Getting Started: Touch-8000 HMI Linking ICP DAS PAC And M-7000 I/O Modules

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Chapter 1 : Getting Started

1.1 Introduction

The Touch-8000 series HMI supports Modbus TCP/IP master protocols via its Ethernet port and Modbus RTU master protocol via its RS-232 and RS-485 ports. Touch-8000 can link to the ICP DAS Modbus PACs and M-7000 I/O Modules easily. For example, it can link to the uPAC-7186EG and iPAC-8447/8847 and WinPAC-8147/8447/8847 and i-7188XG and M-7018z or other ICP DAS PAC which support the Modbus TCP/IP slave or Modbus RTU slave protocols.

Item	Screen size and available Modbus TCP/IP and Modbus RTU ports
Touch-8070T	7" color TFT LCD, 480x234 One 10/100Base-T , COM1: RS-232 / RS-485 (2 wire / 4 wire) COM2: RS-232 , COM3: RS-232 / RS-485 (2 wire)
Touch-8104T	10.4" color TFT LCD, 640x480 One 10/100Base-T , Other serial ports are same as Touch-8070T.

Download Development Software from the Internet:

Please install the ”EasyBuilder 8000” software (Ver. 2.10 or later version) first before you can program the Touch-8000 series touch HMI. Please download it at ftp://ftp.weintek.com/MT8000/eng/ > “EB8000V210_090306_en.zip” or other newer version number.

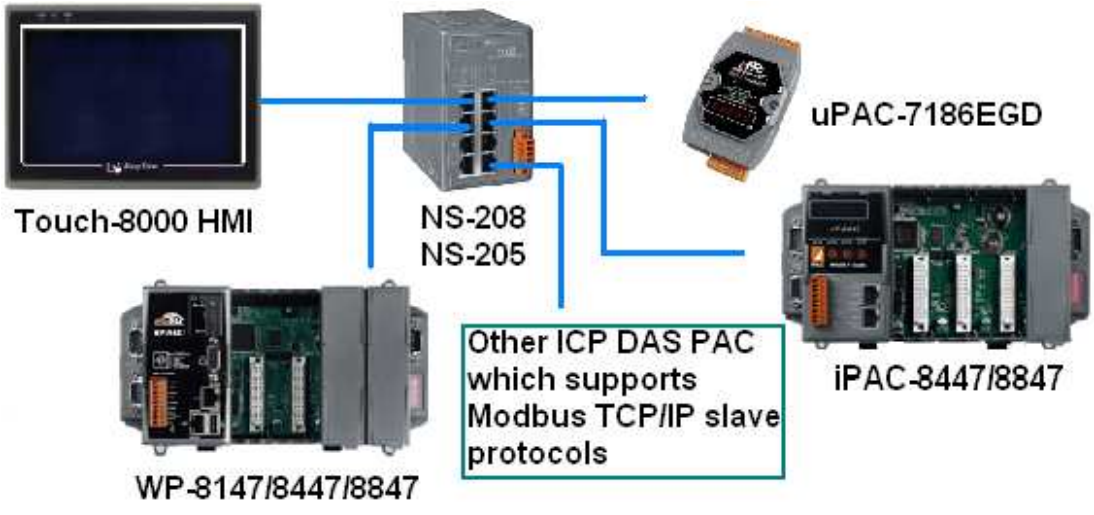
User's Manual:

1. Getting Started manual: this document. (Touch-8000 CD-ROM:\napdos\touch8000\english_manu\)
2. User's manual: ftp://ftp.weintek.com/MT8000/eng/UserManual/ > all PDF files.

More Information: NS-208/NS-205 : http://www.icpdas.com/products/Switch/switch_list.htm
ICP DAS ISaGRAF PAC: http://www.icpdas.com/products/PAC/i-8000/isagraf.htm
WinPAC-8xx7: http://www.icpdas.com/products/PAC/winpac/wp-8x47.html
Touch HMI: http://www.icpdas.com/products/HMI/touch_lcd/touch_human.htm
M-7000: http://www.icpdas.com/products/Remote_IO/m-7000/m-7000_list.htm

Ethernet connection:

Recommend not connecting more than 6 controllers. The more connectted, the slower rate.



Pin assignment of RS-485 ports:

The RS-485 Cable Pin assignment between the Touch 8000 and uPAC-7186EG, iPAC-8xx7, WP-8xx7 or other ICP DAS controller which supports Modbus RTU slave protocols in RS-485 port is as the following. (Recommend connect no more than 7 controllers or M-7000. The more connectted, the slower communication rate)

Touch-8000 COM1: RS-485		ICP DAS controller or M-7000		ICP DAS controller or M-7000
2 Data +	———	Data +	———	Data +
1 Data -	———	Data -	———	Data -

Touch-8000 COM3: RS-485		ICP DAS controller or M-7000		ICP DAS controller or M-7000
9 Data +	———	Data +	———	Data +
6 Data -	———	Data -	———	Data -

Pin assignment of RS-232 ports:

The RS-232 Cable Pin assignment between the Touch 8000 and uPAC-7186EG, iPAC-8xx7, WP-8xx7 or other ICP DAS Modbus RTU slave controllers is as the following.
(Only one controller can be connected by the RS-232 cable)

Touch-8000 COM1: RS-232		ICP DAS controllers
2 RXD	———	TXD
3 TXD	———	RXD
5 GND	———	GND
7 RTS		
8 CTS		

Touch-8000 COM2: RS-232		ICP DAS controllers
6 RXD	———	TXD
4 TXD	———	RXD
5 GND	———	GND
7 RTS		
8 CTS		

Touch-8000 COM3: RS-232		ICP DAS controllers
8 RXD	———	TXD
7 TXD	———	RXD
5 GND	———	GND

1.2: Setting up the IP address and password of the Touch-8000

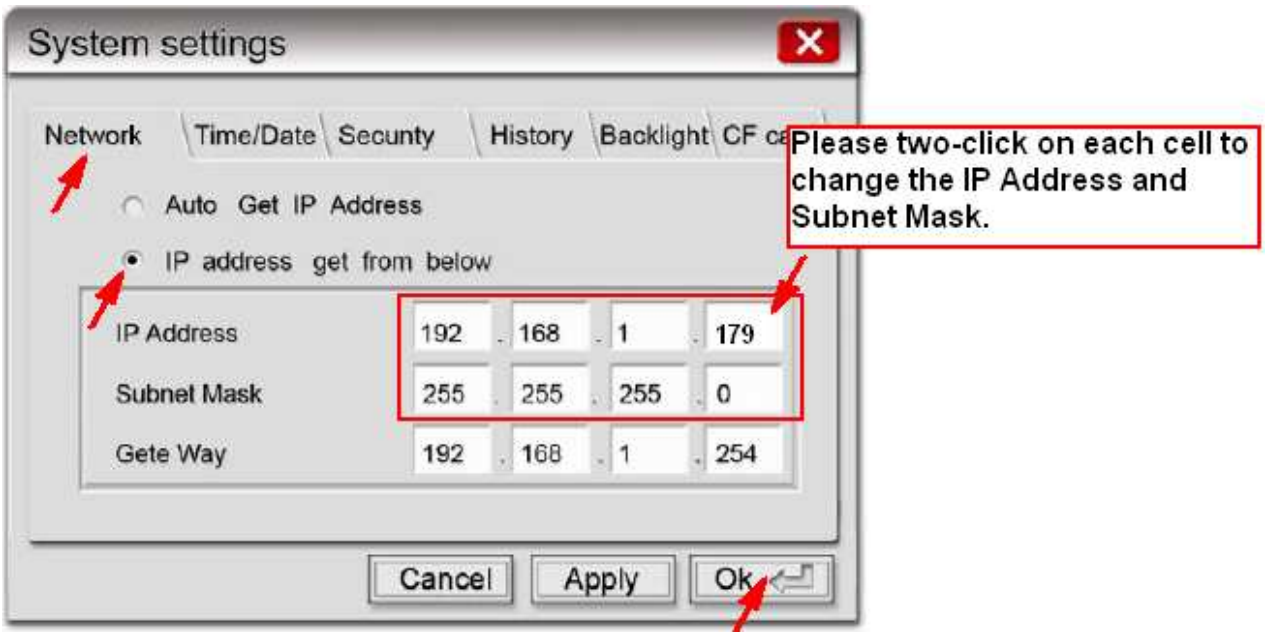
To make your PC can connect the Touch-8000 or Touch-8000 can connect to some controllers, please setup proper IP address and its password for downloading HMI pictures.

1. First, make sure the DIP SW No. 1 to 4 on the back of the Touch-8000 are all set as OFF. Then power up the Touch-8000.

2. Then use your finger to touch the bottom-right corner to make the tools-bar appeared. You may also try to use one USB mouse to plug in one USB port on the back of the Touch-8000 to operate it. (If it is not easy to click the bottom-right corner of your Touch-8000 , please go to the step 6 on the next page to do screen calibration)

3. Then click the fourth item to do further settings.
Enter the correct password. The default password when shipping out is 111111 .

4. After the correct password entered, please click the “Network” and “IP address get from below” to setup the IP address and subnet mask of the Touch-8000.



5. Then click on “Security” and “ Download Password” to enter new Password and confirm it. (You may use the default password 111111). This download password is necessary when user downloading HMI pictures from PC to the Touch-8000 .

6. Important To do calibration or forget the password, please set Dip SW 1 on the back of the Touch-8000 as ON and SW 2 to 4 as OFF and then re-cycle the power once. Then the Touch 8000 will guide you to calibrate the screen. After that, there will have one “Restore to default password” window pop-up. You may click “yes” (or “No” to do calibration only) to make the password become 111111. Then do above steps 1 to 5 again.

1.3: A sample program for connecting the Touch-8000 to ICP DAS controllers by Modbus TCP/IP protocols

To make uPAC-7186EG, WinPAC-8xx7, iPAC-8xx7, I-7188EG & WinCon-8xx7 controllers to be accessible by the Touch-8000 HMI, variables in the controllers should be assigned with a network address. Please refer to the section 4.1 and 4.2 of the ISaGRAF User's manual. If you are not familiar with the ISaGRAF programming, recommend to review Chapter 2 of the ISaGRAF User's manual.

ISaGRAF user's manual : “user_manual_i_8xx7.pdf” and “user_manual_i_8xx7.pdf_appendix”
WP-8xx7 CD-ROM: \napdos\isagraf\wp-8xx7\english_manu\ or
uPAC-7186EG , iPAC-8xx7 CD_ROM: \napdos\isagraf\8000\english_manu\ or
http://www.icpdas.com/products/PAC/i-8000/getting_started_manual.htm

1.3.1: ISaGRAF sample program

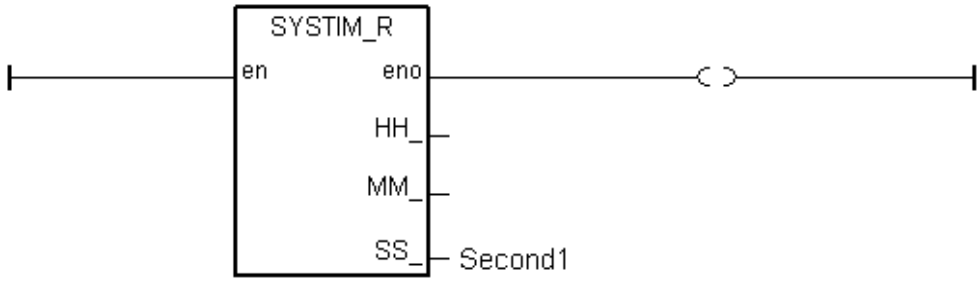
Please set the IP address of the ISaGRAF controller to be 192.168.1.180 and mask as 255.255.255.0. (This example will use this IP to connect to the Touch-8000)

This ISaGRAF project file is at Touch-8000 CD-ROM:\napdos\touch8000\example\touch1.pia . (Please refer to Chapter 9.5 of the ISaGRAF User’s manual to restore it to PC / ISaGRAF workbench.)

Variables used in this example.

Name	Type	Attribute	Network address	Others
OUT01	Boolean	Internal	**0001**	
Second1	Integer	Internal	**000B** (Dec. is 11)	Used as 16-bit integer
VAL1	Integer	Internal	**000C** (Dec. is 12)	Used as 32-bit integer
F1	Real	Internal	**000E** (Dec. is 14)	32-bit IEEE floating point value

A simple Ladder program to get the system time .



After you finish this project, compile it and then download it to the ISaGRAF controller.

(If you are not familiar with the ISaGRAF programming, recommend to review Chapter 2 of the ISaGRAF User's manual.)

1.3.2: Program the Touch-8000

The project file of this example : Touch-8000 CD-ROM:\napdos\touch8000\example\touch_01.mtp

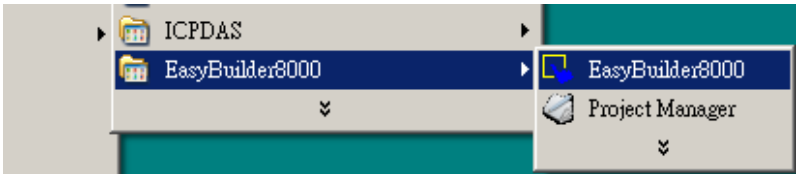
The “EasyBuilder8000” software is for programming many useful pictures for the Touch-8000 series HMI. This section illustrates a simple example to program a Touch-8070T. For more information about programming on the Touch series, please refer to the Easybuilder 8000 user manual.

Please install the ”EasyBuilder 8000” software (Ver. 2.10 or later version) first before you can program the Touch-8000 series touch HMI. Please download it at ftp://ftp.weintek.com/MT8000/eng/ > “EB8000V210_090306_en.zip” or other newer version number.

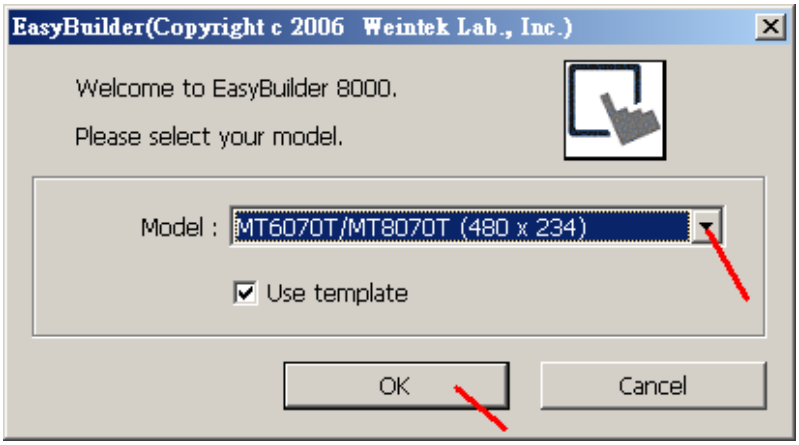
User's Manual:
A. Getting Started manual: this document. (Touch-8000 CD-ROM:\napdos\touch8000\english_manu\)
B. User's manual: ftp://ftp.weintek.com/MT8000/eng/UserManual/ > all PDF files.

Steps to program the HMI project:

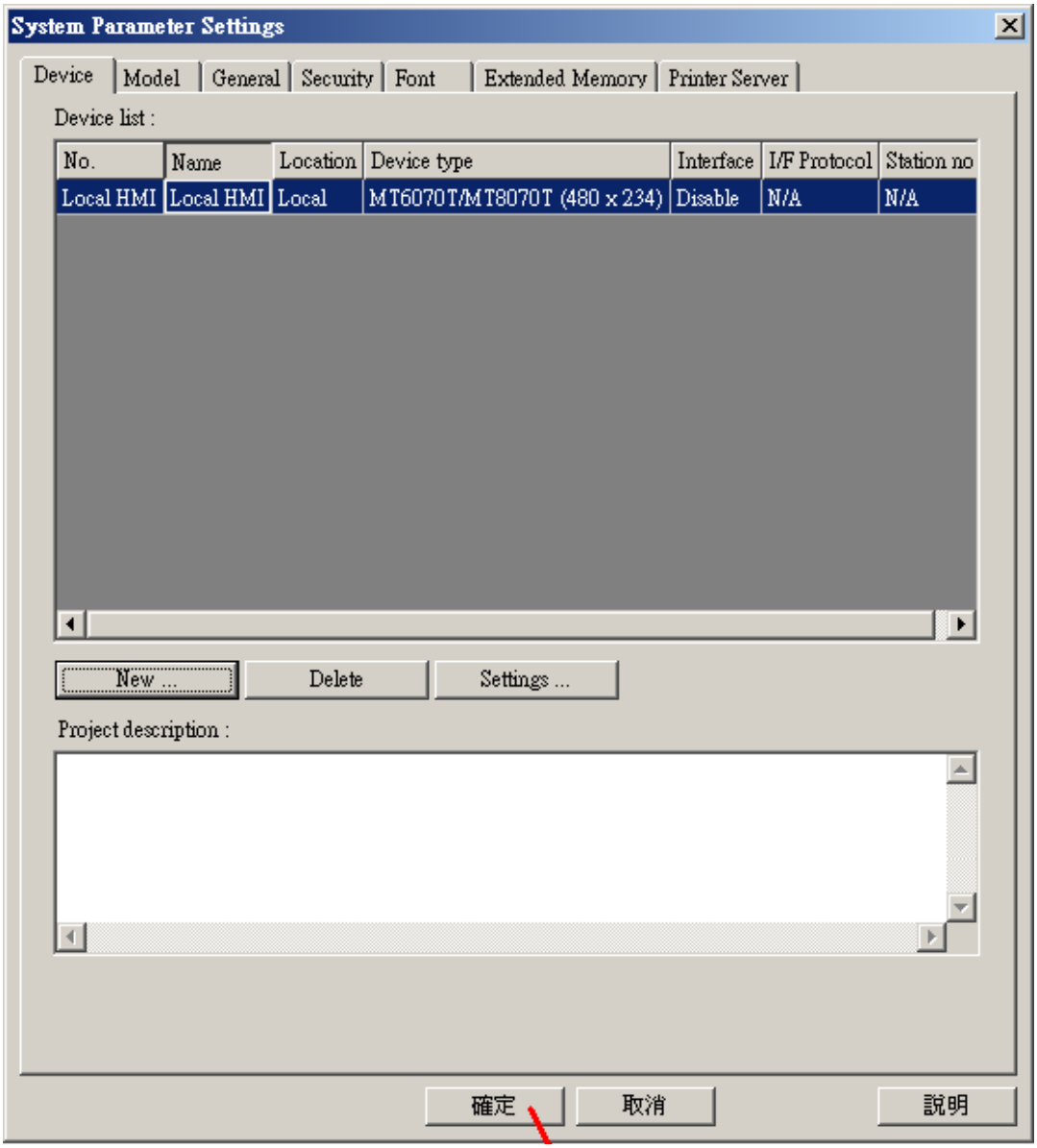
1. Click on the Windows "Start" button, then click on the "Program" , then click on the "EasyBuilder8000" – “EasyBuilder8000”.



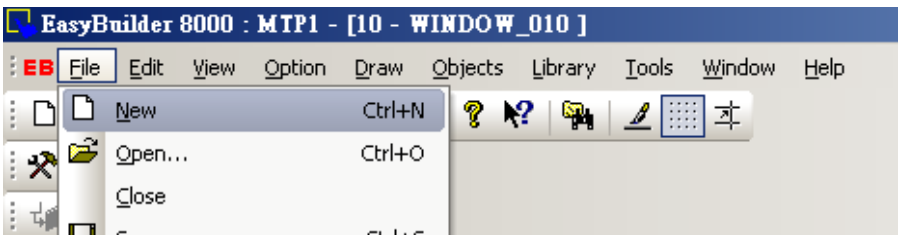
The following windows will be displayed. Select the proper model for your application. Here use the 8070T .



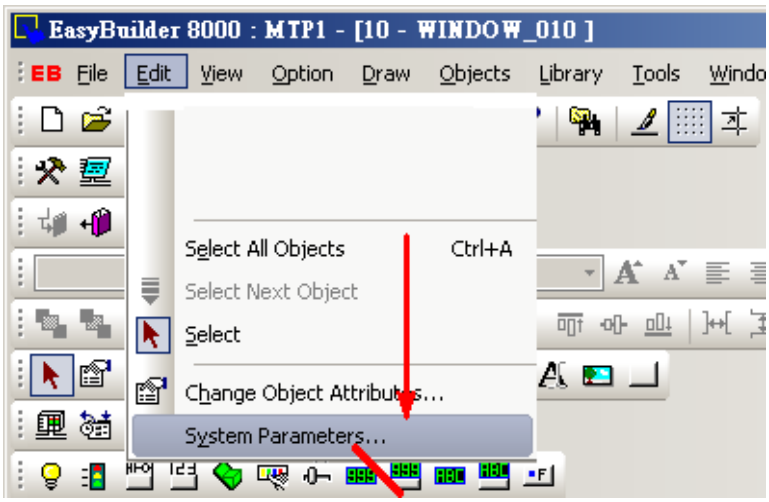
Then click ok in the “System Parameter Settings” window.



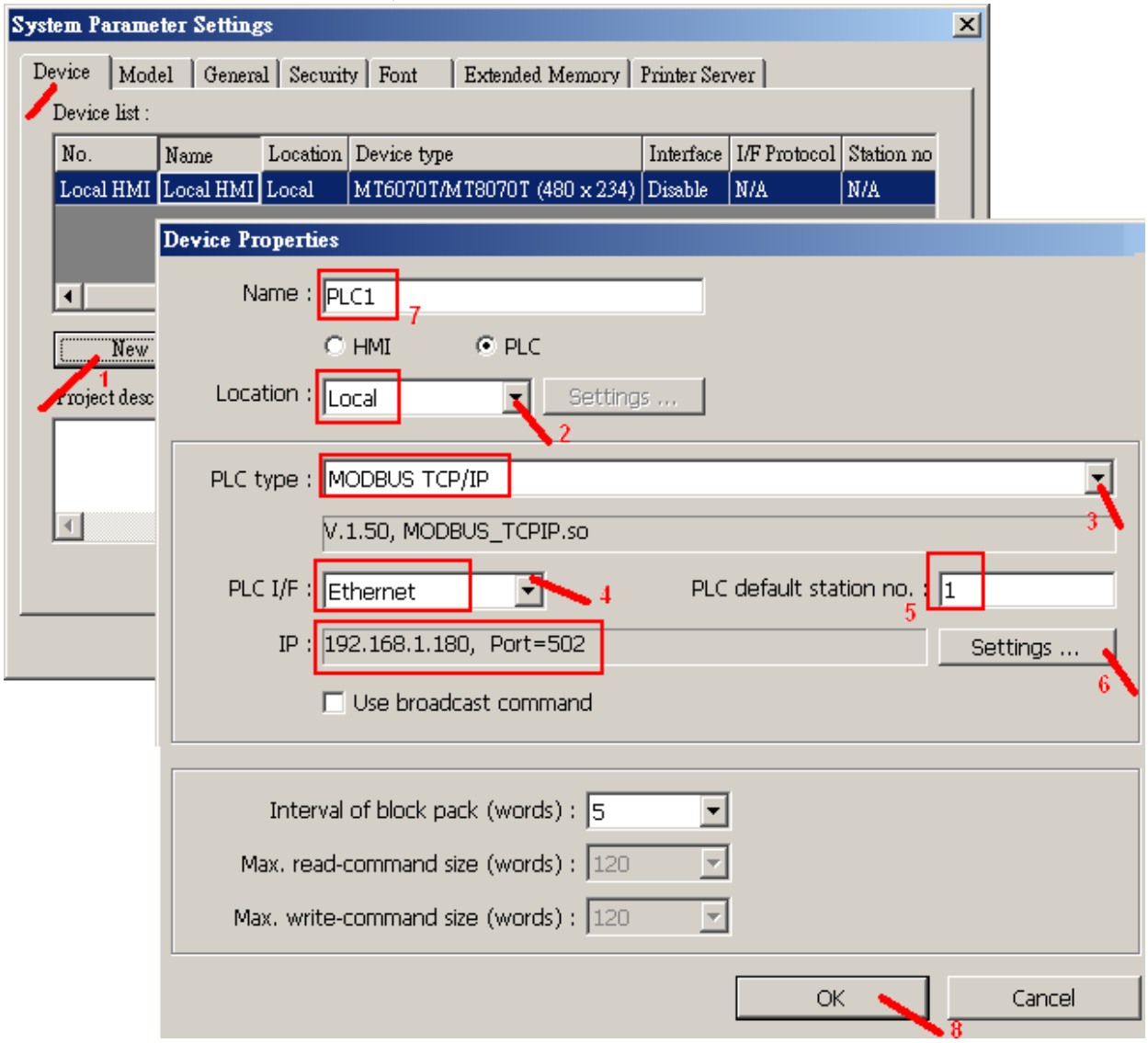
2. To create a new project, please run “File” > “New” as the following window.



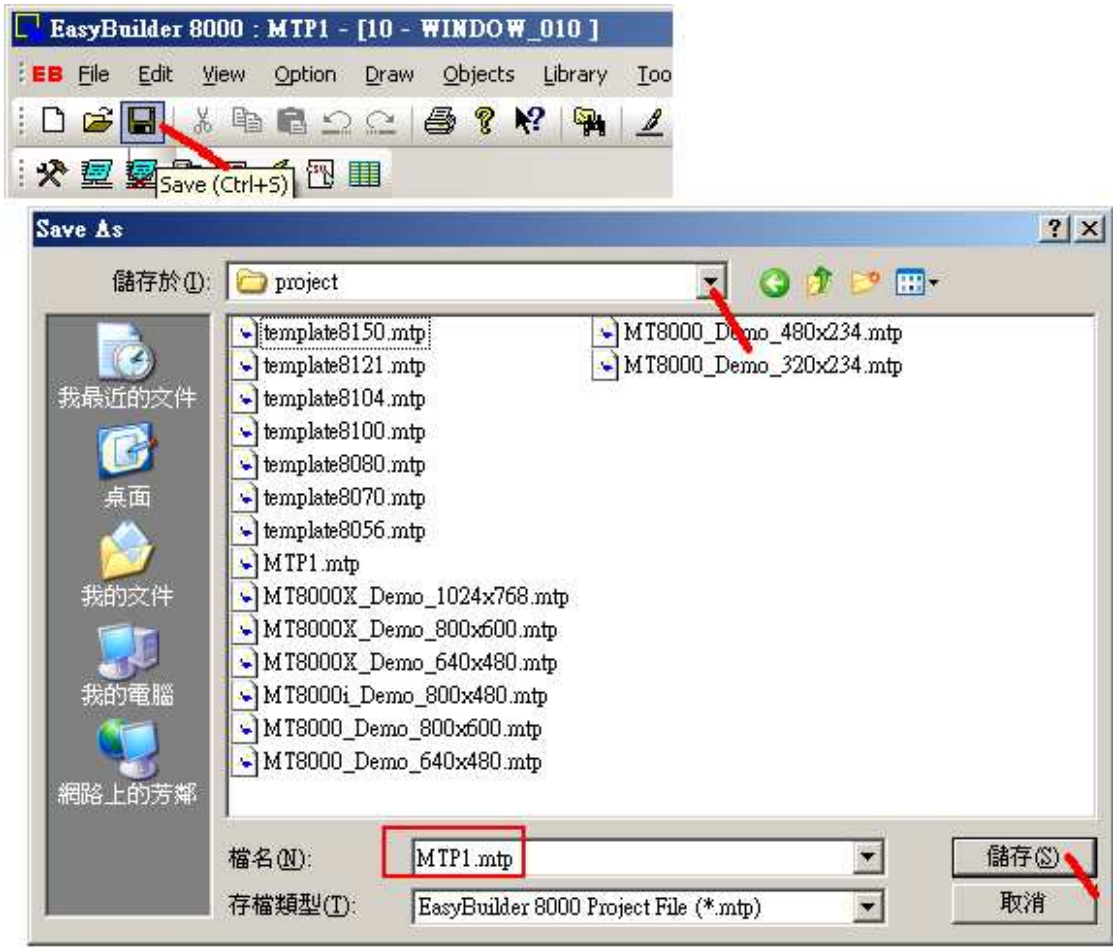
3. Then run “Edit” > “System Parameters ...”



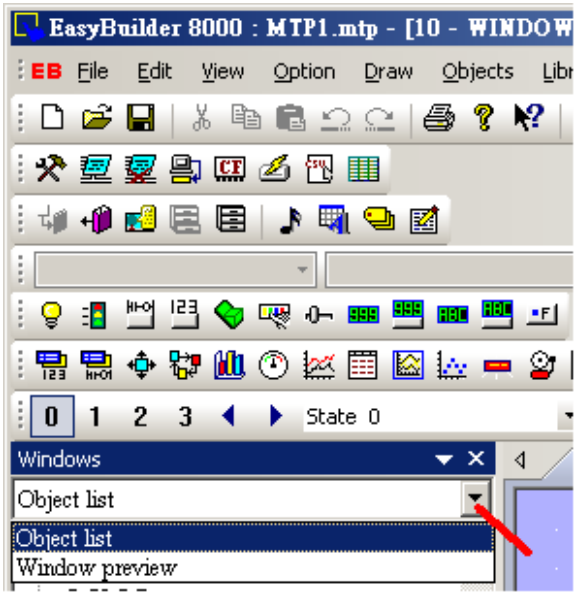
Click on “New” to create a new device. Then enter the proper setting for that device as following. Here set the IP of PLC as 192.168.1.180 , Port No. as 502 .



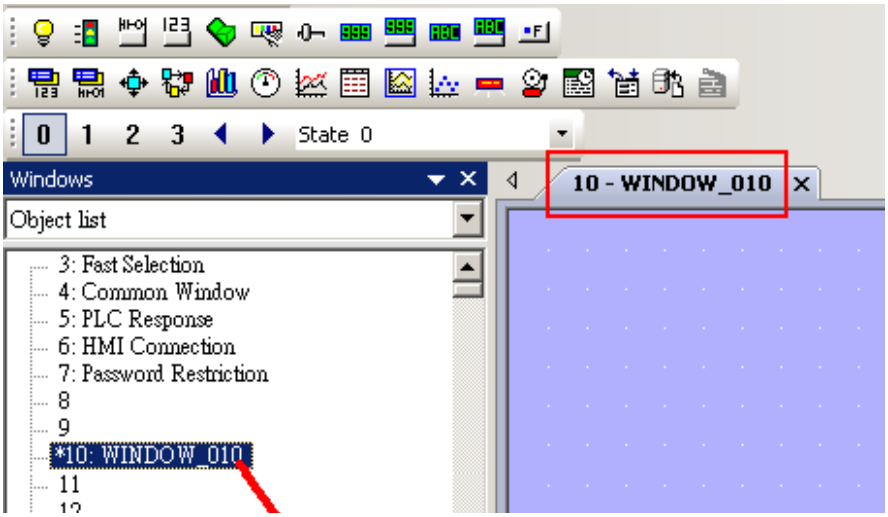
4. Click on “Save” and entering a name to save the above settings.



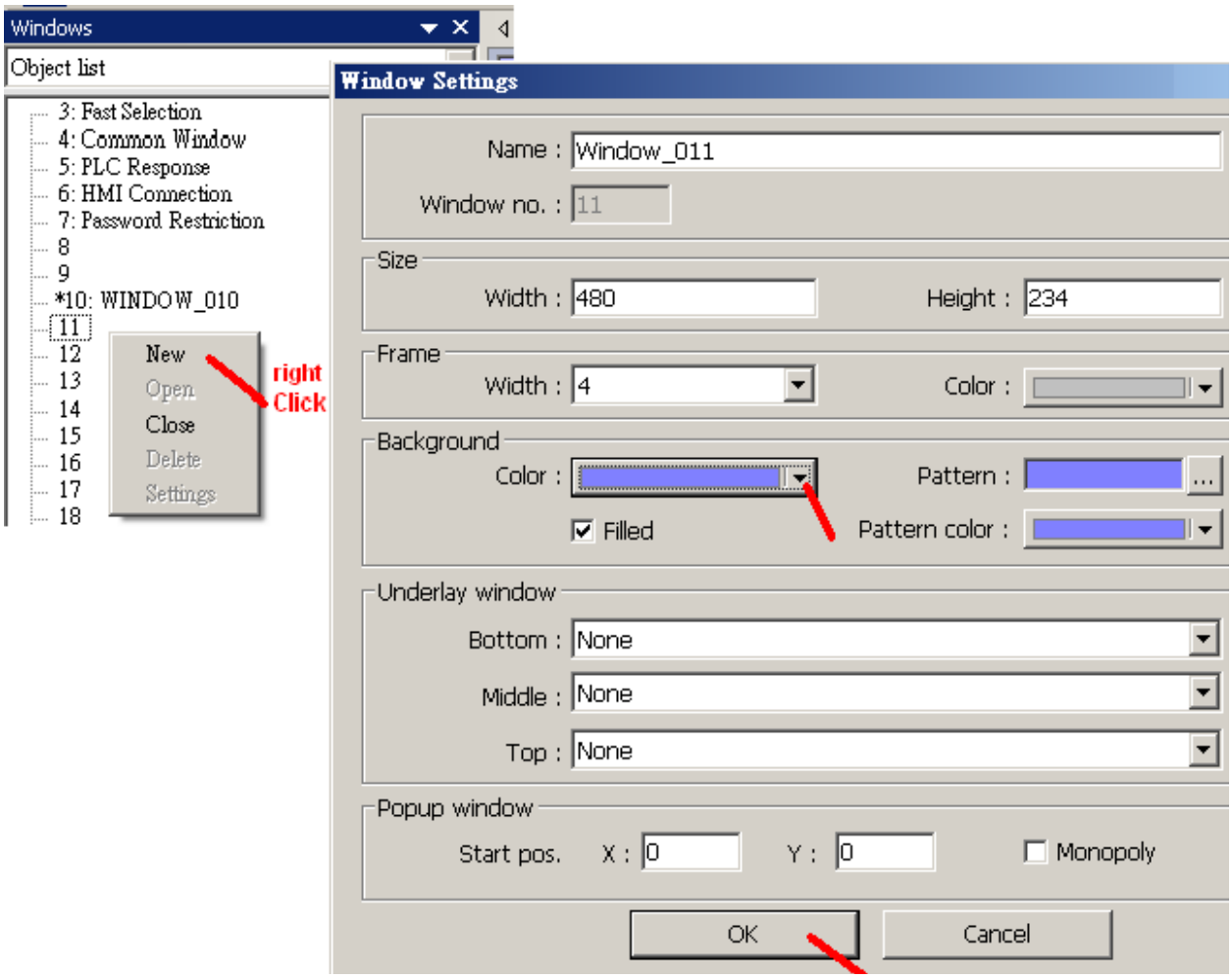
5. Select the “object list” as the following.



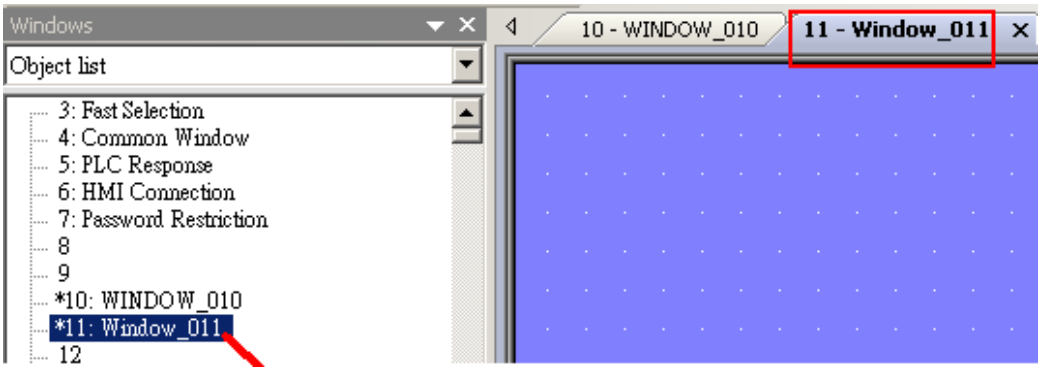
Then double-click the “*10: WINDOW_010” . The “10” window is the starting window (First page) when power on the Touch-8000 HMI .



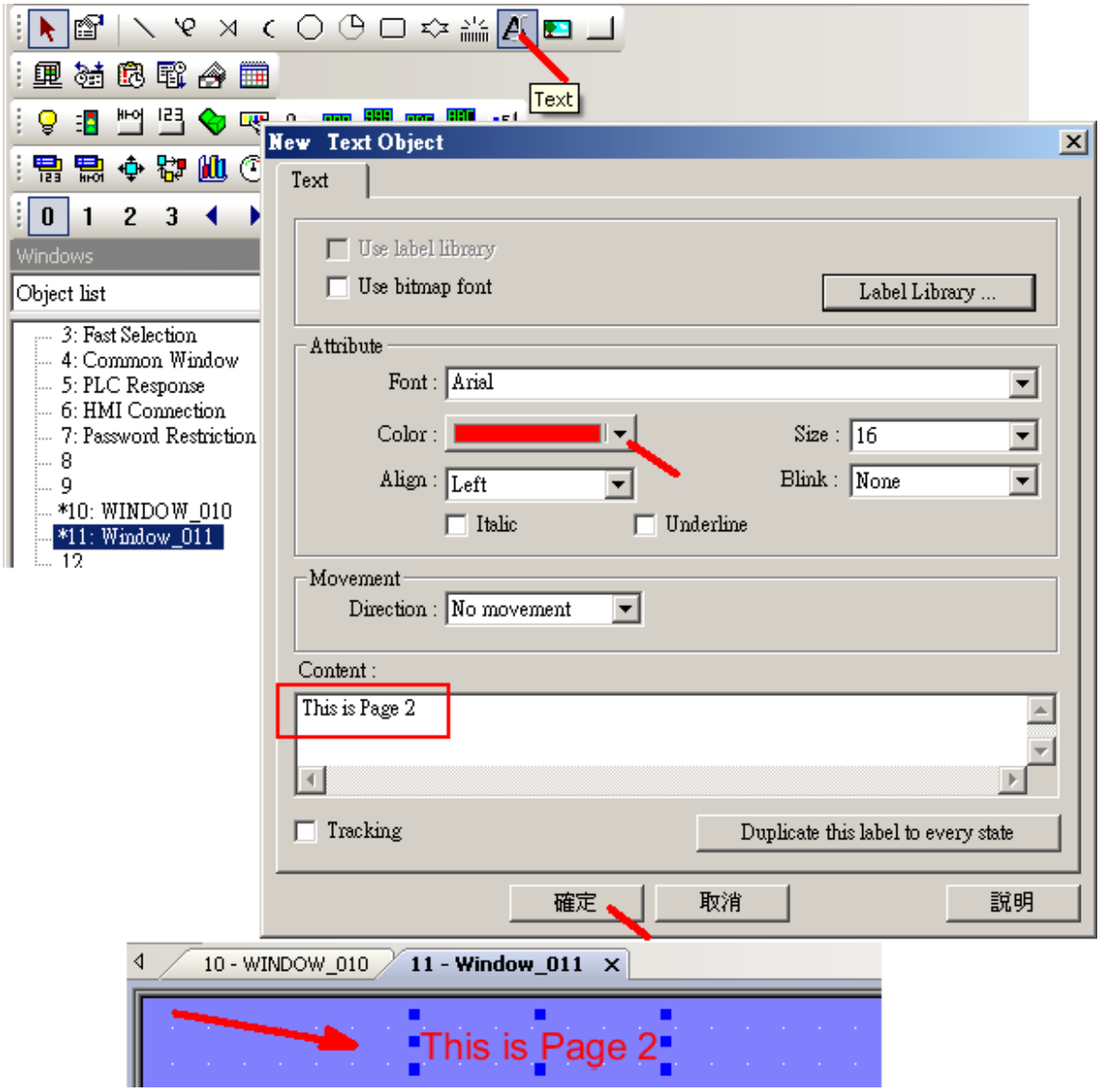
6. Before editing the “10” window, here we are going to create the “11” window as the following. Move the mouse cursor to “11” and **right click** on the “11”. Select the “New” to create it.
Select the proper Background color for this new created window.



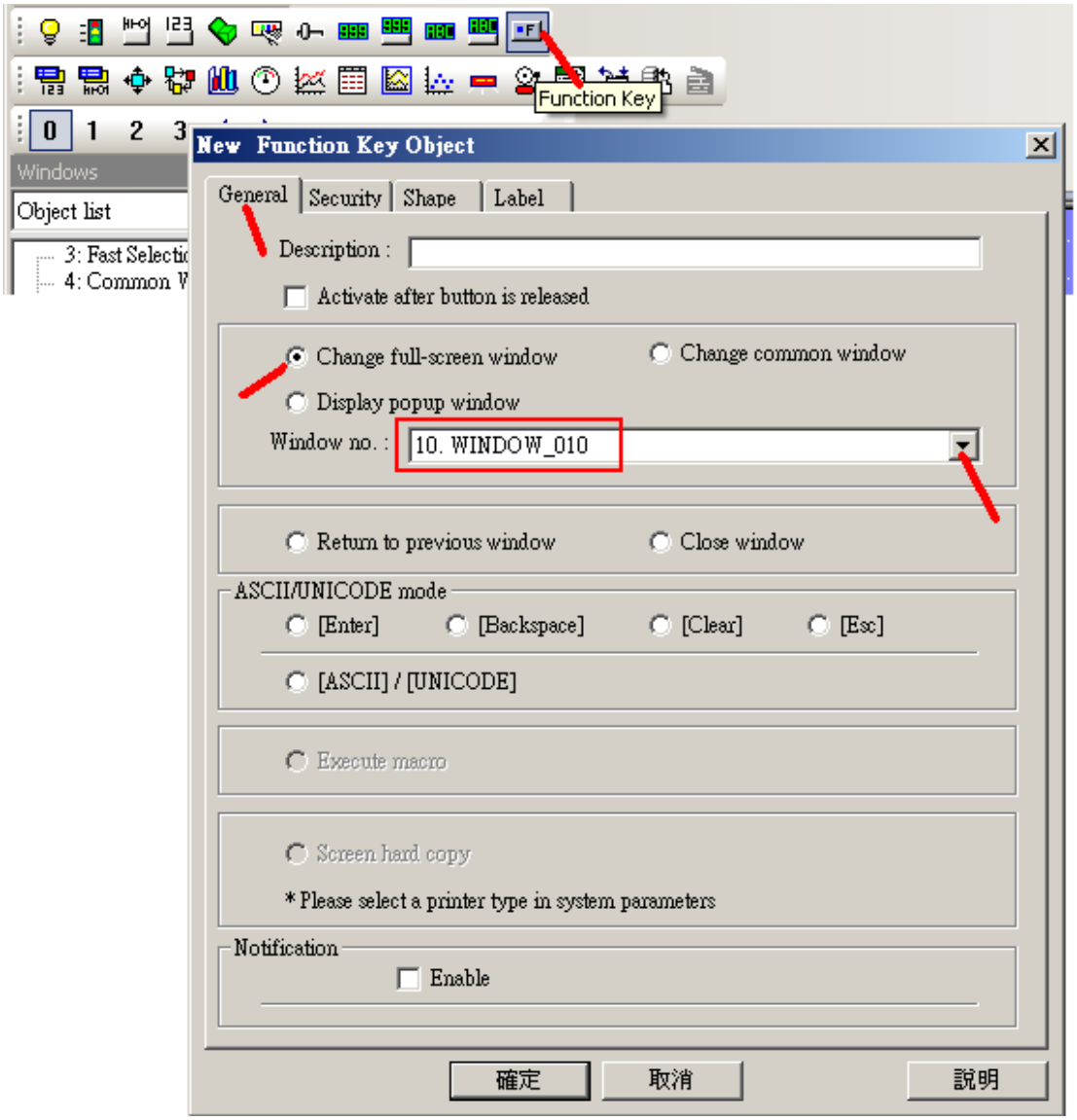
7. Editing the “11” window.
First click on “*11: Window_011” to get into this window.



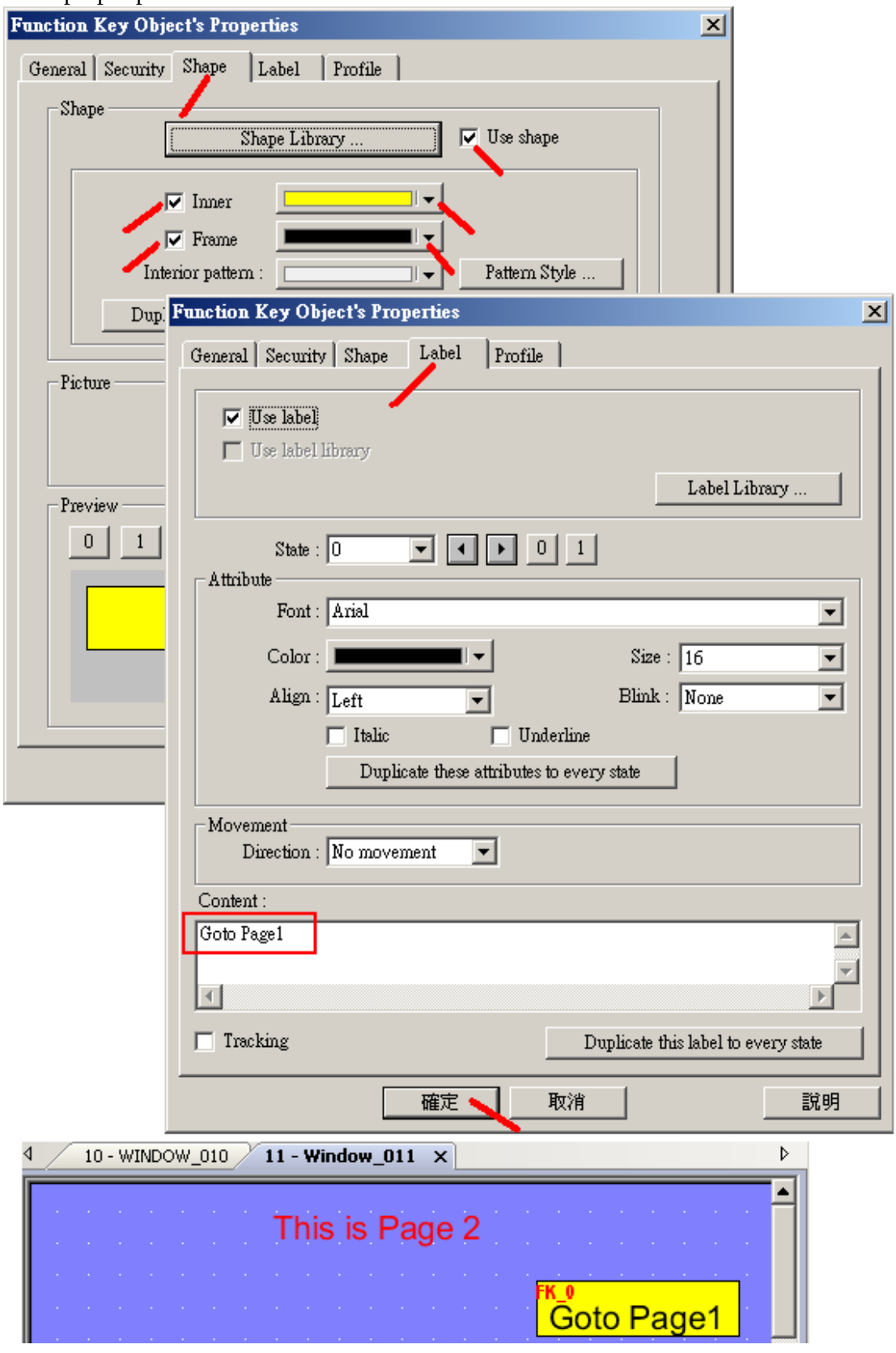
Then click on “A” to enter a Text Label and move it to a proper position.



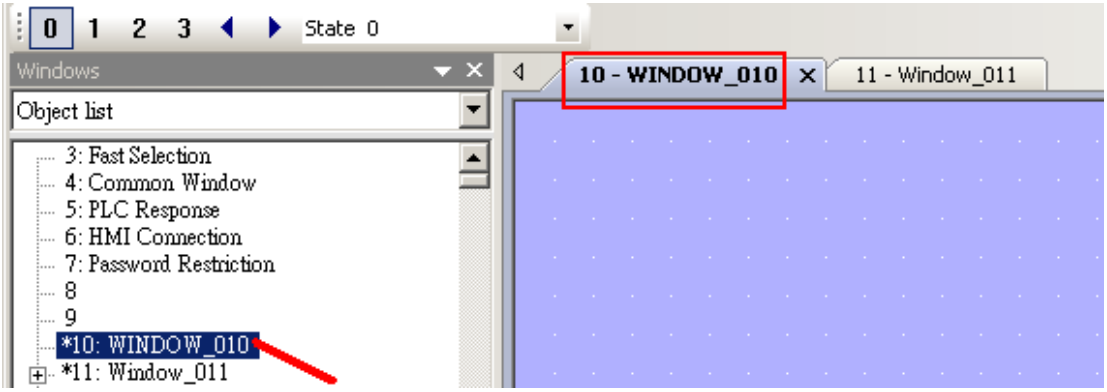
Then Click on “Function Key” to create a “change window key” as the following. (for switching to the “10” window)



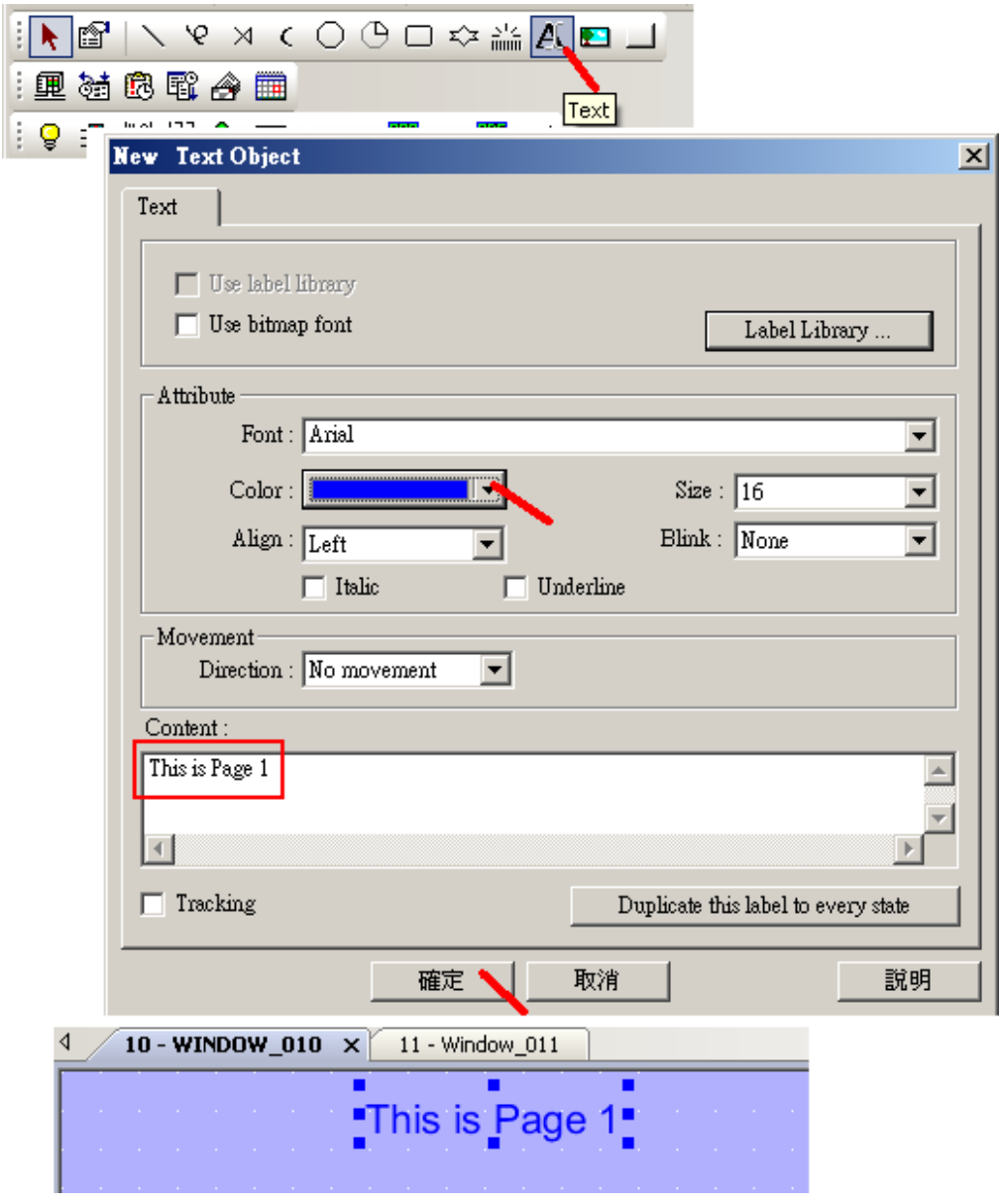
Please set proper “shape” , color for “shape” and Label for this function key as the following. Then move it to a proper position.



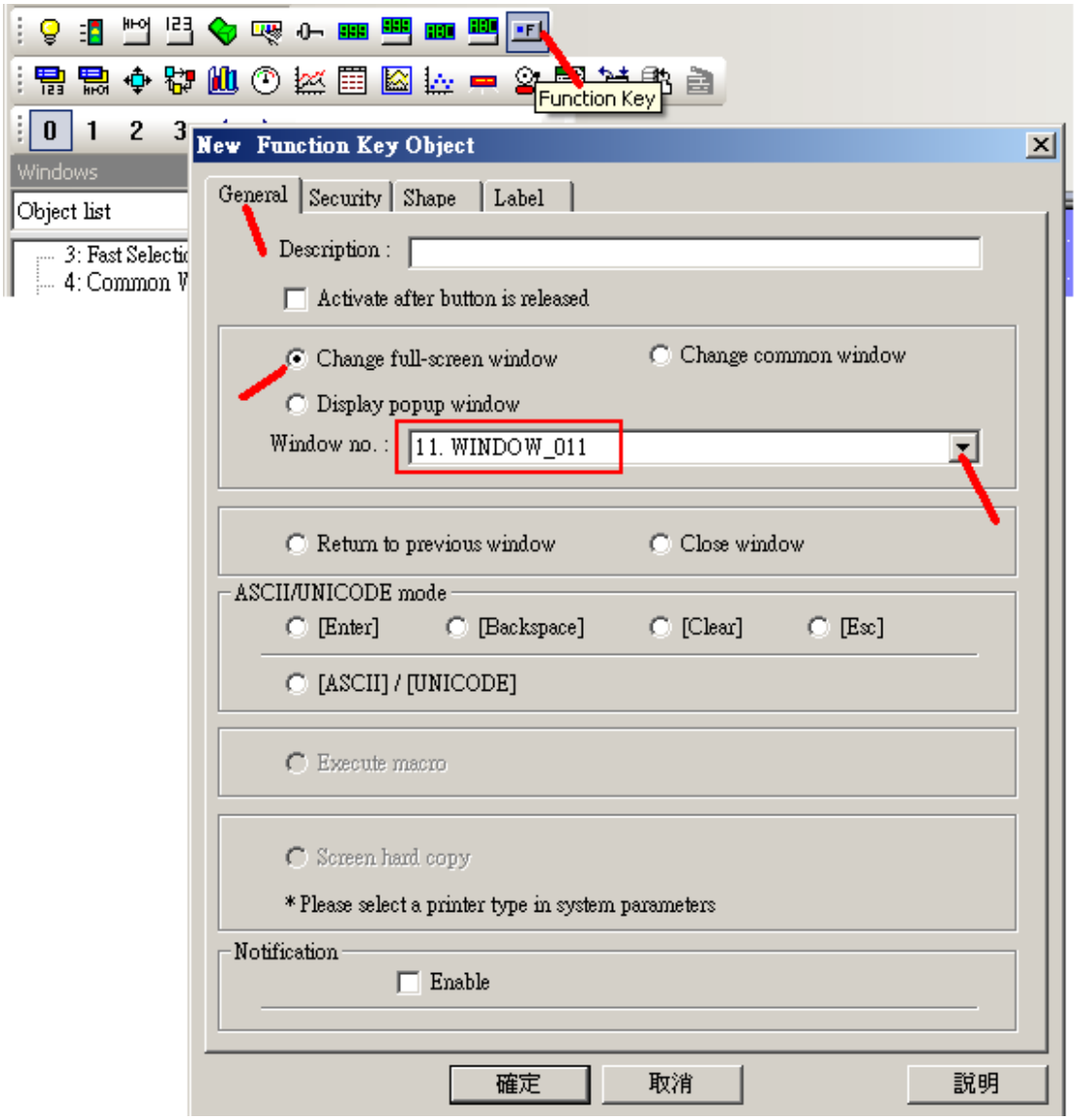
8. Now we are going to edit the “10” window.



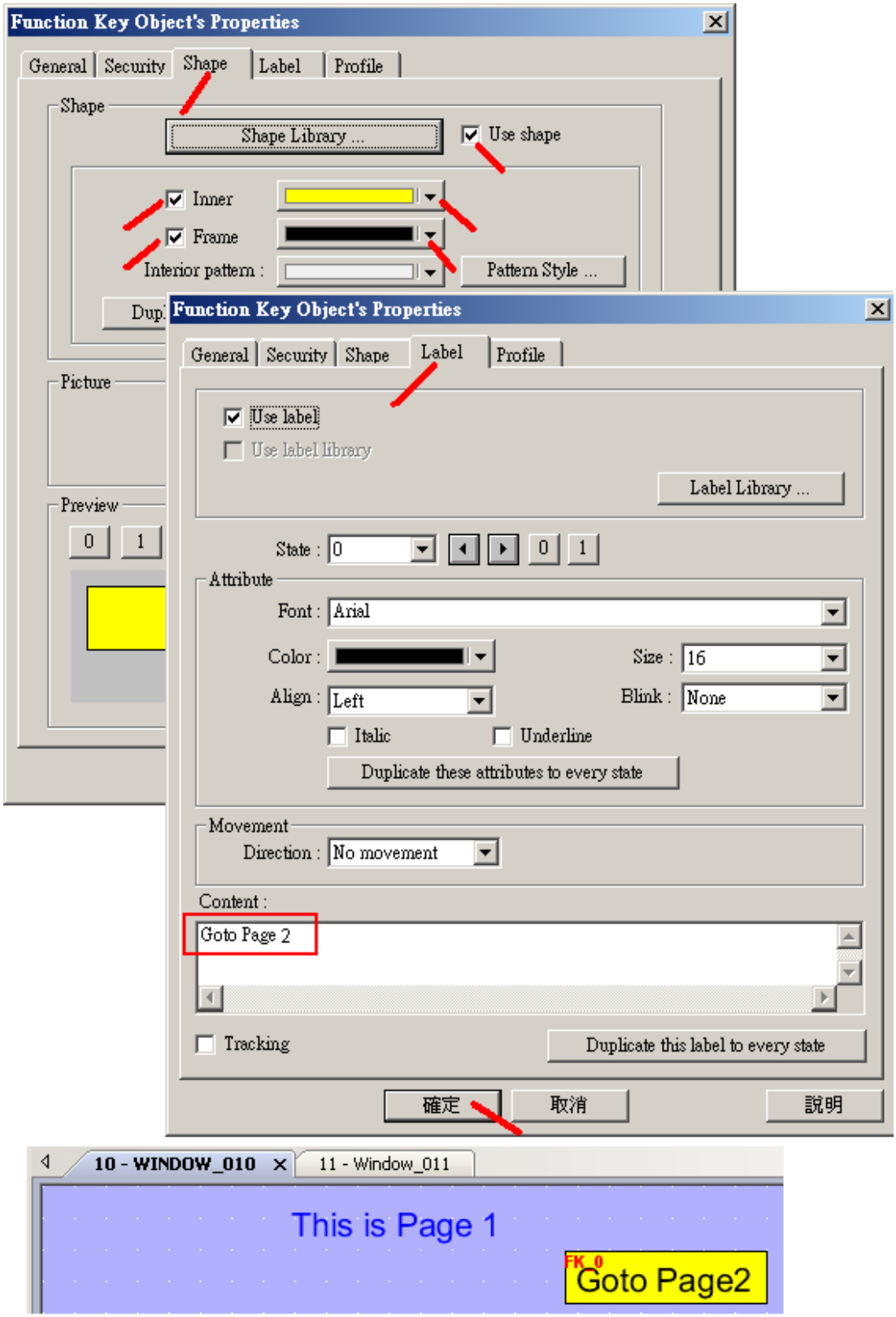
Create a label “This is Page 1” as the following.



And then create a function key to switch to the “11” window.



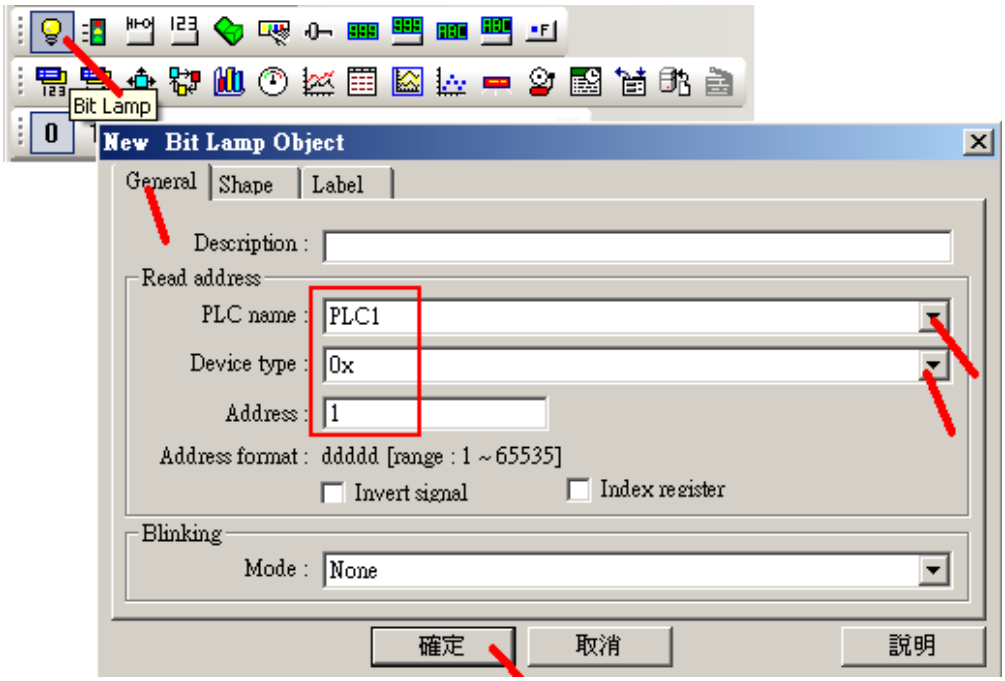
Please set proper “shape” , color for “shape” and Label for this function key as the following. Then move it to a proper position.



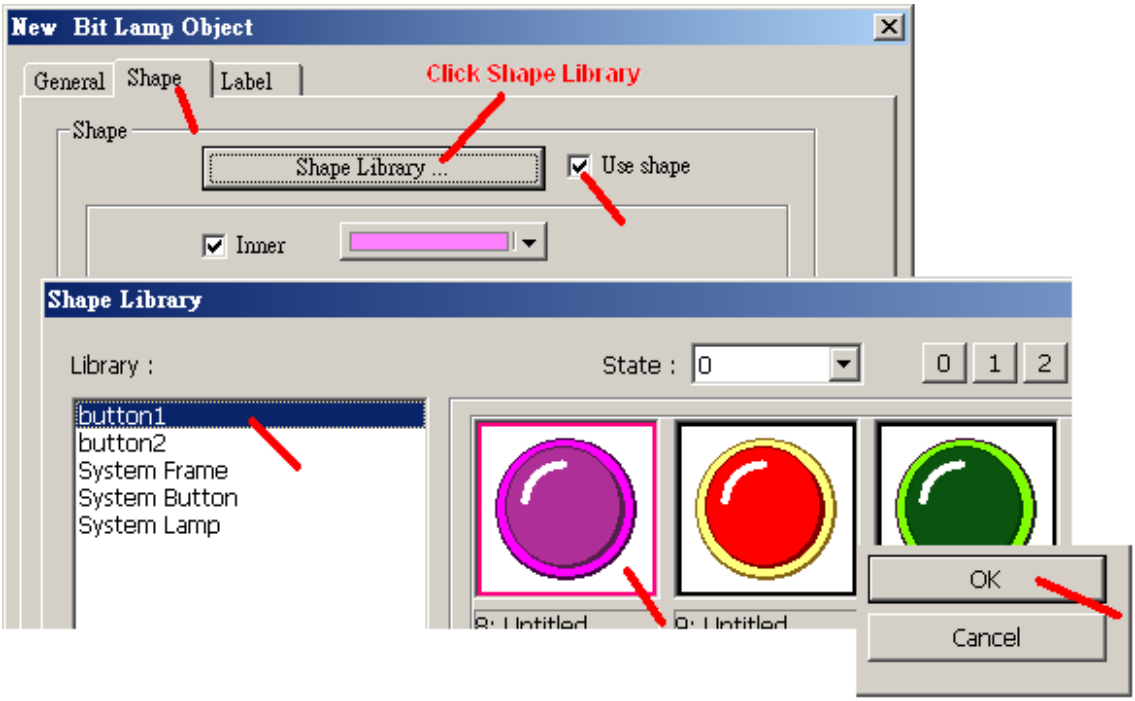
9. Then we are going to create a bit lamp and two buttons to change the state of the “OUT01” variable in the ISaGRAF controller listed in section 1.3.1 .

Name	Type	Attribute	Network address	Others
OUT01	Boolean	Internal	**0001**	

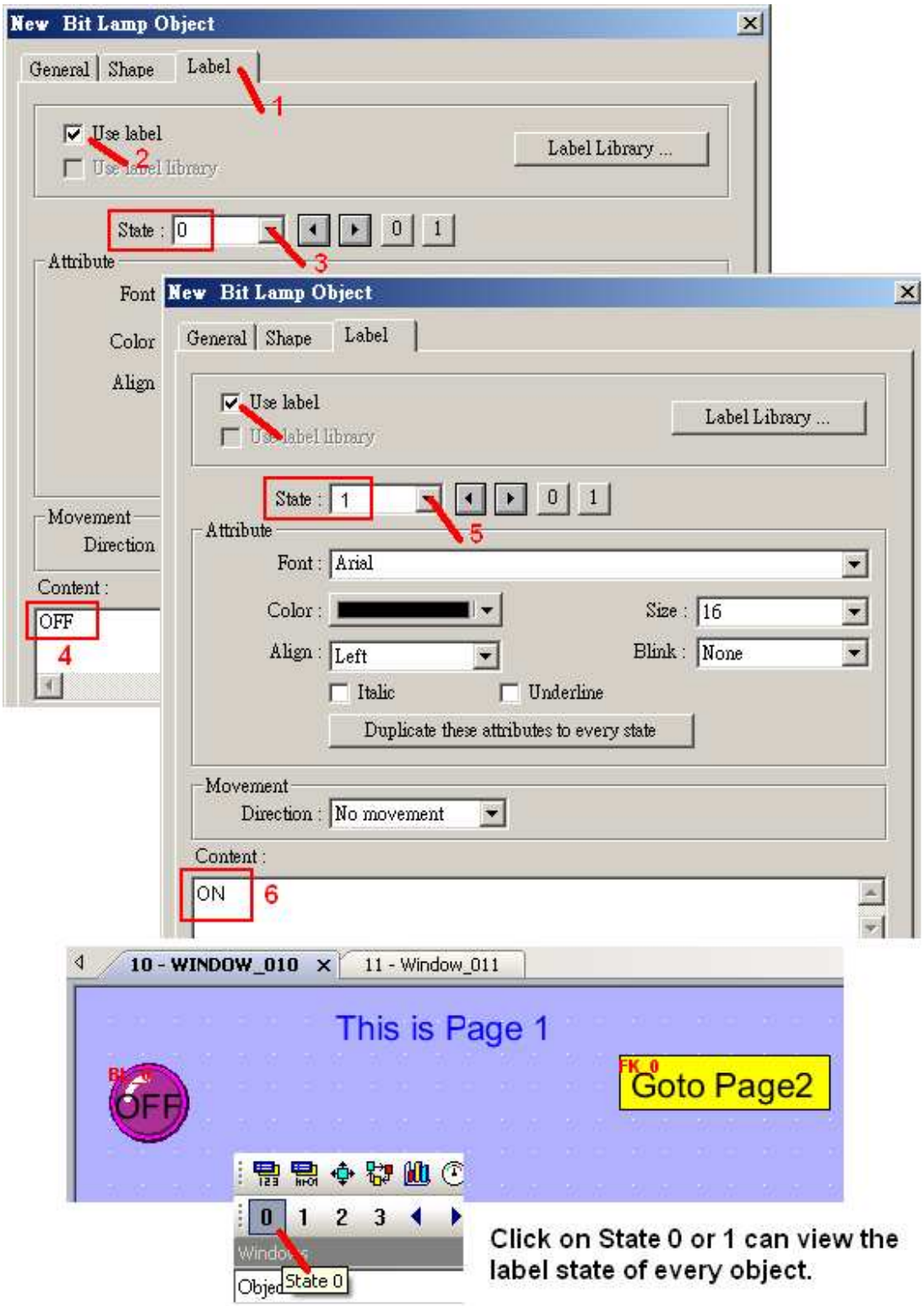
Click on “Bit Lamp” and then select “PLC name” as “PLC1” device which we have created in step 3. The boolean operation must use “Device type” as “0x” . The “Address” filed is the “Network address” number of the “OUT01” variable in ISaGRAF program. It is number “1” in this example.



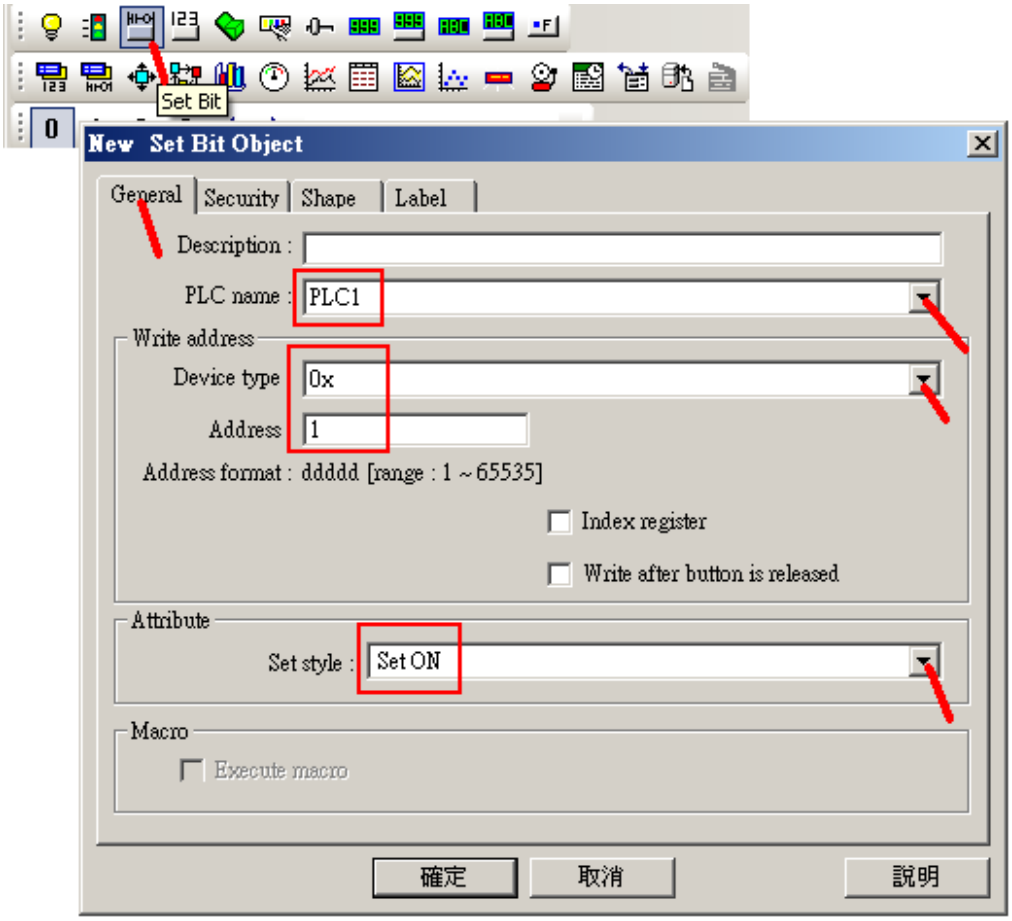
Click on “Shape” to setup the proper shape for this bit lamp.



Then Click on “Label” to set proper label for state “0” and state “1” . Remember to click on “OK” and then move it to proper position as the following figure.

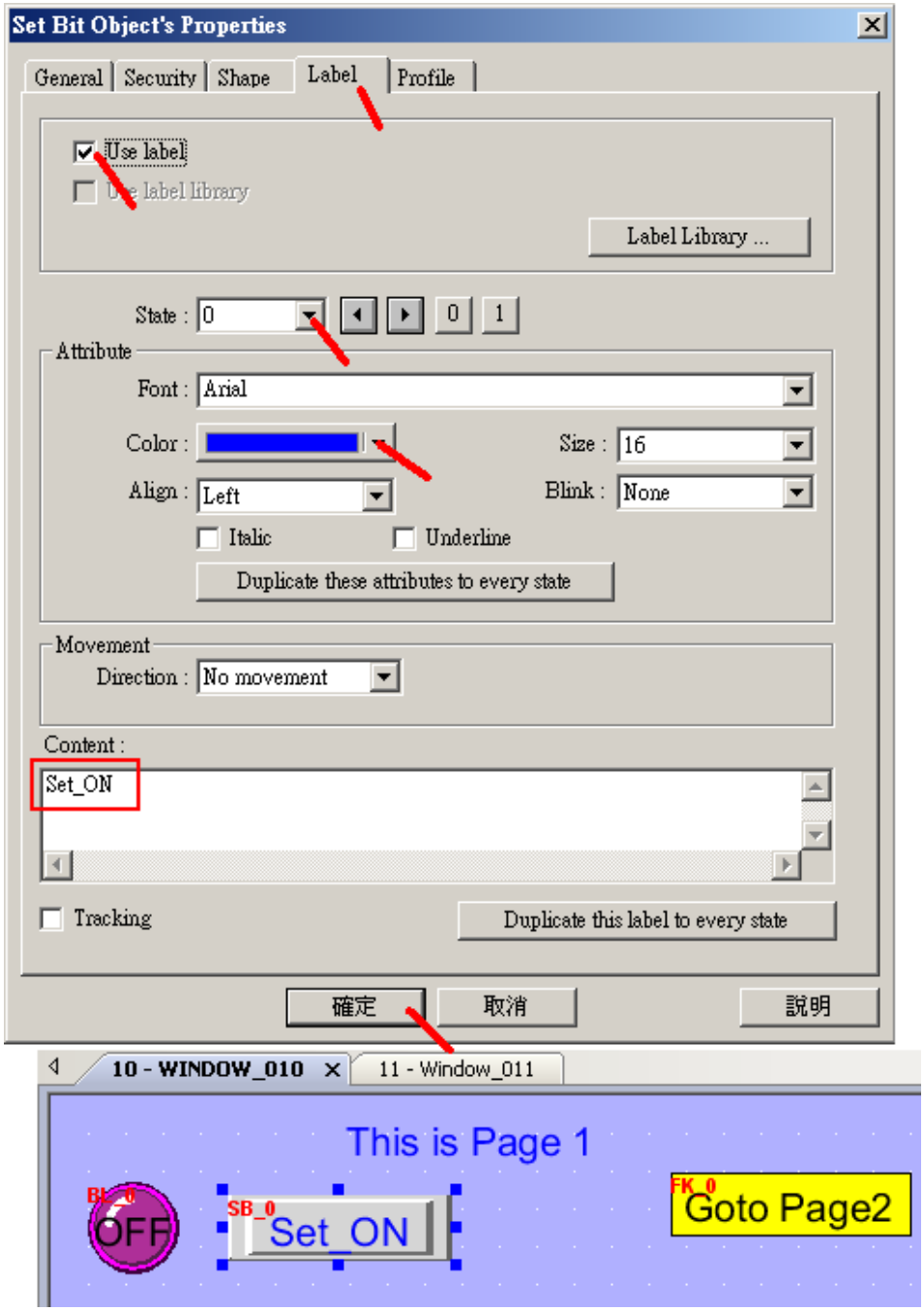


10. Then we are going to create the first “Set Bit” button to switch the “OUT01” value to ON. Click on “Set Bit”, then set “PLC name” as “PLC1” which we have created in section 1.3.1 . Then set “Device type” as “0x” (0x is for Boolean variable) and the “address” as 1 (the network address of “OUT01”) . And then set “style” as “Set ON” .

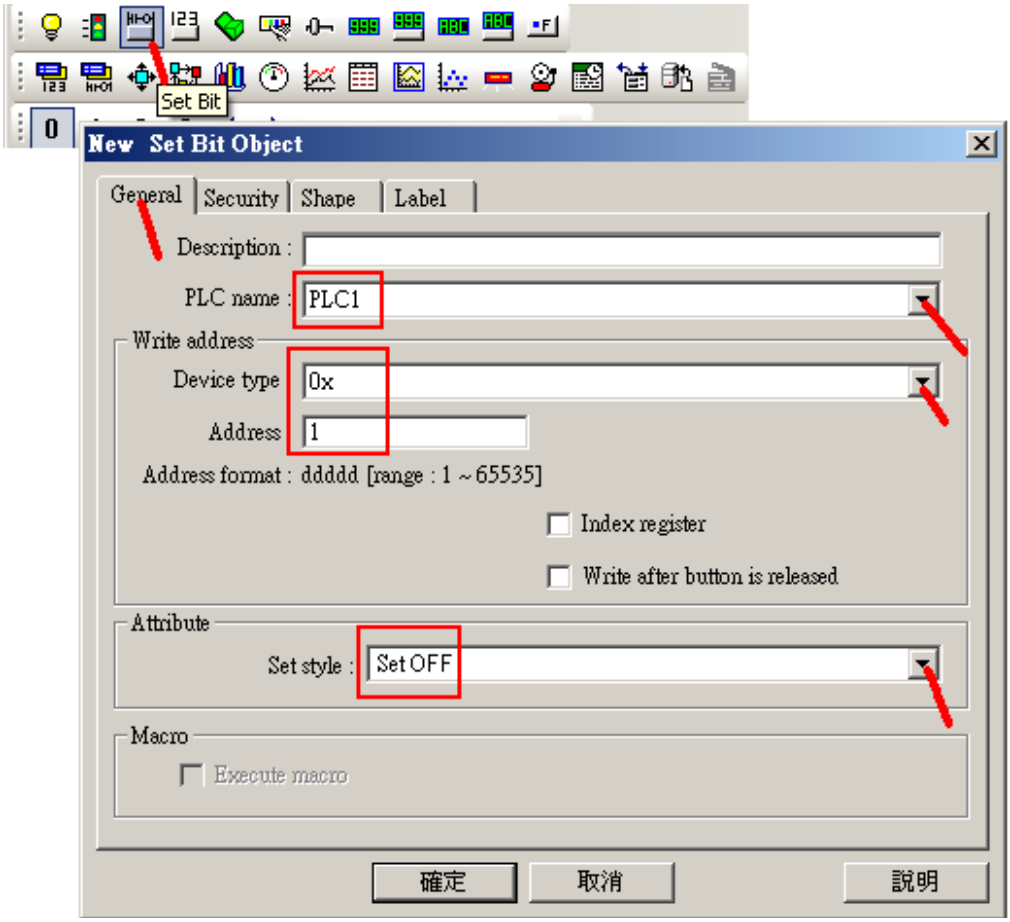


Then follow similar step as former to set proper “Shape” and “Shape library” .

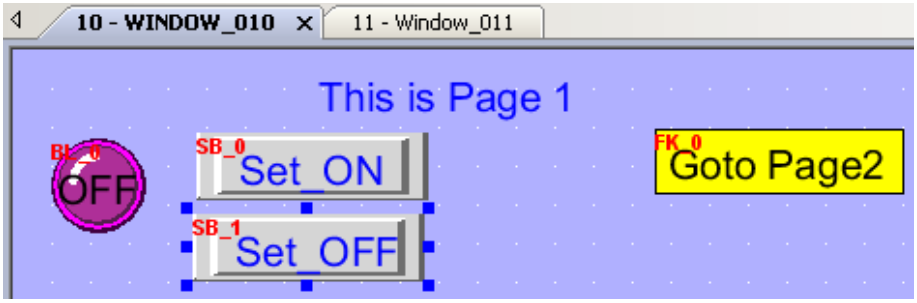
And set Label “Set_ON” to state 0 , and move it to proper position as the following figure.



Then follow the same step to create the second “Set Bit” button to switch “OUT01” value to OFF .



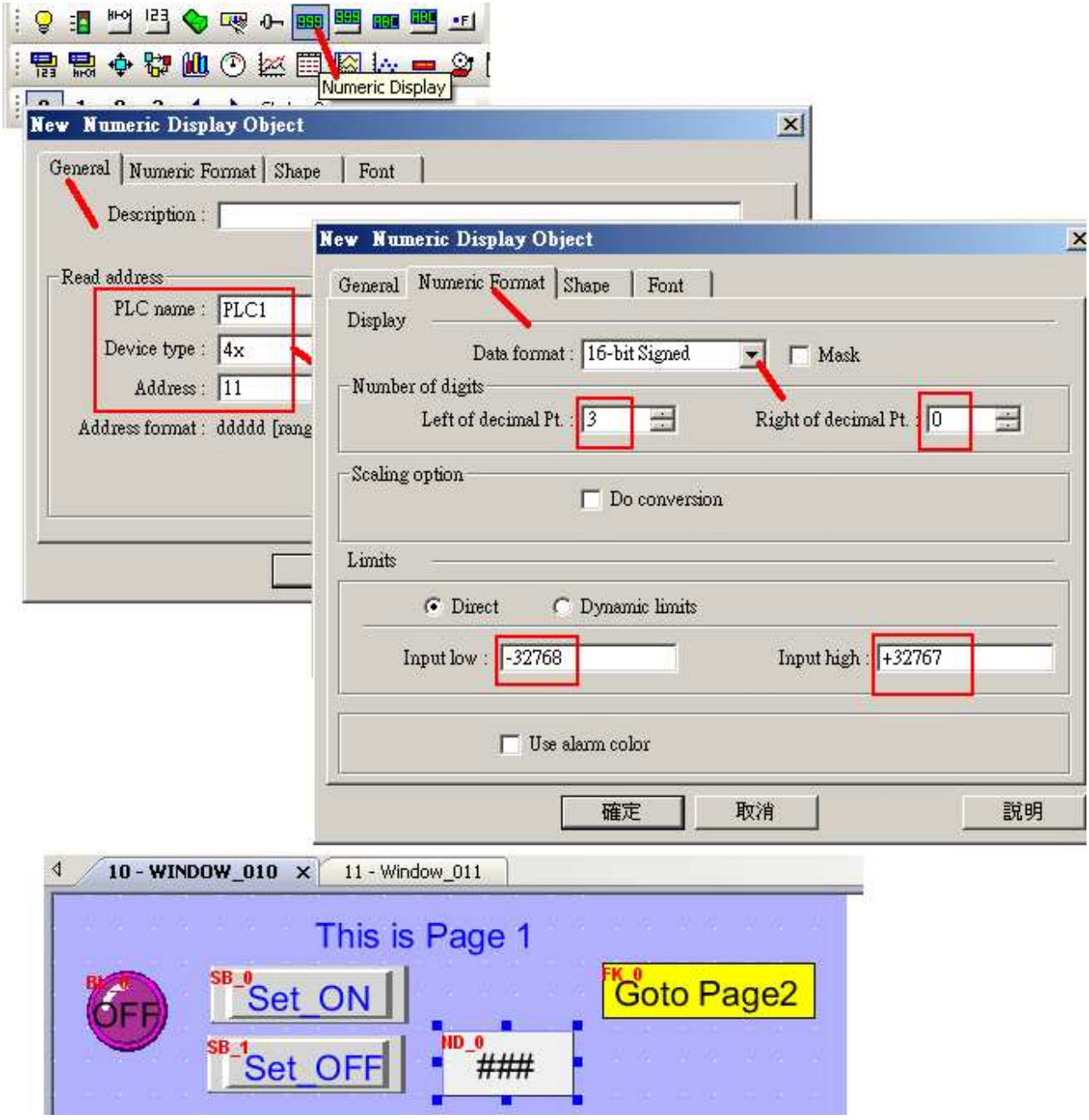
Then set proper “Shape” and “Shape library” for it. And set Label “Set_OFF” to state 0 . Then we have the following figure.



11. Here we are going to create a “Numeric Display” to display the “Second1” in the ISaGRAF controller. The “Second1” in this example is to get the second number of the controller 's system time. The value is between 0 to 59 . Its network address is assigned as 11 in the ISaGRAF program.

Name	Type	Attribute	Network address	Others
Second1	Integer	Internal	**000B** (Dec. is **11**)	Used as 16-bit integer

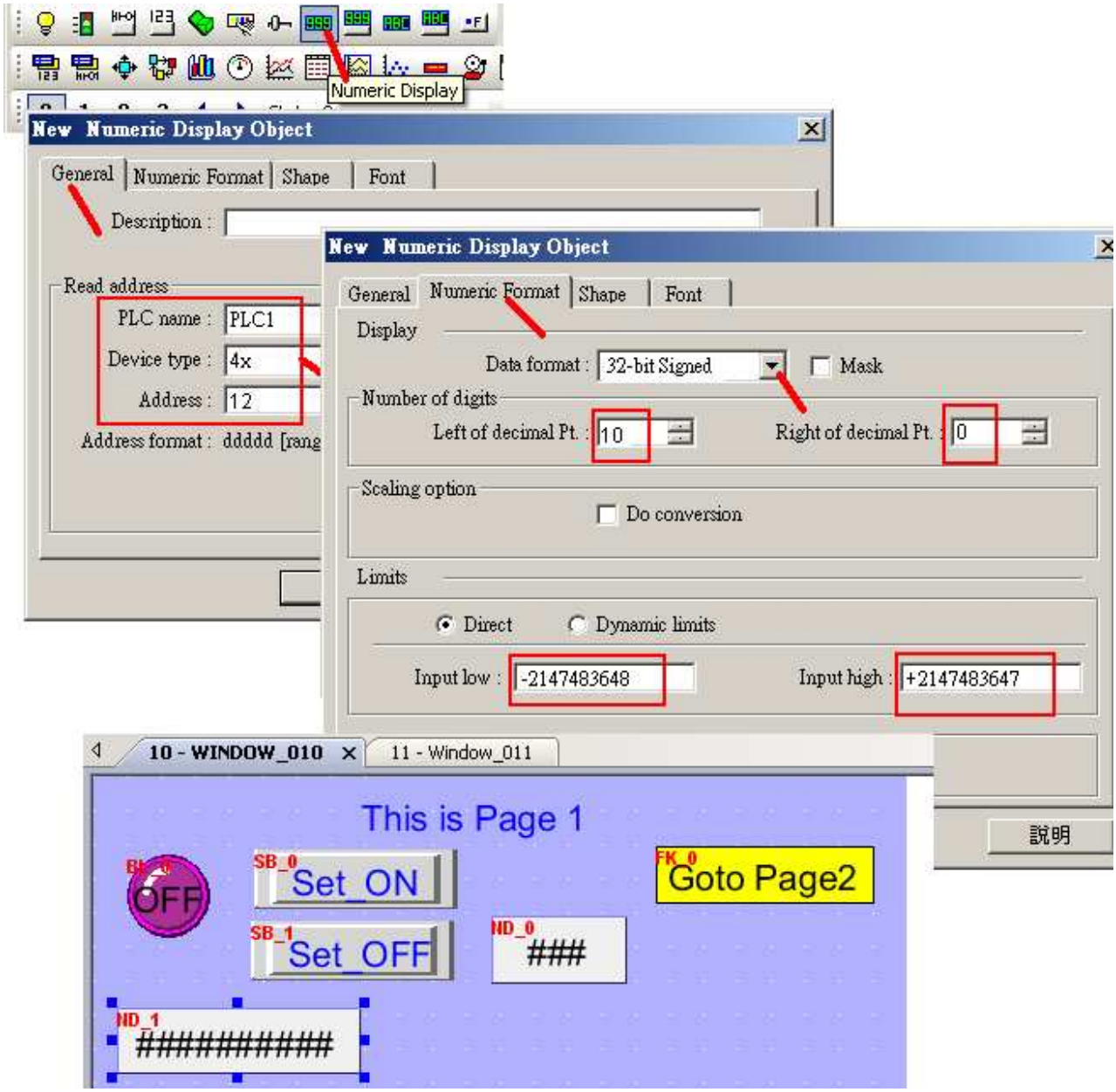
Please follow the below figure to create one “Numeric Display” . Set “PLC name” as “PLC1” which we have created in section 1.3.1 and set “Device type” as “4x” (4x is for integer and floating point value). Then set “Address” as **11,** “Left of decimal Pt.” as 3. Set “Data format” as “16-bit Signed” (means the value occupy only 1 Modbus word, signed value between -32768 to +32767) .



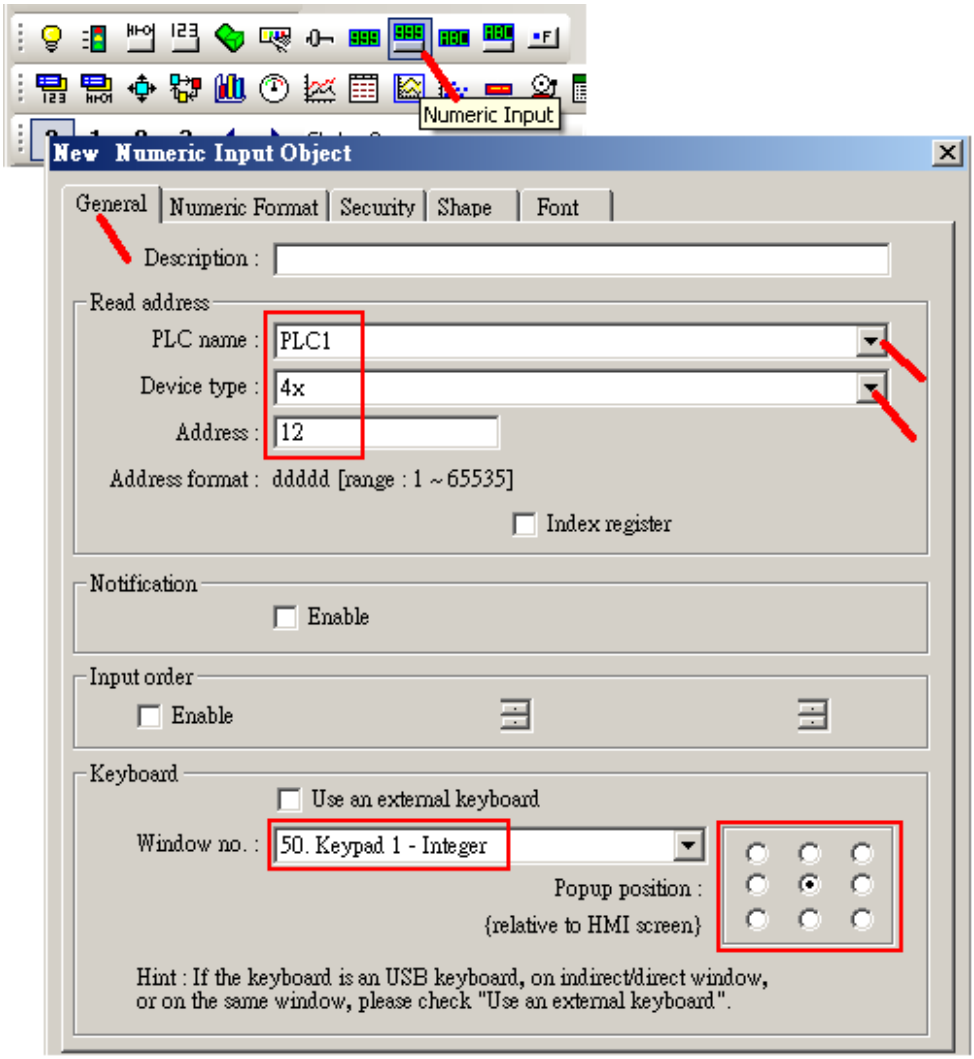
12. Here we are going to create a “Numeric Display” to display the integer variable “VAL1” in the ISaGRAF controller. The “VAL1” in this example is used as 32-bit integer .

Name	Type	Attribute	Network address	Others
VAL1	Integer	Internal	**000C** (Dec. is 12)	Used as 32-bit integer

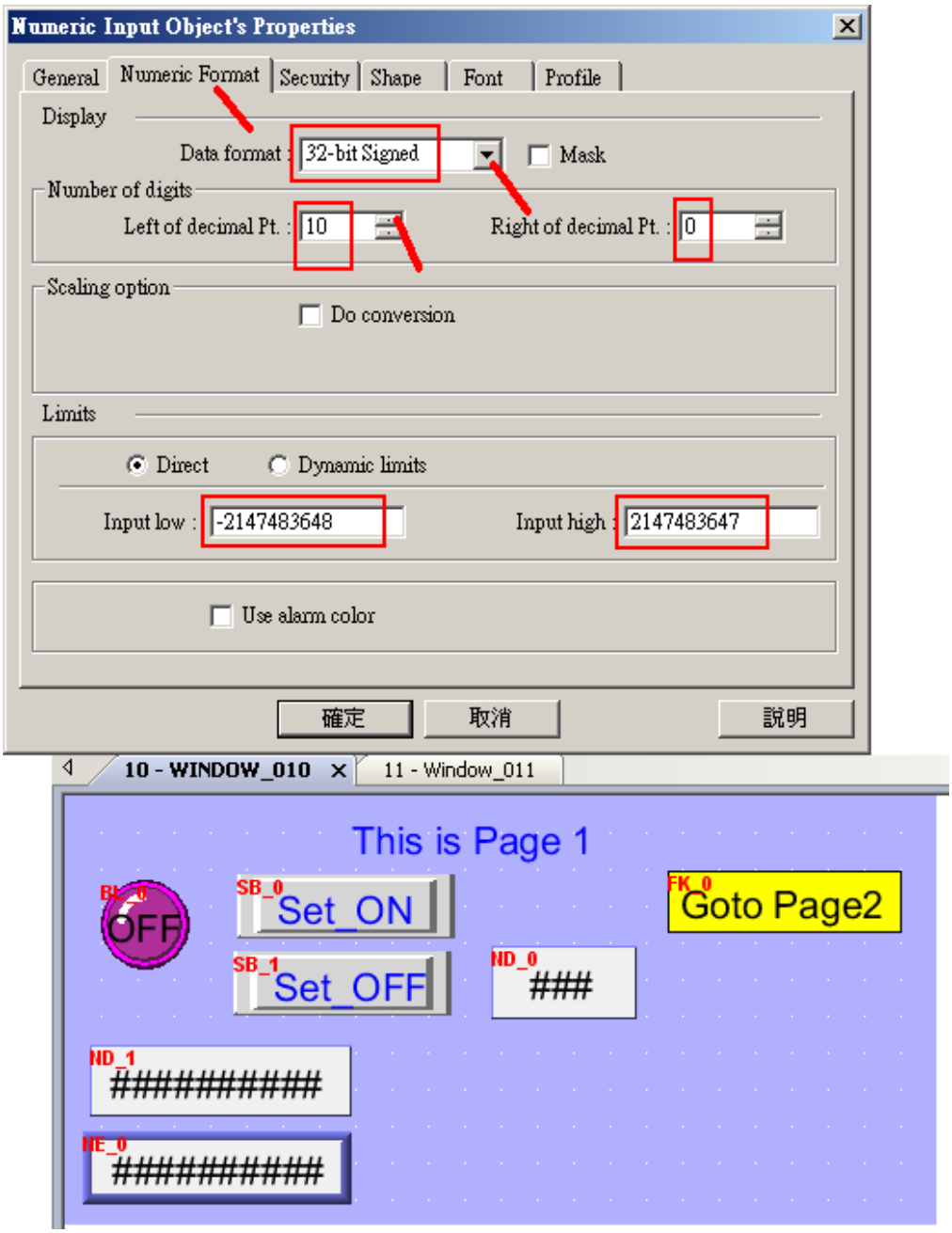
Please follow the below figure to create one “Numeric Display” . Set “PLC name” as “PLC1” which we have created in section 1.3.1 and set “Device type” as “4x” (4x is for integer and floating point value). Then set “Address” as **12** , “Left of decimal Pt.” as 10. Set “Data format” as “32-bit Signed” (means the value occupy 2 Modbus words, signed value between -2147483648 to +2147483647)



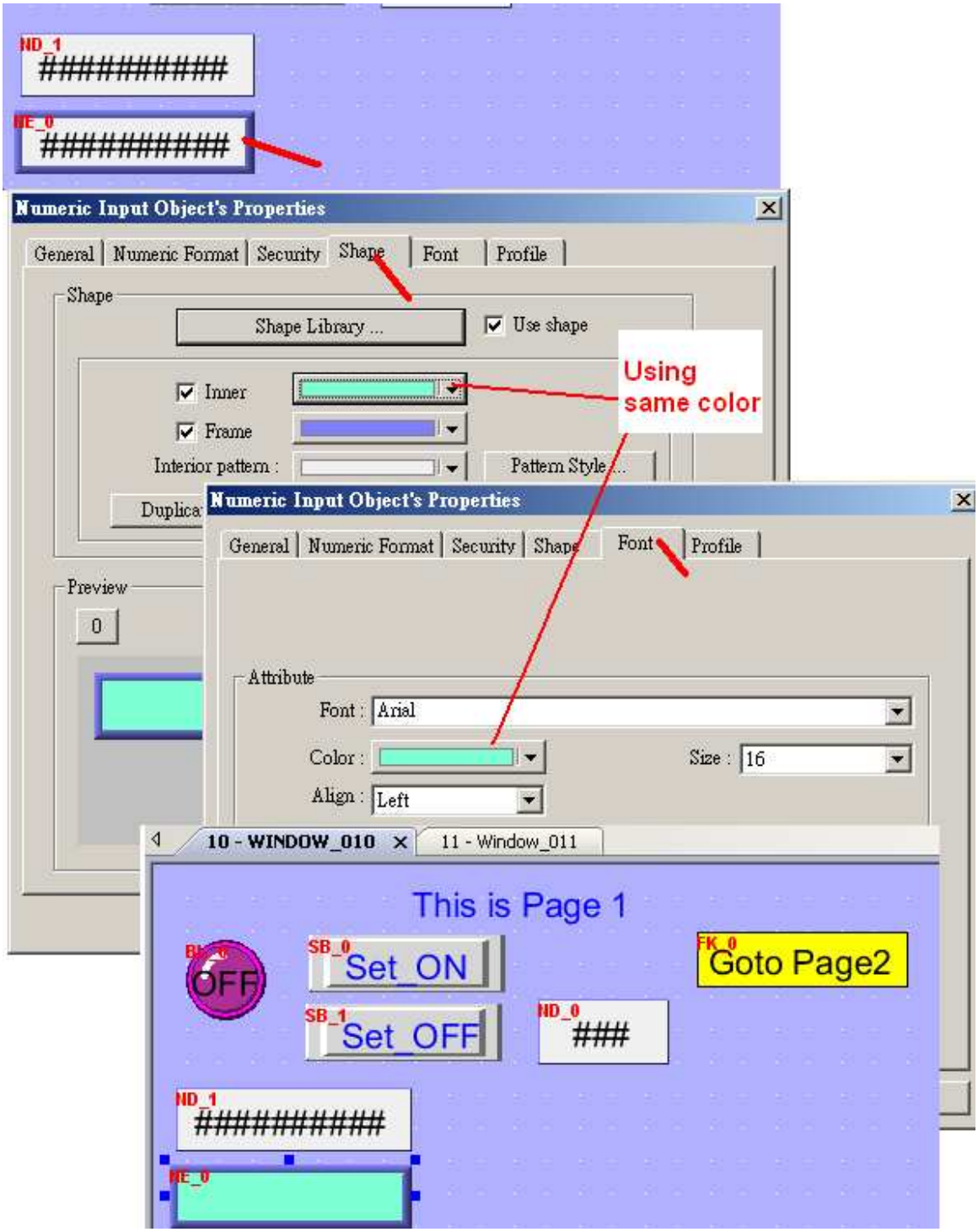
13. To create a “Numeric Input” button for the “VAL1” integer, please follow steps in the following figure. Set “PLC name” as “PLC1” , Device type as “4x” and “Address” as 12 .



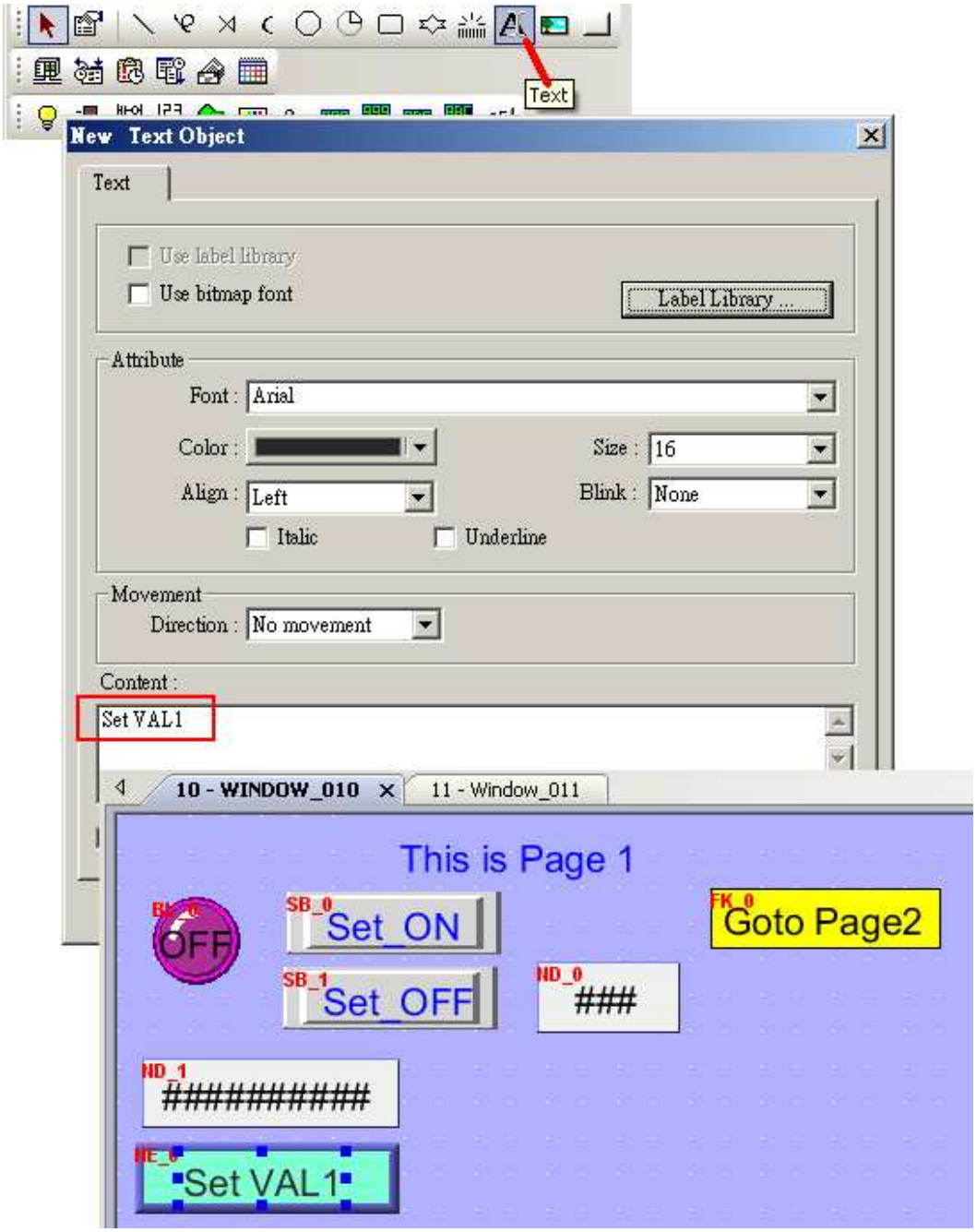
Click on “Numeric Format” to set “Data format” as “32-bit signed” , “Left of decimal Pt.” as 10 . And then move it the proper position as the following figure.



Here we can do a tricky way to cover the "########" symbol on the "Numeric Input" button. Double-click on the "Numeric Input" button to modify its original settings, then set the same color to both of "Shape" and "Font" .



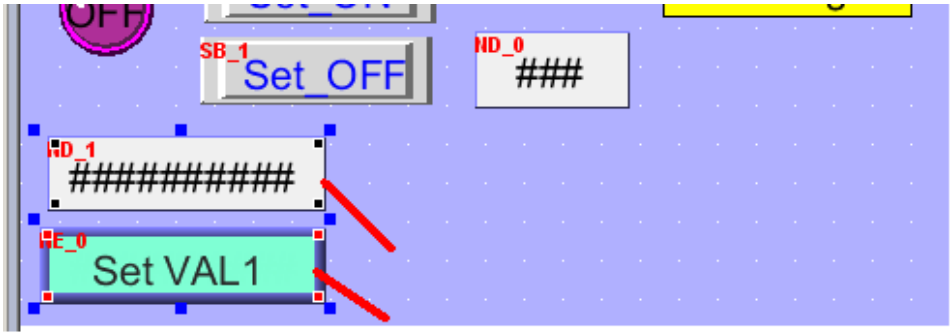
Then add one Label “Set VAL1” to the “Numeric Input” button as the following figure. Move it to just on the “Numeric Input” button.



14. Here we are going to create a “Numeric Display” to display the floating point value “F1” and a “Numeric Input” to modify the value of “F1” .

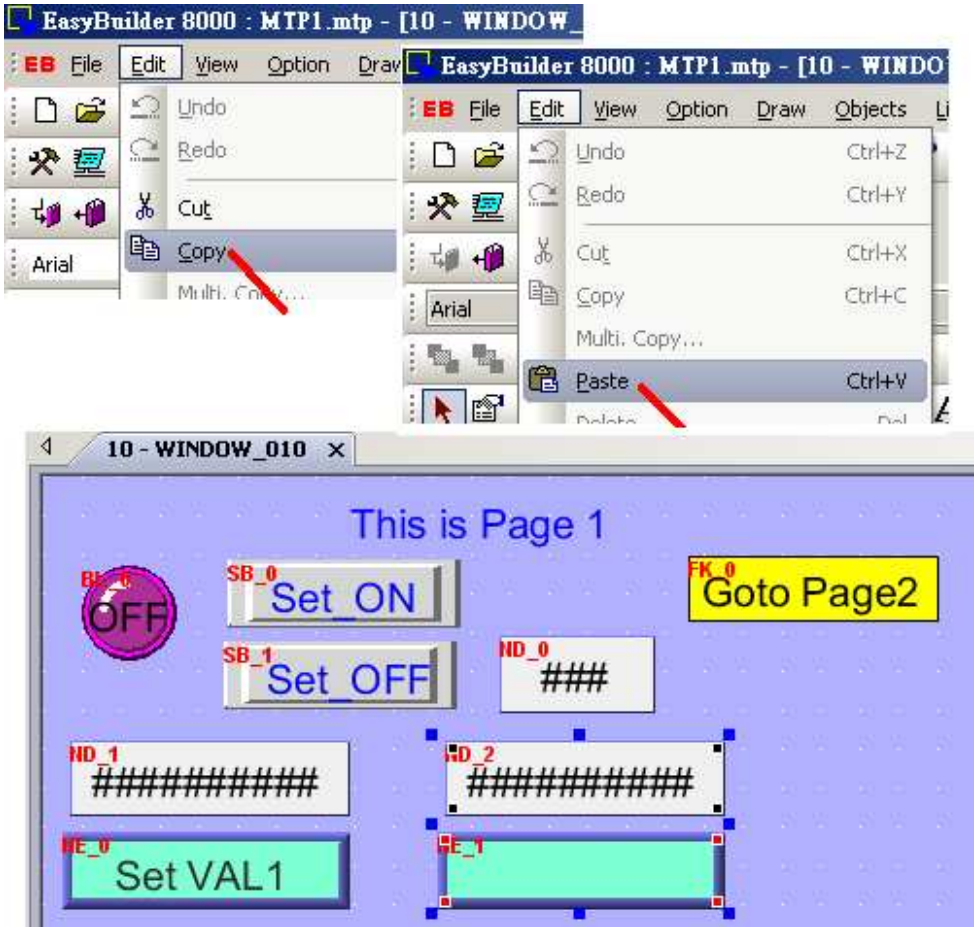
Name	Type	Attribute	Network address	Others
F1	Real	Internal	**000E** (Dec. is 14)	32-bit IEEE floating point value

The way to create them is similar as the former step 12 and step 13. However there is one quick way to create them. Just copy them from the former objects as the following.

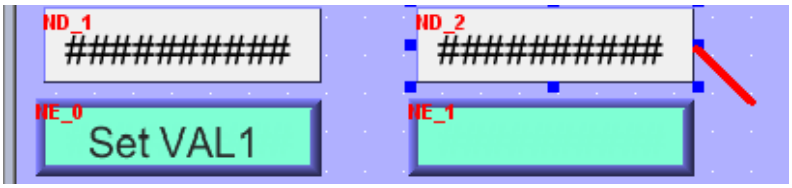


Press the "Ctrl" key and using mouse click on these two objects one by one

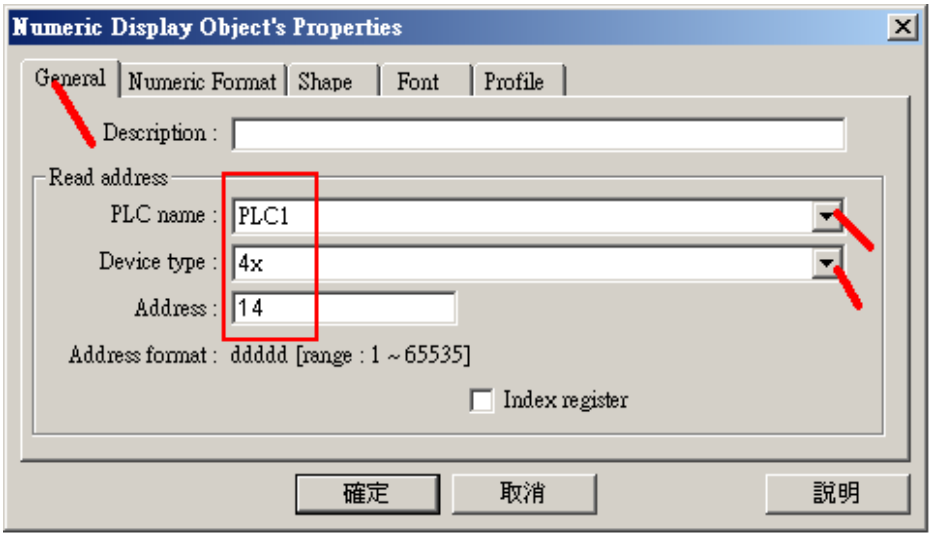
Then run “Copy” and then run “Paste” . Move the new copied objects to proper position.

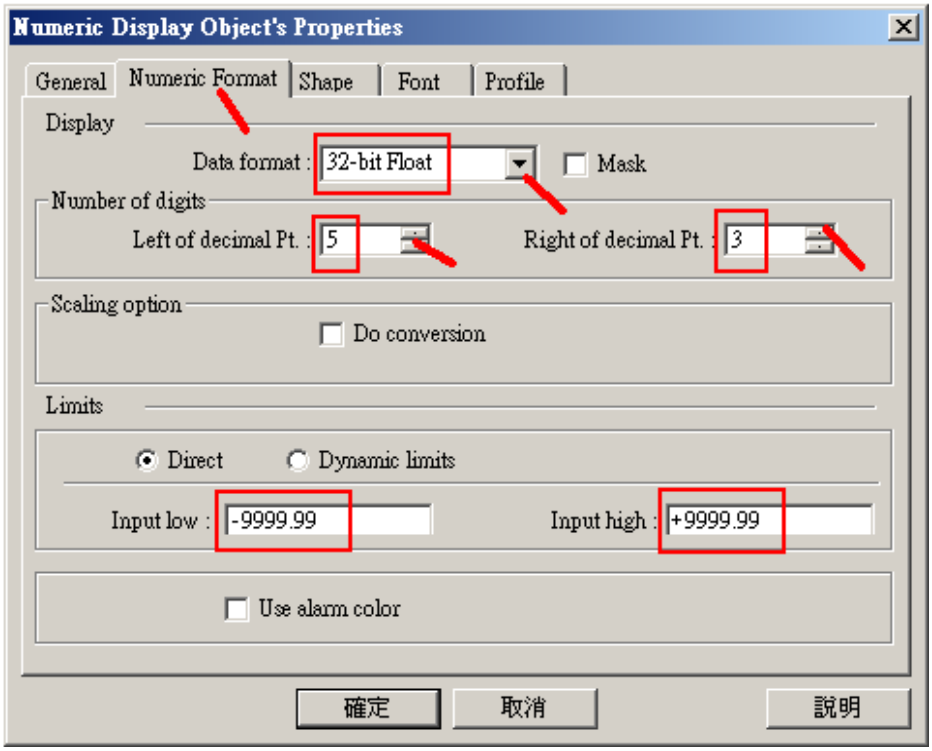


To change the property of the new copied object, use mouse to two-click on it.

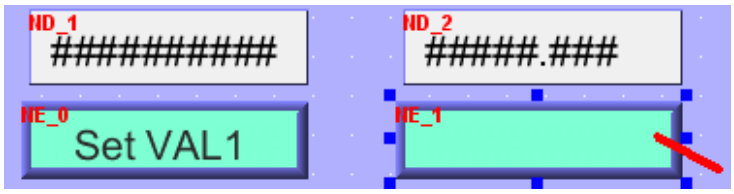


Then modify the “Address” to 14. (the network address of variable “F1”) . Then click on “Numeric format” to set the “Data format” as “32-bit Float” , “Left of decimal Pt.” as 5 , “Right of decimal Pt.” as 3 , “Input low” as -9999.999 and “Input high” as +9999.999 .

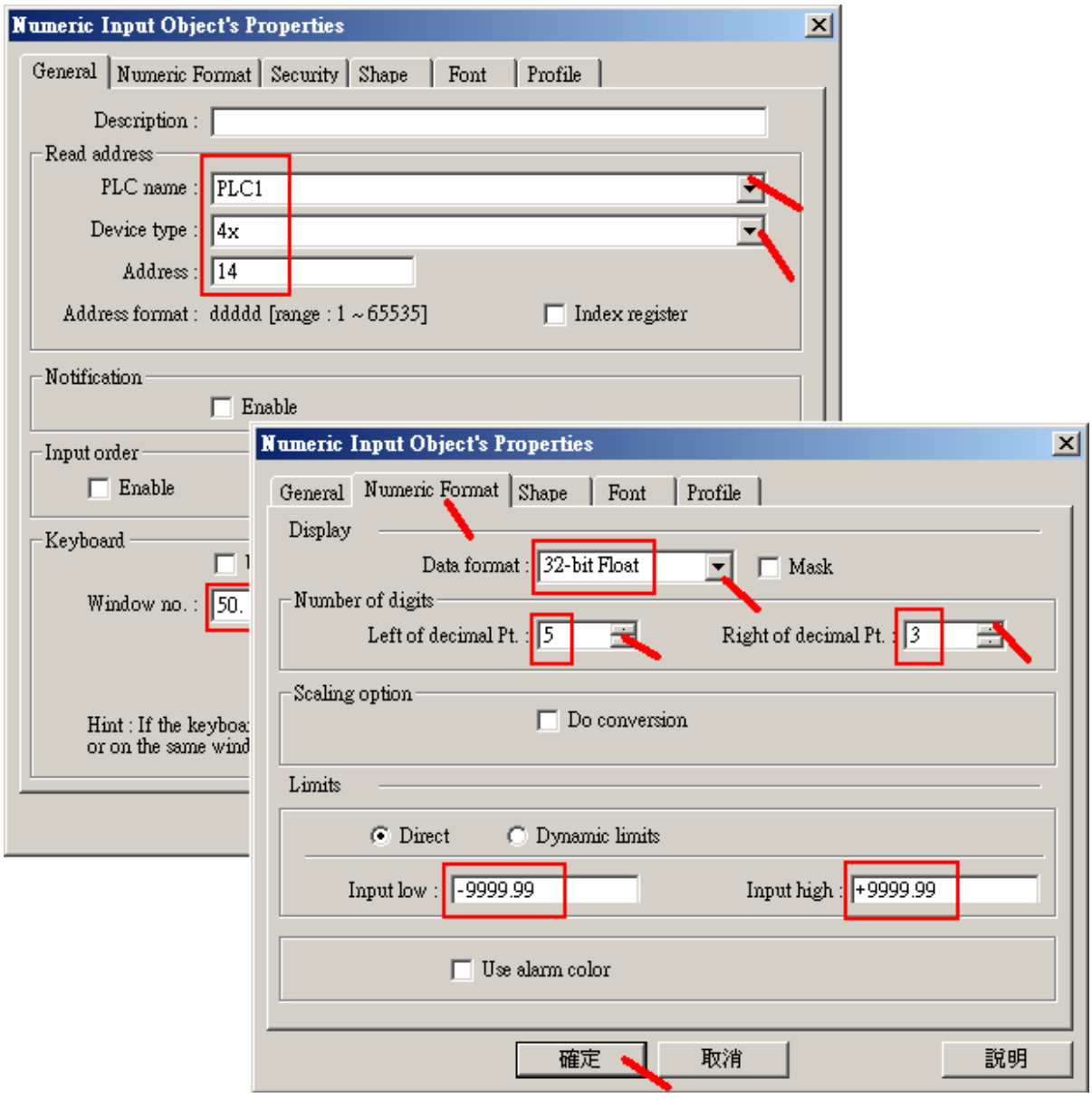




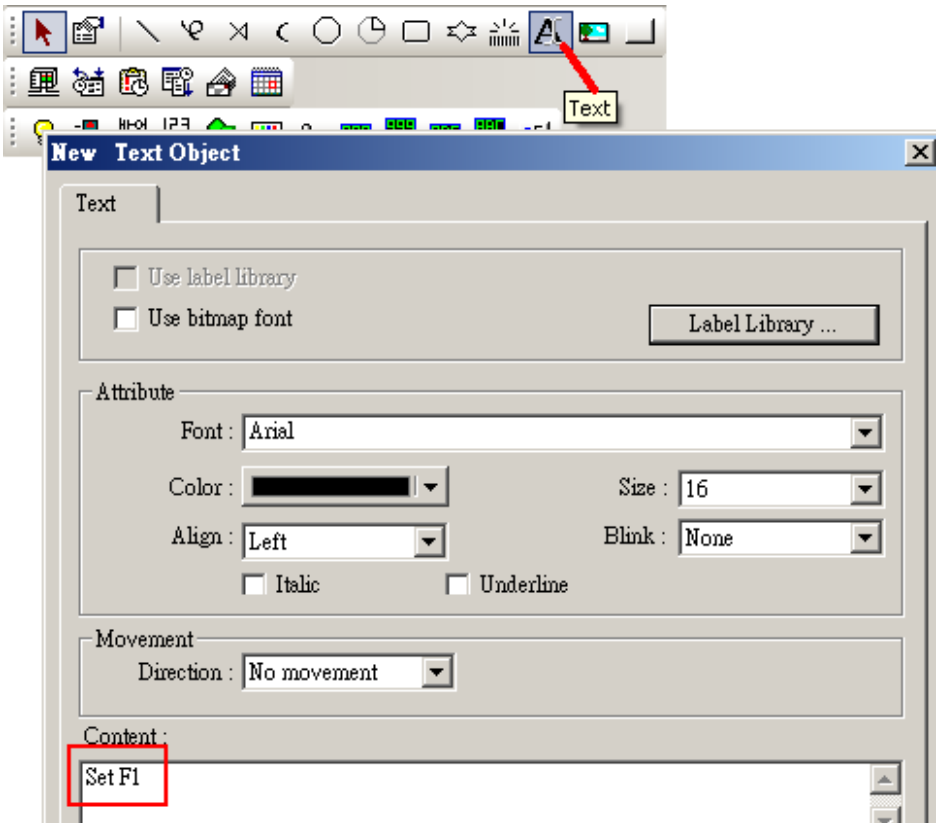
Then two-click on next “Numeric Input” object to modify its property.



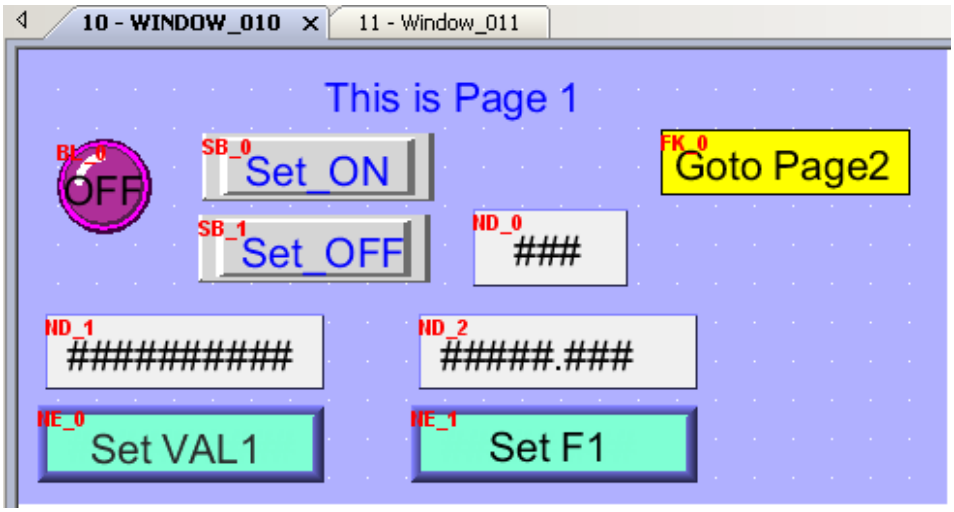
Then modify the “Address” to 14. (the network address of variable “F1”) . Then click on “Numeric format” to set the “Data format” as “32-bit Float” , “Left of decimal Pt.” as 5 , “Right of decimal Pt.” as 3 , “Input low” as -9999.999 and “Input high” as +9999.999 .



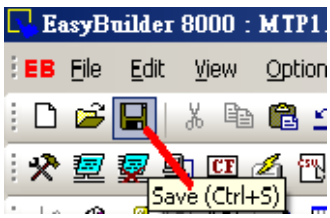
Then create one Label “Set F1” and move it to just on the “Numeric Input” button.



Then we have finished the “10” window as below.

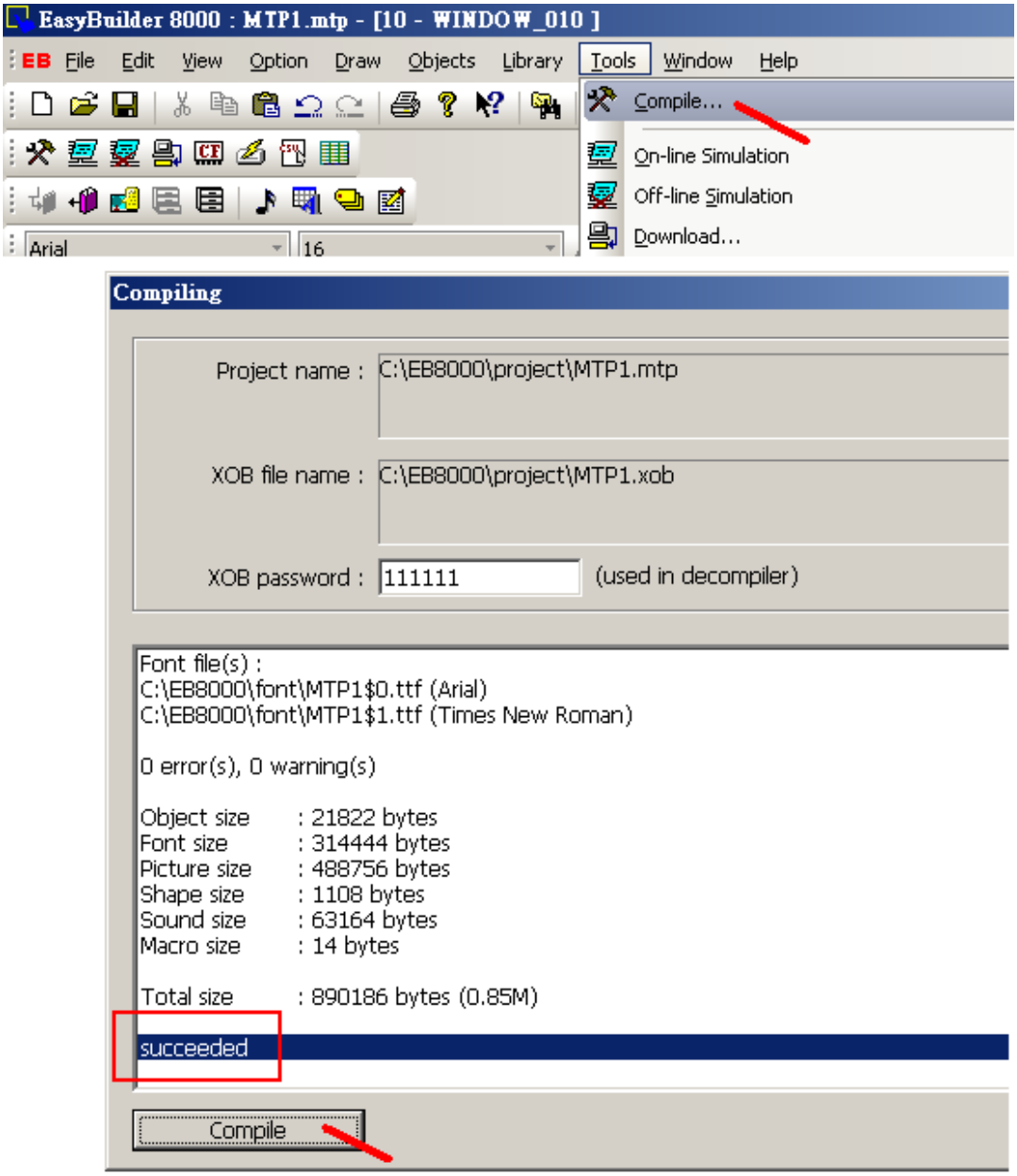


Then click on “Save” to save it.



1.4: Compile / Download and Test the Touch-8000

Please run “Tools” > “Compile...” to compile the Touch-8000 project .

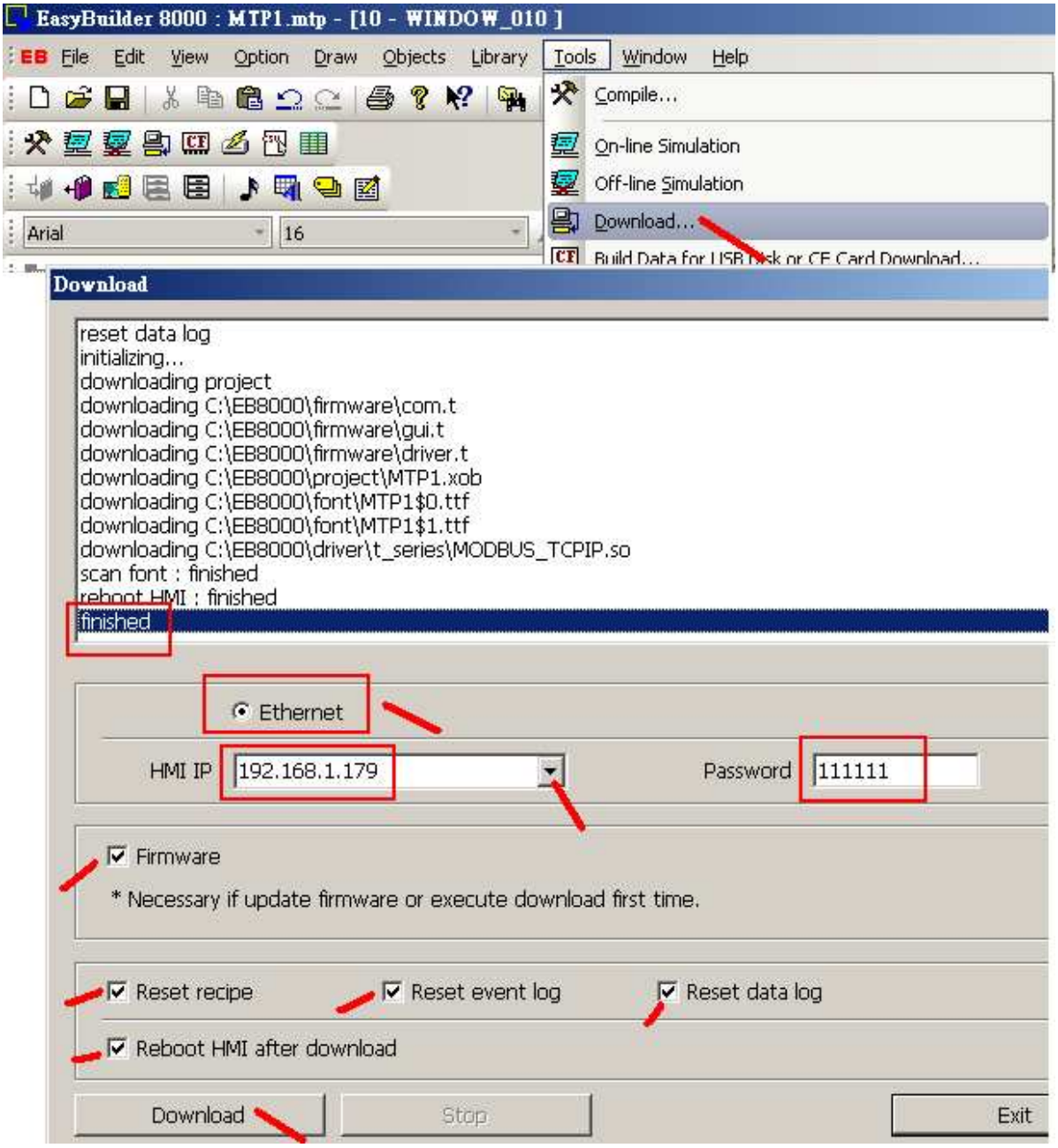


After clicking on “Compile” , if it shows “succeeded” , then the HMI picture can be download to the Touch-8000 by steps listed on next page.

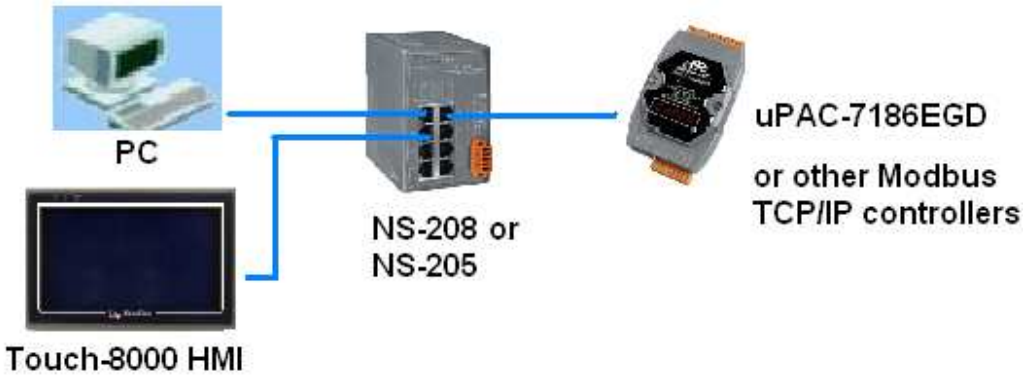
We are going to download the HMI project to the Touch-8000 by using Ethernet cable. Please make sure the Ethernet cable is connected well between PC --- Ethernet switch --- Touch-8000. And also the IP, Mask and download password are well set (refer to section 1.2) .

Note: The (IP, Mask) setting of the PC must lie in the same domain as the Touch-8000.
For ex, PC (192.168.1.20 , 255.255.255.0) and Touch-8000 (192.168.1.179 , 255.255.255.0) is ok.
However PC (192.168.**3**.20 , 255.255.255.0) can not connect Touch (192.168.**1**.179 , 255.255.255.0).

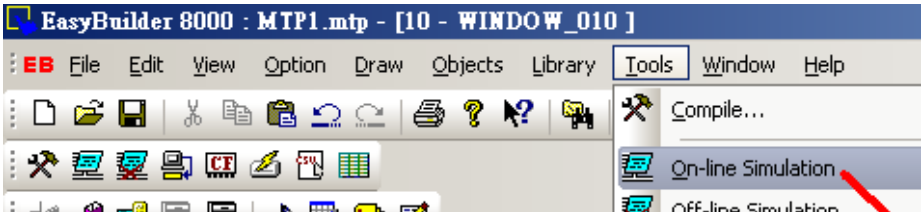
Then run “Tools” > “Download...” . Set the correct HMI IP (In this example, we are setting Touch-8000 's IP as 192.168.1.179 in section 1.2) and download password (here is using default password 111111) . Then click on “Download” . If everything is well set, it will take about 20 to 100 seconds to download the HMI project. Then the Touch-8000 will reboot itself once automatically.



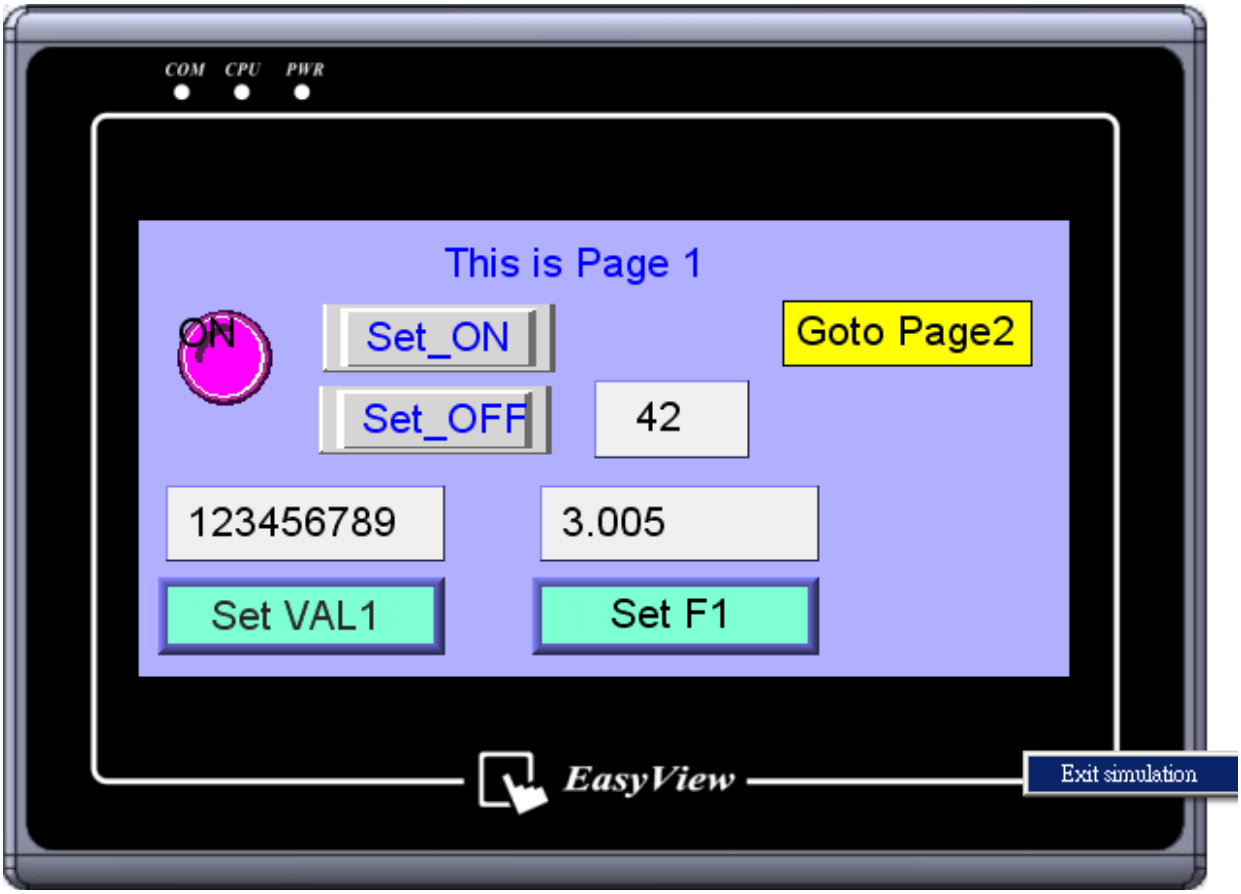
The “On-line Simulation” is one useful utility to test the Touch-8000. Please make sure the Ethernet cables are well connected as the following figure. The “On-line Simulation” can simulate the HMI picture on PC without downloading to the Touch-8000 (The PC must link to the Touch-8000).



Then run “Tools” > “On-line Simulation”



To exit the simulation, use mouse right-click on the widow, then run “Exit simulation”.

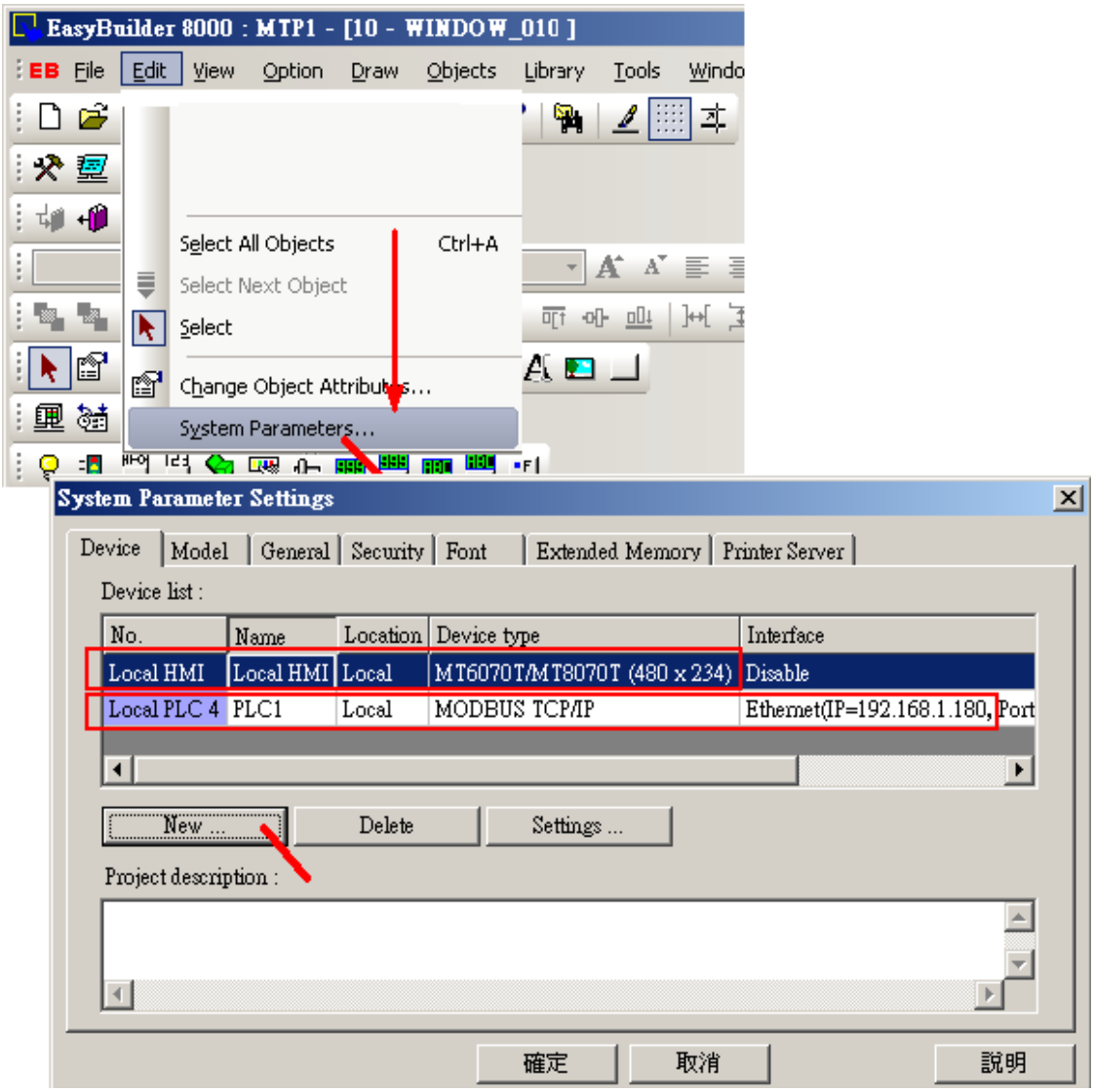


Chapter 2 : Some Advanced Topics

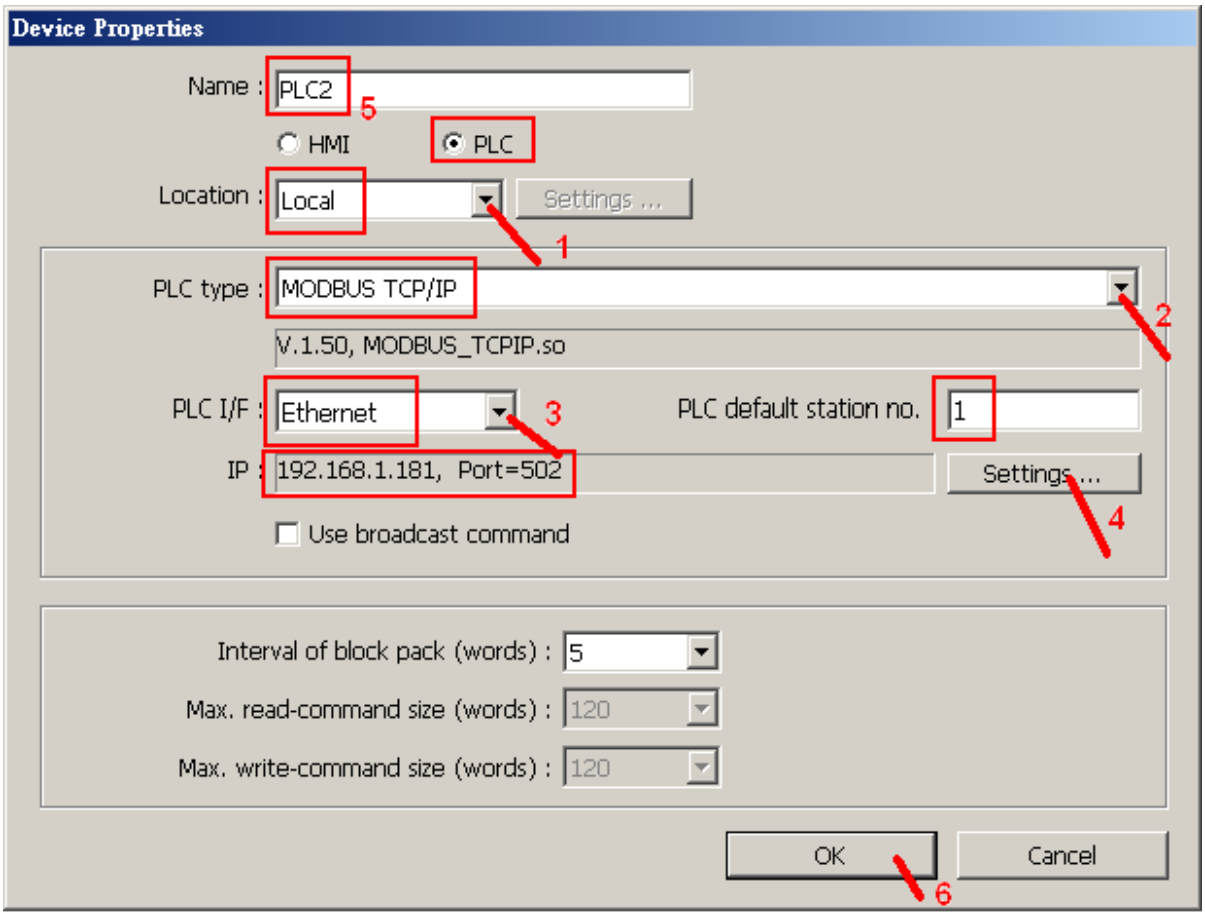
2.1: Connecting one Touch-8000 to Many Controllers

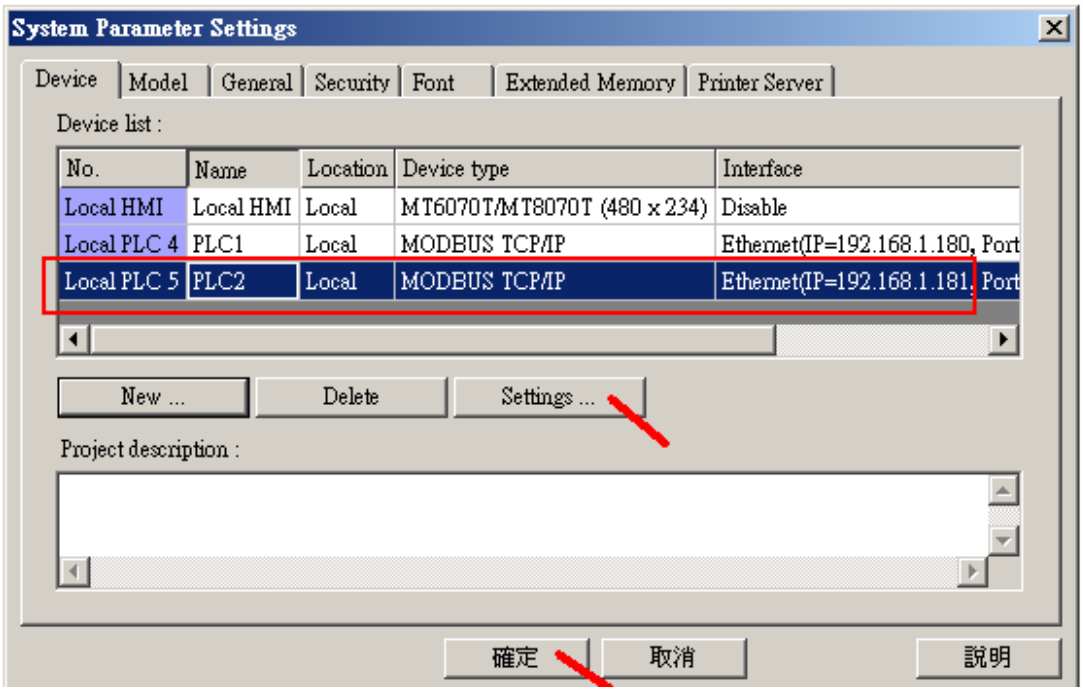
The Touch-8000 's Ethernet port can link to many ICP DAS Modbus TCP/IP controllers, like the WP-8xx7, uPAC-7186EG, iPAC-8x47 or others supporting Modbus TCP/IP slave protocols. However recommend not connecting more than 6 controllers (The more connectted, the slower communication scan rate). The COM1: RS-232/485, COM2: RS-232 and COM3: RS-232/485 of the Touch-8000 can also link to ICP DAS Modbus RTU controllers, like the WP-8xx7, uPAC-7186EG, uPAC-7186XG, I-7188XG, I-8x47, iPAC-8x47 or others supporting Modbus RTU slave protocols.

In the “System Parameters” windows, user can create more than one device. The first “Local HMI” is necessary. It defines the Touch-8000 itself. We have created one device in Chapter 1.3, named as “PLC1” as below figure. **To create one more device, please click on “New”** .



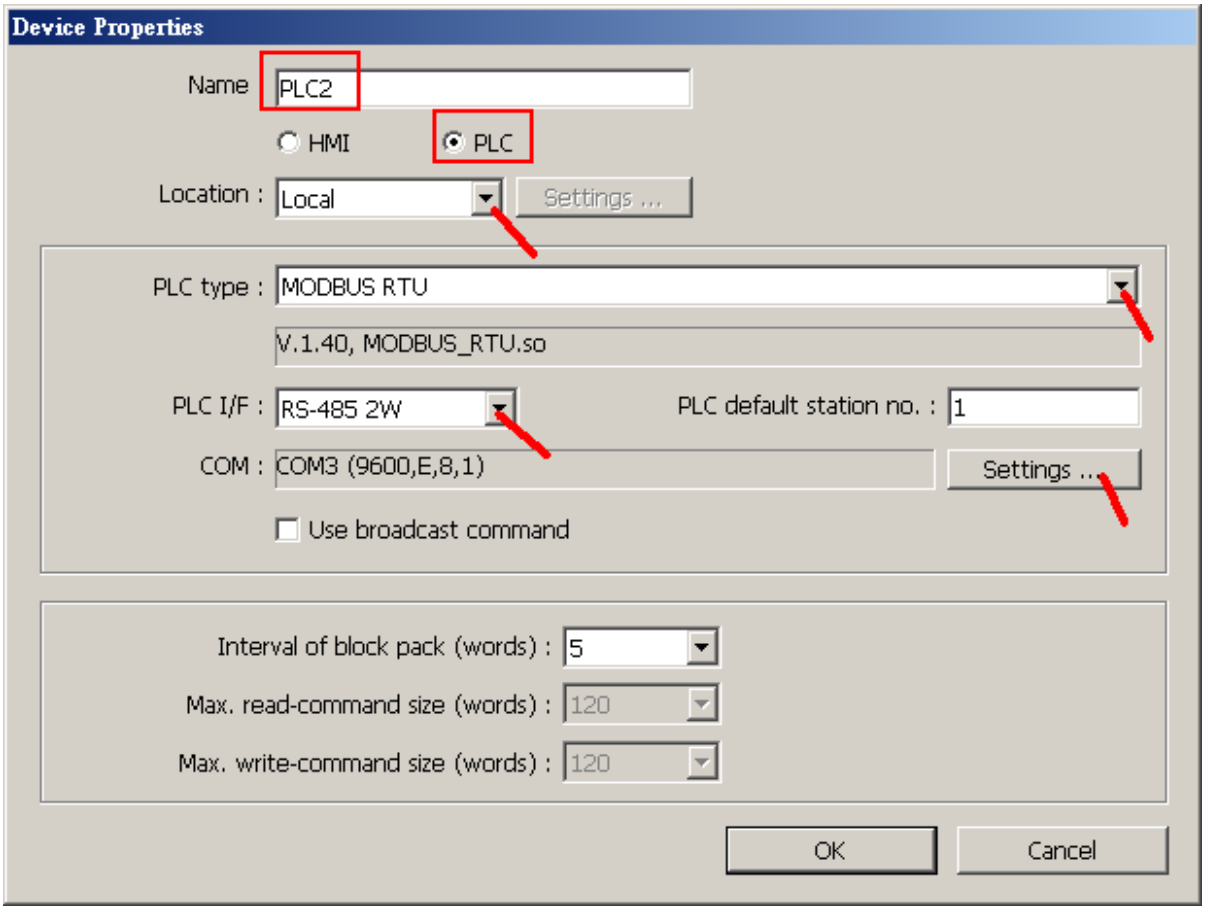
Set proper property for this new device. Here we are connecting one another Modbus TCP/IP controller with IP=192.168.1.181 , port=502 and NET-ID = 1 (PLC station No.)



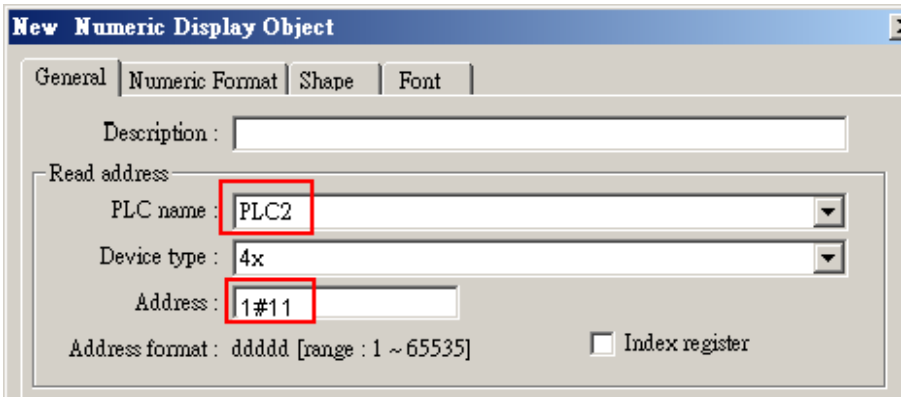


If the new connected device is a Modbus RTU controller by RS-485 (2 wire) communication, the user can set its property as the following figure. Setting the “PLC type” as “Modbus RTU”, “PLC I/F” as “RS-485 2W” , PLC default station No. as 1 (can be modified in each object 's address setting) , ...

Note: Recommend connect no more than 7 controllers or M-7000s in each Touch-8000 ’s RS-485 port (2-wire). The more connected, the slower communication rate.

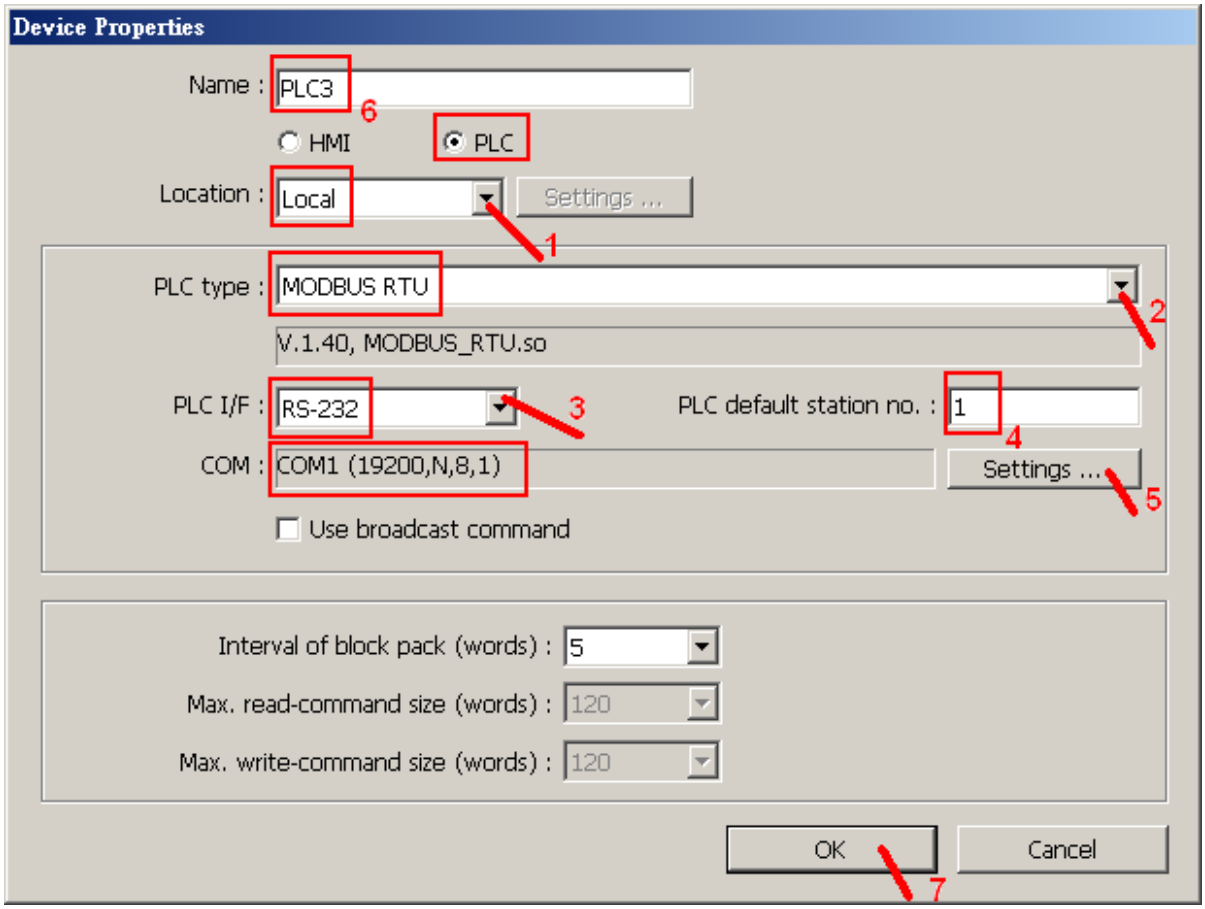


Then when creating the HMI object, please select the related “PLC name” and Address similar as below. The number before the '#' means the related PLC 's station No. (NET-ID). For ex, 1#20 means station No. 1 's address 20 , While 2#150 means station No. 2 's address 150 .

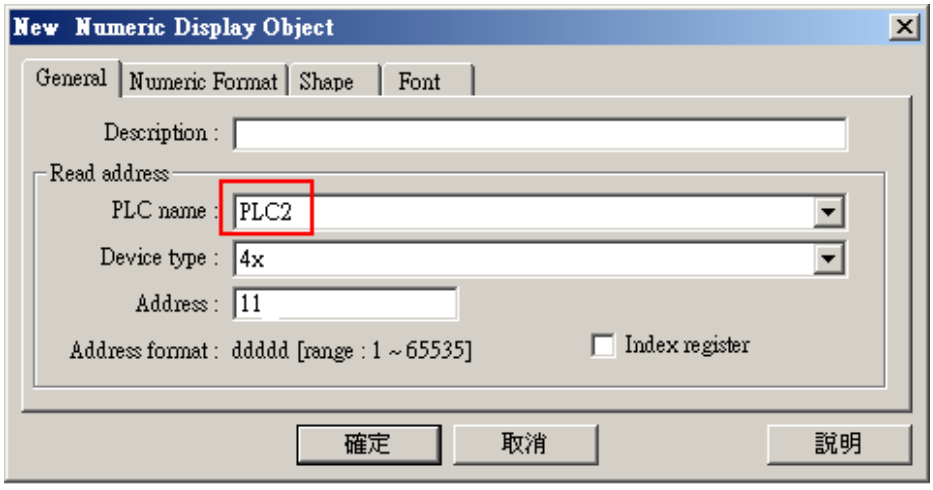


If the new connected device is a Modbus RTU controller by RS-232 communication, the user can set its property as the following figure. Setting the “PLC type” as “Modbus RTU”, “PLC I/F” as “RS-232” , PLC station No. as 1 (NET-ID of the new PLC) , ...

Note: Each Touch-8000 's RS-232 port can connect only one controller.

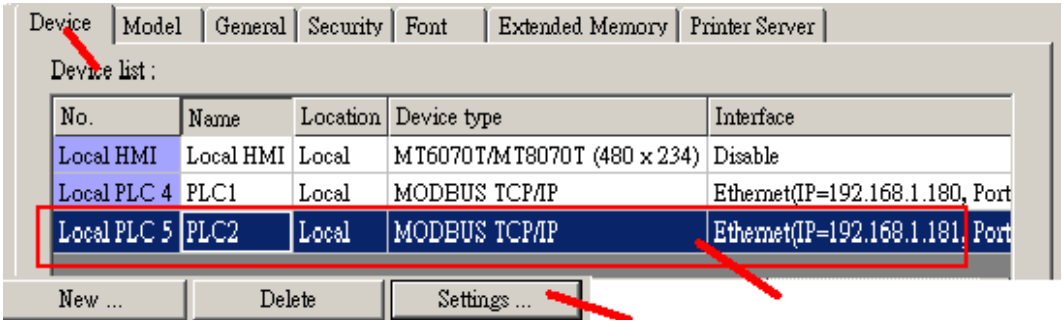


Then when creating the HMI object, please select the related “PLC name” as below.

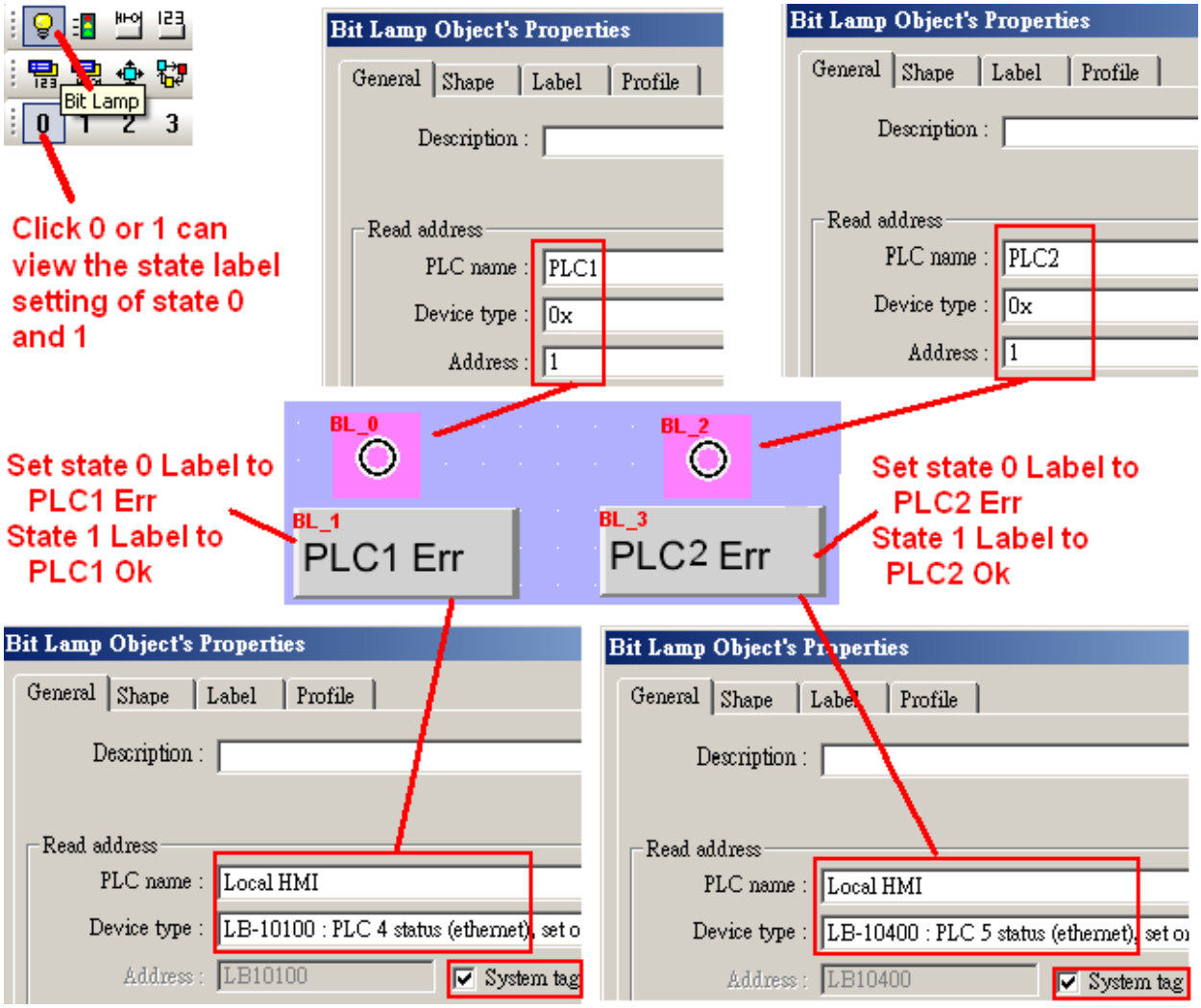


2.1.1: Display the PLC communication state (Via Ethernet)

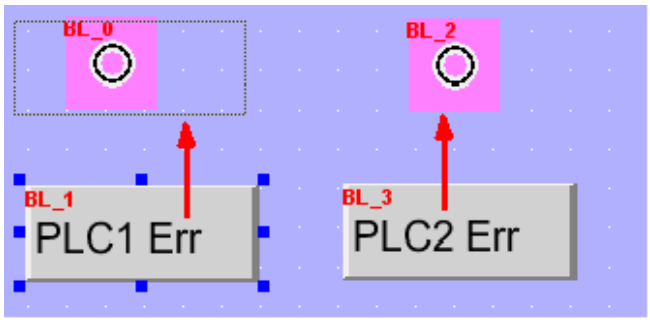
The PLC communication state (via Ethernet) can be displayed on Touch-8000. Below “System Parameter” shows there is 2 Modbus TCP/IP PLCs connected by Touch-8000. One is named as “PLC1” with “No.” = “Local PLC4” . The other one is named as “PLC2” with “No.” = “Local PLC5” .



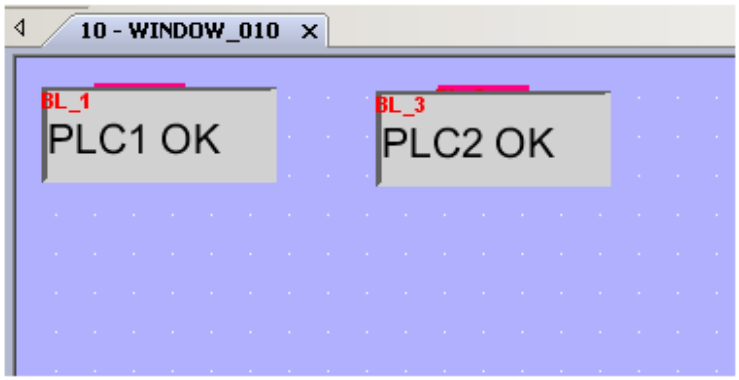
To display the communication state of “Local PLC4” and “Local PLC5”, please create four “Bit Lamp” as the following figure. Check the “System tag” and select “Local HMI” to use the “LB-10100: PLC 4” to display the communication status of “Local PLC4” and “LB-10400” for “Local PLC 5” . The first and second Bit lamps (PLC1 , 0x , addr.=1) and (PLC2 , 0x , addr.=1) are necessary to inform the Touch-8000 to read some value from these two PLCs (using other addr. is also ok).



The first and second bit lamps are not necessary to display on the screen (however they are necessary to exist for detecting the communication state of the PLC1 and PLC2). So here we can move the third and fourth bit lamps to cover the first and second bit lamps as below.



Then we have the following picture. Click on State 1 can view the Label setting of state 1 .

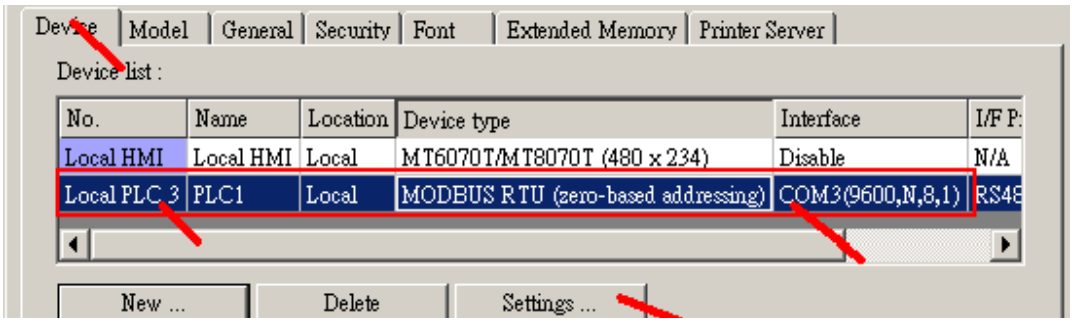


Then save, compile and download to the Touch-8000 to test it (steps is similar as Chapter 1.4).

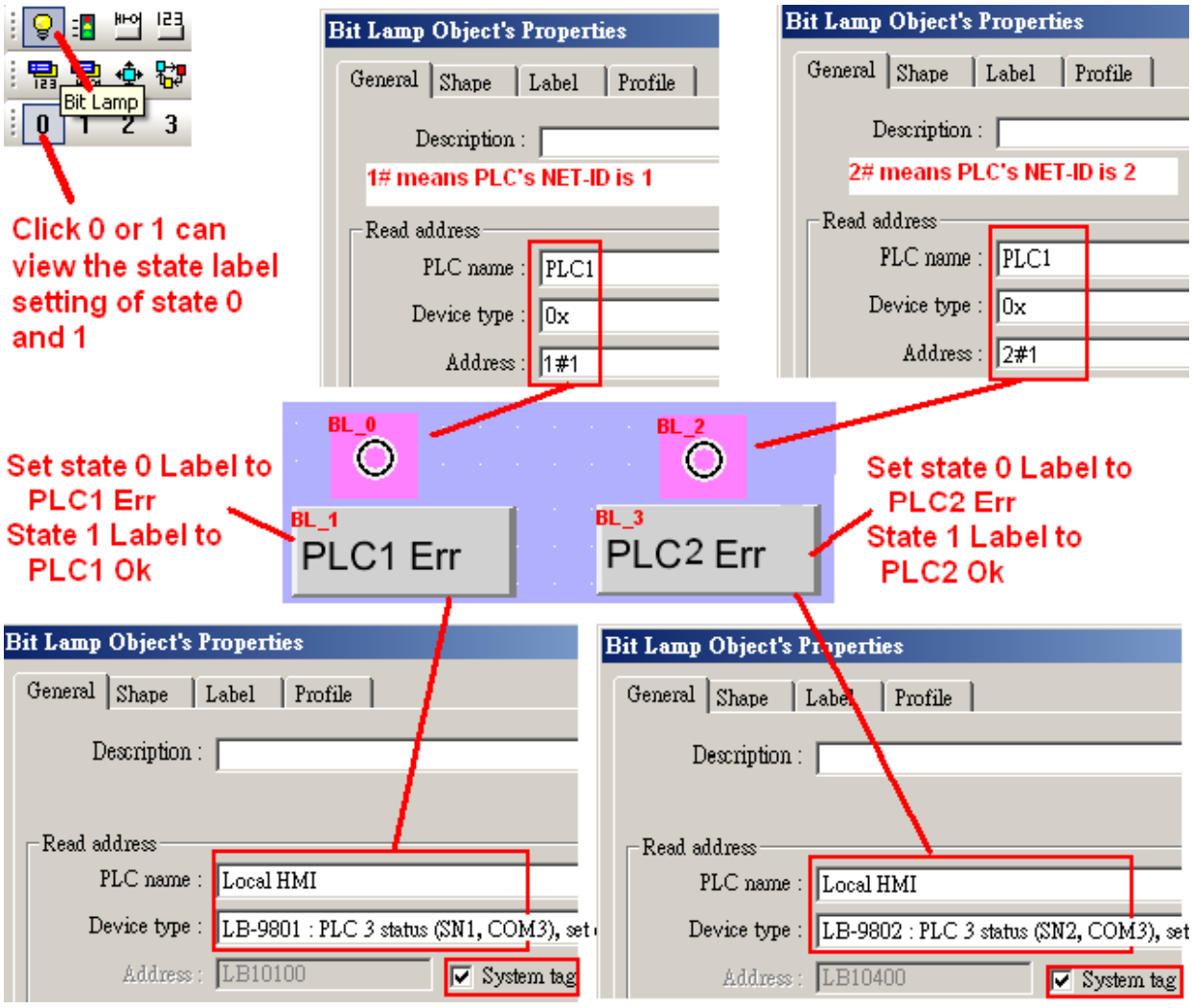
Then user may un-plug the Ethernet cable of PLC1 and PLC2 to see if the third and fourth bit lamps change its display.

2.1.2: Display the PLC communication state (Via RS-485 or RS-232)

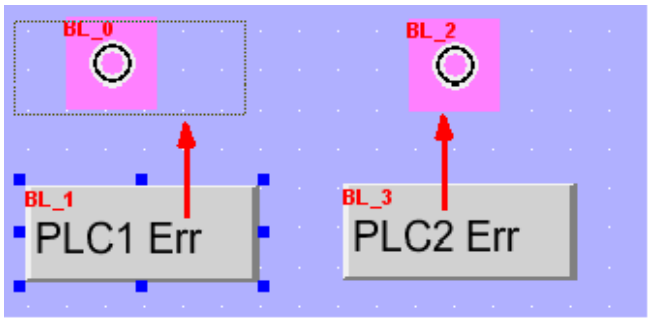
To detect the communication state of the PLC via RS-485 and RS-232 is similar as steps listed in section 2.1.1 . The following figure is using Touch-8000 's COM3: RS-485 to link two PLCs .



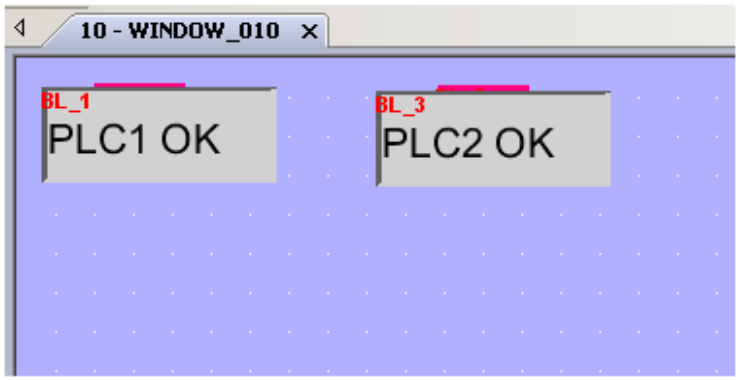
The following figure is for detecting two PLC 's communication state via COM3: RS-485. One PLC 's NET-ID (or called station No.) is 1 , the other is 2. Please create four “Bit Lamp” as below figure. Check the “System tag” and select “Local HMI” to use the “LB-9801” to display the communication state of the PLC with Net-ID=1 (via COM3). And “LB-9802” for the PLC with Net-ID=2 (via COM3) . “2#1” means the NET-ID is 2, data address is 1.



The first (1#1) and second bit lamps (2#1) are not necessary to display on the screen (however they are necessary to exist for detecting the communication state). So here we can move the third and fourth bit lamps to cover the first and second bit lamps as below.



Then we have the following picture. Click on State 1 can view the Label setting of state 1 .

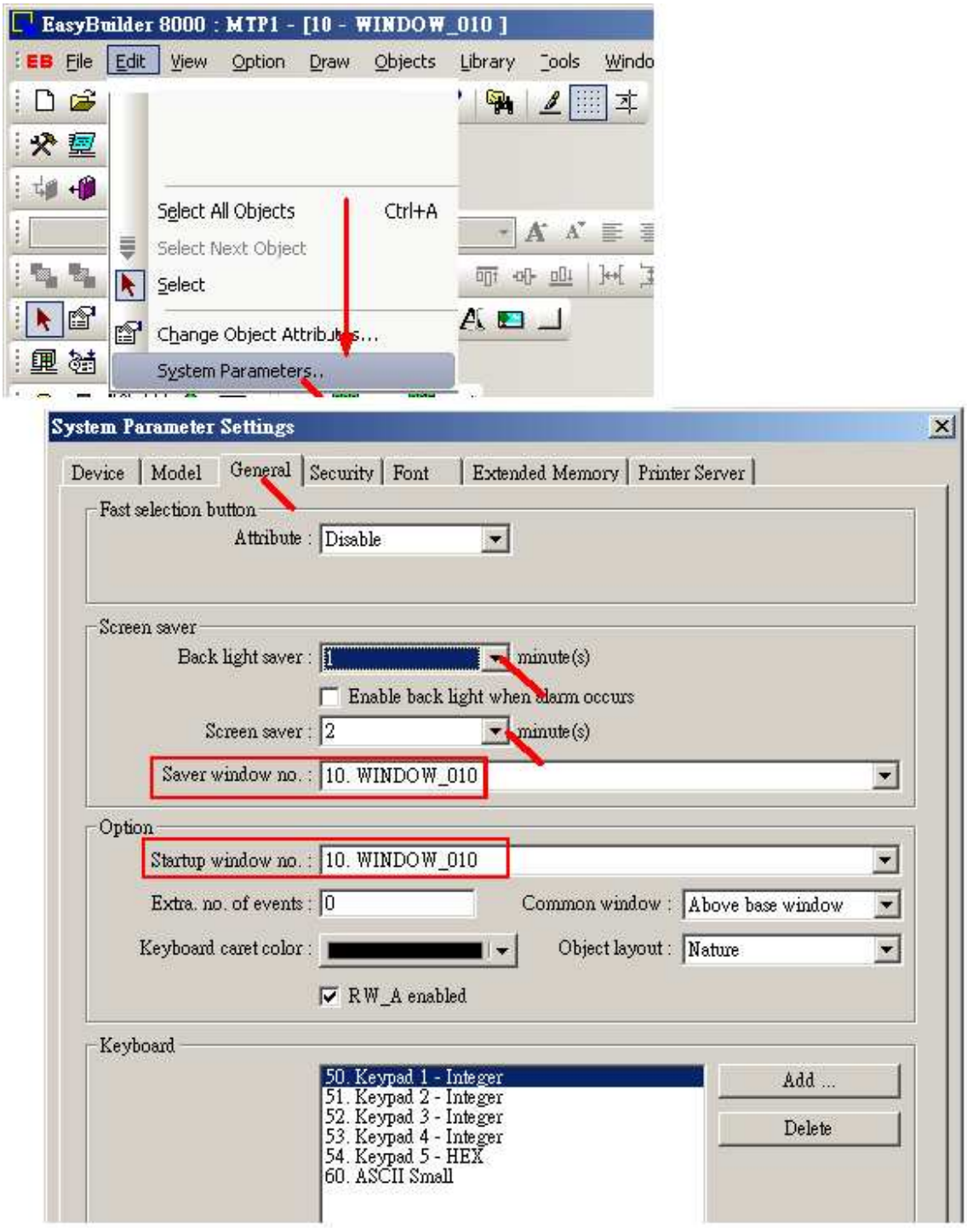


Then save, compile and download to the Touch-8000 to test it (steps is similar as Chapter 1.4).

Then user may un-plug the Ethernet cable of PLC1 and PLC2 to see if the third and fourth bit lamps change its display.

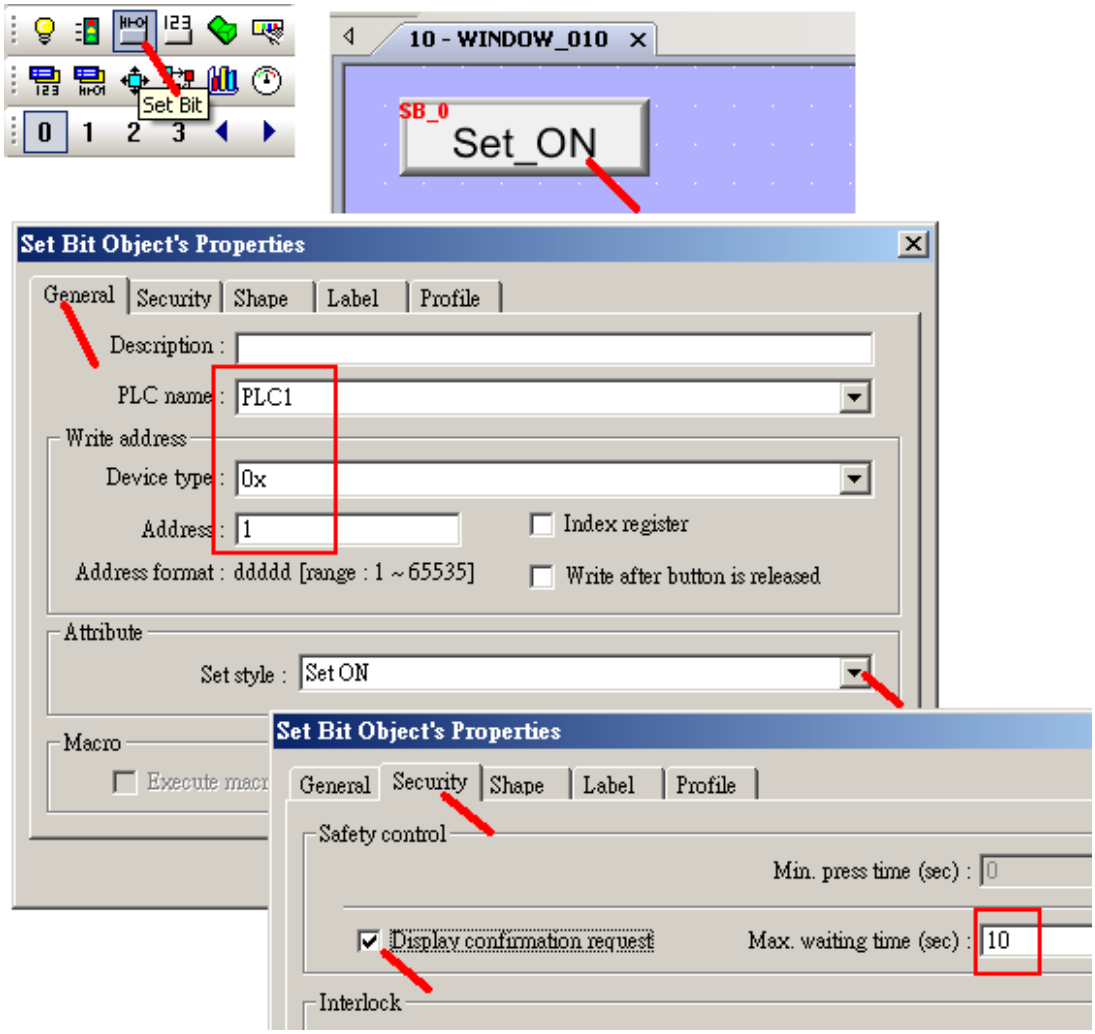
2.2: Screen saver and Back light saver

User can enable the “Back light saver” or the “Screen Saver” as listed in the below figure.

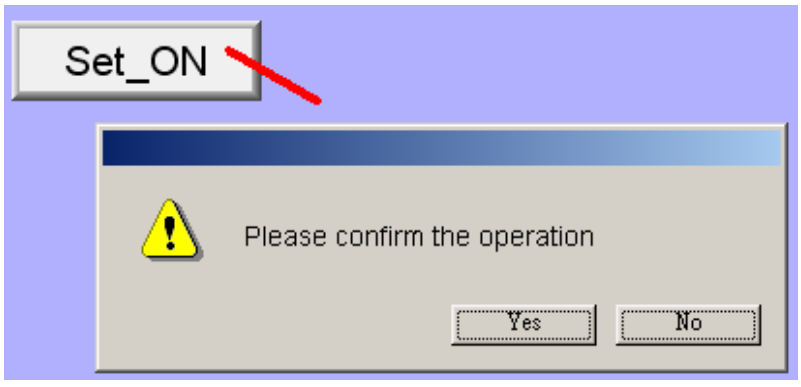


2.3: Confirm after touching a Set-Bit button

User can enable the “Display confirmation request” on a “Set Bit” object as below figure. The “Max waiting time (sec)” define the waiting time if no answer to the confirmation window .



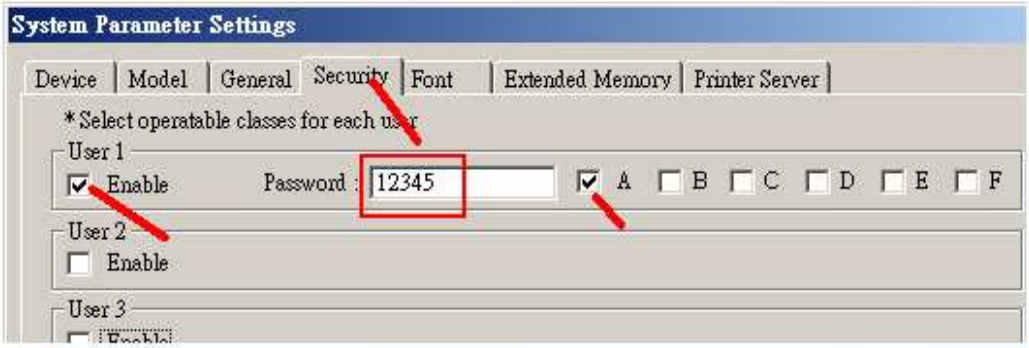
Then when touch this “Set Bit” button, the confirmation window will pop-up. You can try not answering it longer than 10 seconds. You can see the pop-up window will disappear .

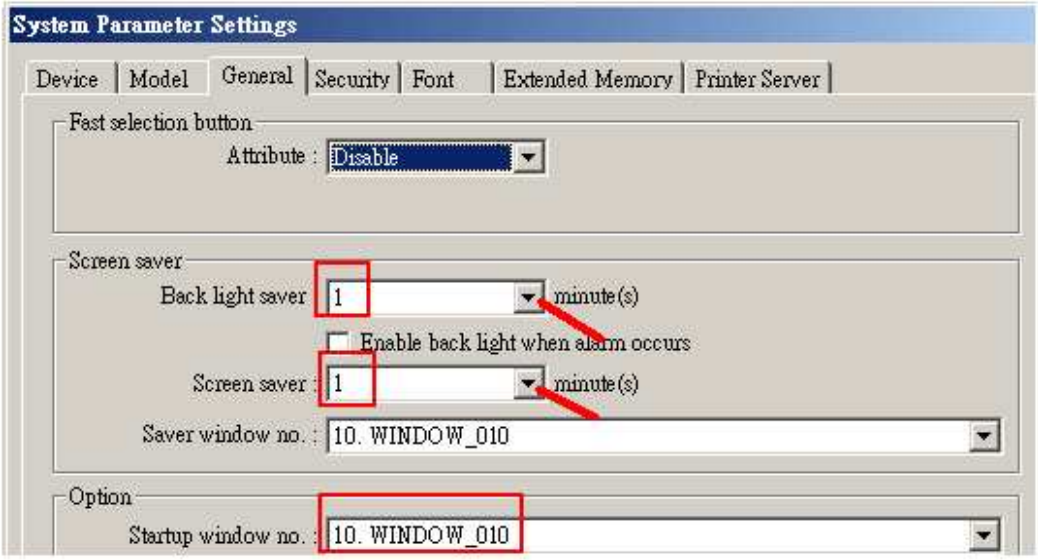


2.4: Setting password security for HMI objects

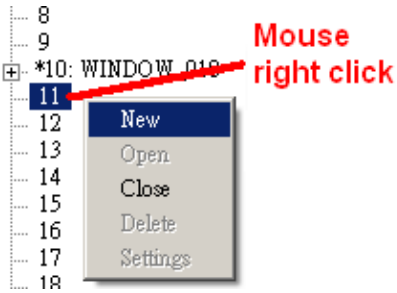
The project file of this example : Touch-8000 CD-ROM:\napdos\touch8000\example\touch_03.mtp

The Touch-8000 can setup password to protect each HMI object. The following example is setting User No. 1 as “Class A” with a password number of “12345” . (The user No. can be 1 to 12, the password number can be 1 to 999,999,999). First do “System Parameter settings” as below. Enable “User 1” and set as Class “A” and password as “12345” . And also enable the “Back light saver” and “Screen saver” as 1 minute, set the startup window no. as “10”

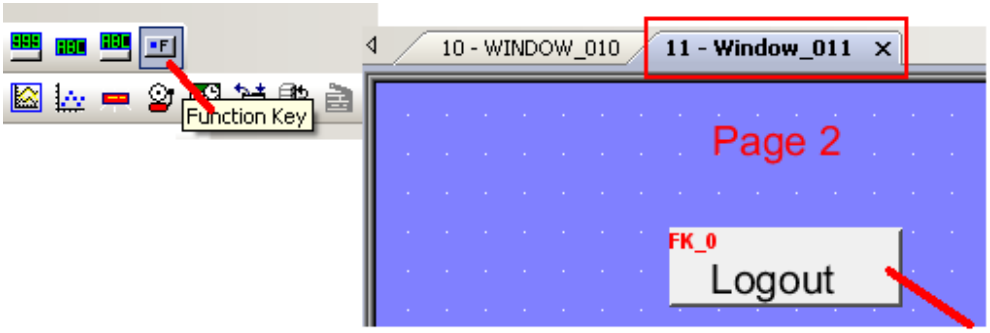


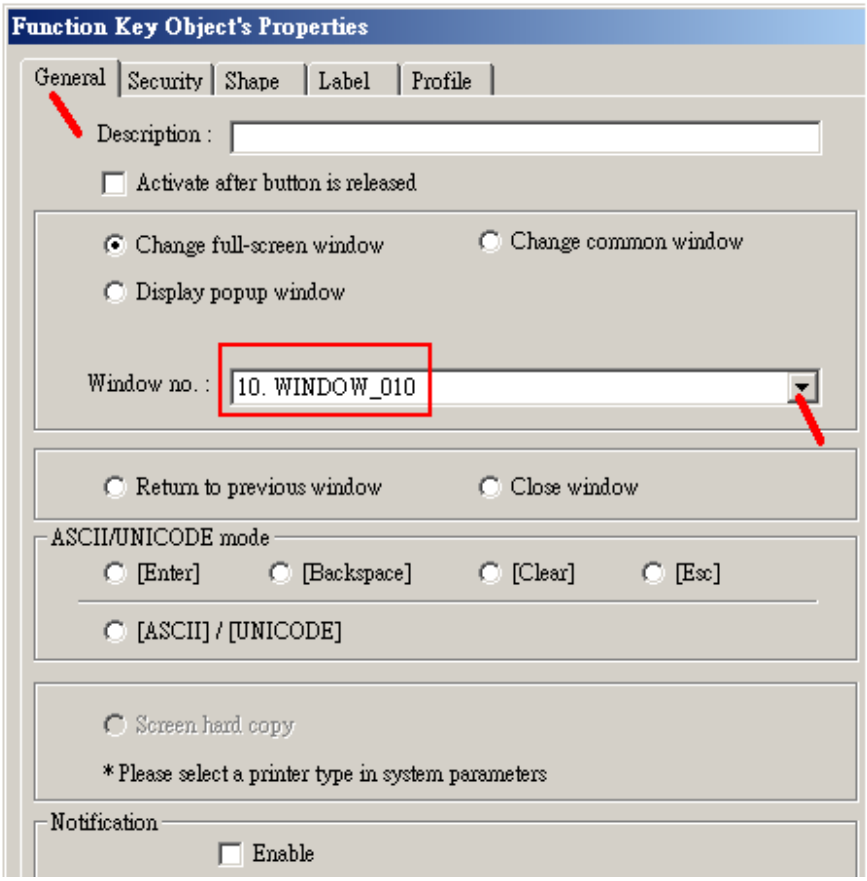


Then create the “11” window.

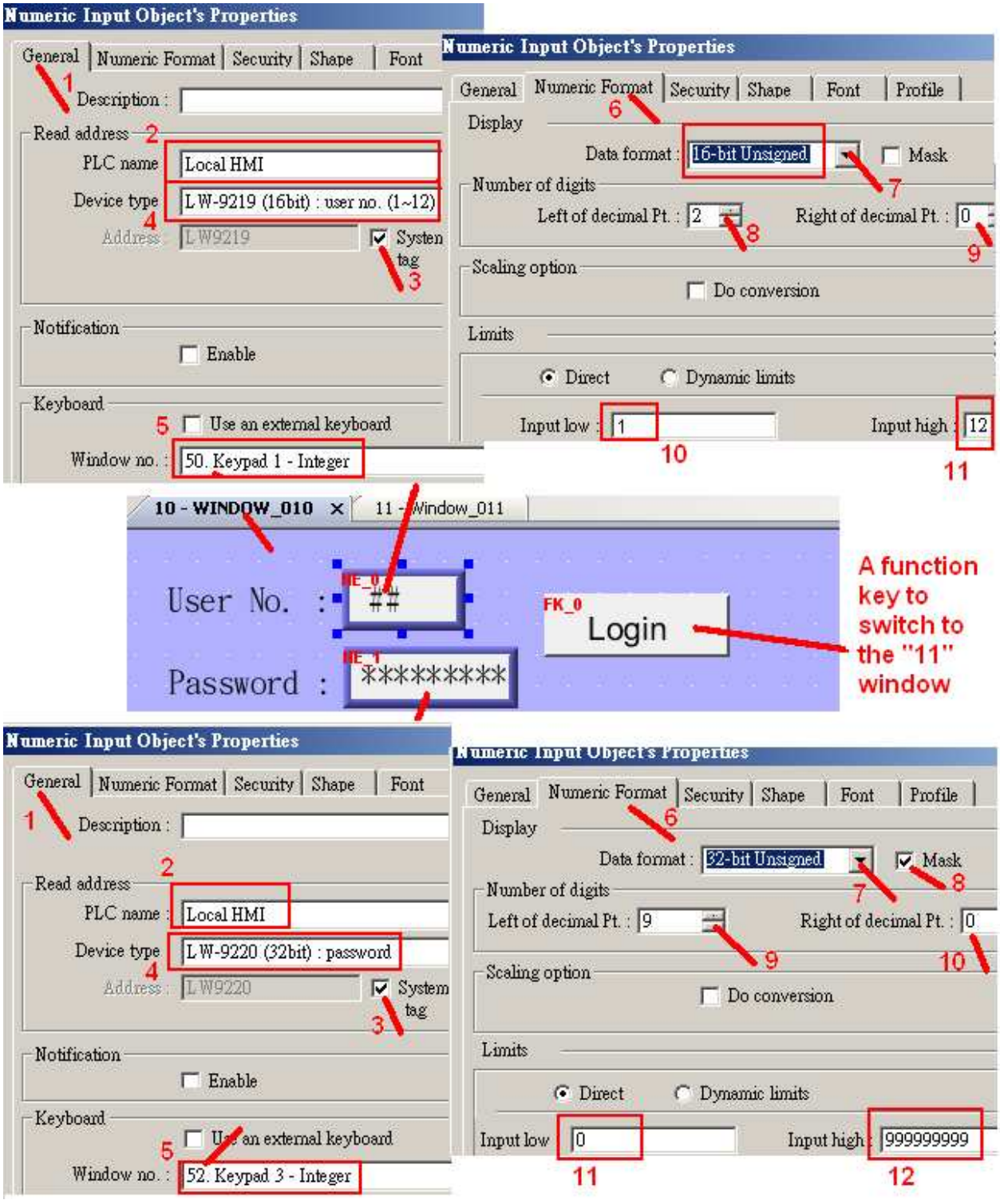


Then create one “Page 2” text and one “Logout” function key in the “11” window as below to switch to the “10” window.

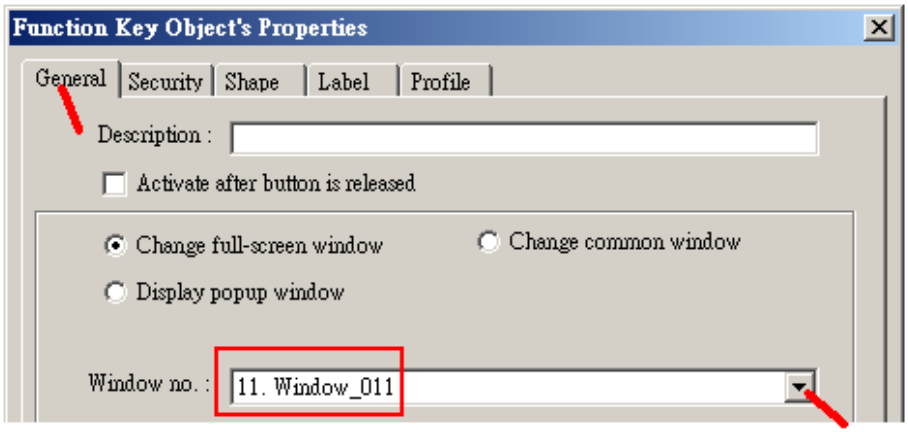


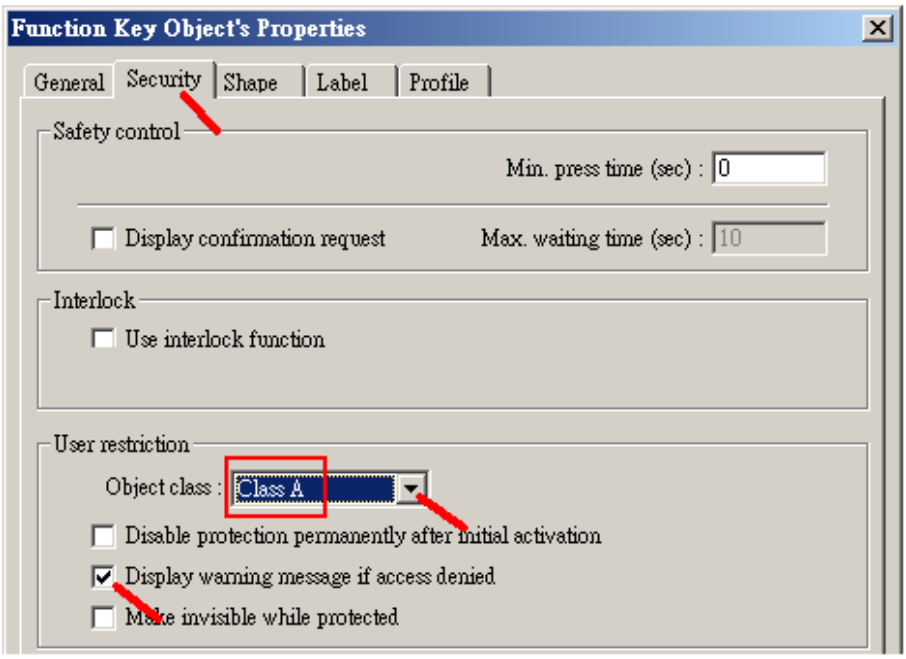


In the “10” window, create two “text” - “User No.” and “Password” and create two “Number Input” and one “Function Key” to switch to the “11” window. The upper “Numeric Input” is for entering the User No. (1 to 12). Its “PLC name” is “Local HMI” , “Device type” as “LW-9219” and using “Keyboard window no” of “50” , data format is “16-bit”. The lower “Numeric Input” is for password. Its “PLC name” is “Local HMI” , “Device type” as “LW-9220” and using “Keyboard window no” of “52” . data format is “32-bit”. Remember to check on “Mask” for the lower “Numeric Input” .

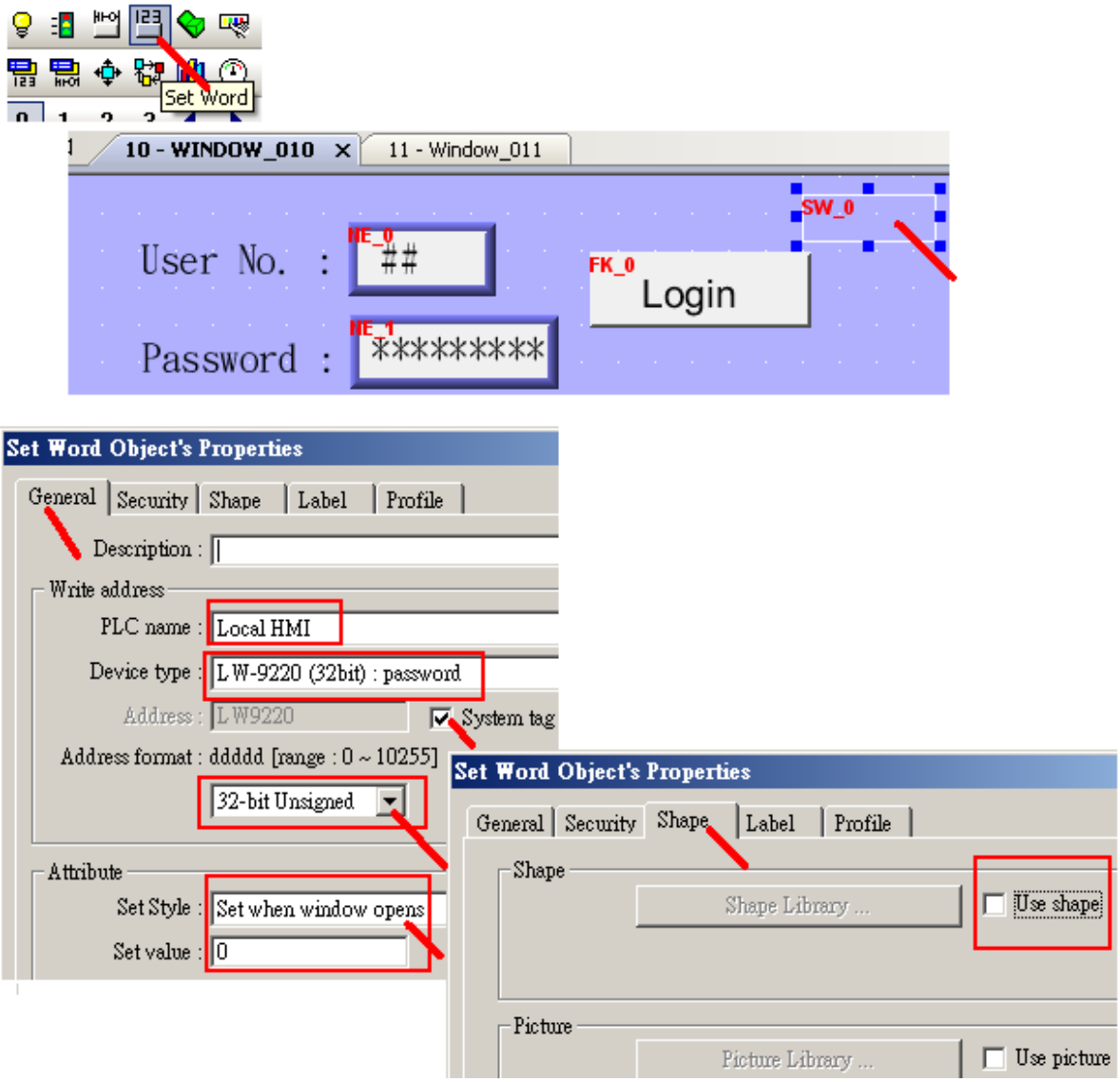


The “Login” Function key to switch to the “11” window in the previous page must set as the following figure. Set the “Object class” as “Class A” and check the “display warnning message if access denied”

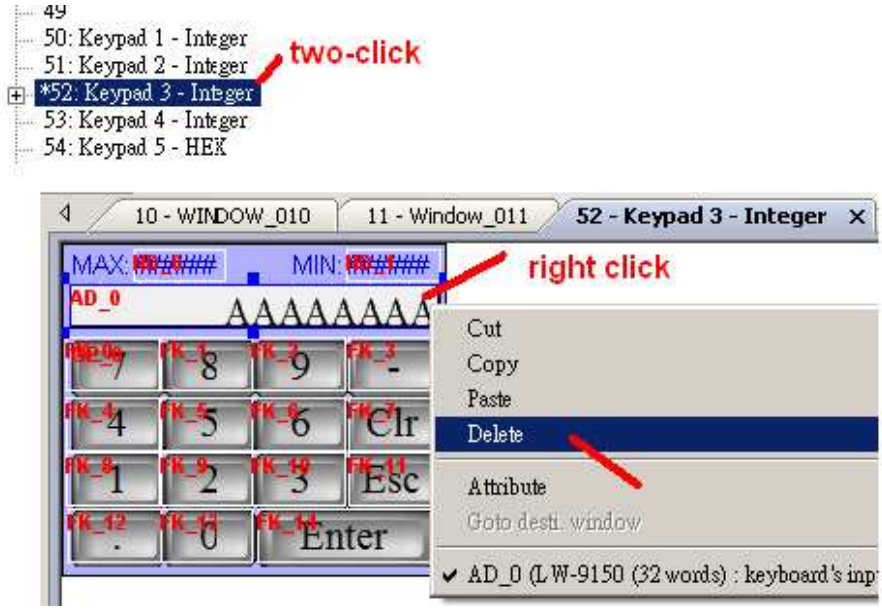




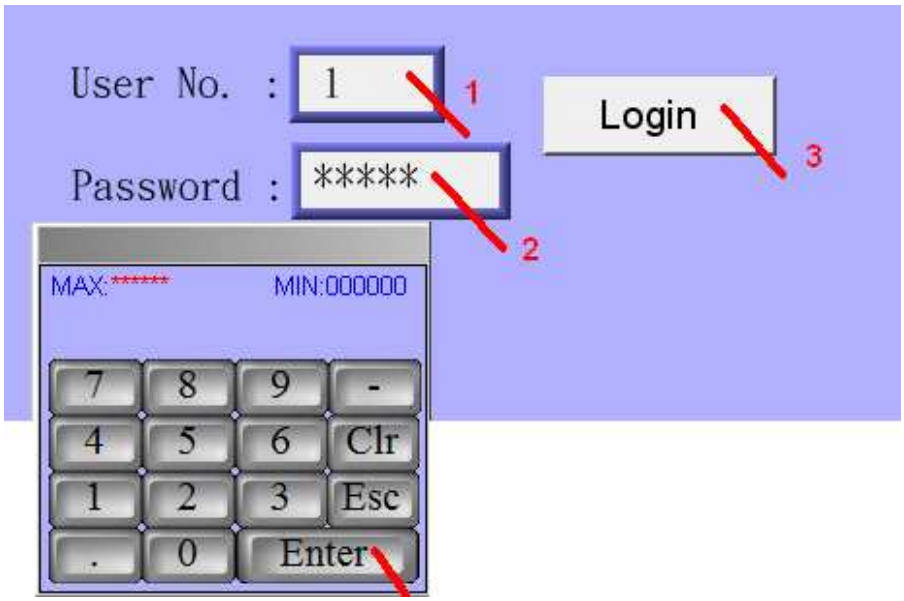
Then please create one “Set Word” in the “10” window as the following. Set “PLC name” as “Local HMI” , “Device type” as “LW-9220” and 32-bit Unsigned, “Set Style” as “Set when window opens” , “Set value” as “0” . This “Set Word” should be invisible, so do not check the “Use shape” and “Use picture” .



We don't want to display any number when entering the password. So delete the ASCII Display of the “52” Keypad.

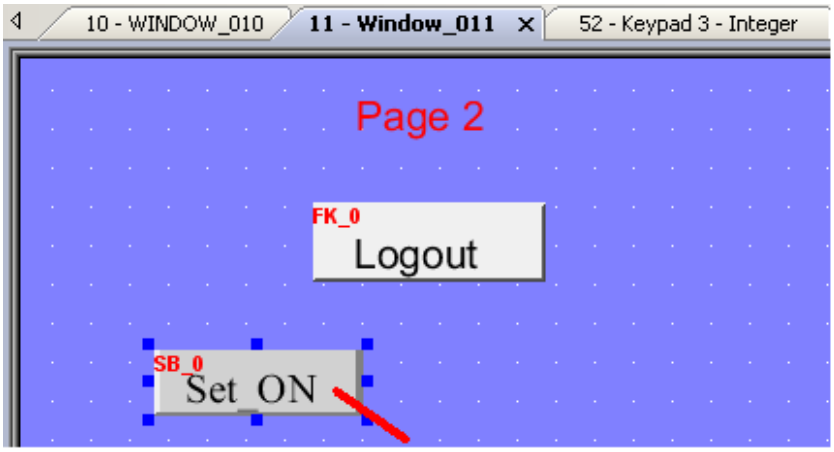


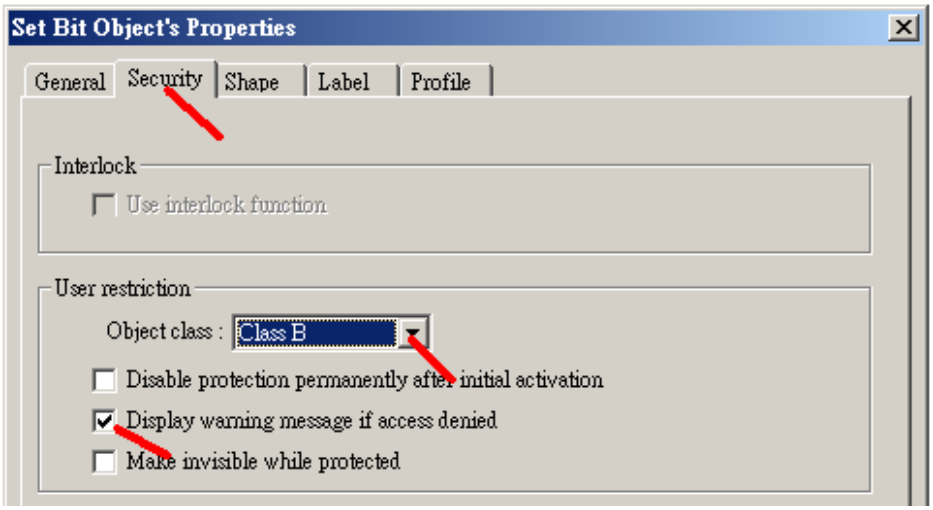
Then after compilling , download the HMI project to the Touch-8000, please test it as the following. You can see if the User No. and Password is correct, then touch at “Login” will switch to the “11” window.



2.4.1: Setting password protection for single object

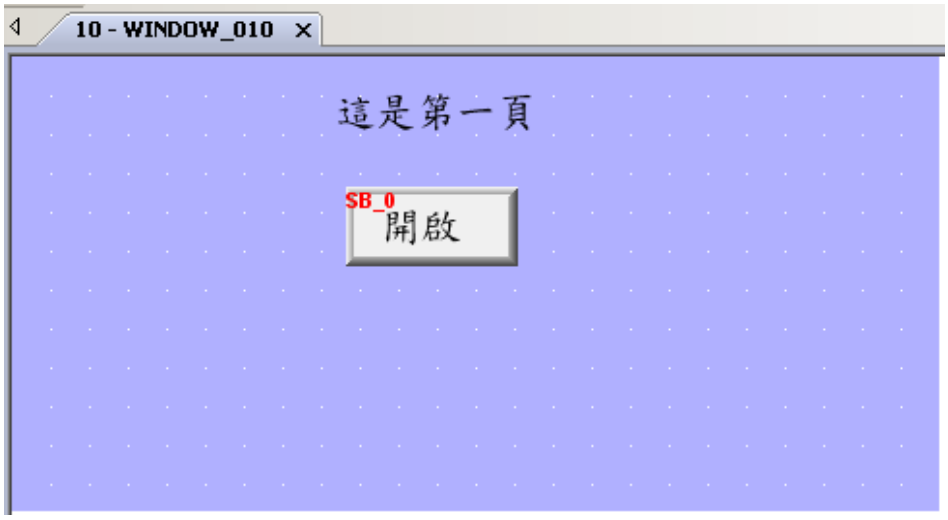
Each HMI object may use security function to protect itself. For example, the following “Set Bit” object can be operated only for the User No. with “Class B” checked. User login with other class is impossible to operate it.





2.5: Display local language on HMI objects

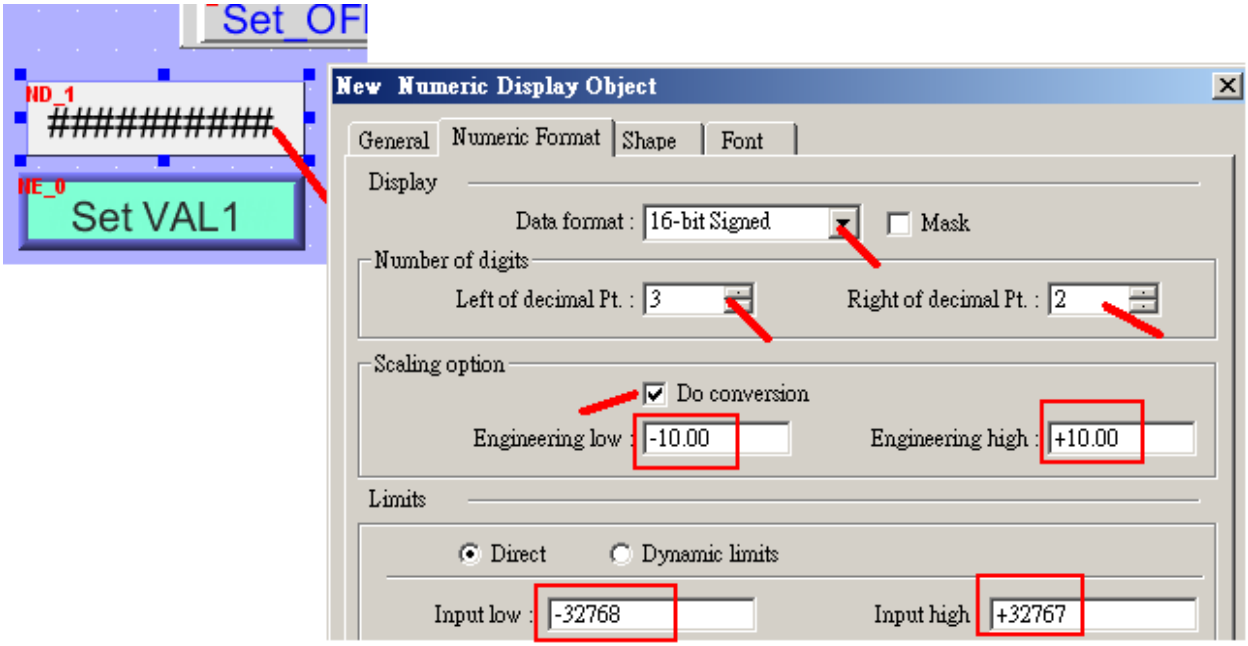
User can display local language of many countries on the Touch-8000 HMI. For example, the English, Chinese, ... When you edit the text of your HMI objects on the Easybuilder 8000 software, just type it by using your local language.



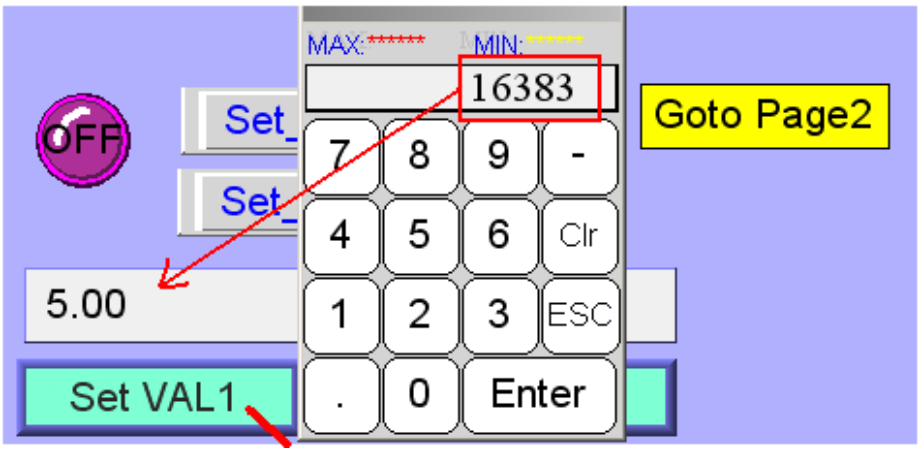
2.6: Scaling an integer value or a real value

In some application, user may want to scale an integer value or a real value to become an engineering value and then displayed on the HMI screen.

For example, to scale the integer value (-32768 , +32767) to become (-10.00 , +10.00) . Here using the same Touch-8000 project we have created in the Chpater 1.3.2 > step 12 and step 13. Please modify the “Numeric Display” as the following figure. Modify the “Data format” as “16-bit Signed” , “Left of decimal Pt” as 3 , “Right of deciaml Pt” as 2 . Then check the “Do conversion” and entering “Engineering low” as “-10.00” , “Engineering high” as “+10.00” , “Input low” as “-32768” , “Input high” as “+32767”



Then when you re-compile and download this project. You can see the original value of “16383” is scaling to be “5.00” .



2.7: Touch-8000 linking M-7000 I/O modules.

The project file of this example : Touch-8000 CD-ROM:\napdos\touch8000\example\touch_02.mtp

The Touch-8000 can use its COM1:RS-485 and COM3: RS-485 and COM2:RS-232 plus one I-7520R (RS-232 to RS-485 conveter) to connect many M-7000 I/O modules.

M-7000: http://www.icpdas.com/products/Remote_IO/m-7000/m-7000_list.htm
I-7520R: http://www.icpdas.com/products/Industrial/communication_module/communication_list.htm

Recommend connect no more than 7 controllers or M-7000 I/O modules in each Touch-8000 ‘s RS-485 port (2-wire).

Touch-8000 COM1: RS-485		ICP DAS controller or M-7000		ICP DAS controller or M-7000
2 Data +	——	Data +	——	Data +
1 Data -	——	Data -	——	Data -

Touch-8000 COM3: RS-485		ICP DAS controller or M-7000		ICP DAS controller or M-7000
9 Data +	——	Data +	——	Data +
6 Data -	——	Data -	——	Data -

Touch-8000 COM2: RS-232		I-7520R (RS-232 to RS-485 conveter)			ICP DAS controller or M-7000
6 RXD	——	2 TXD	Data +	——	Data +
4 TXD	——	3 RXD	Data -	——	Data -
5 GND	——	5 GND			

Note: If you are not familiar with the Touch-8000 programming, please read Chapter 1.2 to 1.4 first.

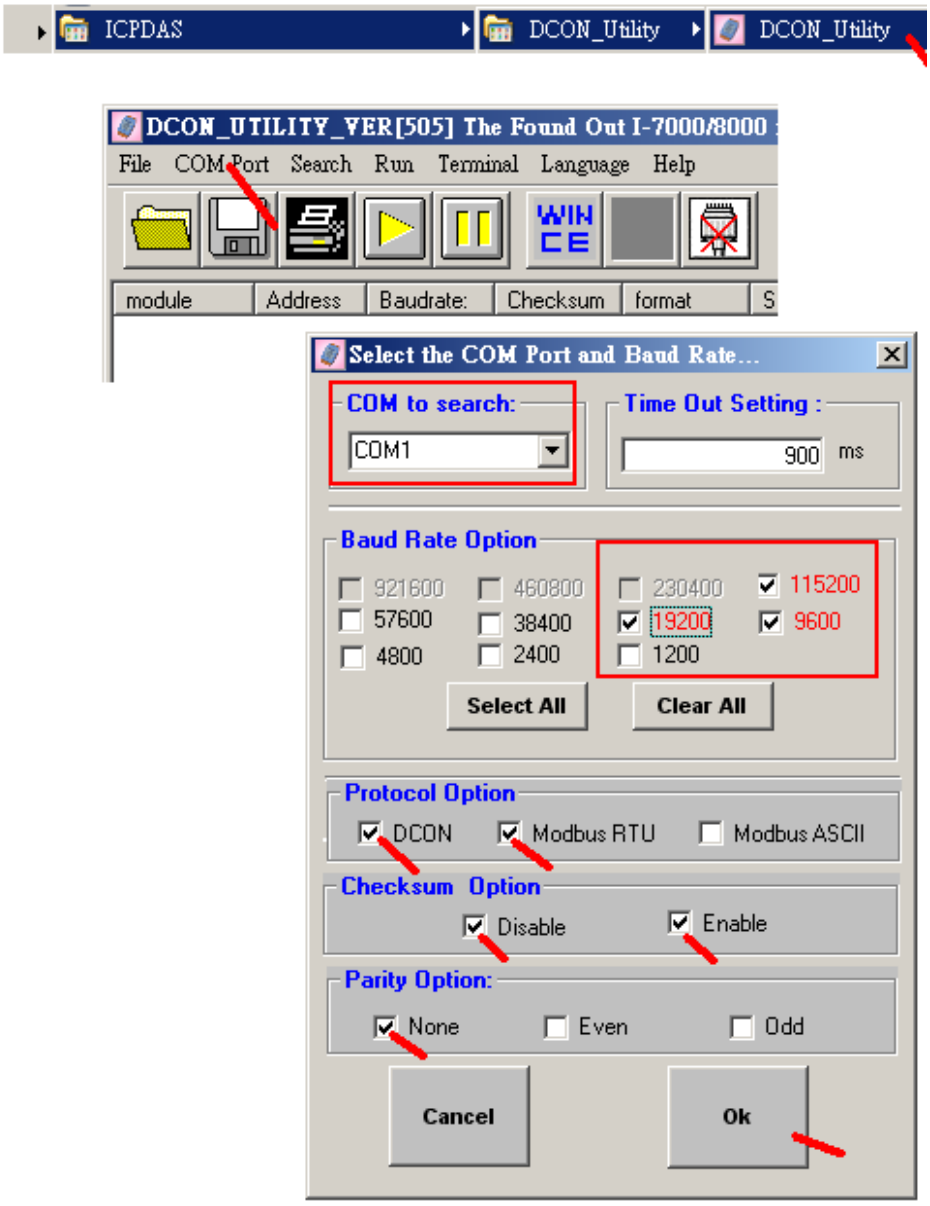
Here we are going to build an Touch-8070T HMI project and use its COM3: RS-485 to connect one M-7017R (Addr or station No. = 1 , Comm. Parameter = 9600, 8, N, 1) and one M-7067D (Addr or station No. = 2 , Comm. Parameter = 9600, 8, N, 1) .

1. First doing initial setting for every M-7000 I/O module by the DCON utility one by one. Please connect PC 's RS-232 port to one I-7520R then connect to only one M-7000 to do the initial setting. Before doing initial settings , please switch the Dip on the back of the M-7000 module to the “INIT” position (Some may have no dip switch, then wire its “INIT*” to GND) and then power on the M-7000 and I-7520R.

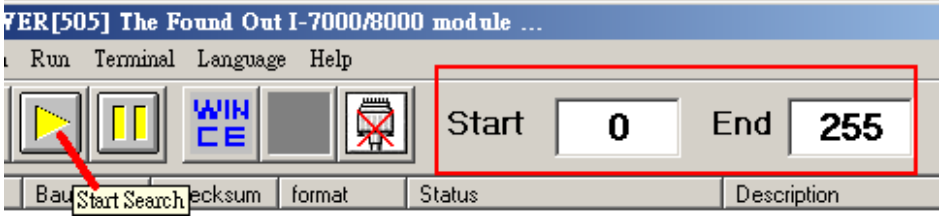
PC (RS-232) 9-Pin DSUB		M-7520R (RS-232 to RS-485 conveter)			M-7000
2 RXD	——	2 TXD	Data +	——	Data +
3 TXD	——	3 RXD	Data -	——	Data -
5 GND	——	5 GND			

Then run the DCON utility in your PC to do the initial setting as listed in the next page.
Recommend to use the DCON utility version 5.1.2 or later version . It can be downloaded at ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/setup/

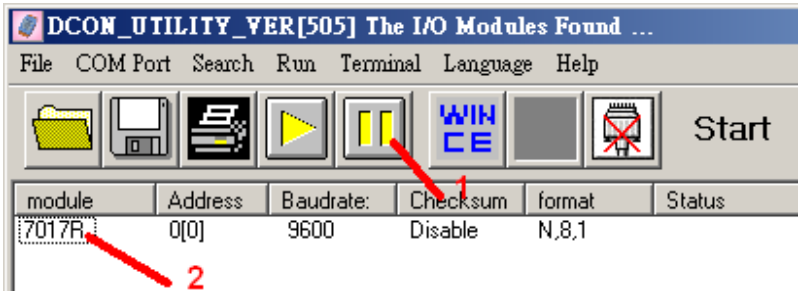
Run DCON utility and the set proper “COM Port” setting. (The port No. should be your PC 's port No. it can be COM1, COM2, or other COM number)



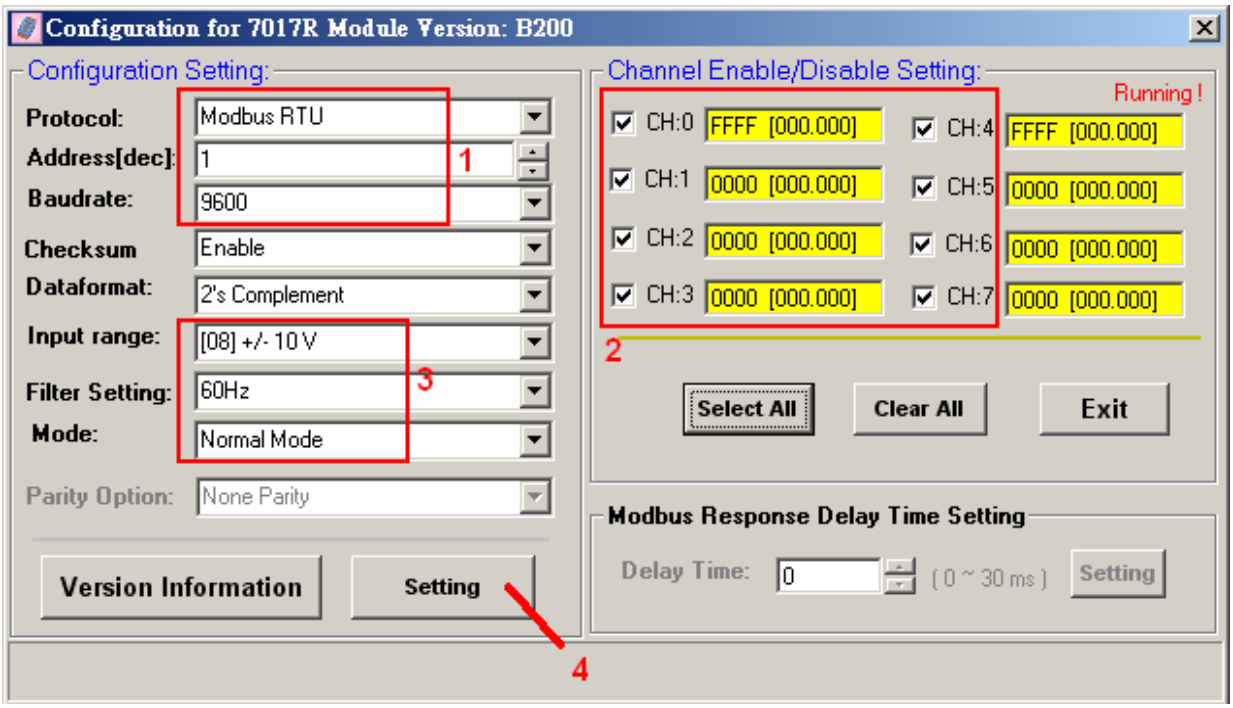
Then set “Start” as 0 , “End” as 255 and the click on “Start Search” to search the only one connected M-7000 module. Its address must be 0 because it is in initial mode . (The Dip on the back is set on “INIT” position before power it up)



When the Address 0 (or called station No. 0) is found as the following figure, click on “Stop” to stop searching and the click on the Module name to do further setting.



Then select “Protocol” as “Modbus RTU”, set proper “Address” (station No. 1 to 247, every M-7000 in the same RS-485 network should have different Address number) , proper baudrate (every M-7000 in the same RS-485 network should have the same baudrate). And if the M-7000 has other necessary settings, please set it. (Don't mind at the “Checksun” and “Dataformat”, it will auto-switch to “2's Complement” and “Enable” when selecting the “Modbus RTU” after the setting)



If all settings are correct, the following window will pop-up. Then please un-plug this M-7000 and switch it back to “Normal” mode (Not “INIT” mode) . Then do initial setting for next M-7000.
Every M-7000 must do the initial setting before they can be connected by the Touch-8000 HMI.

Important note for some M-7000 Input modules:

If your M-7000 module is not in the below lists, please go ahead to the step 2.

After the above initial setting is finished , please give below Modbus command to below M-7000 modules 's Digital input channels to invert them.

01 46 29 01 (4-byte command, each byte is 2 Hex-number)

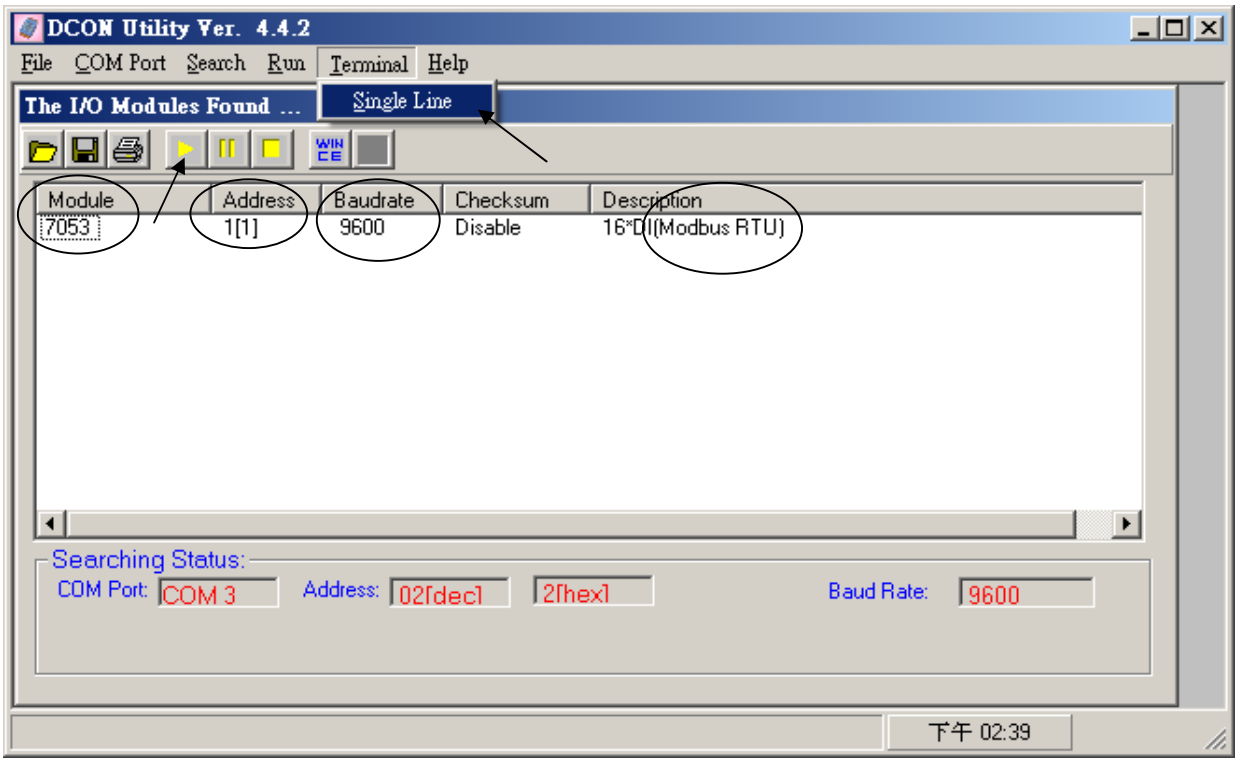
The first byte is the M-7000 Address number been set by DCON utility, it may be 01, 02, 03, ..., 0F, ... to F7 depends on your setting of the related M-7000. The other 3 bytes "46 29 01" should be always same.

M-7000 Modules should be inverted
M-7041 , M-7044 , M-7050 , M-7053 , M-7060 , M-7063 , M-7065
M-7041D , M-7044D , M-7050D , M-7053D , M-7060D , M-7063D , M-7065D

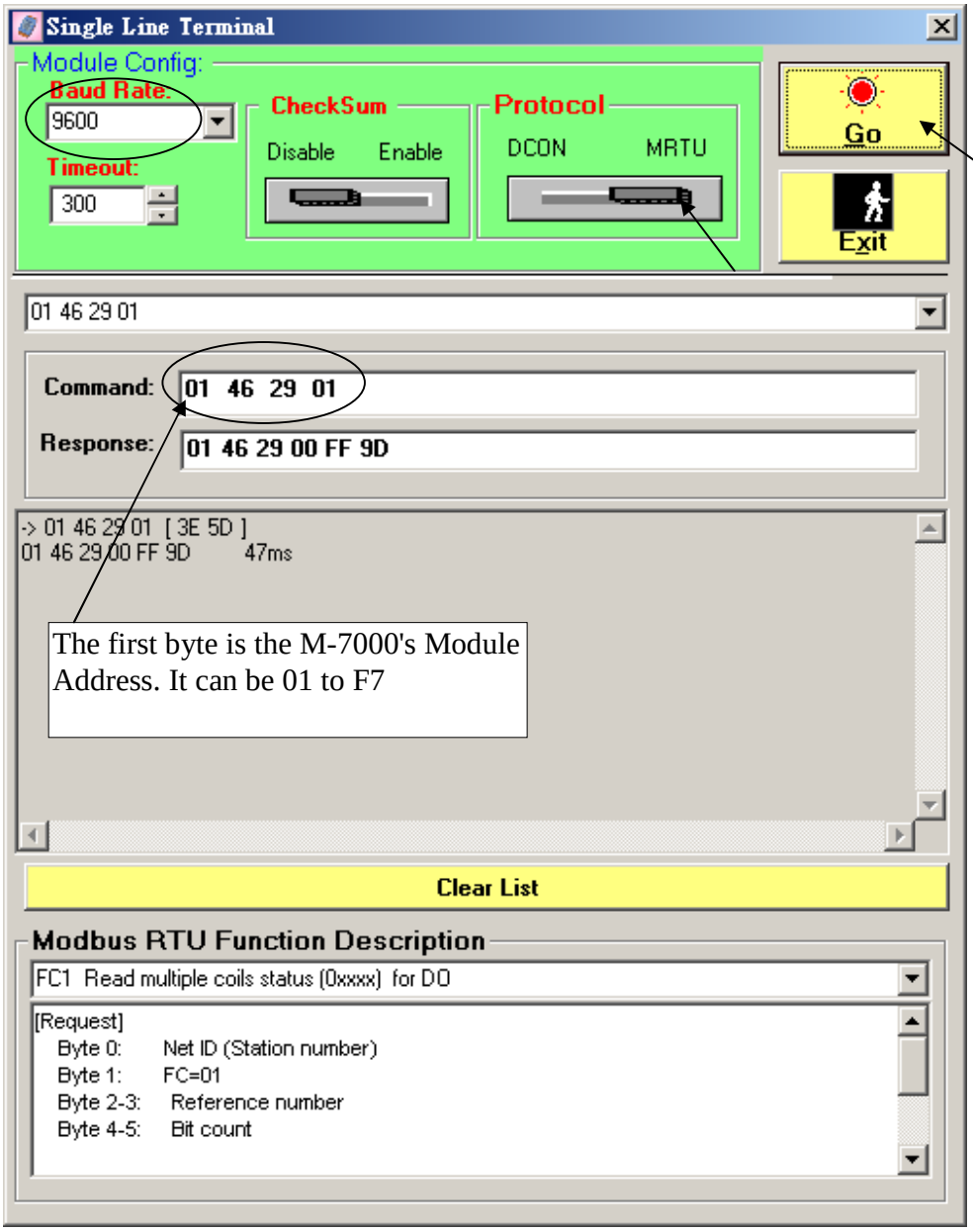
Please Do Not give the upper command to other M-7000 modules which are not in the above lists.

Steps to invert the digital input channels:

Power on the M-7041 or M-7044 or M-7050 or M-7053 or M-7060 or M-7063 or M-7065. Run DCON utility to search the module first. If module is found, stop searching. Make sure the Module name is one of M-7041 or M-7044 or M-7050 or M-7053 or M-7060 or M-7063 or M-7065. Then goto "Terminal" - "Single Line"



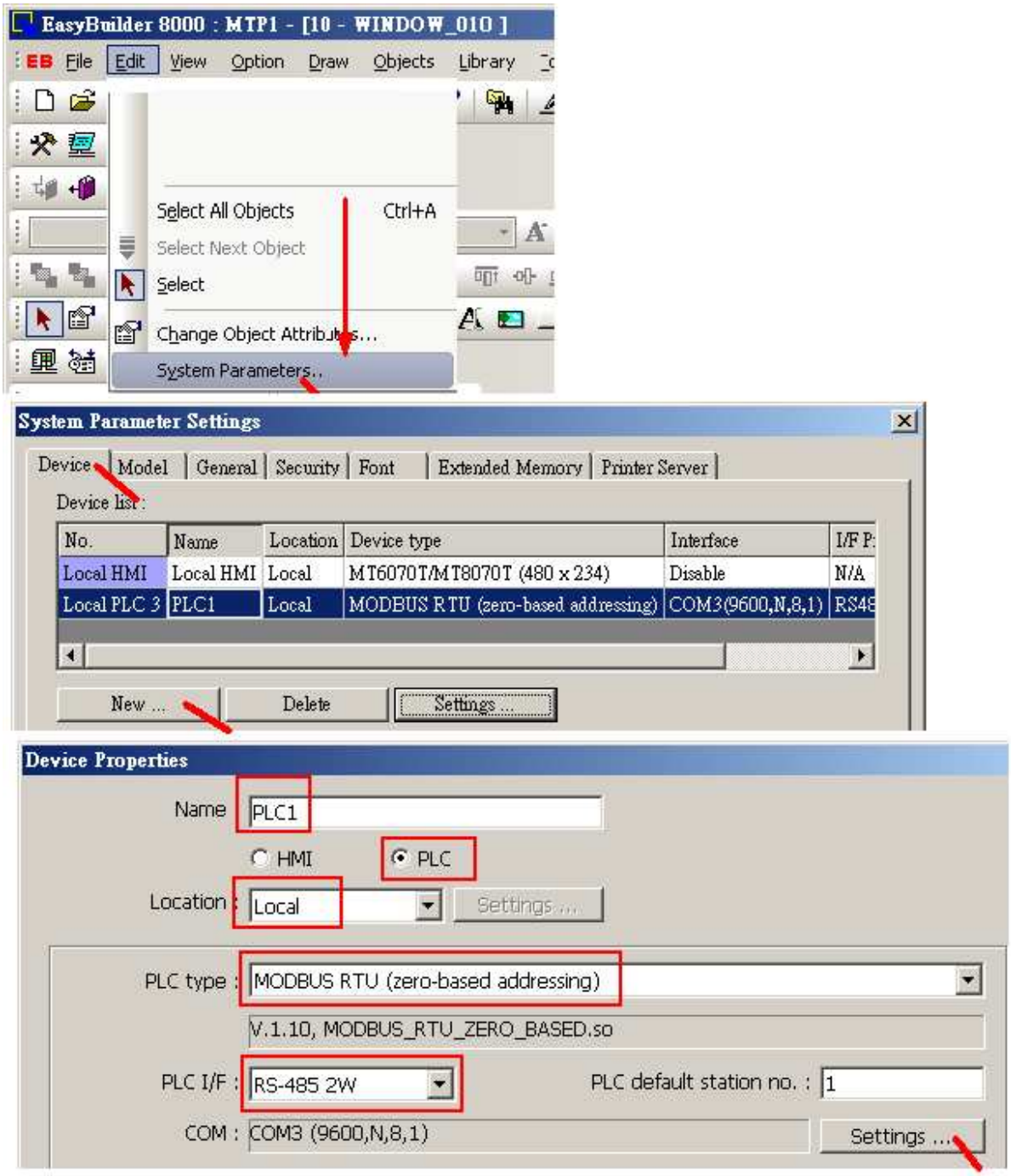
Select the correct baudrate, Protocol should be set to “MRTU”. Then type in the inverted command as below, the first byte should be the Module's Address number. It can be 01 to F7. And then click “Go” . If the response is “01 46 29 ...” , it means command succeed. Power off this M-7000 module. And it is well configured.



2. Set proper “System Parameter Settings” in the Easybuilder 8000 software. (If are not not familiar with the Easybuilder 8000 software, please read Chapter 1.2 , 1.3 and 1.4).

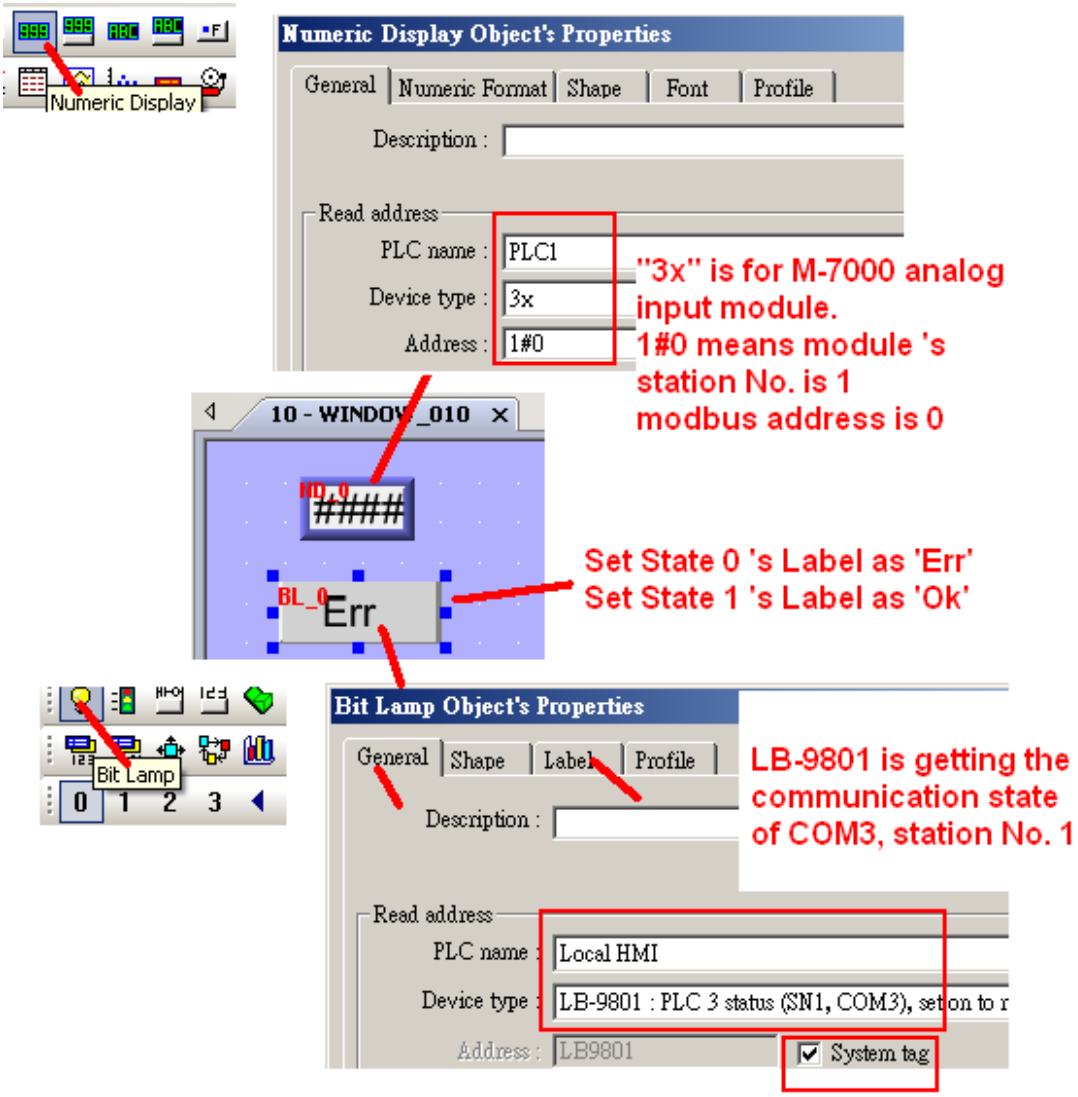
Please create one new device . This example is create one “Modbus RTU (zero-based addressing)” device in COM3 with COM parameter as “RS-485 2W” , “9600, N, 8, 1” (the same setting as the connected M-7000).

Note: The PLC type must set as “Modbus RTU (zero-based addressing)” if connecting the M-7000 I/O modules. Because they are using the 0-base addressing. They are not like the ISaGRAF controllers uising the normal addressing (Modbus RTU).

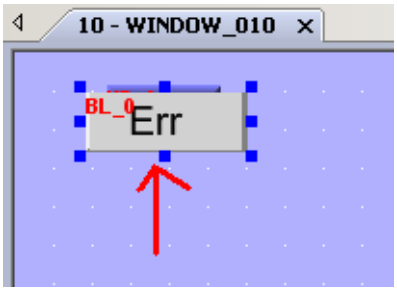


3. In this example, we are connecting one M-7017R (station No. is 1) and one M-7067D (station No. is 2). First create one “Numeric Display” and one “Bit Lamp” for detecting the communication state of the M-7017R . Please set the “Bit Lamp” 's state 0 with a Label “Err” and state 1 with a Label “Ok” .

Note: For M-7000, “**3x**” is for Analog input modules, “4x” is for Analog output modules, “1x” is for Digital Input modules, “0x” is for Digital output modules.

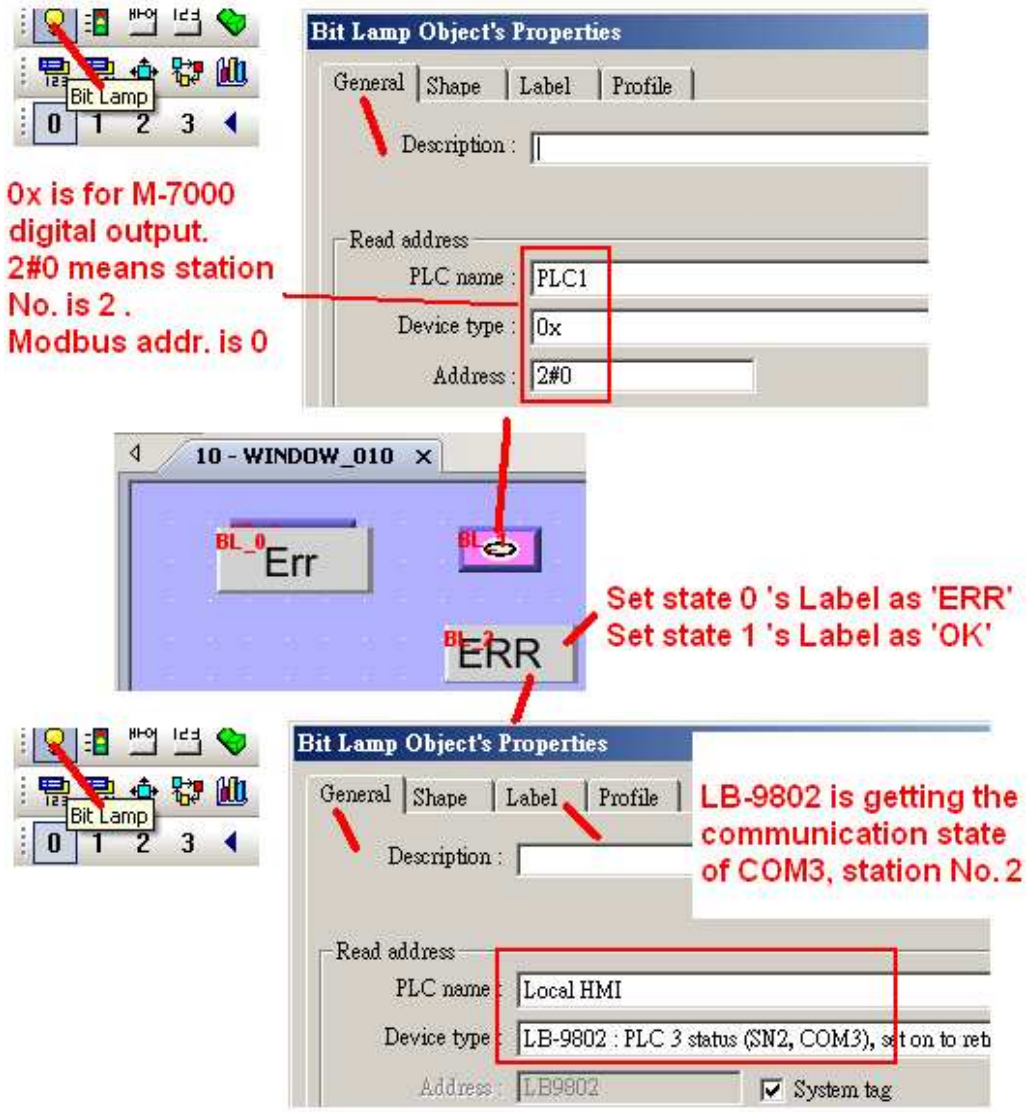


We don't want to display this “Numeric Display”, so please move the “Bit Lamp” to covert it as below.

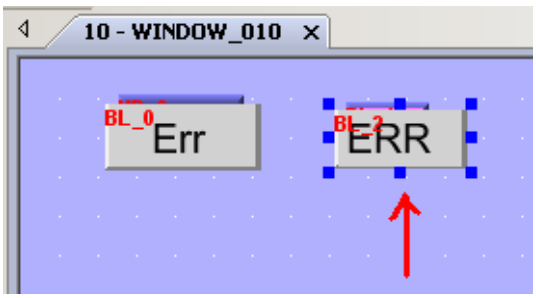


Then create two “Bit Lamp” as the following to detect the communication state of the M-7067D. Please set the second “Bit Lamp” 's state 0 with a Label “ERR” and state 1 with a Label “OK” .

Note: For M-7000, “3x” is for Analog input modules, “4x” is for Analog output modules, “1x” is for Digital Input modules, “**0x**” is for Digital output modules.

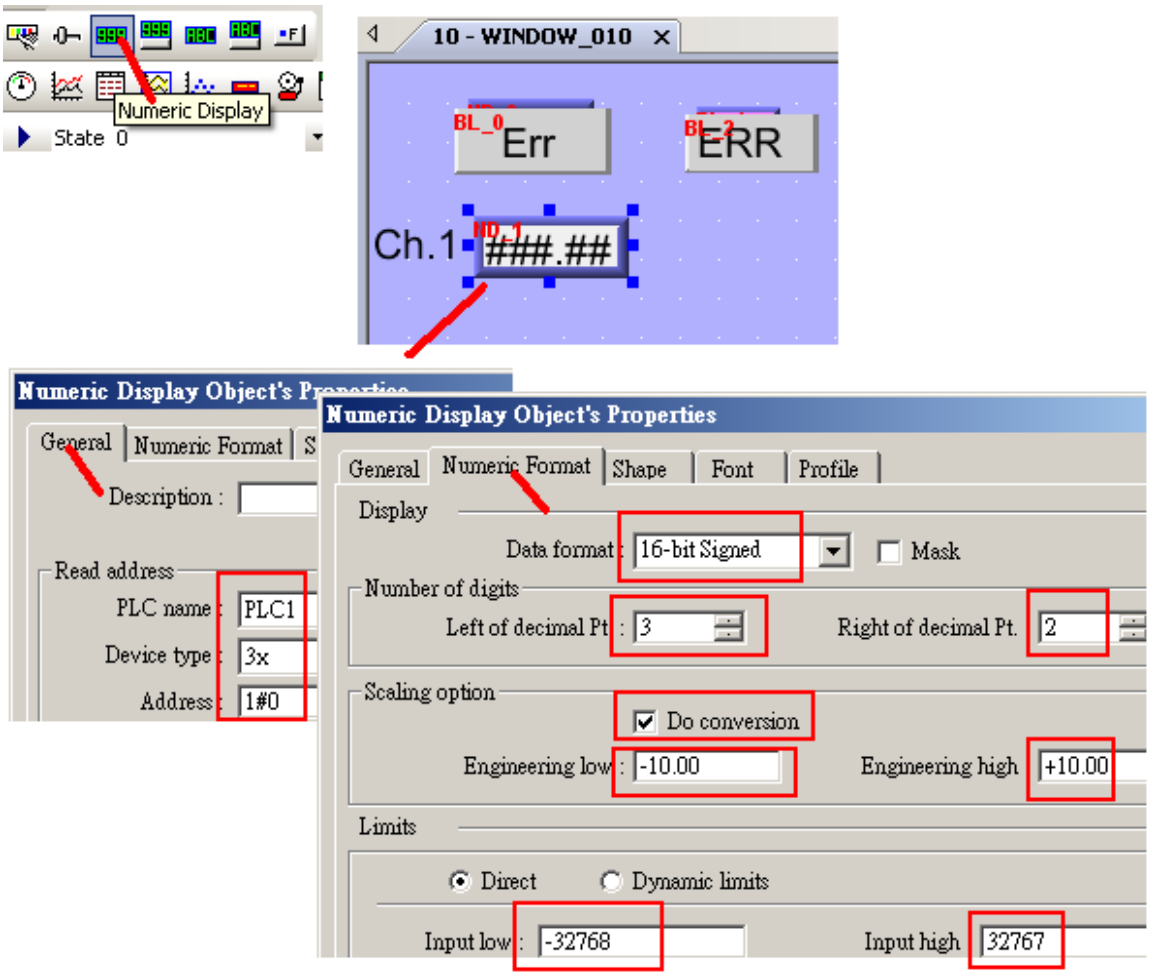


Then move the lower “Bit Lamp” to covert the upper one as below.

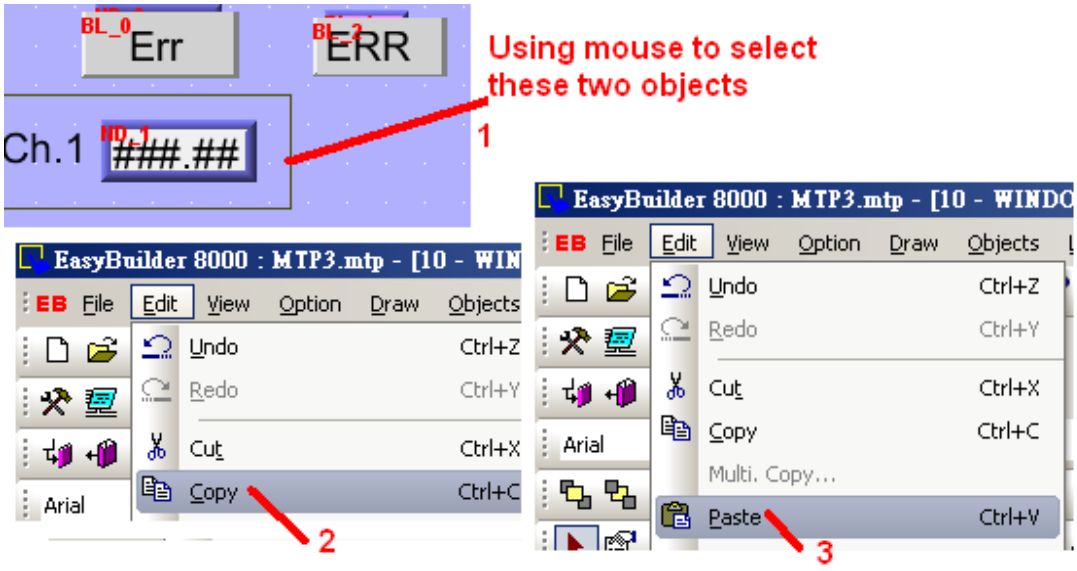


We have set the M-7017R by DCON utility to measure “+/- 10V” and Addr. As 1 (means station No. is 1). So here please create one text as “Ch.1” and one “Numeric Display” as the following figure to get the Ch.1 value (1#0 means station No. 1 , Modbus addr. 0) and convert it from (-32768 , +32767) to (-10.00 , +10.00) Volt .

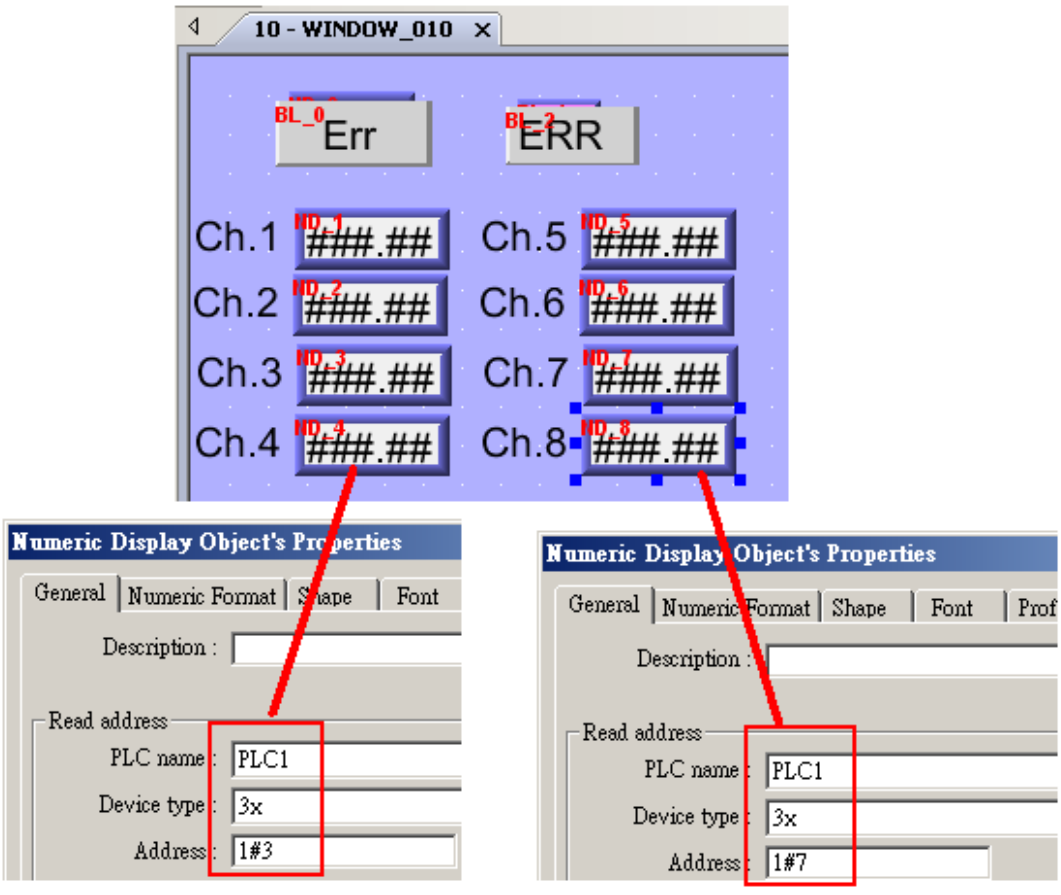
Note: For M-7000, “**3x**” is for Analog input modules, “4x” is for Analog output modules, “1x” is for Digital Input modules, “0x” is for Digital output modules.



Then please create other text and Numeric Display as the following to get Ch.2 to 8 's analog input value. Copy from the first one and paste to Ch.2 to Ch. 8 .

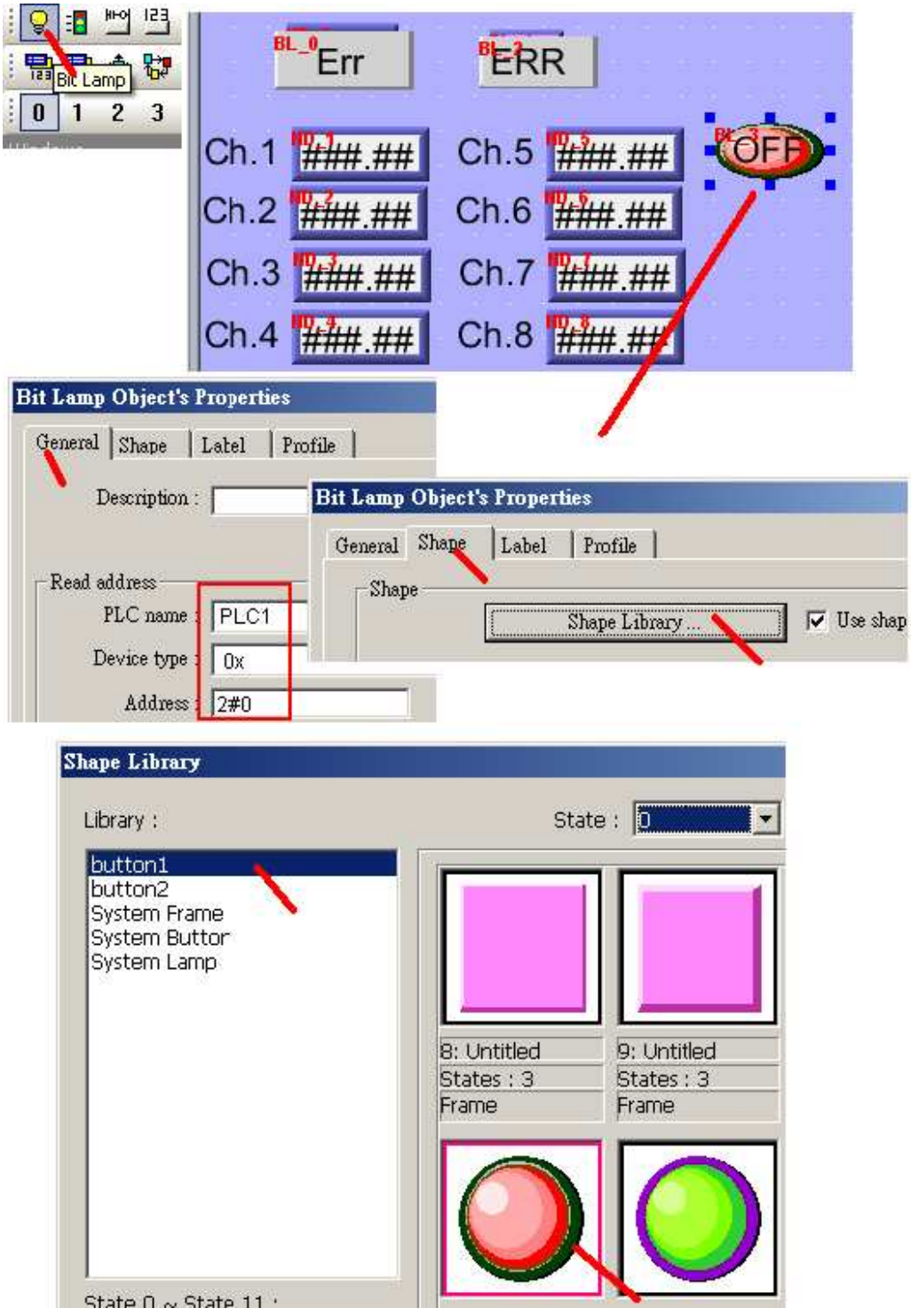


Remember to modify each Numeric Display 's “Address” to a proper value. Ch.1 is using 1#0 , Ch.2 is 1#1 , Ch.3 is 1#2 , Ch4. Is 1#3 , Ch.5 is 1#4 , Ch.6 is 1#5 , Ch.7 is 1#6 , Ch.8 is 1#7 .

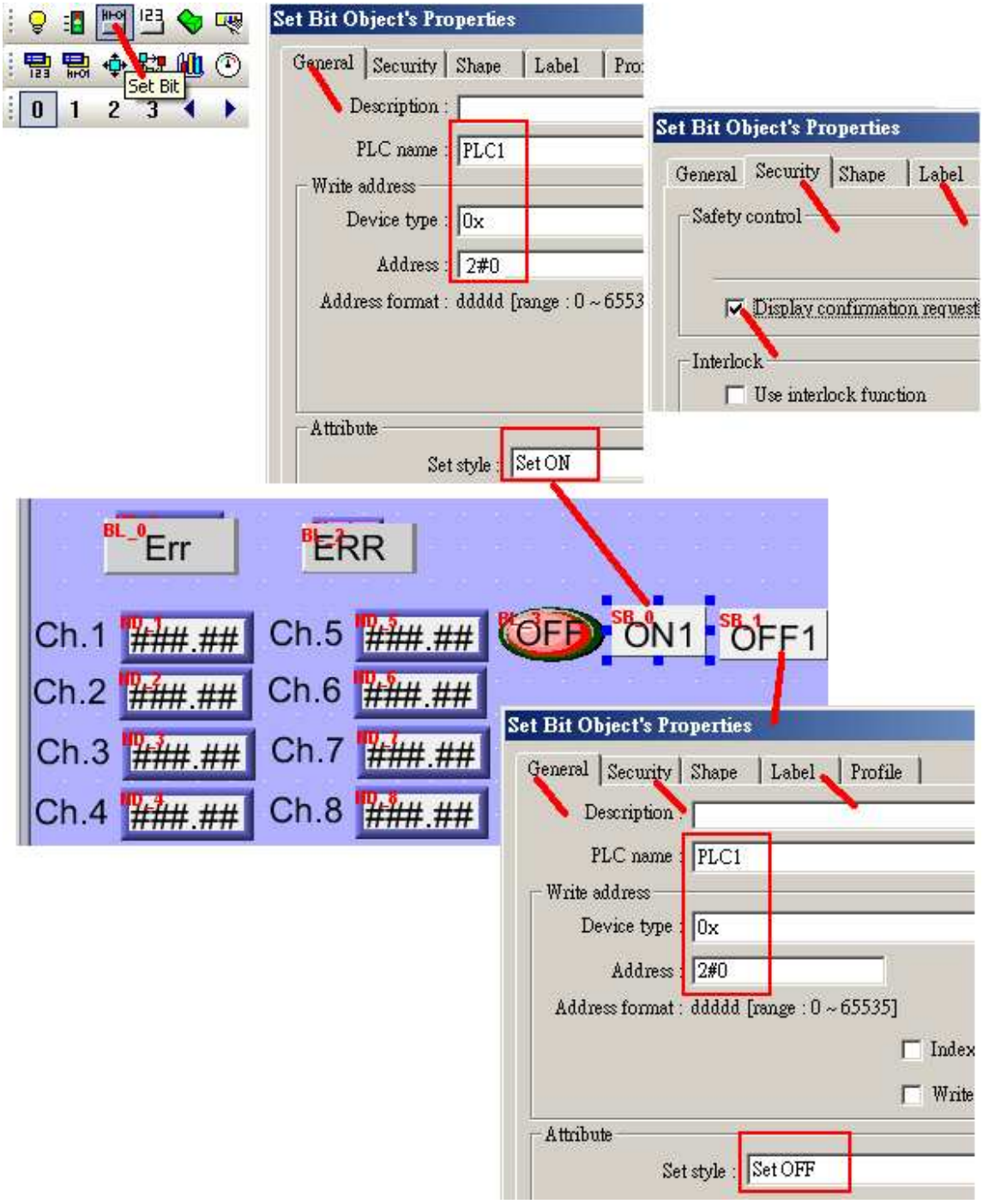


We have set the M-7067D by DCON utility as Addr=2 (means station No. is 2). Please create one “Bit Lamp” as the following figure to display the Ch.1 state of the M-7067D (2#0 means station No. is 2 , Modbus addr. Is 0).

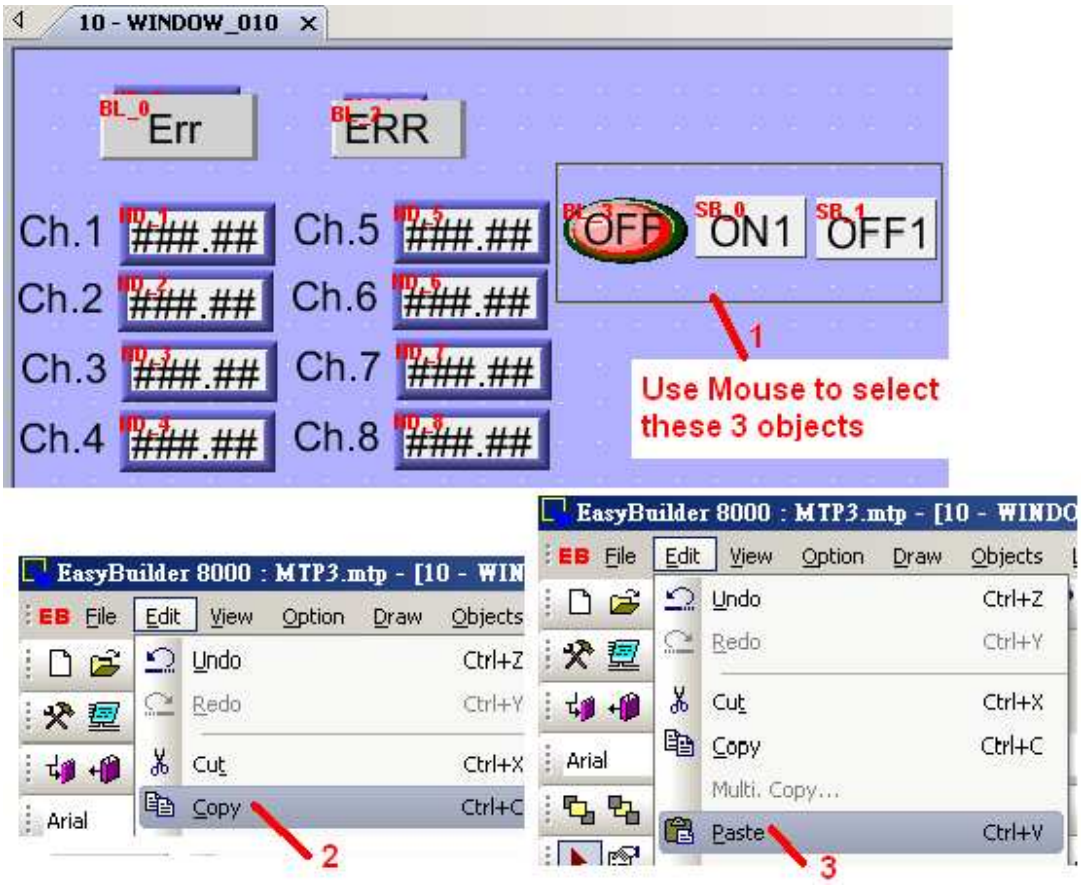
Note: For M-7000, “3x” is for Analog input modules, “4x” is for Analog output modules, “1x” is for Digital Input modules, “**0x**” is for Digital output modules.

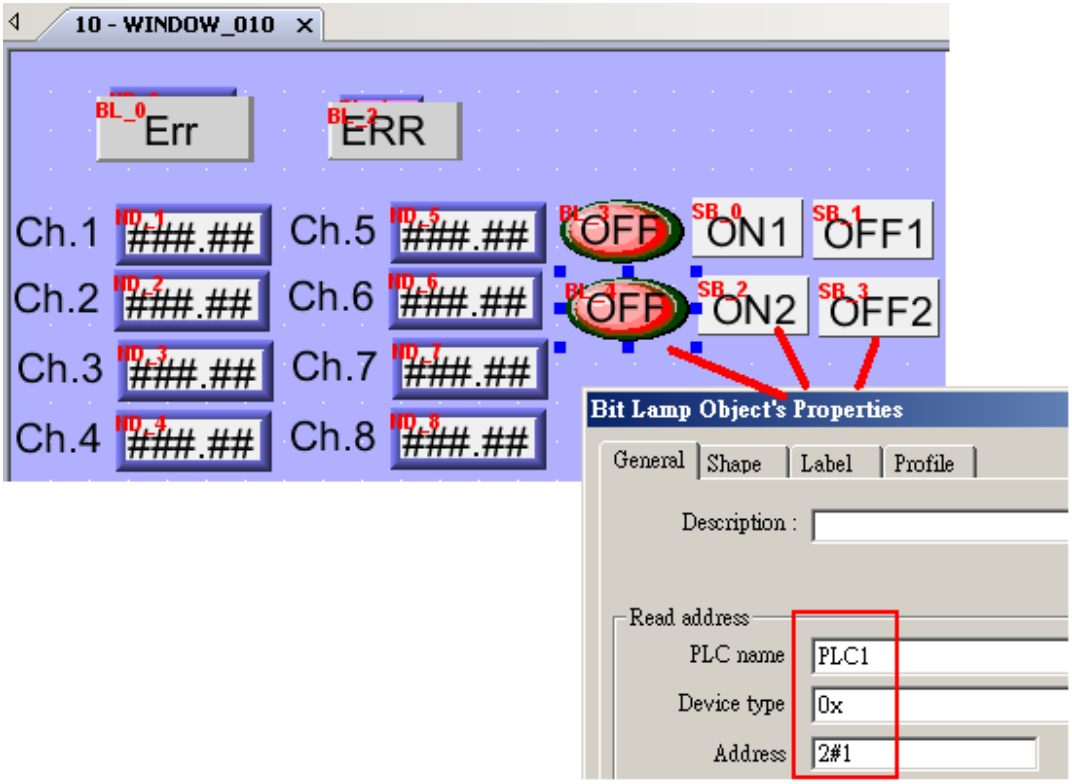


Then create two “Set Bit” to switch the state of Ch.1 of M-7067D . (M-7067D is M-7000 Digital output module)



Please create one another “Bit Lamp” and two “Set bit” for Channel 2 of the M-7067D .





We have finished the touch-8000 project. Please save it, compile it and then download it to the Touch-8000 HMI. (If you are not familiar with the Easybuilder 8000 software, please refer to Chapter 1.2 thru. 1.4)

Check if you have connected the RS-485 cable well between Touch-8000 's COM3 and M-7017R and M-7067D.

Touch-8000 COM3: RS-485		M-7017R (Addr. 1)		M-7067D (Addr. 2)
9 Data +	——	Data +	——	Data +
6 Data -	——	Data -	——	Data -

Then test it. You can try to turn off the power of M-7017R or M-7067D to see if the communication state change to “Err” (“ERR”) . And give for example , 5 volt to Ch.2 of the M-7017R to see if the value displayed well .

Product information:

NS-208/NS-205 : http://www.icpdas.com/products/Switch/switch_list.htm
ICP DAS ISaGRAF PAC: http://www.icpdas.com/products/PAC/i-8000/isagraf.htm
WinPAC-8xx7: http://www.icpdas.com/products/PAC/winpac/wp-8x47.html
Touch HMI: http://www.icpdas.com/products/HMI/touch_lcd/touch_human.htm
M-7000: http://www.icpdas.com/products/Remote_IO/m-7000/m-7000_list.htm

2.8: More Topics

Please visit below web sites for more functions about the Touch-8000 series HMI.

English: ftp://ftp.weintek.com/MT8000/eng/UserManual/ > all PDF files.
Chinese: ftp://ftp.weintek.com/MT8000/tw/UserManual/ > all PDF files.

For example, please refer to Chapter 7 and Chapter 13.22 for “Event log” and “Event display” .

Chapter	Topics
1	EasyBuilder_8000_Installation
2	Project_Manager_Operations
3	Easy_to_using_EB8000
4	MT8000_Hardware
5	System_Parameters
6	Window_Operations
7	Event_Log
8	Data_Sampling
9	Object_General_Properties
10	Object_Secuity_Guard
11	Index_Register
12	Designing_and_Using_Keypad
13	Object
14	Shape_Library
15	Picture_Library
16	Group_Library
17	Label_Library
18	Address_Tag_Library
19	Sound_Library
20	Ethernet_Communication_and_Multi
21	HMI_State_Controlling
22	PLC_connecting_guide
23	MT8000_supports_printer
24	Transferring_Recipe_Data
25	Macro_User
26	Exemplification
Appendix 2	EasyPrinter

Service : service@icpdas.com