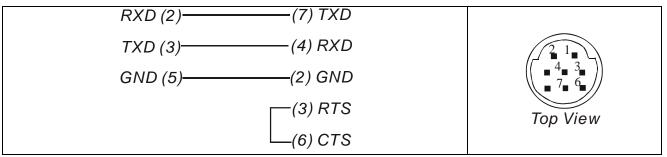
Low byte stores bit address.

High byte stores file number.

# 3. Controller Wiring

# <u>RS232</u>

DOP Series	Controller	Controller	
9 pin D-SUB male (RS-232)	8 pin Mini DIN male	8 pin Mini DIN male	
	(RS-232)	(RS-232)	



DELTA

# Facon PLC

A. HMI factory settings

Baud rate: 9600, 7, Even, 1. Controller Station number: 1. Control area/state area: R0 / R10.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	Device	Format	Read/writ	Data longth	
Register type	<u>Name</u>	Format	Word No.	Bit No.	<ul> <li>Data length</li> </ul>
Input Relay	0x00	WXn	n: 0-9992	None	Byte
Output Relay	0x01	WYn	n: 0-9992	None	Byte
Internal Relay	0x02	WMn	n: 0-9992	None	Byte
Step Relay	0x03	WSn	n: 0-9992	None	Byte
Data Register	0x04	Rn	n: 0-65534	None	Word
Data Register	0x05	Dn	n: 0-65534	None	Word
Timer Present Value	0x06	RTn	n: 0-9999	None	Word
Counter Present Value	0x07	RCn	n: 0-9999	None	Word
Data Register	0x08	DRCn	n: 200-255	None	Double Word

Input Relay / Output Relay / Internal Relay / Special Relay: it must be the multiple of 8.

#### 2. Contacts

Contact type	Device	Device Format		Read/write range		
	Name	Format	Word No.	Bit No.		
Input Relay	0x80	Xn	None	n: 0-9999		
Output Relay	0x81	Yn	None	n: 0-9999		
Internal Relay	0x82	Mn	None	n: 0-9999		
Step Relay	0x83	Sn	None	n: 0-9999		
Timer Flag	0x84	Tn	None	n: 0-9999		
Counter Flag	0x85	Cn	None	n: 0-9999		

C. Controller wiring

<u>RS-232</u>

DOP Series 9 pin D-SUB male (RS-232)	Controller 15 pin male (RS-232)	Controller 15 pin male (RS-232)
RXD (2)	——(2) TXD	
TXD (3)	——(1) RXD	6 21
GND (5)	(6) SG	14 13
	(3) RTS	Top View
	(4) CTS	

### **Festo PLC**

<u>DELTA</u>

#### A. HMI factory settings

Baud rate: 9600, 7, Even, 1.

Controller Station number: 0. (no PLC station number in protocol)

Control area/state area: R0 / R10.

Note: 1. Communication port of PLC: COM port

2. It needs to use the specific cable of FESTO (the cable for transfer TTL to RS232) (FC34)

#### **B.** Definition of controller Read/Write address

1. Registers

Register type	Format	Word No.	<u>Bit No.</u>	Data Size
WORD_DEVICE_IW	IWn	n: 0-255	None	Word
WORD_DEVICE_OW	OWn	n: 0-255	None	Word
WORD_DEVICE_FW	FWn	n: 0-9999	None	Word
WORD_DEVICE_TW	TWn	n: 0-255	None	Word
WORD_DEVICE_CW	CWn	n: 0-255	None	Word
WORD_DEVICE_R	Rn	n: 0-255	None	Word
WORD_DEVICE_TP	TPn	n: 0-255	None	Word
WORD_DEVICE_CP	CPn	n: 0-255	None	Word

#### 2. Contacts

Register type	Format	<u>Word No.</u>	<u>Bit No.</u>
BIT_DEVICE_I	ln.b	n: 0-255	b: 0-15
BIT_DEVICE_O	On.b	n: 0-255	b: 0-15
BIT_DEVICE_F	Fn.b	n: 0-9999	b: 0-15
BIT_DEVICE_T	Tn	None	n: 0-255
BIT_DEVICE_C	Cn	None	n: 0-255
BIT_DEVICE_TON	TONn	None	n: 0-255
BIT_DEVICE_TOFF	TOFFn	None	n: 0-255

BIT\_DEVICE\_T / BIT\_DEVICE\_C / BIT\_DEVICE\_TON / BIT\_DEVICE\_TOFF: Only 1 BIT for each communication.

Only 1 BIT or 1 WORD for read/write (each communication).

#### C. Controller wiring

It needs to use the specific cable of FESTO (the cable for transfer TTL to RS232 and it is 6 pin at PLC side) (FC34)

### **HUST CNC**

A. HMI factory settings

Baud rate: 9600, 7, EVEN, 2. Controller station number: 0. Control area/state area: W0 / W10.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	<u>Device</u>	Format	Read/wri	Read/write range Communicat		Data
Register type	<u>Name</u>	Tonnac	Word No. Bit Noba		-base address	Length
Word Register	0x00	Wn	n: 0-13500	None	0	Word
Double Word Register	0x01	Dn	n: 0-13500	None	0	Double Word

Note: the unit for Hust CNC is Dword and Wn is the low word of Dn.

#### 2. Contacts

DELTA

Contact type	Device	Format			Communication
Contact type	Name	Format	Word No.	<u>Bit No.</u>	-base address
BIT_DEVICE_B	0x80	Bm.n	m: 0-13500	n: 0-31	0
BIT_DEVICE_I	0x81	In	None	n: 0-255 (8 DW)	10800
BIT_DEVICE_O	0x82	On	None	n: 0-255 (8 DW)	10808
BIT_DEVICE_C	0x83	Cn	None	n: 0-255 (8 DW)	10816
BIT_DEVICE_S	0x84	Sn	None	n: 0-255 (8 DW)	10824
BIT_DEVICE_A	0x85	An	None	n: 0-1023 (32 DW)	10832

### C. Controller wiring

#### **RS-232**

DOP Series 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)
RXD (2)	(2) TXD	Pin1+
TXD (3)	(3) RXD	
GND (5)	(5) SG	C
	(8) RTS	Top View
	(7) CTS	

# Koyo SU/DL Series

A. HMI factory settings

Baud rate: 9600, 8, ODD, 1.

Controller station number: 1.

Control area/state area: V1400 / V1410.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Pogistor typo	Format	Read/write range			Data
Register type Format			Word No.	Bit No.	Length
Timer Accumulated	Vn	n:	0 ~ 177 (octal)	0	Word
Counter Accumulated	Vn	n:	1000 ~ 1177 (octal)	0	Word
V Memory	Vn	n:	1400 ~ 7777 (octal)	0	Word

#### <u>DELTA</u>

Register type Forma		Read/write rang	Data	
Register type	Format	Word No.	Bit No.	Length
Linker Relays	Vn	n: 40000 ~ 40037 (octal)	0	Word
Input Status	Vn	n: 40400 ~ 40423 (octal)	0	Word
Output Status	Vn	n: 40500 ~ 40523 (octal)	0	Word
Control Relays	Vn	n: 40600 ~ 40635 (octal)	0	Word
Stage	Vn	n: 41000 ~ 41027 (octal)	0	Word
Timer Status	Vn	n: 41100 ~ 41107 (octal)	0	Word
Counter Status	Vn	n: 41140 ~ 41147 (octal)	0	Word
Spec. Relay 1	Vn	n: 41200 ~ 41205 (octal)	0	Word
Spec. Relay 2	Vn	n: 41216 ~ 41230 (octal)	0	Word

2. Contacts

Contact type	Format	Read/write range		
Contact type	Format	Word No.	Bit No.	
Linker Relays	GXn	0	n: 0 ~ 777 (octal)	
Input Status	Xn	0	n: 0 ~ 477 (octal)	
Output Status	Yn	0	n: 0 ~ 477 (octal)	
Control Relays	Cn	0	n: 0 ~ 737 (octal)	
Stage	Sn	0	n: 0 ~ 577 (octal)	
Timer Status	Tn	0	n: 0 ~ 177 (octal)	
Counter Status	CTn	0	n: 0 ~ 177 (octal)	
Spec. Relay 1	SPn	0	n: 0 ~ 137 (octal)	
Spec. Relay 2	SPn	0	n: 320 ~ 617 (octal)	

C. Controller wiring

RS-232

DOP 9 pin D-SUB male (RS-232)	Controller RJ-11 (RS-232)	Controller
RXD(2) TXD(3) GND(5)		ریس ۱-6 Top View

# LG Master K120S/200S

#### <u>DELTA</u>

#### A. HMI factory settings

Baud rate: 38400, 8, None, 1.

Controller station number: 0.

(Note: it can't designate PLC station, only one PLC can be communicated) Control area/state area: DT0 / DT10.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	Format	Word No.	Bit No.	Data Size
WORD_DEVICE_PW	PWn	n: 0-15	None	Word
WORD_DEVICE_MW	MWn	n: 0-191	None	Word
WORD_DEVICE_KW	KWn	n: 0-31	None	Word
WORD_DEVICE_LW	LWn	n: 0-63	None	Word
WORD_DEVICE_FW	FWn	n: 0-63	None	Word
WORD_DEVICE_TW	TWn	n: 0-255	None	Word
WORD_DEVICE_CW	CWn	n: 0-255	None	Word
WORD_DEVICE_DW	DWn	n: 0-9999	None	Word

#### 2. Contacts

Contact type	Format	Word No.	<u>Bit No.</u>
BIT_DEVICE_P	Pnb	n: 0-15	b: 0-f
BIT_DEVICE_M	Mnb	n: 0-191	b: 0-f

BIT_DEVICE_K	Knb	n: 0-31	b: 0-f
BIT_DEVICE_L	Lnb	n: 0-63	b: 0-f
BIT_DEVICE_F	Fnb	n: 0-63	b: 0-f
BIT_DEVICE_T	Tn	None	n: 0-255
BIT_DEVICE_C	Cn	None	n: 0-255

# D. Controller wiring

# RS-232

DOP 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232 for LG K120S/200S)	Controller
RXD (2)	(3) TXD	Pin1.
TXD (3)	(2) RXD	
GND (5)	(5) GND	
		Top View

# LIYAN LYPLC EX

A. HMI factory settings

Baud rate: 9600, 7, EVEN, 1. Controller station number: 0. Control area/state area: D0 / D10.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	Format	Read/write	Data length	
Register type	Format	Word No.	Bit No.	Data length
Auxiliary Relay	Mn	n: 0-3064	None	Byte
Special Auxiliary Relay	Mn	n: 8000-8248	None	Byte
Status Relay	Sn	n: 0-992	None	Byte
Input Relay	Xn	n: 0-360(octal)	None	Byte
Output Relay	Yn	n: 0-360(octal)	None	Byte
Timer PV	Tn	n: 0-255	None	Word

<u>DELTA</u>

Pogistor type	Format	Read/writ	Data longth	
Register type	Format	Word No.	<u>Bit No.</u>	Data length
16-bit Counter PV	Cn	n: 0-199	None	Word
32-bit Counter PV	Cn	n: 200-255	None	Double Word
Data Register	Dn	n: 0-7999	None	Word
Special Data Register	Dn	n: 8000-8255	None	Word

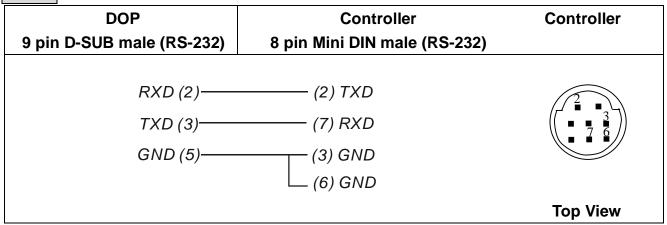
Auxiliary Relay / Special Auxiliary Relay / Status Relay / Input Relay / Output Relay: must be the multiple of 8.

#### 2. Contacts

Contact type	Format	Format Read/write rang	
Contact type	Format	Word No.	<u>Bit No.</u>
Auxiliary Relay	Mn	None	n: 0-3071
Special Auxiliary	Mn	None	n: 8000-8255
Relay			
Status Relay	Sn	None	n: 0-999
Input Relay	Xn	None	n: 0-377(octal)
Output Relay	Yn	None	n: 0-377(octal)
Timer Flag	Tn	None	n: 0-255
Counter Flag	Cn	None	n: 0-255

# C. Controller wiring

#### **RS-232**



# Matsushita FP PLC

A. HMI factory settings

Baud rate: 9600, 8, ODD, 1.

Controller station number: 238.

Control area/state area: DT0 / DT10.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	Device	Format	Read/writ	Data longth	
Register type	<u>Name</u>	Format	Word No.	Bit No.	Data length
Internal Relay	0x00	WRn	n: 0-875,	None	Word
Special Internal Relay			900-910		
Link Relay	0x01	WLn	n: 0-639	None	Word
External Input Relay	0x02	WXn	n: 0-255	None	Word
External Output Relay	0x03	WYn	n: 0-255	None	Word
Timer/Counter P.V.	0x04	EVn	n: 0-2047	None	Word
Timer/Counter S.V.	0x05	SVn	n: 0-2047	None	Word
Data Register	0x06	DTn	n: 0-10239	None	Word
Link Data Register	0x07	LDn	n: 0-8447	None	Word
File Register	0x08	FLn	n: 0-32764	None	Word

#### 3. Contacts

Contact type	Device	Format	Read/write range		
contact type	Name	Format	Word No.	Bit No.	
Internal Relay	0x80	Rnb	n: 0-875	b: 0-f	
Special Internal			n: 900-910	b: 0-f	
Relay					
Link Relay	0x81	Lnb	n: 0-639	b: 0-f	
External Input Relay	0x82	Xnb	n: 0-255	b: 0-f	
External Output	0x83	Ynb	n: 0-255	b: 0-f	
Relay	UXOS				
Timer Flag Contact	0x84	Tn	None	n: 0-2047	
Counter Flag Contact	0x85	Cn	None	n: 0-2047	

#### C. Controller wiring

<u>RS-232</u>

DOP Series 9 pin D-SUB male (RS-232)	Controller 5 pin Mini DIN male (RS-232 for FP0)	Controller 5 pin Mini DIN male
RXD (2) TXD (3) GND (5)	——(3) RXD	Top View

<u>RS-232</u>

DOP Series 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232 for FP1)	Controller 9 pin D-SUB male
RXD (2)	(2) TXD	Pinl*
TXD (3)	(3) RXD	
GND (5)	(7) GND	
	(4) RTS	Top View
	(5) CTS	

# Mirle FAMA SC

A. HMI factory settings

Baud rate: 9600, 7, EVEN, 1.

Controller station number: 0.

Control area/state area: 40100 / 40200.

#### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	Device	Format	Read/write range		Data Length
Register type	<u>Name</u>	Format	Word No.	Bit No.	
Output Registers	0x00	Wn	n: 40001-50000	None	Word
Input Registers	0x01	Wn	n: 30001-40000	None	Word

Input Registers is "read only".

# DELTA

#### 2. Contacts

Contact type	Device	Format	Read/write range	
Contact type	Name	Format	Word No.	Bit No.
Discrete Outputs	0x80	Bn	None	n: 1-10000
Discrete Inputs	0x81	Bn	None	n: 10001-20000

Discrete Inputs is "read only".

#### C. Controller wiring

# <u>RS-232</u>

DOP Series 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)
RXD (2) TXD (3) GND (5)	——(2) RXD	Pinl.

# Mitsubish FX/FX2N PLC

A. HMI factory settings

Baud rate: 9600, 7, EVEN, 1. Controller station number: 0. Control area/state area: D0 / D10.

### **B.** Definition of controller Read/Write address

#### 1. Registers

Register type	<b>Device</b>	Format	Read/write	e range	Data length
Register type	<u>Name</u>	Format	Word No.	<u>Bit No.</u>	Data length
Auxiliary Relay	0x00	Mn	n: 0-3064	None	Byte
Special Auxiliary	0x01	Mn	n: 8000-8248	None	Byte
Relay					
Status Relay	0x02	Sn	n: 0-992	None	Byte
Input Relay	0x03	Xn	n: 0-360(octal)	None	Byte
Output Relay	0x04	Yn	n: 0-360(octal)	None	Byte
Timer PV	0x05	Tn	n: 0-255	None	Word
16-bit Counter PV	0x06	Cn	n: 0-199	None	Word
32-bit Counter PV	0x07	Cn	n: 200-255	None	Double
					Word
Data Register	0x08	Dn	n: 0-7999	None	Word
Special Data Register	0x09	Dn	n: 8000-8255	None	Word

DELTA

Auxiliary Relay / Special Auxiliary Relay / Status Relay / Input Relay / Output Relay: it must be the multiple of 8.

2. Contacts

Contact type	Device	Format	Read/write range_	
	Name	Format	Word No.	Bit No.
Auxiliary Relay	0x80	Mn	None	n: 0-3071
Special Auxiliary	0x81	Mn	None	n: 8000-8255
Relay				
Status Relay	0x82	Sn	None	n: 0-999
Input Relay	0x83	Xn	None	n: 0-377(octal)
Output Relay	0x84	Yn	None	n: 0-377(octal)
Timer Flag	0x85	Tn	None	n: 0-255
Counter Flag	0x86	Cn	None	n: 0-255

#### **C.** Controller Wiring

#### **RS-422**

DOP Series 9 pin D-SUB male (RS-422)	Controller 8pin Mini DIN male (RS-422)	Controller 8pin Mini DIN male (RS-422)
RXD+ (2)	(7) TXD+	
RXD- (1)	(4) TXD-	
TXD+ (3)	(2) RXD+	
TXD- (4)	——(1) RXD-	Top View
GND (5)	(3) SG	

## Modbus(Master) --- 984 RTU / ASCII mode

#### DELTA

#### A. HMI factory settings

Baud rate: 9600, 7, EVEN, 1. Controller station number: 0. Control area/state area: 40100 / 40200.

#### B. Definition of controller Read/Write address

#### 1. Registers

Register typeDevice Name	Device	Format	Read/write range		Data length
	Format	<u>Word No.</u>	<u>Bit No.</u>		
Output Registers	0x00	Wn	n: 40001-50000	None	Word
Input Registers	0x01	Wn	n: 30001-40000	None	Word

Input Registers is "read only".

2. Contacts

Contact type	Device	Format	Read/write range_	
	Name	Format	<u>Word No.</u>	<u>Bit No.</u>
Discrete Outputs	0x80	Bn	None	n: 1-10000
Discrete Inputs	0x81	Bn	None	n: 10001-20000

Discrete Inputs is "read only".

C. Controller Wiring: Refer to B-1 for detail.

# Modbus(Slave) --- 984 RTU / ASCII mode

# <u>DELTA</u>

A. HMI factory settings

Baud rate: 9600, 7, EVEN, 1. (ASCII)

9600, 8, EVEN, 1. (RTU)

Controller station number: 0. (no function)

Control area/state area: W40100 / 40200.

Note: 1. HMI station number is Slave station number. (default is 0)

2. The relation between Modbus address and HMI internal registers.

Modbus address	Data definition in HMI
W40001 ~ W41024 🏻 ->	\$0 ~ \$1023
W42001 ~ W43024 🛛 ->	\$M0 ~ \$M1023
₩44001 →	RCPNO
₩45001 ~ →	RCP0 ~ RCPn
B00001 ~ B01024 💛	\$2000.0 ~ \$2063.15
B01025 ~ B02048 →	\$M200.0 ~ \$M263.15

- **B.** Definition of controller Read/Write address
  - 1. Registers

Register type	Format	Read/write r	Data length	
		Word No.	Bit No.	Data length
Output Registers	Wn	n: 40001-50000	None	Word

### 2.Contacts

Contact type	Format	Read/write range		
	Format	Word No.	Bit No.	
Discrete Outputs	Bn	None	n: 1-2048	

C. Controller Wiring: Refer to B-1 for detail.

# **Modicon TSX Micro**

### A. HMI factory settings

Baud rate: 9600, 8, ODD, 1.

Controller station number: 2.

Control area/state area: W0 / W10.

Note: 1. HMI station needs to adjust to 1-8.

- 2. PLC station and HMI station can be the same.
- 3. You should set internal memory and relative parameters at PLC first. Otherwise, it cannot communicate except %S.

### **B.** Definition of controller Read/Write address

1. Registers

Register type	Format	Word No.	<u>Bit No.</u>	Data Size
WORD_DEVICE_	%MWn	n: 0-65534	None	Word
Internal				
WORD_DEVICE_	%SWn	n: 0-127	None	Word
System				
WORD_DEVICE_ Input	%KWn	n: 0-65534	None	Word

%KWn: only read.

2. Contacts

Contact type	Format	Word No.	<u>Bit No.</u>
BIT_DEVICE_ Internal	%Mn:b	n:0-65534	b:0-15
BIT_DEVICE_ System	%Sn		n:0-127
BIT_DEVICE_ Internal1	%Mn		n:0-65534

%Mn: b is bit address that corresponds to WORD\_DEVICE\_ Internal (%MWn). %Mn is PLC internal relay address.

The read/write range of WORD\_DEVICE\_ Internal / BIT\_DEVICE\_ Internal depends on PLC used memory.

C. Controller Wiring: It needs to use specific cable of Modicon Uni-Telway. (RS232)

# **Omron C Series PLC**

A. HMI factory settings

Baud rate: 9600, 7, EVEN, 2. Controller station number: 0. Control area/state area: DM0 / DM10.

# **B.** Definition of controller Read/Write address

# 1. Registers

Register type	Device	Format	Read/wri	te range	Data length
Register type	<u>Name</u>	Format	Word No.	<u>Bit No.</u>	Data length
IR area	0x00	IRn	n: 0-511	None	Word
HR area	0x01	HRn	n: 0-99	None	Word
AR area	0x02	ARn	n: 0-27	None	Word
LR area	0x03	LRn	n: 0-63	None	Word
TC area	0x04	TCn	n: 0-511	None	Word
DM area	0x05	DMn	n: 0-6655	None	Word

### 2. Contacts

Contact type	Device	Format	Read/write range	
Contact type	Name	Format	Word No.	Bit No.
IR area	0x80	IRnb	n: 0-511	b: 00-15
HR area	0x81	HRnb	n: 0-99	b: 00-15
AR area	0x82	ARnb	n: 0-27	b: 00-15
LR area	0x83	LRnb	n: 0-63	b: 00-15
TC area	0x84	TCn	None	n: 0-511

### C. Controller Wiring

# <u>RS-232</u>

# 1:1 Host Link via RS-232C converter

DOP Series 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)
RXD (2)	(2) TXD	
TXD (3)	(3) RXD	Pin1+
GND (5)	(9) SG	0
	(4) RS	
	(5) CS	Top View

# Siemens S7 200 PLC

DELTA

### A. HMI factory settings

Baud rate: 9600, 8, EVEN, 1. Controller station number: 2. Control area/state area: VW0 / VW10.

- **B.** Definition of controller Read/Write address
  - 1. Register

<b>Decister</b> type	Device	Format	Read/wr	ite range	Communication
Register type	Name	Format	Word No.	Bit No.	-base address
Timer	0x00	Tn	n: 0-255	None	0x1F (Word)
Analog input word	0x01	AlWn	n: 0-30	None	0x06 (Byte)
Counter	0x02	Cn	n: 0-255	None	0x1E (Word)
Analog output word	0x03	AQWn	n: 0-30	None	0x07 (Byte)
Input Image	0x04	IWn	n: 0-14	None	0x81 (Byte)
Input Image	0x05	IDn	n: 0-12	None	0x81 (Byte)
Output Image	0x06	QWn	n: 0-14	None	0x82 (Byte)
Output Image	0x07	QDn	n: 0-12	None	0x82 (Byte)
Special Bits	0x08	SMWn	n: 0-199	None	0x05 (Byte)
Special Bits	0x09	SMDn	n: 0-197	None	0x05 (Byte)
Internal Bits	0x0A	MWn	n: 0-98	None	0x83 (Byte)
Internal Bits	0x0B	MDn	n: 0-96	None	0x83 (Byte)
Data Area	0x0C	VWn	n: 0-9998	None	0x84 (Byte)
		(DBWn)	(n: 0-9998)		
Data Area	0x0D	VDn	n: 0-9996	None	0x84 (Byte)
Special S	0x0E	SWn	n: 0-99	None	0x04 (Byte)
Special S	0x0F	SDn	n: 0-97	None	0x04 (Byte)

### 2. Contacts

Contact type	Device	Format	Read/wr	ite range	Communication
Contact type	Name	Format	Word No.	Bit No.	-base address
Timer Bit	0x80	Tn	None	n: 0-255	0x1F
Counter Bit	0x81	Cn	None	n: 0-255	0x1E
Input Image	0x82	In.b	n: 0-15	b: 0-7	0x81
Output Image	0x83	Qn.b	n: 0-15	b: 0-7	0x82
Special Bit	0x84	SMn.b	n: 0-200	b: 0-7	0x05
Internal Bit	0x85	Mn.b	n: 0-99	b: 0-7	0x83
Data Area Bit	0x86	Vn.b	n: 0-9999	b: 0-7	0x84
Special S Bit	0x87	Sn.b	n: 0-100	b: 0-7	0x04

# C. Controller wiring

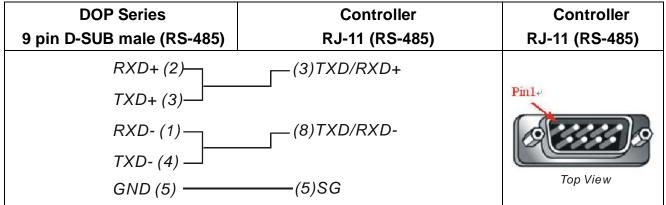
<u>RS-232</u>

via RS232 / PPI Multi-Master Cable

DOP Series 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)	Controller 9 pin D-SUB male (RS-232)
RXD (2)	(2) RD	Pinle
TXD (3)	———(3) TD	0
GND (5)	(5) GND	Top View

### <u>RS-485</u>

### via PLC Program Port (RS-485)



# Siemens S7 300 PLC (with PC Adapter)

#### **DELTA**

#### A. HMI factory settings

Baud rate: 38400, 8, ODD, 1. (RS232).

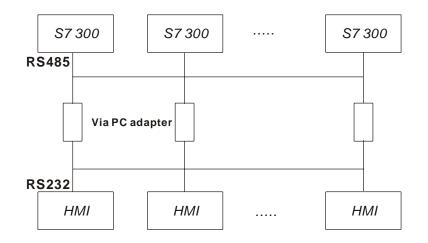
Controller station number: 2.

(PLC station won't be used when using by PC adapter. Therefore, only 1-to-1 communication is allowed).

Control area/state area: DBW0 / DBW20.

Note:

- 1. PLC DB memory (DBm.DBWn, DBm.DBDn, DBm.DBXn.b) must be open that HMI can read/write.
- The reason for using PC adapter: When communicating via PC adapter, it is profibus with <u>187.5 K</u> baudrate at PLC side. Therefore, the network structure is rapider and steadier.



When HMI communicates with PLC without PC adapter, the protocol will be complicated and it needs to lower PLC baud rate to 19200 due to HMI bard rate limit. Therefore, the efficiency of the network structure of S7 300 will be badly.

- 3. Baud rate setting
  - A. It needs to set PLC baud rate to 187.5 K and higher. (it cannot use 19.2K)
  - B. It needs to set baud rate of two sides when using PC Adapter
    - a. "PLC side": as previous item it needs to set PLC baud rate to 187.5 K and higher and cannot use 19.2K)
    - b. "HMI side": it can select 38.4K or 19.2K by using switch on the cable. (only these two choices)
    - c. HMI baud rate: it needs to set the baud rate of HMI side of PC adapter as previous item to 38.4K or 19.2K) (protocol setting is still 8, ODD, 1)
    - d. There is no setting for PLC station and HMI station, so it won't have the communication problem with error station setting.
    - e. PC Adapter :
      - 1. The power LED will be lit once connect to PLC. (power supply of PC adapter is from PLC)
      - 2. If communication is OK, the communication LED will be blink. Otherwise, it will be dark.

### **B.** Definition of controller Read/Write address

### 1. Register

Pogistor typo	Format	Read/write	e range
Register type	Format	Word No.	<u>Bit No.</u>
Input Image	IWn	n: 0-65534	None
Input Image	IDn	n: 0-65532	None
Output Image	QWn	n: 0-65534	None
Output Image	QDn	n: 0-65532	None
Internal Bits	MWn	n: 0-65534	None
Internal Bits	MDn	n: 0-65532	None
Data Area	DBm.DBWn	n: 0-65534	m: 1-255
	DBm.DBDn	n: 0-65532	m: 1-255
Data Area (DB10)	DBWn	n: 0-65534	None
	DBDn	n: 0-65532	None
	VWn	n: 0-65534	None
	VDn	n: 0-65532	None

#### 2. Contacts

Contact type	Format	Read/write range		
Contact type	Format	<u>Word No.</u>	<u>Bit No.</u>	
Input Image	ln.b	n: 0-65535	b: 0-7	
Output Image	Qn.b	n: 0-65535	b: 0-7	
Internal Bit	Mn.b	n: 0-65535	b: 0-7	
Data Area Bit	DBm.DBXn.b	n: 0-65535	b: 0-7	
			m = 1-255	
Data Area Bit (10 DB)	DBXn.b	n: 0-65535	b: 0-7	
	Vn.b	n: 0-65535	b: 0-7	

For all contacts when multiple copies:

a. if it exceeds 65535 when increasing, it will be regarded as 0.

b. If it is less than 0, it will be regarded as 655XX.

C. Controller wiring

RS-232

### HMI connects to PC Adaptor

DOP	Controller	Controller
9 pin D-SUB male	9 pin D-SUB female	
RXD (2)	(3) TXD	Pin1
TXD (3)	(2) RXD	0
GND (5)	(5) GND	
RTS (7)	<i>(8)</i> CTS	Top view
CTS (8)	(7) RTS	

# Taian TP02 PLC

### A. HMI factory settings

Baud rate: 19200, 7, None, 1.

Controller station number: 1.

Control area/state area: V1 / V10.

#### **B.** Definition of controller Read/Write address

### 1. Registers

Register type	Format	Read/write range		Dete length
		Word No.	<u>Bit No.</u>	Data length
WORD_DEVICE_X	Xn	n: 1-384	None	Word
WORD_DEVICE_Y	Yn	n: 1-384	None	Word
WORD_DEVICE_C	Cn	n: 1-2048	None	Word
WORD_DEVICE_V	Vn	n: 1-1024	None	Word
WORD_DEVICE_D	Dn	n: 1-2048	None	Word
WORD_DEVICE_WS	WSn	n: 1-128	None	Word
WORD_DEVICE_WC	WCn	n: 1-912	None	Word

Note: WORD\_DEVICE\_X / WORD\_DEVICE\_Y / WORD\_DEVICE\_C: address must be 1 or the multiple of 16+1

#### 2. Contacts

Contact type	Format	Read/write range	
		Word No.	Bit No.
BIT_DEVICE_X	Xn	None	n: 1-384
BIT_DEVICE_Y	Yn	None	n: 1-384
BIT_DEVICE_C	Cn	None	n: 1-2048
BIT_DEVICE_SC	SCn	None	n: 1-128

BIT\_DEVICE\_SC: only read 1 bit for each communication.

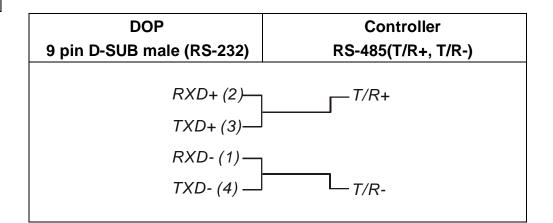
**DELTA** 

## C. Controller wiring

# RS-422

	Controller	
9 pin D-SUB male (RS-422)	9 pin D-SUB male (RS-422)	
RXD+ (2)	(3) TXD+	
RXD- (1) ——	(8) TXD-	
TXD+ (3)	(2) RXD+	
TXD- (4) ——	——— (7) RXD-	

## **RS-485**



# YOKOGAWA ACE PLC DELTA

A. HMI factory settings

Baud rate: 9600, 8, EVEN, 1. (ASCII code) Controller station number: 1. CPU NO. : 1. Control area/state area: D1 / D10.

- **B.** Definition of controller Read/Write address
- 1. Registers

			1
Register type	Format	<u>Word No.</u>	Data Size
WORD_DEVICE_X	Xn	n: 201-65464	Word
WORD_DEVICE_Y	Yn	n: 201-65464	Word
WORD_DEVICE_I	In	n: 1-16384	Word
WORD_DEVICE_E	En	n: 1-4096	Word
WORD_DEVICE_L	Ln	n: 1-65488	Word
WORD_DEVICE_M	Mn	n: 1-9984	Word
WORD_DEVICE_TP	TPn	n: 1-3072	Word
WORD_DEVICE_CP	CPn	n: 1-3072	Word
WORD_DEVICE_D	Dn	n: 1-8192	Word
WORD_DEVICE_B	Bn	n: 1-32768	Word
WORD_DEVICE_W	Wn	n: 1-65499	Word
WORD_DEVICE_Z	Zn	n: 1-512	Word
WORD_DEVICE_V	Vn	n: 1-64	Word
WORD_DEVICE_R	Rn	n: 1-4096	Word
WORD_DEVICE_TS	TSn	n: 1-3072	Word
WORD_DEVICE_CS	CSn	n: 1-3072	Word

WORD\_DEVICE\_X / WORD\_DEVICE\_Y: the last two digits of address must be 1 or (the multiple of 16+1) and less than 65.

WORD\_DEVICE\_I / WORD\_DEVICE\_E / WORD\_DEVICE\_L / WORD\_DEVICE\_M: address must be 1 or (the multiple of 16+1)

WORD\_DEVICE\_X / WORD\_DEVICE\_Y / WORD\_DEVICE\_L / WORD\_DEVICE\_W: valid address is discontinuous.

2. Contacts

Contact type	Format	Label	Bit No.
BIT_DEVICE_X	0x80	Xn	n: 201-65464
BIT_DEVICE_Y	0x81	Yn	n: 201-65464
BIT_DEVICE_I	0x82	In	n: 1-16384
BIT_DEVICE_E	0x83	En	n: 1-4096
BIT_DEVICE_L	0x84	Ln	n: 1-65488
BIT_DEVICE_M	0x85	Mn	n: 1-9984
BIT_DEVICE_TU	0x86	TUn	n: 1-3072
BIT_DEVICE_CU	0x87	CUn	n: 1-3072

BIT\_DEVICE\_X / BIT\_DEVICE\_Y : the last two digits of address must be less than 65 (1-64).

BIT\_DEVICE\_X / BIT \_DEVICE\_Y / BIT \_DEVICE\_L : valid address is discontinuous.

Multiple copies:

The next bit address of X264 is X301 (invalid addresses <u>X265-X300</u> are skipped)

The next bit address of X364 is X401.

The address of Y is the same as X.

(The WORD addresses of X and Y are also auto skip invalid addresses)

### C. Controller wiring

It needs to use specific cable of YOKOGAWA ACE PLC.

**RS-232** 

DOP 9 pin D-SUB male (RS-232)	Controller (6 pin) (RS-232 for YOKOGAWA)	Controller
TXD (3)	(1) TXD (2) RXD (5) GND	Top View