Chapter 3 Setting Up A Web HMI Demo

The XP-8xx7-CE6 is the abbreviation of the XP-8047-CE6/8347-CE6/8747-CE6.
The XP-8xx6-CE6 is the abbreviation of the XP-8046-CE6/8346-CE6/8746-CE6.

Important Notice:

1. **The XP-8xx7-CE6 / XP-8xx6-CE6 supports only High profile I-8K and I-87K I/O cards in its slot 1 to 7 (The leftmost I/O slot number is 1). Refer to the XP-8xx7-CE6 CD: \napdos\isagraf\xp-8xx7-ce6\english-manu\ for datasheet**
2. Please always set a **fixed IP** address to the XP-8xx7. (No DHCP) Recommend to use the NS-205 / NS-208 Industrial Switch for XP-8xx7-CE / XP-8xx6-CE6.

3.1 Web Demo List

The Web page location:
XP-8xx7-CE6 CD-ROM: \napdos\isagraf\xp-8xx7-ce6\xpce6-webhmi-demo\

The respective ISaGRAF project location:
XP-8xx7-CE6 CD-ROM: \napdos\isagraf\xp-8xx7-ce6\demo\

Demo list:

Name	Description	I/O board
sample	A Web HMI sample	No I/O board
example1	A simple example listed in Chapter 4	slot 1: I-87055W
xphmi_01	Display controller's date & time	No I/O board
xphmi_02	DI & DO demo	slot 1: I-87055W
xphmi_03	Read / Write Long, float & Timer value	No I/O board
xphmi_04	Read / Write controller's String	No I/O board
xphmi_05	Multi-Pages demo Page menu is on the Left	slot 1: I-87055W
xphmi_05a	Multi-Pages demo Page menu is on the Top	slot 1: I-87055W
xphmi_06	AIO demo, scaling is in ISaGRAF	slot 2: I-87024W slot 3: I-8017HW
xphmi_07	AIO demo, scaling is in PC	slot 2: I-87024W slot 3: I-8017HW
xphmi_08	download controller's file to PC	slot 1: I-87055W
xphmi_09	pop up an alarm window on PC	slot 1: I-87055W
xphmi_11	Trend curve.	slot 2: I-87024W slot 3: I-8017hW
xphmi_12	Record 1 to 8 Ch. i8017HW 's volt every 50ms and draw trend curve by M.S.Excel	slot 3: I-8017hW slot 2: I-8024W
xphmi_13	Record 1 to 4-Ch. i8017HW's voltage every 10ms and draw trend curve by M.S.Excel	slot 3: I-8017hW slot 2: I-8024W

3.2 Steps To Set Up A Web HMI Demo

3.2.1 Step 1 - Setup The Hardware

A. Please have one XP-8347-CE6 or XP-8747-CE6 and plug one I-87055W in its slot 1.

If you don't have the I-87055W (8 IN & 8 OUT board), please follow the same steps as below however your Web HMI demo may be replaced to "xphmi_01" not "xphmi_05"

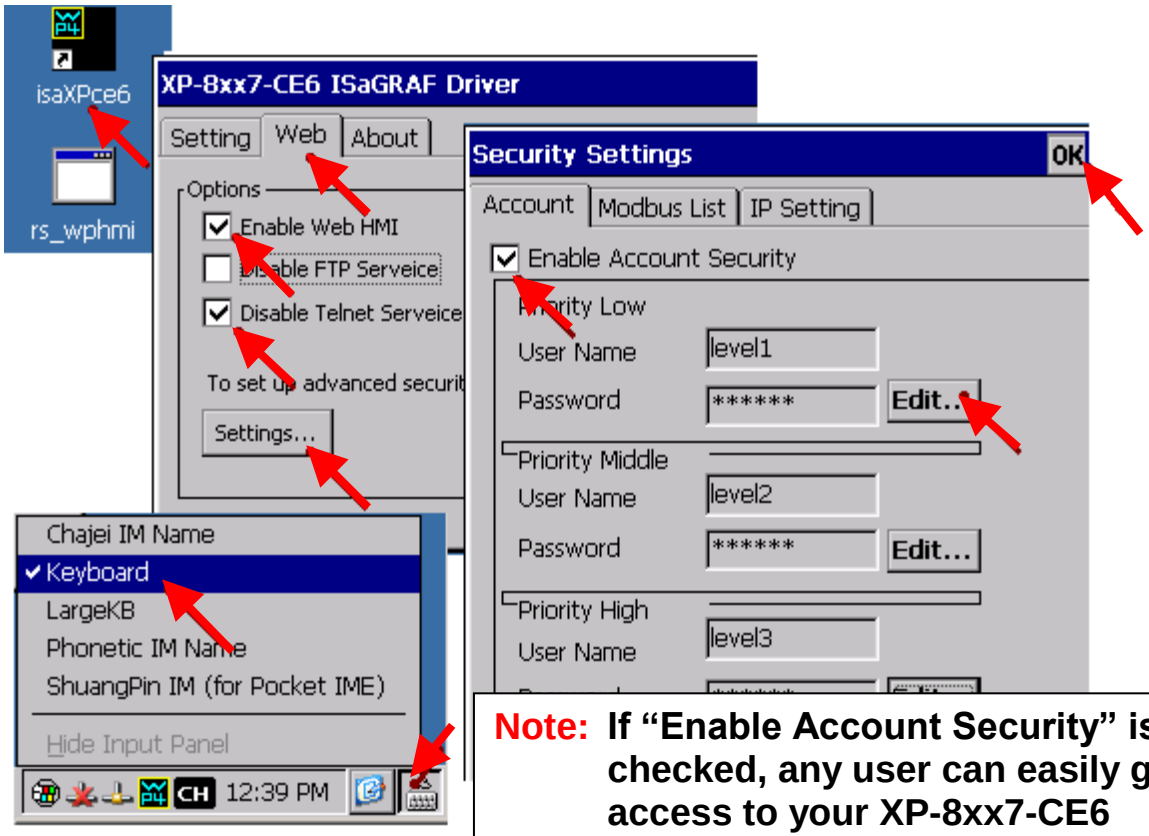
B. Prepare one VGA monitor, one USB mouse and one ethernet cable and then connect them to the XP-8xx7-CE6. (Keyboard is using the software keyboard on the bottom-right of the VGA screen)

C. Power the XP-8xx7-CE6 up.

3.2.2 Step 2 - Setting The Web Options

A. Please refer to the Appendix A.3 of the XP-8xx7-CE6 getting started manual to set a **fixed IP** address to the XP-8xx7-CE6. (No DHCP)

B. Check on "Enable Web HMI" and then click on "Setting", Please check the "Enable Account Security" and then click on "Edit" to set (username , password). **Then remember to click on "OK"**



Note: If "Enable Account Security" is not checked, any user can easily get access to your XP-8xx7-CE6 through the Internet Explorer.

3.2.3 Step 3 - Download ISaGRAF Project

Please download ISaGRAF project "**xphmi_05**" to the XP-8XX7-CE6. It is in the XP-8xx7-CE6 CD: \napdos\isagraf\xp-8xx7-ce6\demo\ "**xphmi_05.pia**"

xphmi_05 demo need one I-87055W. If you don't the I-87055W (8-IN/8-OUT card), download "**xphmi_01**" (CD:\napdos\isagraf\xp-8xx7-ce6\demo\)

If you know how to restore "xphmi_05.pia" to your ISaGRAF Workbench and download it to the controller, please go ahead to the section 3.2.4.

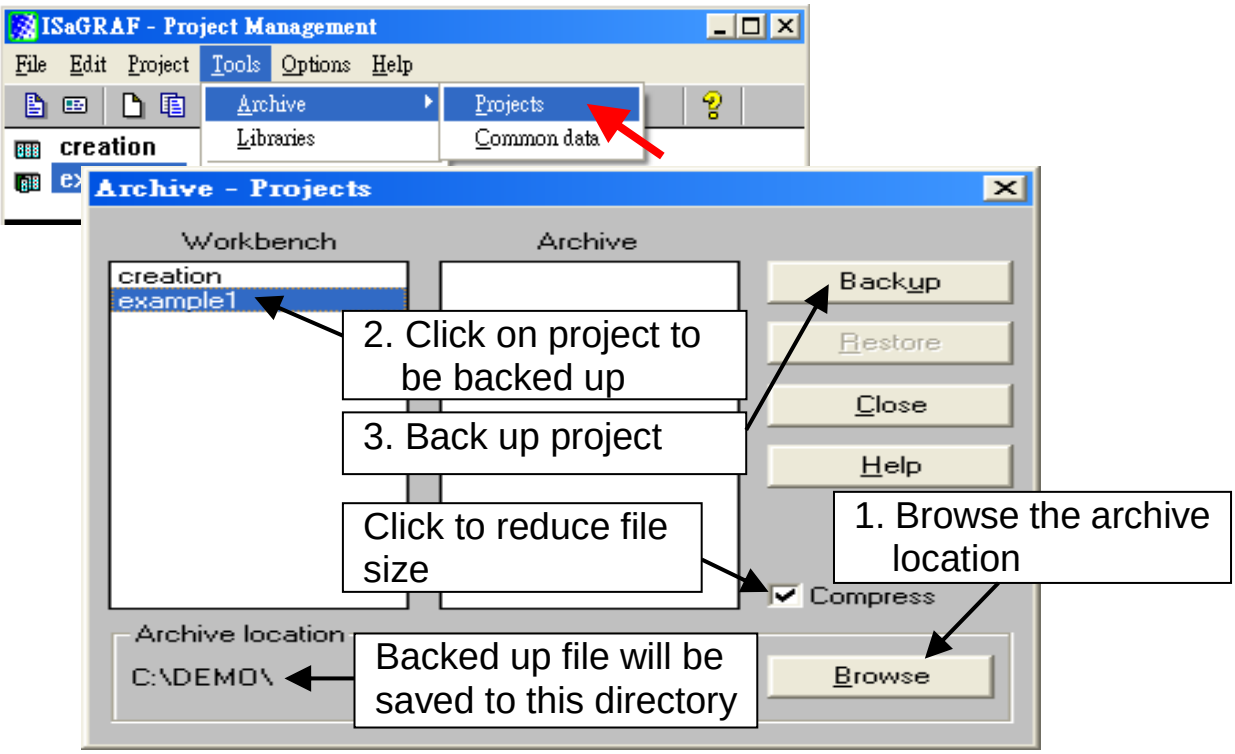
However if you don't know it, please refer to the below steps. Please make sure the ISaGRAF Workbench is already installed to your PC. (refer to the section 2.1 & 2.2)

Steps To Backing Up & Restoring An ISaGRAF Project:

For archiving purposes you can "Back Up" and "Restore" an ISaGRAF project. For example, you may want someone to test your program or email to service@icpdas.com for ICP DAS's ISaGRAF technical service.

Backing Up the ISaGRAF Project

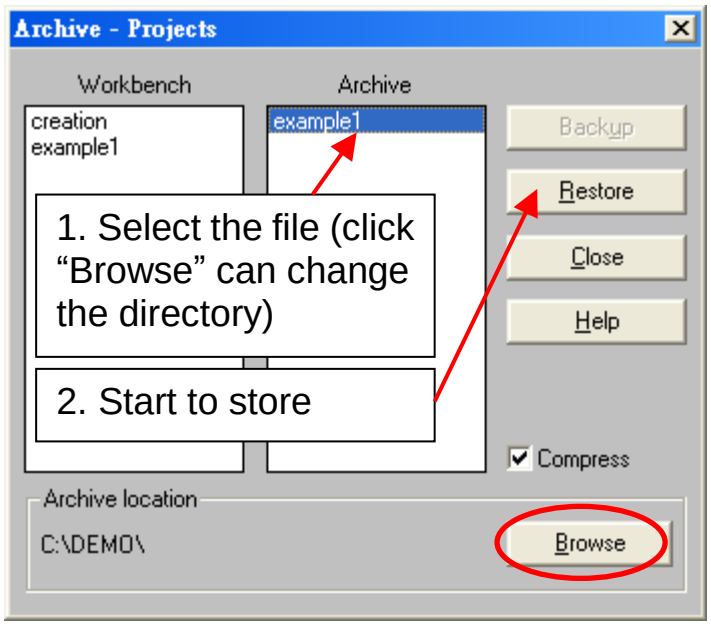
In the "ISaGRAF Project Management" window:
1. Click [Tools] > [Archive] > [Projects] to open the [Archive] window.
2. Click "Browse" can change the directory of file (ex: C:\Demo)
3. Select the projects want to backup from "Workbench"
4. Click "Backup" to backup to the selected folder (ex: \Demo\example1.pia)



Restoring An ISaGRAF Project

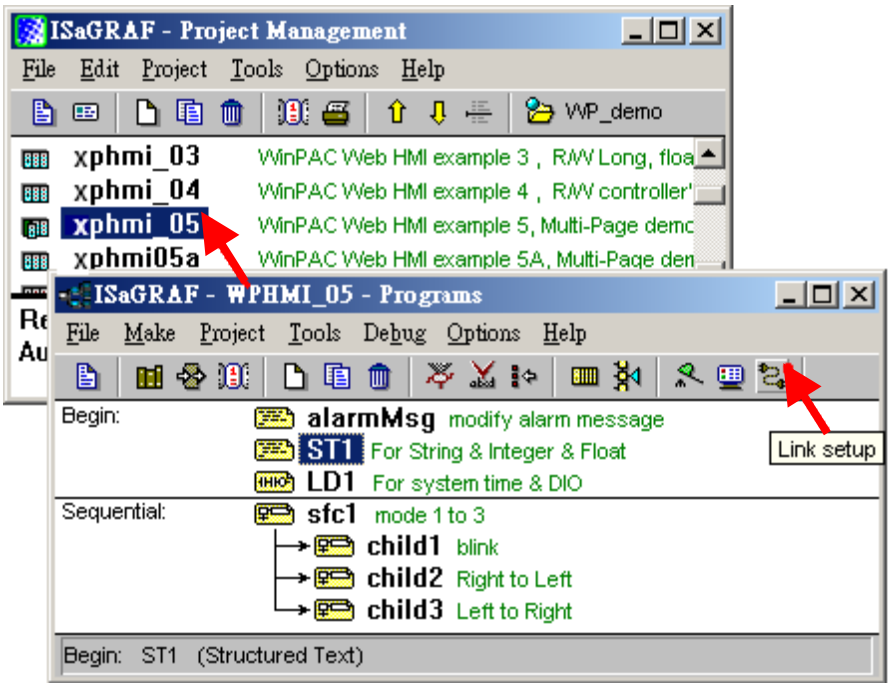
To restore an ISaGRAF project from a backed up file(*.pia), use the 1 & 2 steps of above backup file steps, then:

1. Click on the file name want to restroe from the "Archive" window
2. Click on the "Restore" button to restore the ISaGRAF project.

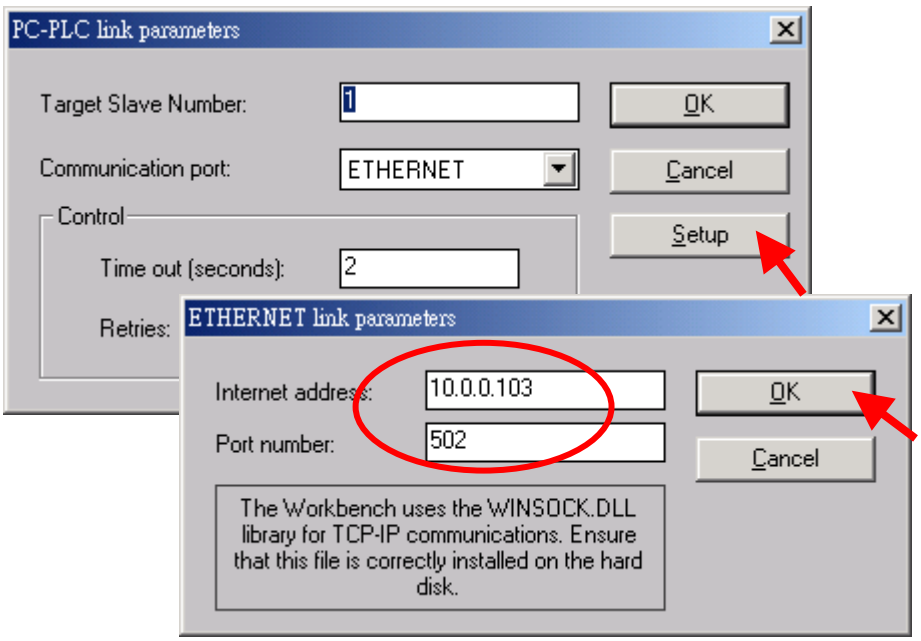


3.2.3.1 Steps To Download an ISaGRAF Project To The Controller:

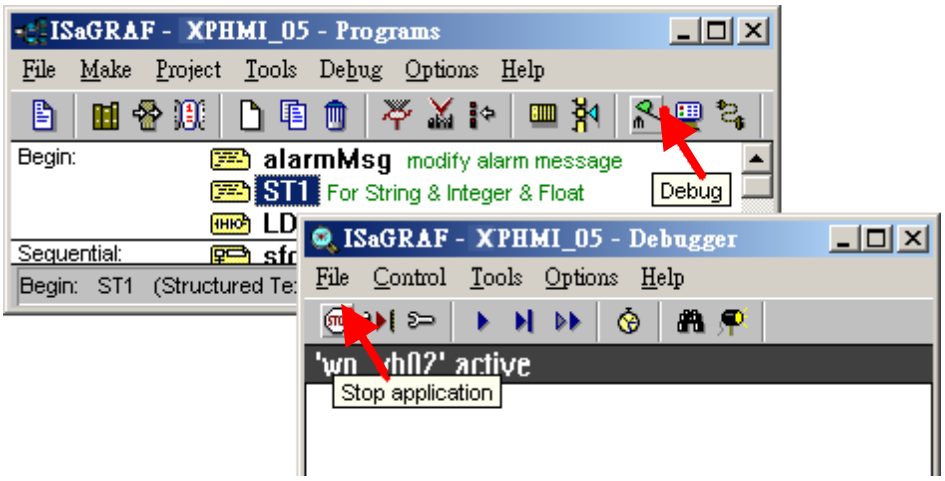
Double click on the "xphmi_05" to get into the project. Then click on "Link setup" .



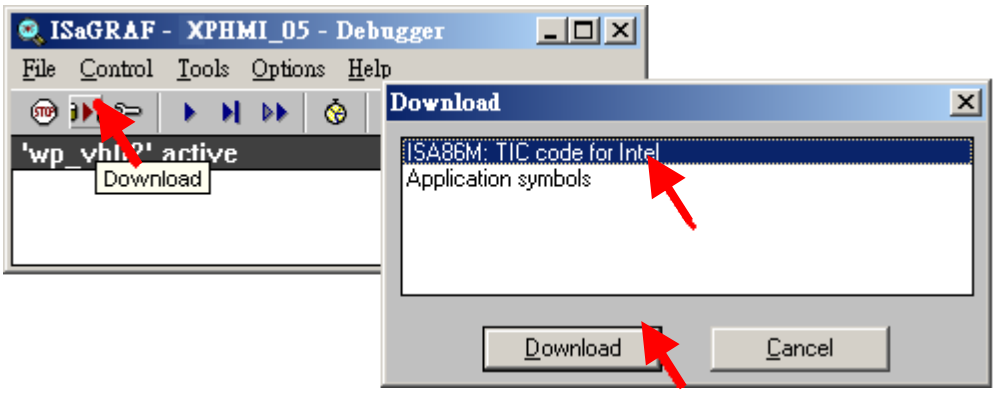
Click on “Setup” first and then entering the IP address of your controller. The port number should be 502.



To download “xphmi_05” project to the XP-8xx7-CE6, Click on “Debug” . If communication is established, click on “stop” first to stop the old project running in the XP-8xx7-CE6.



Then click on “Download” to download it to the controller.



3.2.4 Step 4 - Download Web Pages To The XPAC

A. Please copy all files in the XP-8xx7-CE6 CD-ROM:
CD: \napdos\isagraf\xp-8xx7-CE6\xpce6-webhmi-demo\xphmi_05\ *.*
to the XP-8Xx7-CE6 's \System_Disk\Temp\HTTP\WebHMI\

xphmi_05 demo need one I-87055W in its slot 1. If you don't have the I-87055W (8 IN & 8 OUT board), you may download "xphmi_01"

B. Since the Web Pages are modified or new copied, please run "rs_wphmi.exe" to reset the Web server.
The "rs_wphmi.exe" must be run every time when user has modified any file in the XP-8xx7-CE6 's \System_Disk\Temp\HTTP\WebHMI

3.2.5 Step 5 - Show Time

Please run Internet Explorer (Rev. 6.0 or higher) on PC, key in the IP address of your XP-8xx7-CE6. For example: 61.218.42.10 or http://61.218.42.10

Chapter 4 Programming A Web HMI Example

This chapter shows you how to build a simple ISaGRAF project and Web HMI. The XP-8xx7-CE6 is the abbreviation of the XP-8047-CE6/8347-CE6/8747-CE6. The XP-8xx6-CE6 is the abbreviation of the XP-8046-CE6/8346-CE6/8746-CE6.

Important Notice:

1. **XP-8xx7-CE6/8xx6-CE6 supports only the High profile I-8K and I-87K I/O cards in its slot 1 to 7.** Please refer to XP-8xx7-CE6 CD: \napdos\isagraf\xp-8xx7-ce6\english-manu\ for Data sheet.
2. Please always set a **fixed IP** address to the XP-8xx7-CE6. (No DHCP)
3. Recommend to use NS-205 or NS-208 Industrial Ethernet Switch for XPAC.

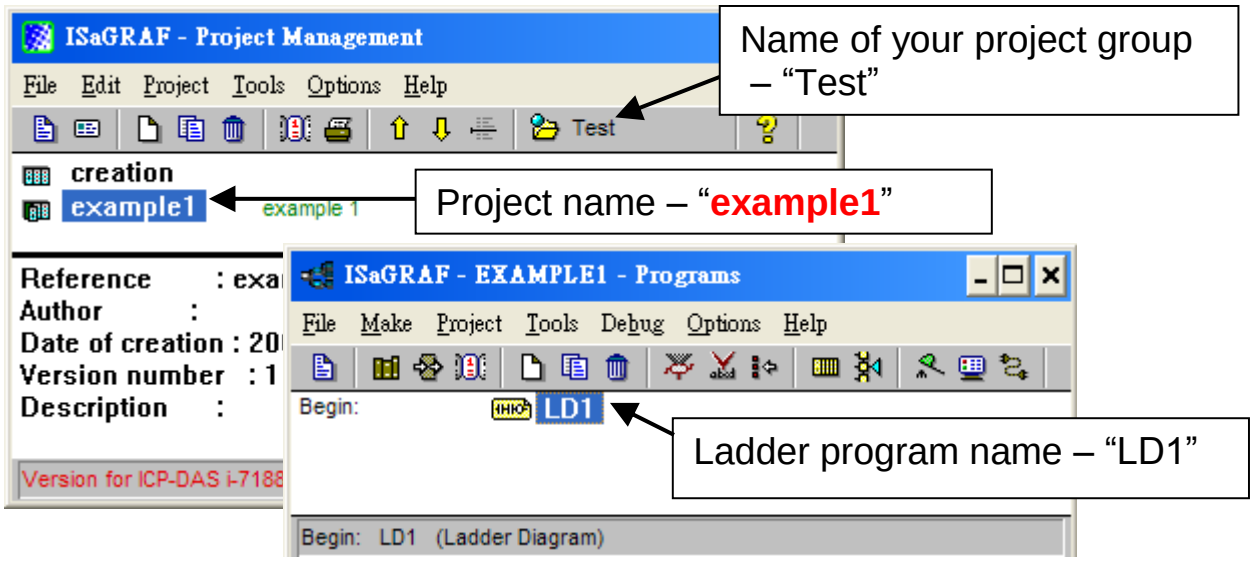
Please refer to below location for detailed ISaGRAF English User's Manual.
XP-8xx7-CE6 CD: \napdos\isagraf\xp-8xx7-ce6\english-manu\
"user_manual_i_8xx7.pdf" - Section 2.1 for detailed ISaGRAF programming basics.

If user would like to program XP-8xx7-CE6 by using both ISaGRAF and VS.net 2008, it is also possible. Please refer to Chapter 6 or Chapter 10.

4.1 Writing A Simple ISaGRAF Program

We are going to use ISaGRAF Workbench to write a simple ISaGRAF example program, then download it to the XP-8xx7-CE6 controller (with one **I-87055W** I/O board in its slot 1) to make it work. If you haven't installed "ISaGRAF" & "ICP DAS Utilities for ISaGRAF", please go back to read chapter 2.

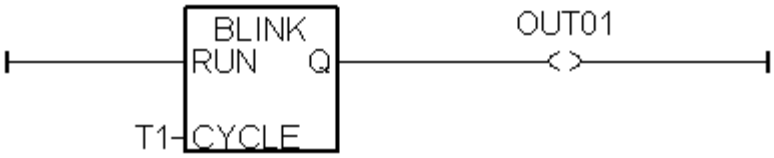
This example contains one Ladder program. (This demo program resides at the XP-8xx7-CE6 CD-ROM: \napdos\isagraf\xp-8xx7-ce6\demo\ "example1.pia")



Variables declaration:

Name	Type	Attribute	Description
OUT01	Boolean	**Output**	Output 1 in the I-87055W, Modbus network addr = 1
OUT02	Boolean	**Output**	Output 2 in the I-87055W, Modbus network addr = 2
K1	Boolean	**Input**	Input 1 in the I-87055W, Modbus network addr = 11
K2	Boolean	**Input**	Input 2 in the I-87055W, Modbus network addr = 12
T1	Timer	**Internal**	Time Period of blinking, initial value set as T#8s Modbus network addr = 21

Ladder Logic Program Outline:

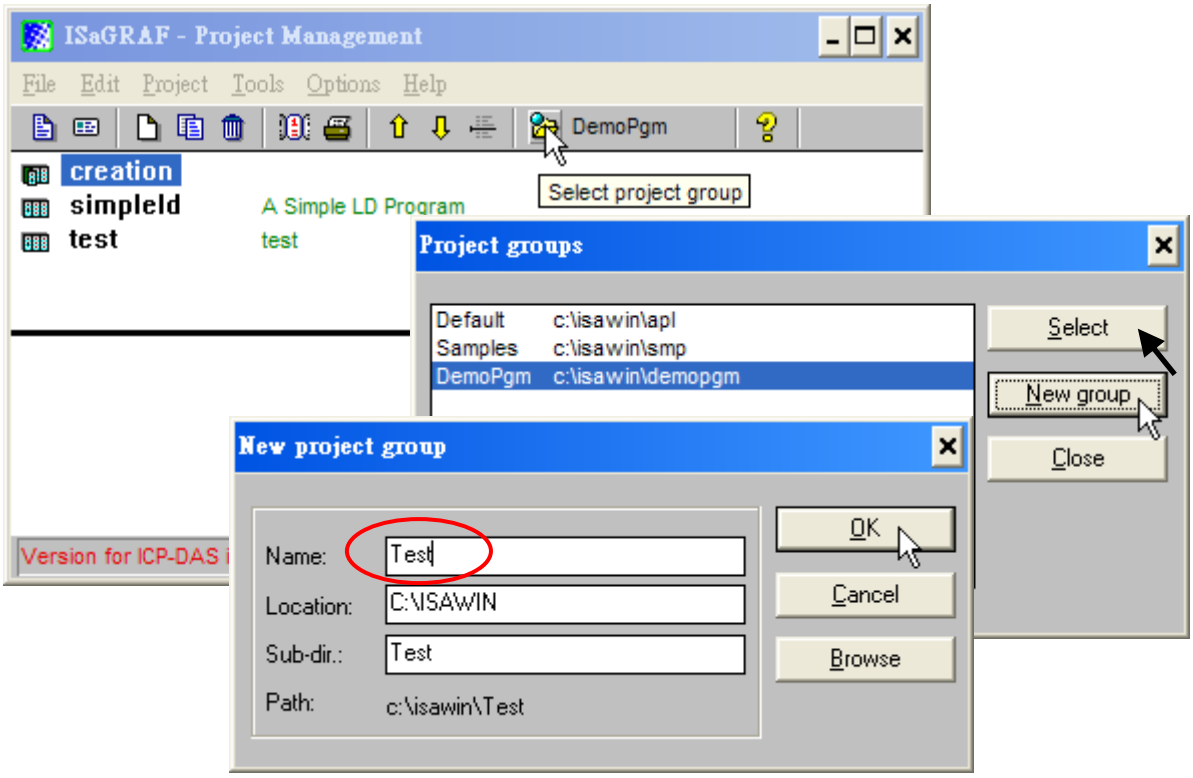


4.1.1 Open ISaGRAF-Project Management

Click on the Windows [Start] > [Programs] > [ISaGRAF 3.4] (or ISaGRAF 3.5) > [Projects] to run the ISaGRAF Workbench.

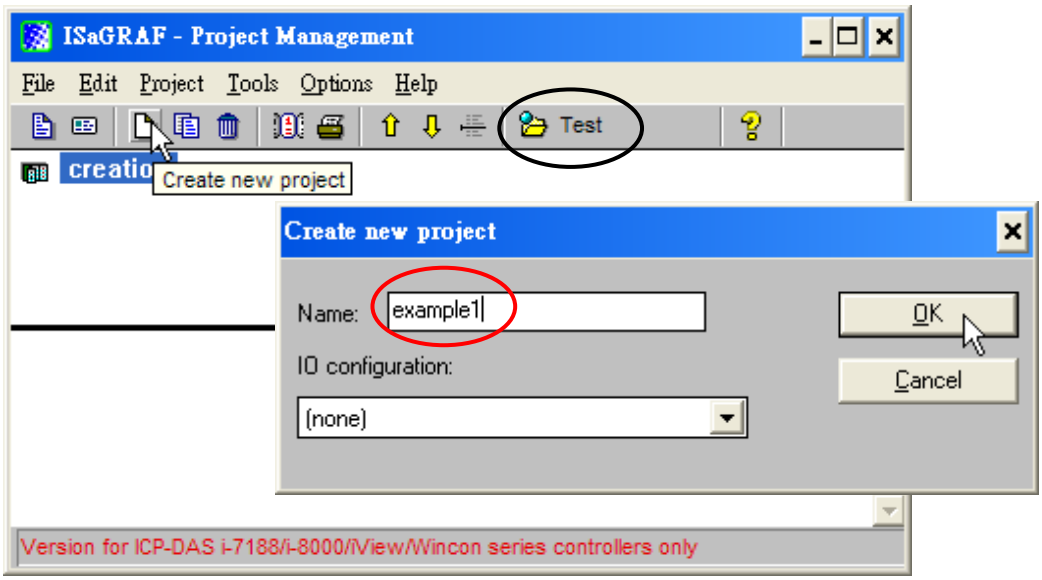
4.1.2 Creating An ISaGRAF User's Group

Click on the "Select Project Group", and then click on "New Group", then type in the name for the new user's group you wish to create, and last click on "OK".

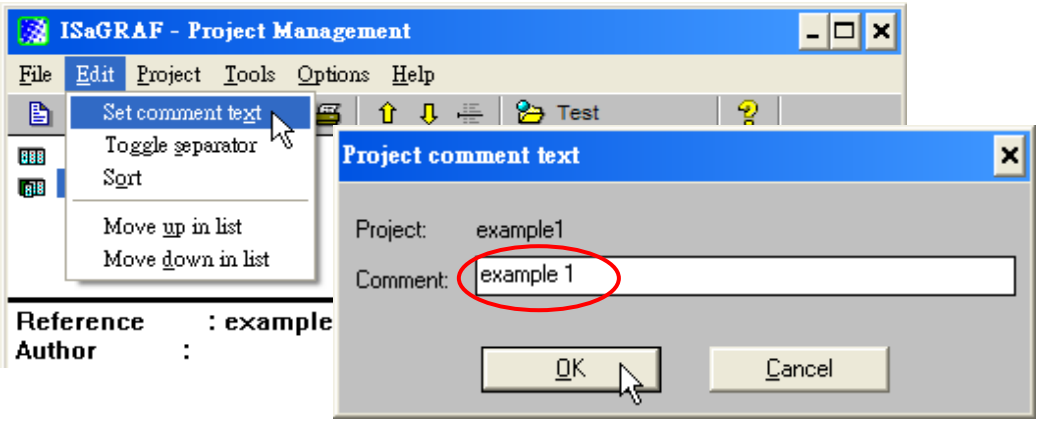


4.1.3 Creating A New ISaGRAF Project

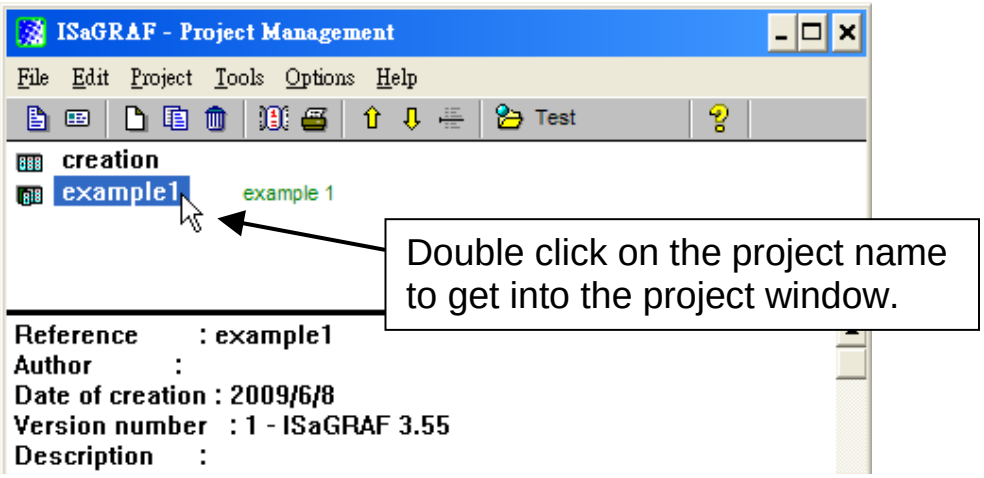
To start a new ISaGRAF project, click on the "Create New Project" icon and enter in the name for the new project.



You can then enter additional information for your project by clicking on the "Edit" and then "Set Comment Text" menu as illustrated below.



You will now see the name of the new project in the "Project Management" window. Double click on the name of the new project to open the new project.

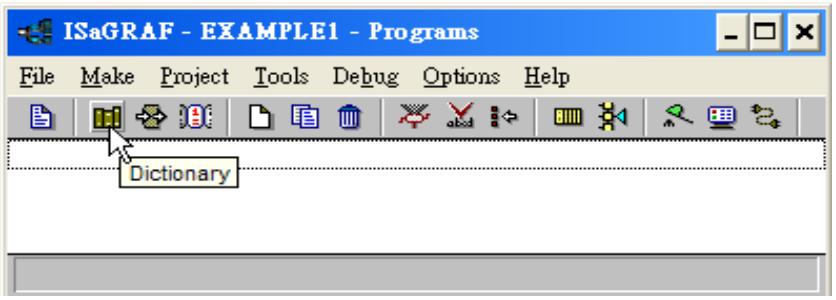


4.1.4 Declaring The ISaGRAF Project Variables

Before you can start creating an ISaGRAF program, you must first declare the variables that will be used in the ISaGRAF program.

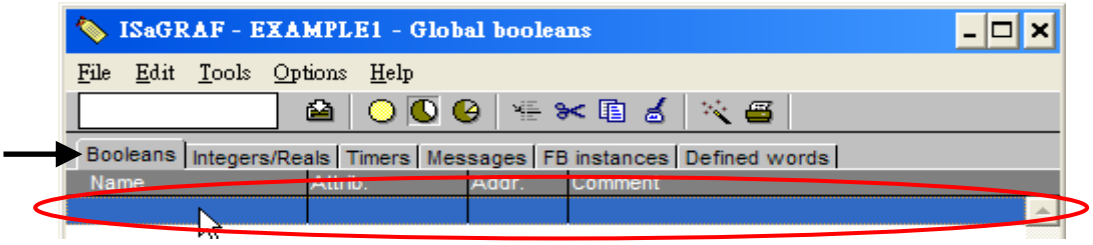
<u>Declare the Boolean Variables</u>

1. Click on the "Dictionary" icon

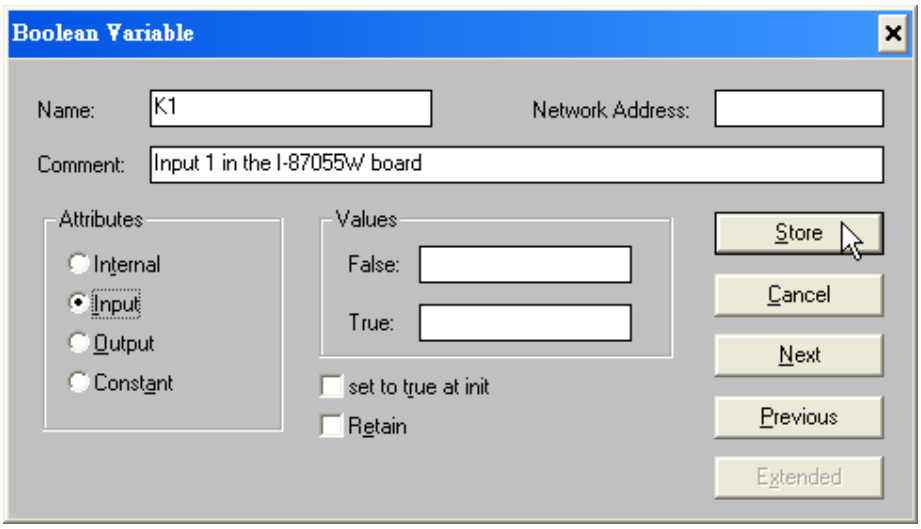


2. Click on the "Boolean" tab to declare the **Boolean variables** that will be used in our example program.

3. Double click on the colored area below the "Boolean" tab, and a "Boolean Variable" window will open.



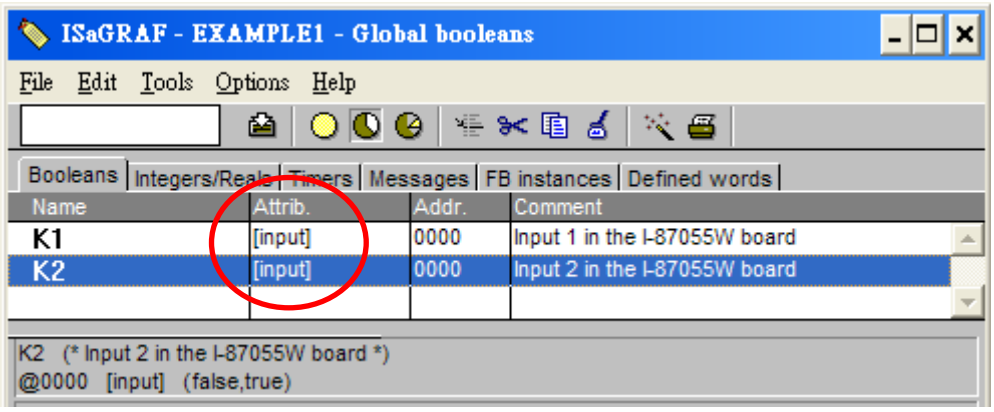
4. Enter in the name of the variable to be used in the project. For the purpose of this example program the variable "Boolean Variable Name" is "K1".
5. Add "Input 1 in the I-87055W board" to the "Comment Section".
6. Then declare the type of "Attribute". In this example program, K1's attribute will be an "Input".
7. Then press the "Store" button to save it.



NOTE:

You MUST make sure that the variable you have declared has the desired **Attribute** assigned. If you decide that you want to change a project variable's attribute, just double click on the variable name and you can reassign the attribute for the variable.

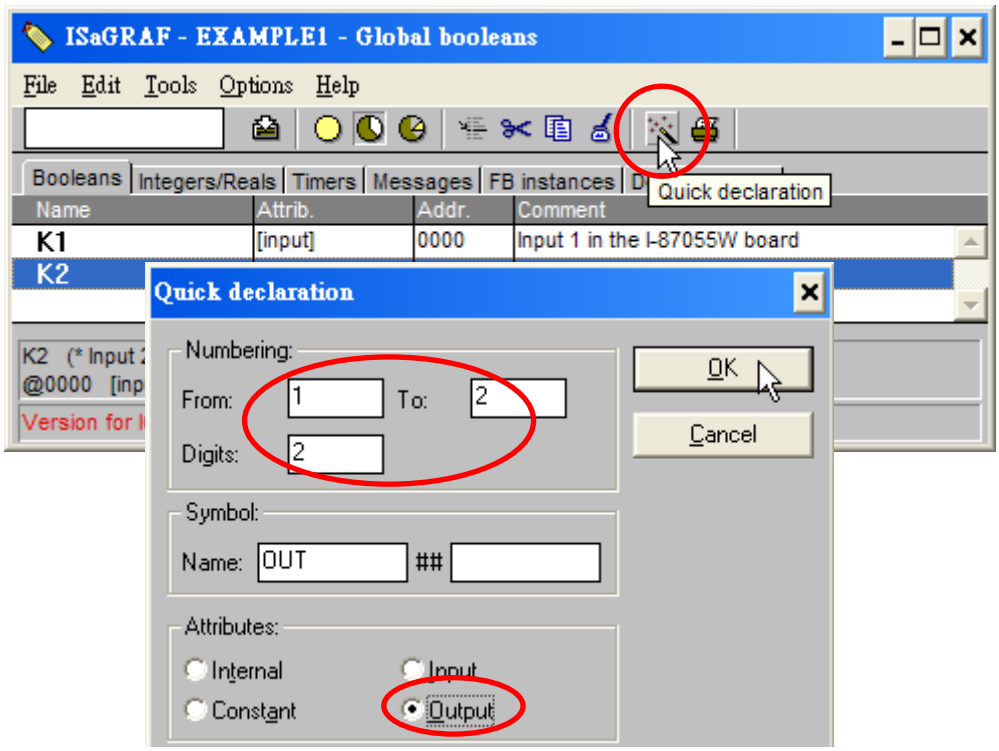
Please follow the above same step to declare one another Boolean variable – "K2". Then you will have as below.

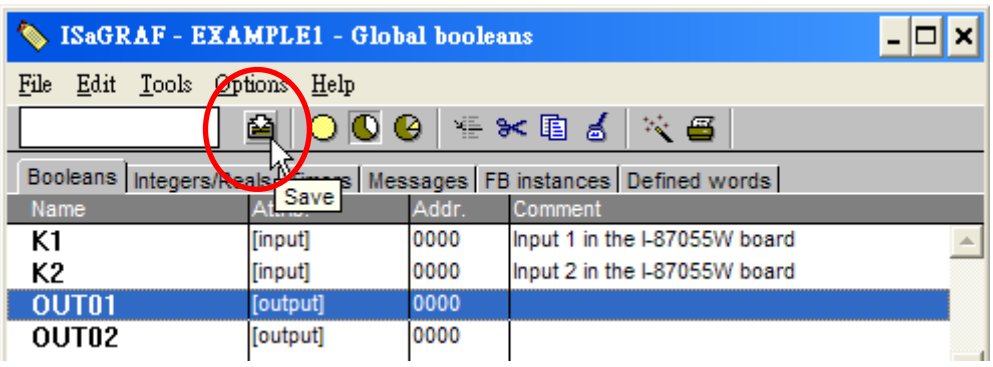


Quick way to declare

There are two outputs used in this example program named "OUT01 and OUT02". ISaGRAF provides a **quick and easy way to declare** like variables that are sequentially ordered.

1. Click on the "Quick Declaration" icon.
2. Enter the output number that you will start with the "Numbering" in “from” and "To" fields (this example uses from 1 to 2).
3. Enter the "Symbol" name for the output variables being declared.
4. Set the attribute to "Output". Click on the "OK" button.
5. When you click on the "OK" button, all two outputs will be immediately added to the "Global Boolean" window. Click on “Save” to store them.

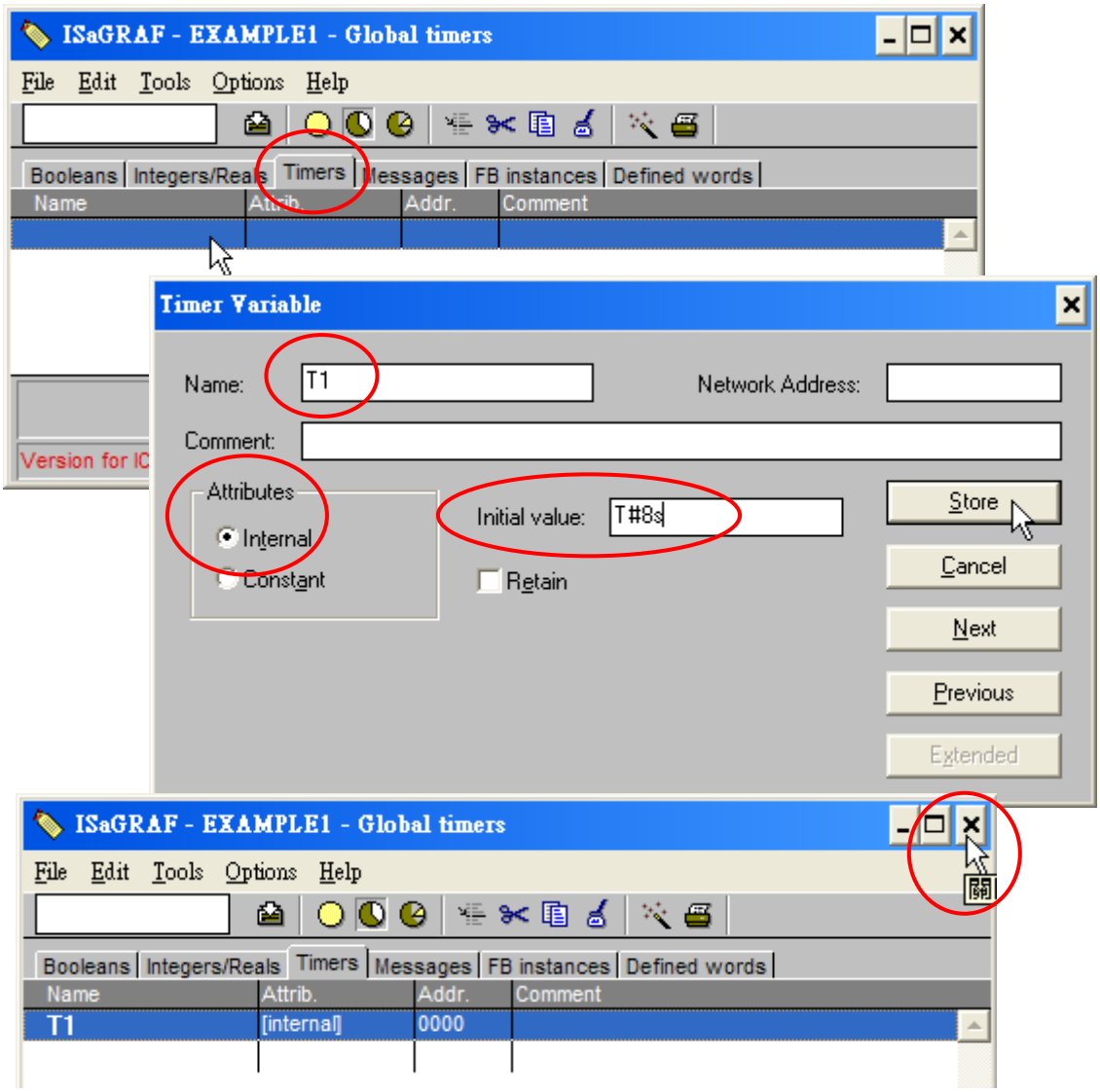




Declare the Timer Variables

To declare the timer (T1) variable used in this example program, click on the "Timers" tab in the setup screen.

1. Double click on the colored area and enter the Name as "T1".
2. Set the "Attributes" to "Internal".
3. Set the "Initial Value" to "T#8s".
4. Click on the "Store" button.
5. Click on “X” to close the “dictionary” window.



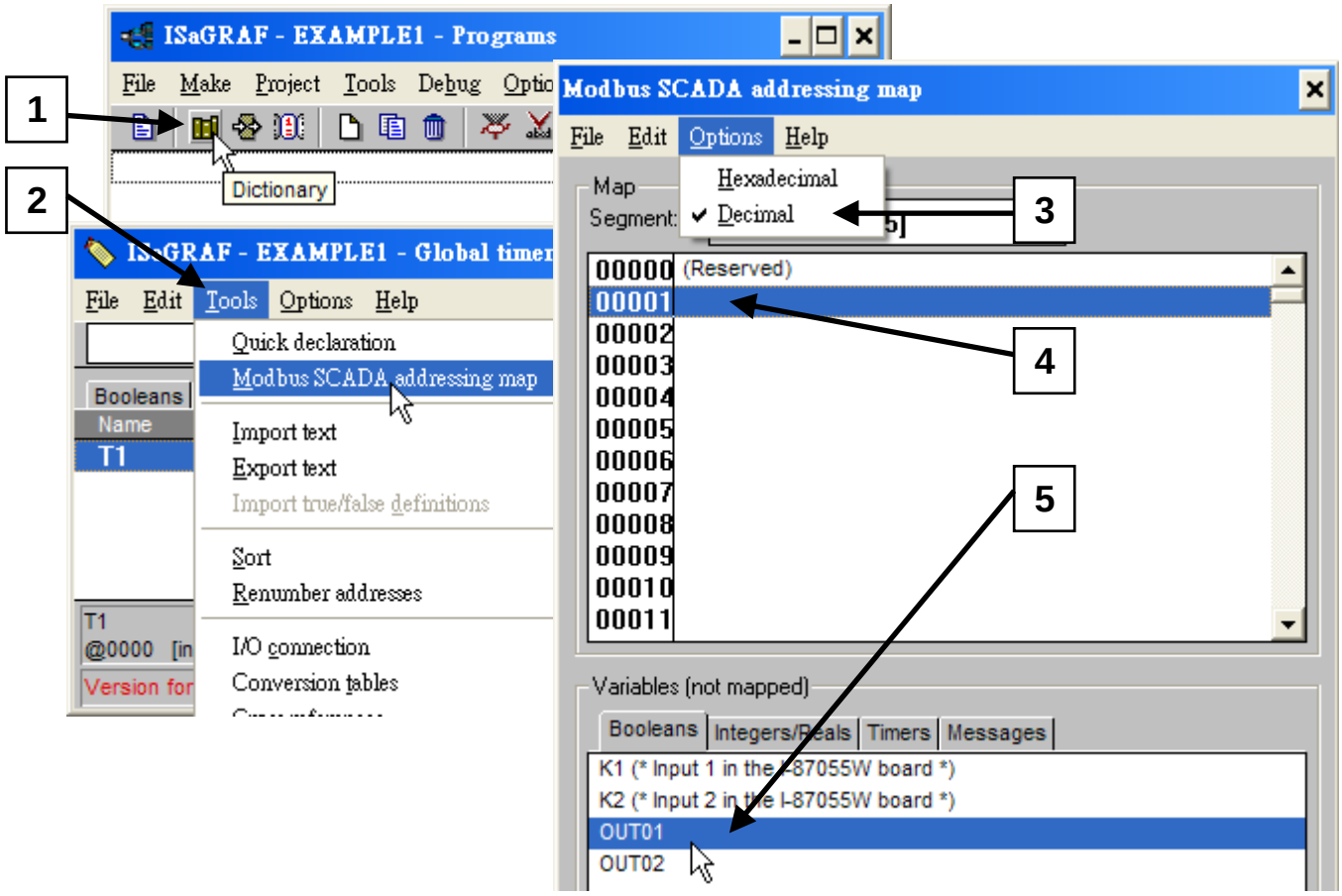
4.1.5 Assign Modbus Network Address No to Variables

The Web HMI will exchange the variable value with the ISaGRAF project if they have assigned the proper “Modbus network address”. The Web HMI only recognizes Modbus No. from 1 to 1024. However other SCADA software may R/W the Modbus No. from 1 to 8191 in the XP-8xx7-CE6.

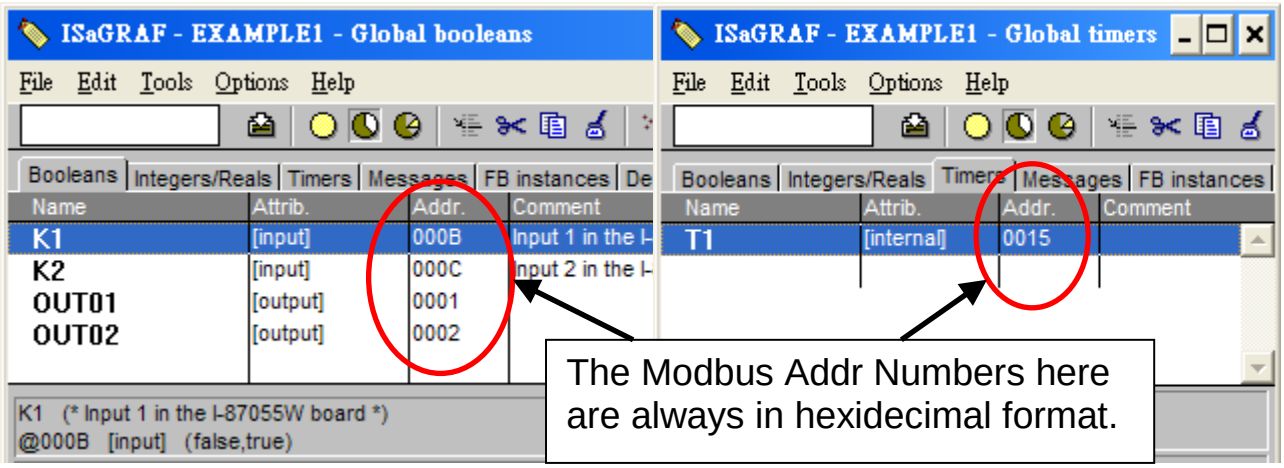
Variables without assigning Modbus No. will not be available by Web HMI and other SCADA software or HMI devices.

Refer to XP-8xx7-CE6 CD-ROM: \napdos\isagraf\xp-8xx7-ce6\english-manu\ "user_manual_i_8xx7.pdf” for section 4.1 & 4.2 for detailed information about assigning Modbus network address.

1. Click on “dictionary” icon
2. Click [Tools] > [Modbus SCADA addressing map]
3. Select [Options] > [Decimal] , or it will use Hexadecimal format as default.
4. Click on “00001” on the top window
5. Double click on “OUT01” to attach it to the Modbus No. 1.



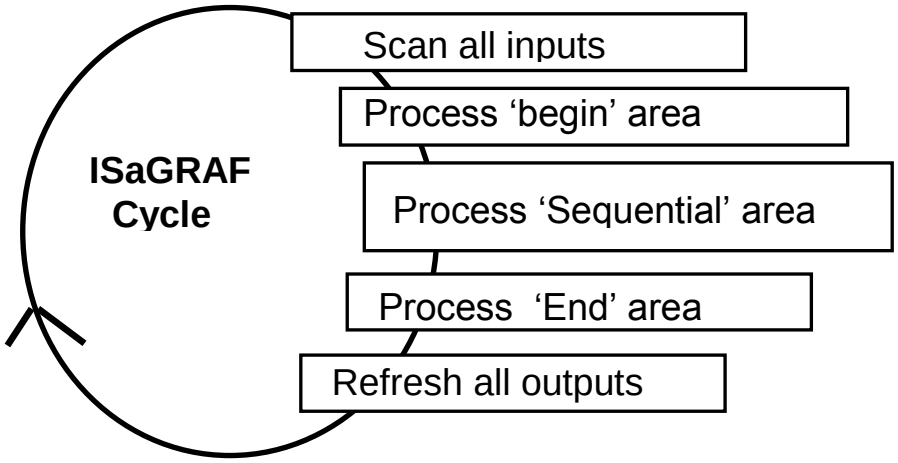
Please follow the same way to assign OUT01 to No.2, K1 to No.11, K2 to No.12 and then Timer variable T1 to No.21. Then we have below window.



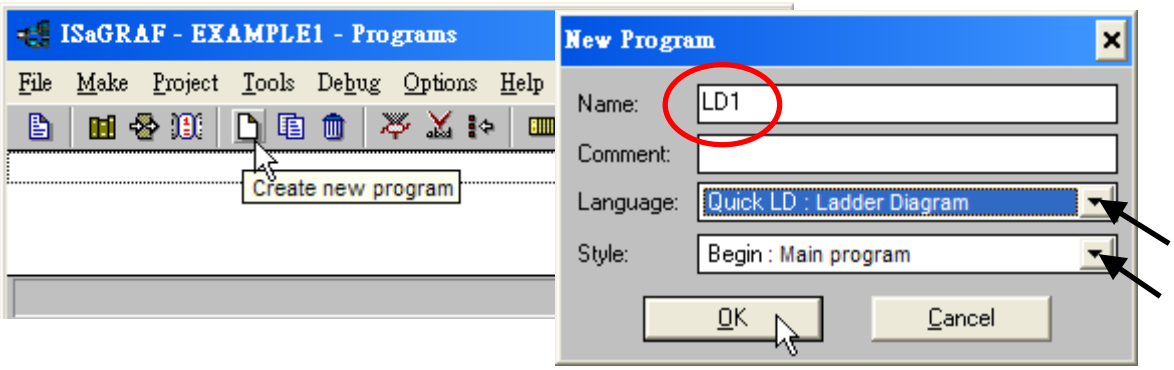
<u>Very Important Notice:</u>
If assign Modbus No. to Long integer or Float or Timer variables, they should occupy two Modbus No. Please refer to XP-8xx7-CE6 CD-ROM: \napdos\isagraf\xp-8xx7-ce6\english-manu\ "user_manual_i_8xx7.pdf" - Section 4.2 for detailed information.

4.1.6 Create The LD - "LD1" Program

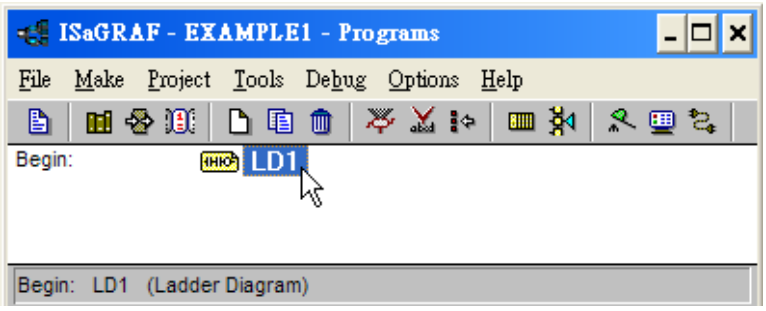
ISaGRAF will run every program one time in each PLC scan cycle. Programs in the "begin" area will run first, then the "Sequential" area, and last the "End" area. An ISaGRAF cycle runs in the way as the below scheme.



1. Click on the "Create New Program" icon
2. In the "New Program" window, enter the "Name" as "LD1".
3. Click on the "Language" scroll button, select "Quick LD: Ladder Diagram".
4. Make sure the "Style" is set to "Begin: Main Program".
5. You can add any desired text to the "Comment" section for the LD program, but it isn't required.

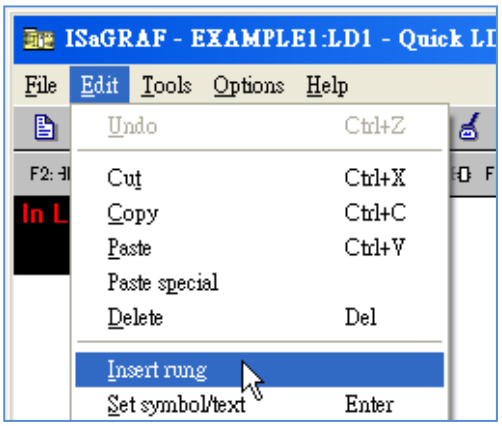


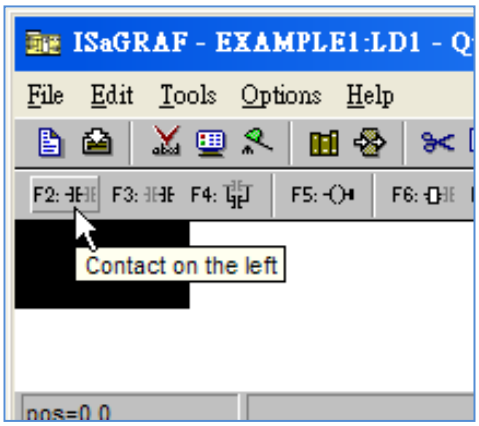
Now we have one program inside this project. Please double click on the "LD1" to get into it.

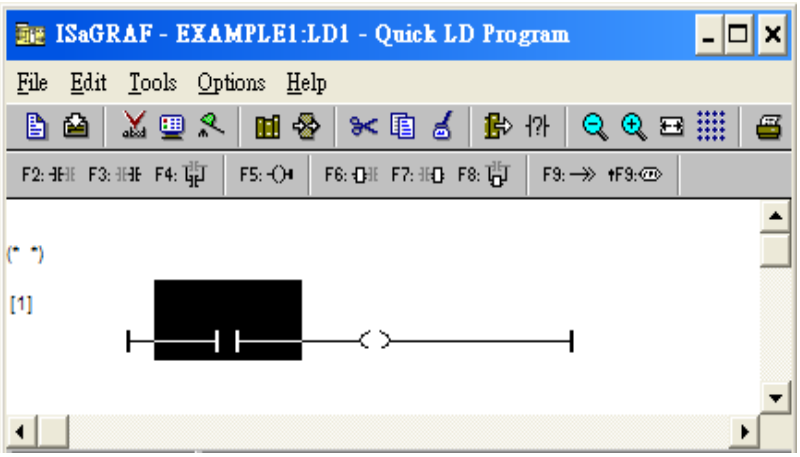


4.1.7 Edit The "LD1" Program

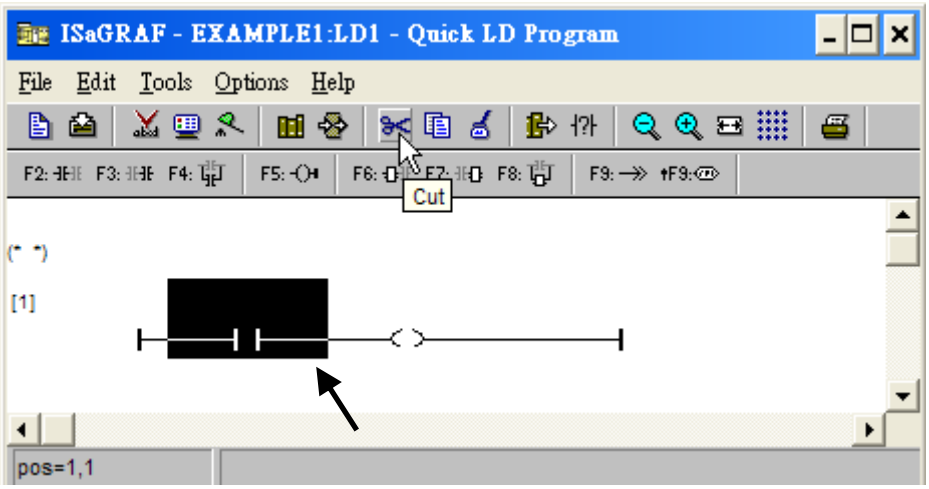
When you double click on the "LD1" name, the "Quick LD Program" window will appear. To start programming our LD program, click on "Edit" from the main menu bar, then click on "Insert Rung" . "Insert Rung" means to insert a basic LD rung just above the current position. **Or, you may just simply click on the "F2 (Contact On The Left)"** icon, and the following will appear within the Quick LD Program window.



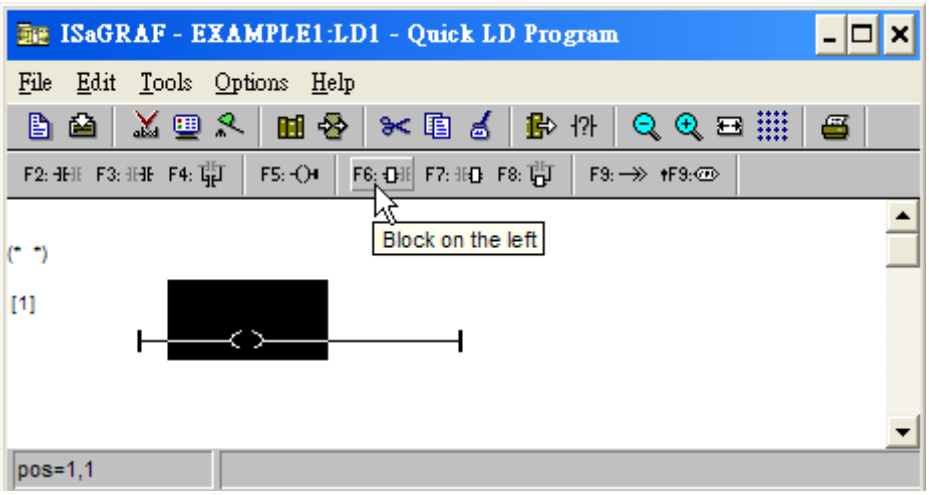




We are going to write the first line of the LD1 program. Move the cursor to the first “contact” and then click on “cut” to delete it.

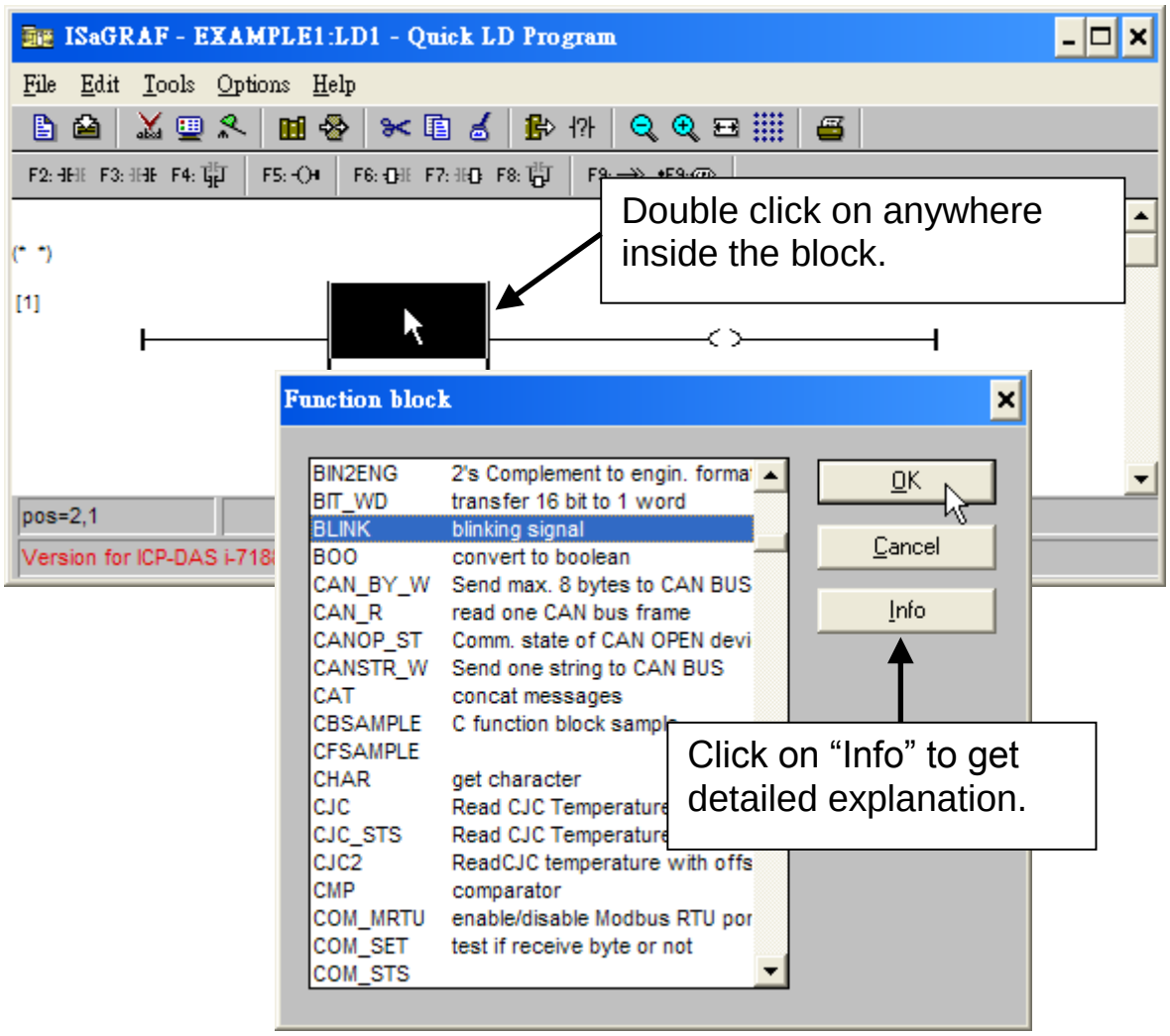


Click on the "F6 (Block on the left)" icon and you will create a block on the left of the “coil”.

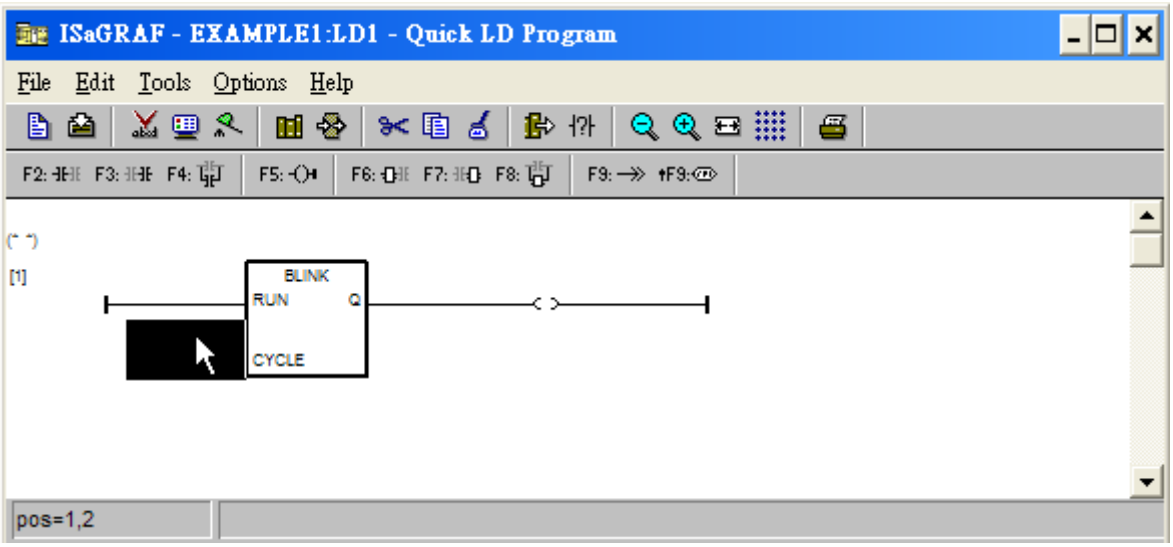


Now we are going to assign the associated variable & constant to each item. Double click anywhere inside of the block and the "Function Block" assignment window appears. Select the "BLINK" type function block. To learn how the

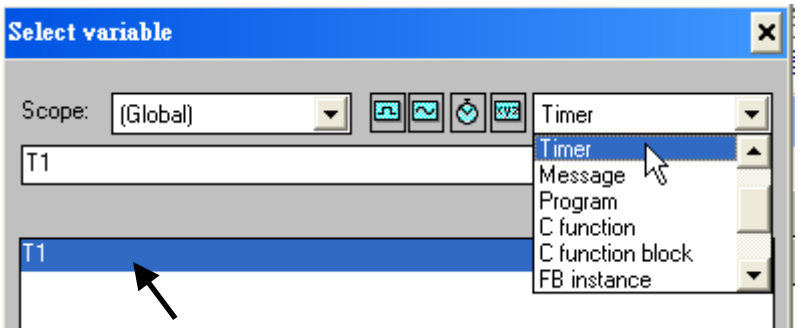
"BLINK" function operates you can click on the "Info" button for a detailed explanation of its functionality



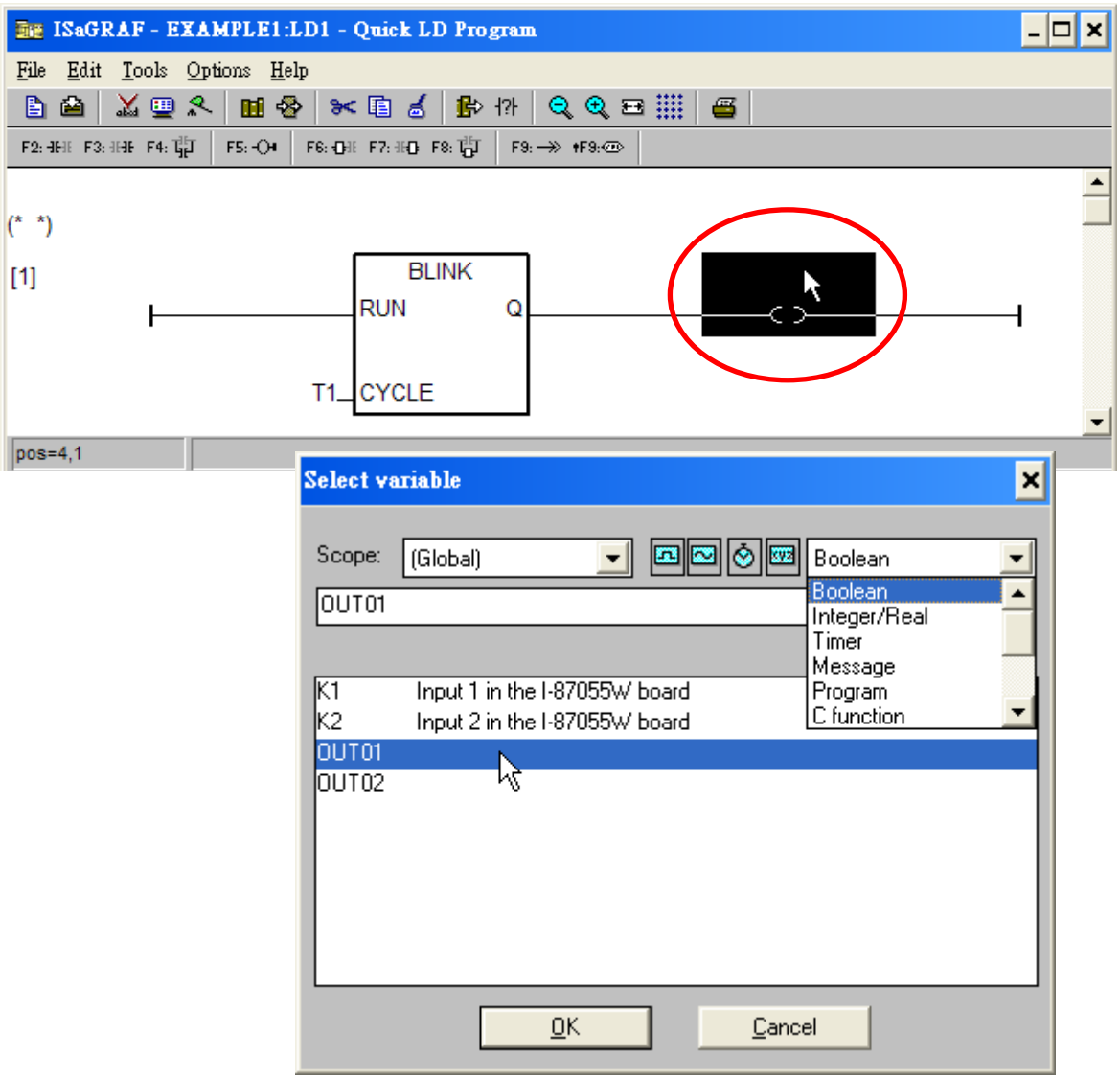
Now move your cursor to the left of the parameter "CYCLE" of the "BLINK" block.



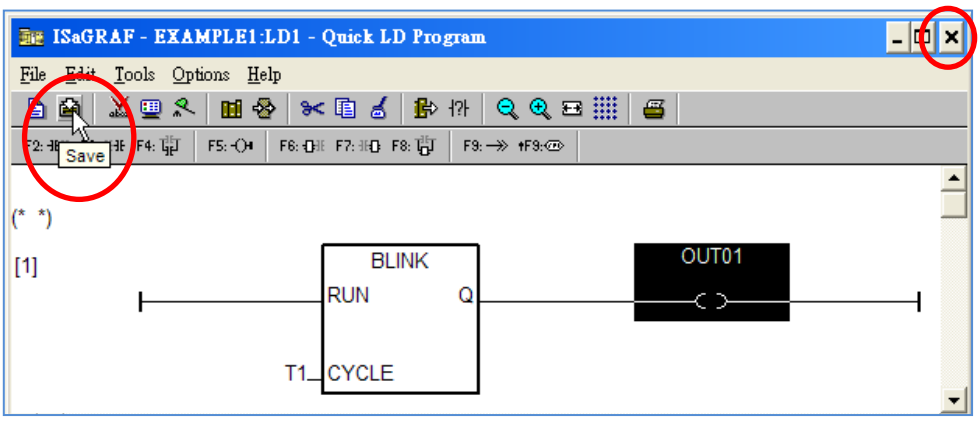
Double click on it, select “Timer” and then double click on variable name - “T1”.



Move your cursor to the “coil”. Double click on it, select “Boolean” and then double click on variable name – “OUT01”.



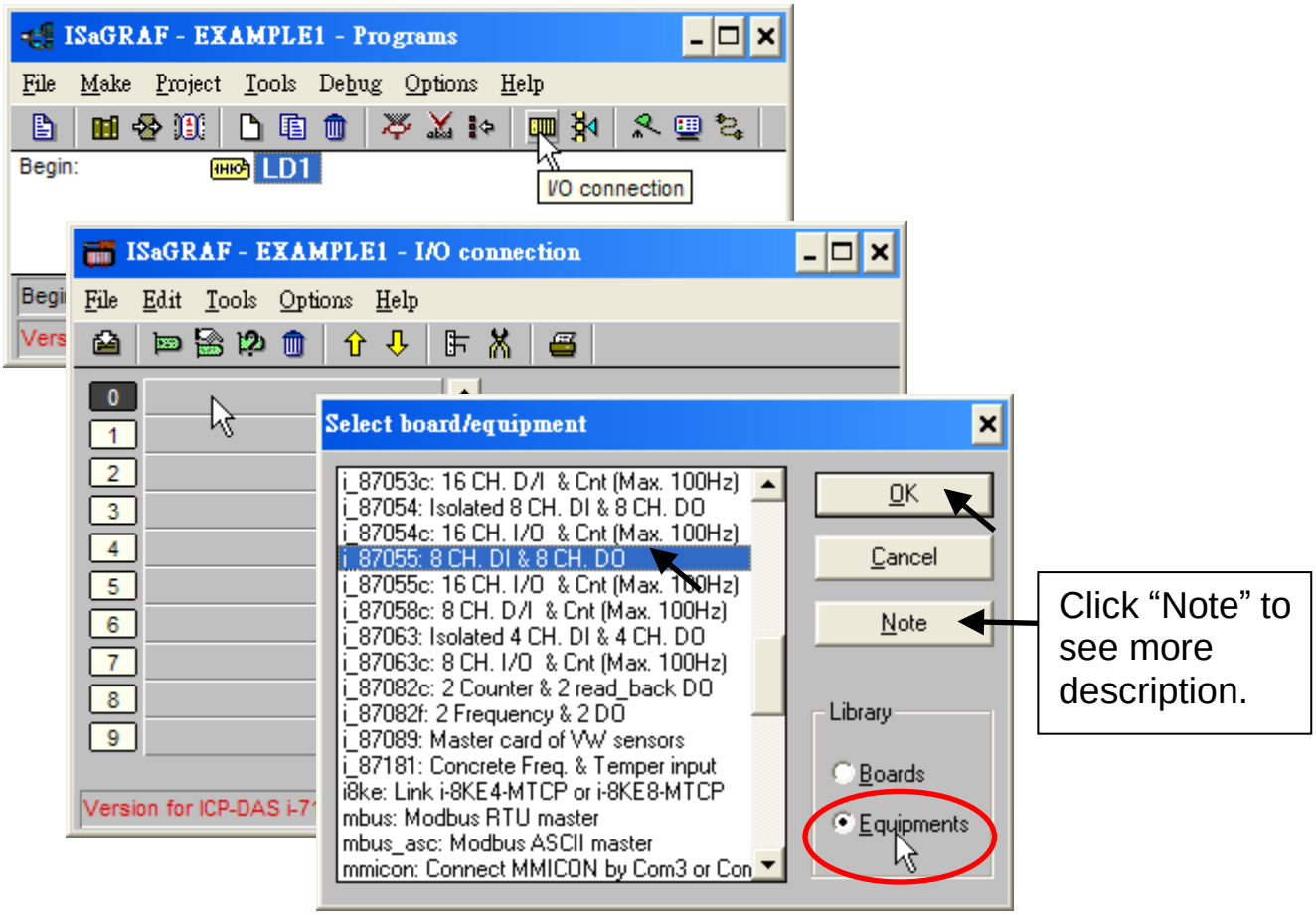
Now we have finished our Ladder code, click on “Save” and then click on “X” to exit.



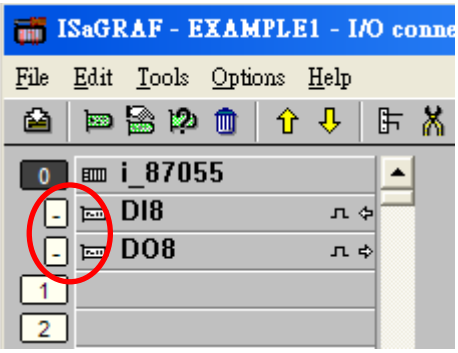
4.1.8 Connecting The I/O

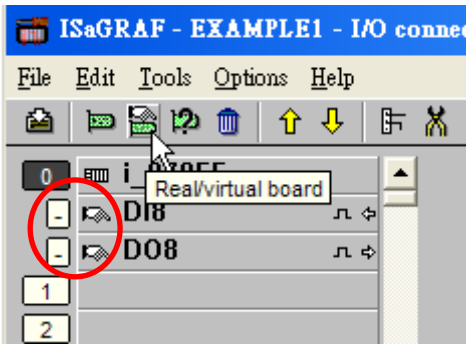
We have defined variables name of “OUT01” , “OUT02” as “output” attribution, while “K1” & “K2” as “input” attribution in step 4.1.4. These “input” & “output” variables should be map to physical I/O in the controller before they can work.

To do that, click on “I/O connection” to get into the I/O connection window. Double click on the first slot column (Please make sure your I-87055W I/O board is plug in slot 1 of the XP-8xx7-CE6) & then check on the “Equipments” & double click on the “I_87055: 8 CH. DI & 8 CH. DO ”. Click “OK”.

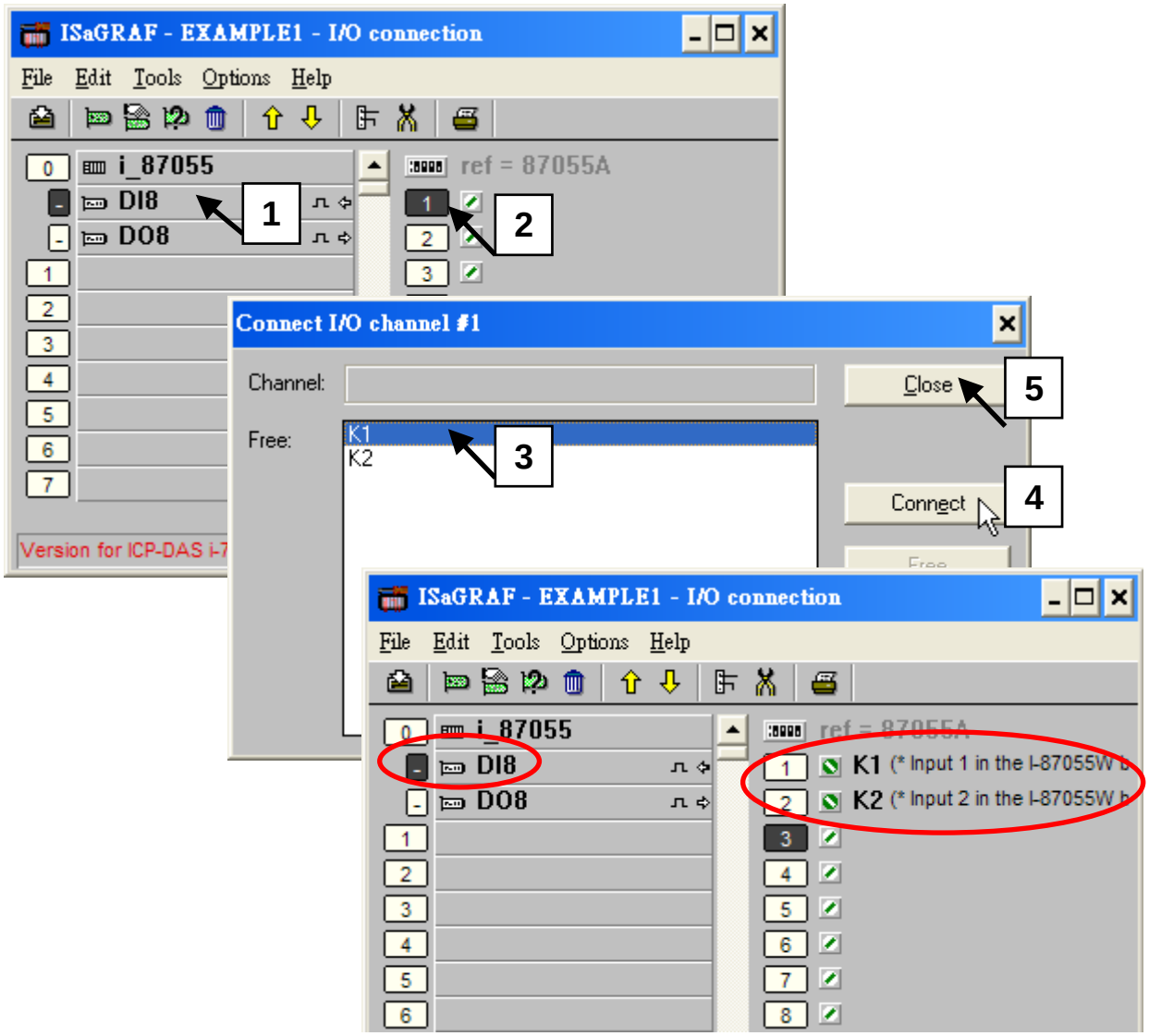


Then we have the screen below. (If you don't have the I-87055W, you may click the “Real / Virtual board” to make it become virtual board.)

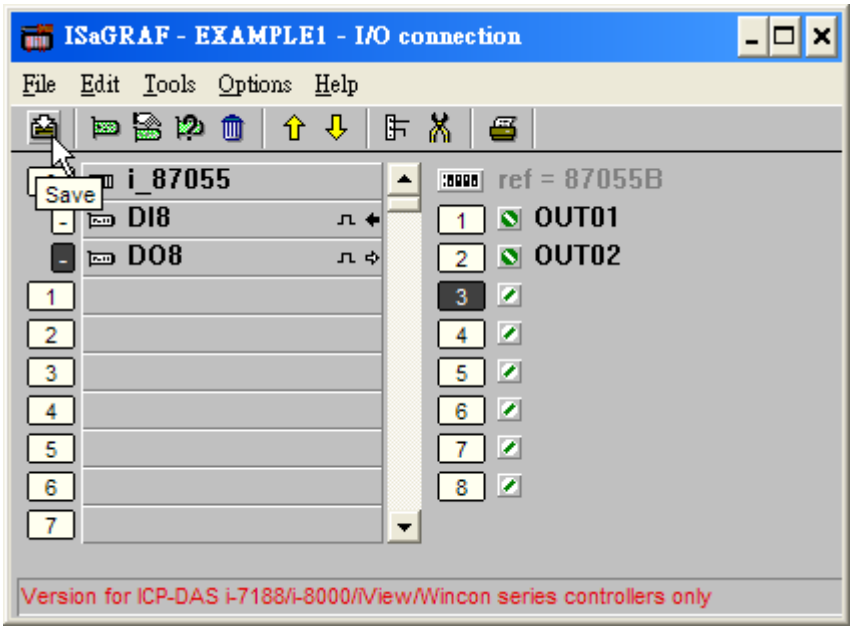




To map input variables “K1” & “K2” to the input channel No. 1 & 2 of the “I-87055”, double click on the channel 1 and then click on “Connect” .Then click on “Connect” again to connect channel 2.



By the same way, please connect “OUT01” , “OUTPUT02” to output channel 1 to 2. Then we have below window. Click on “Save” and then exit.



IMPORTANT NOTICE:

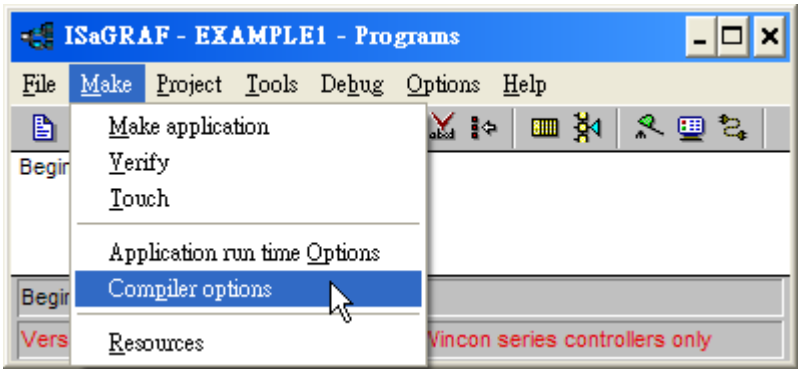
1. I/O Slots 1 through 7 are reserved for REAL I/O boards that will be used in the XP-8xx7-CE6. You can use slot No. 8 and above for additional functionality.

2. All of the variables with “Input” and “Output” attribute MUST be connected through the I/O connection as described above for any program to be successfully compiled. Only the Input and Output attributed variables will appear in the "I/O Connections" window. In this example we have only 2 boolean output variables - OUT01, OUT02 and 2 boolean input variables – K1 & K2.

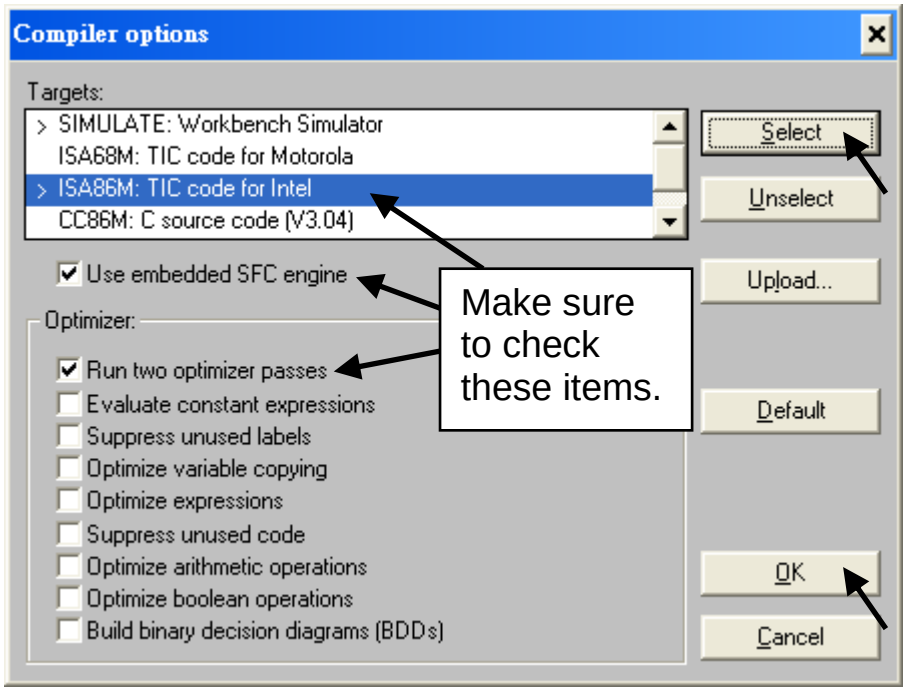
4.2 Compiling & Simulating The Example Project

For ANY AND EVERY ISaGRAF program to work properly with any of the ISaGRAF PACs (ISaGRAF XPAC, WinPAC, ViewPAC, µ PAC, iPAC...) controller systems, it is the responsibility of the programmer to properly select the correct "Compiler Options". You MUST select the "ISA86M: TIC Code For Intel" option as described below.

To begin the compilation process, first click on the [MAKE] > [Compiler Options] as shown below.



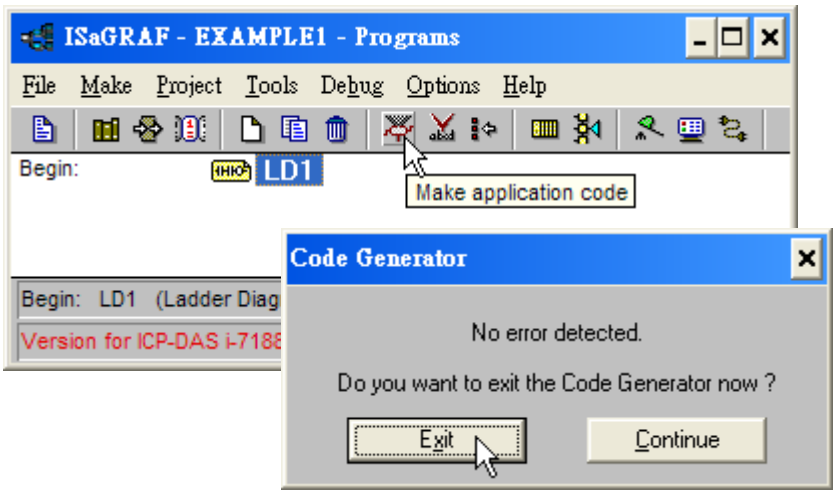
The "Compiler Options" window will now appear. Make sure to select the options as shown below then press the "OK" button to complete the compiler option selections.



Compiling error result in different ISaGRAF Version, please refer to appendix H of this manual.

TIME TO COMPILE THE PROJECT!

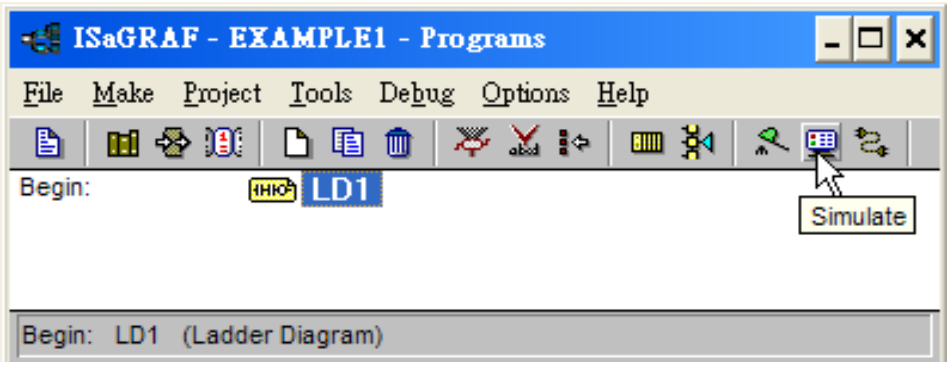
Now that you have selected the proper compiler options, click on the "Make Application Code" icon to compile the example project. If there is no compiler error detected during the compilation process, CONGRATULATIONS, you have successfully created our example program.



If errors are detected during the compilation process, just click on the "CONTINUE" button to review the error messages. Return to the Project Editor and correct the errors as outlined in the error message window.

TIME TO SIMULATE THE PROJECT!

If the compilation is OK, you may simulate the project on the PC to see how the program works without the controller. To do that, click on the “Simulate” icon.

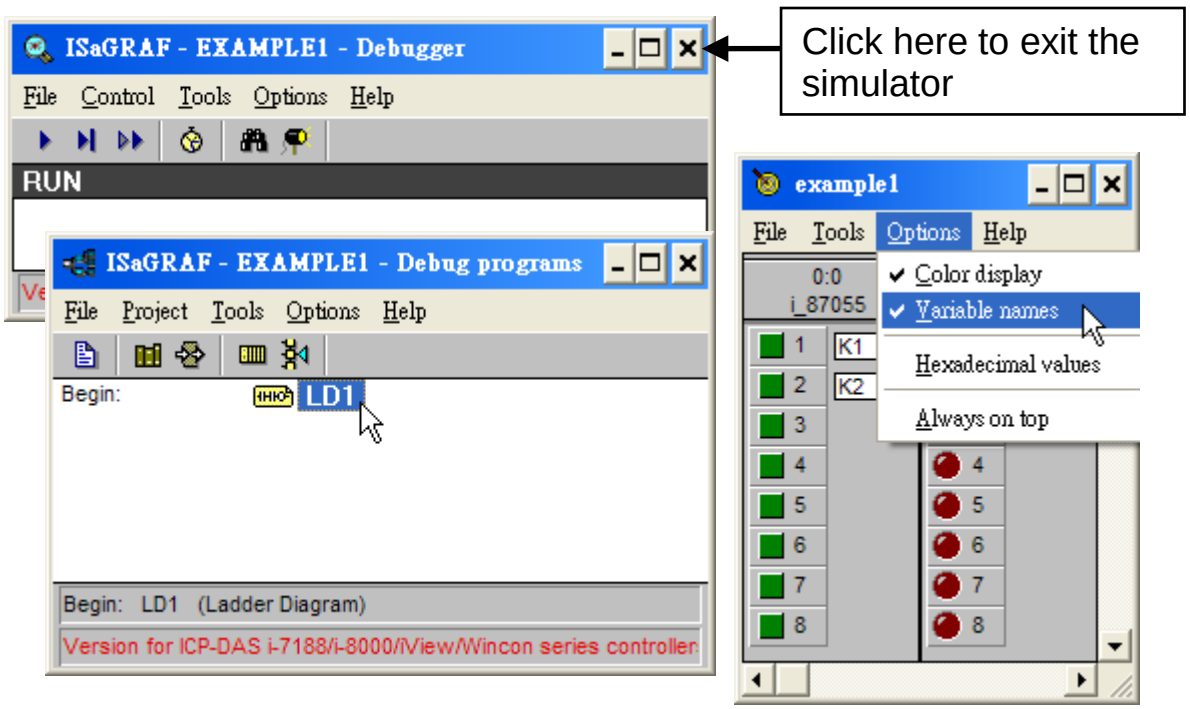


When you click on the "Simulate" icon three windows will appear.

"ISaGRAF Debugger"
"ISaGRAF Debug Programs"
"I/O Simulator"

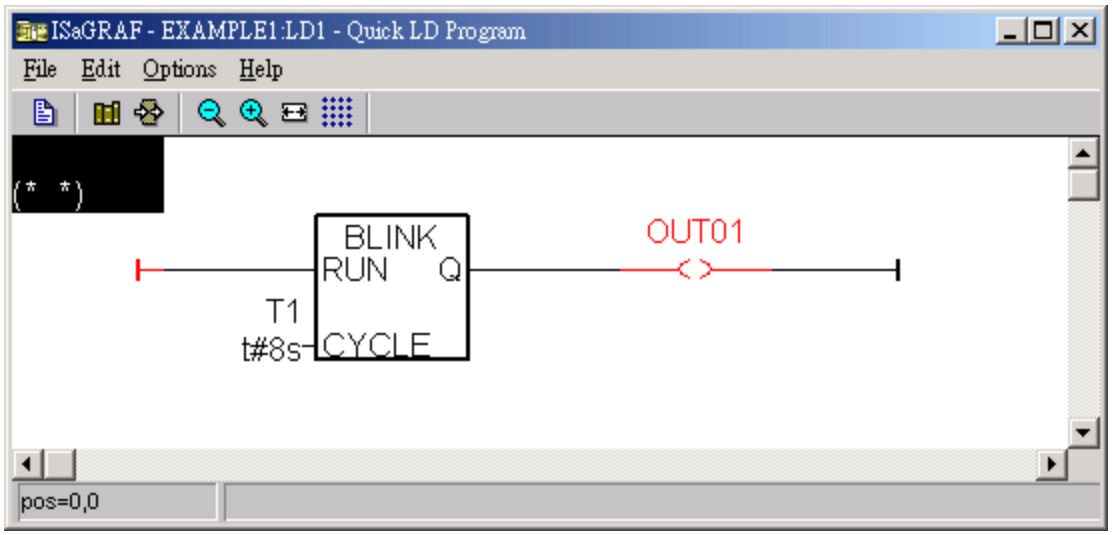
If the I/O variable names you have created DO NOT appear in the I/O simulator window, just click on the [Options] > [Variable names] and the variable names you have created will now appear next to each of the I/O’s in the simulator window.

In the "ISaGRAF Debug Program" window, double click on the "LD1" where the cursor below is positioned. This will open up the ISaGRAF Quick LD Program window and you can see the LD program you have created.



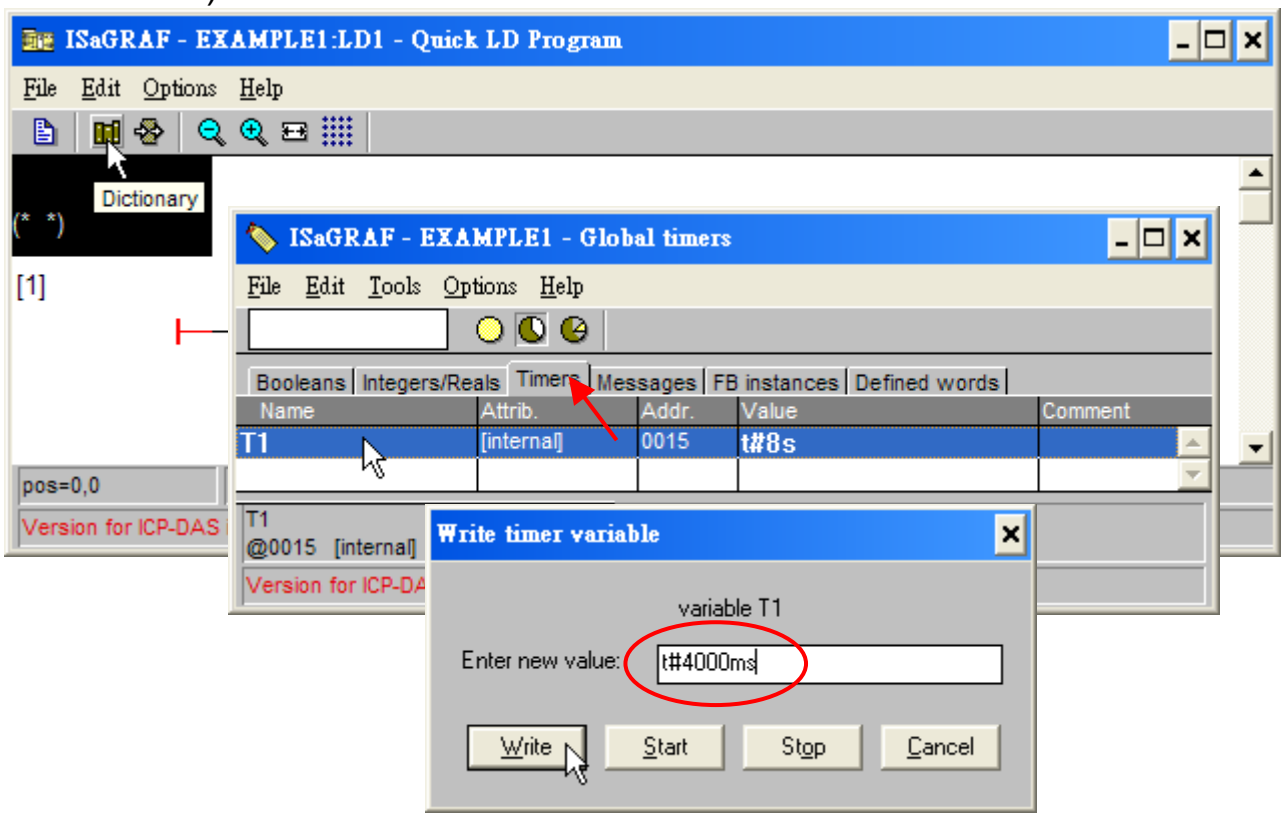
RUNNING THE SIMULATION PROGRAM

When you double click on "LD1" in the "ISaGRAF Debug Programs" window, the follow window should appear.

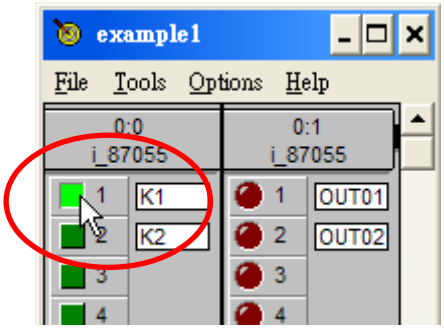


You can see outputs “OUT01” will blink in the period of 8 seconds.

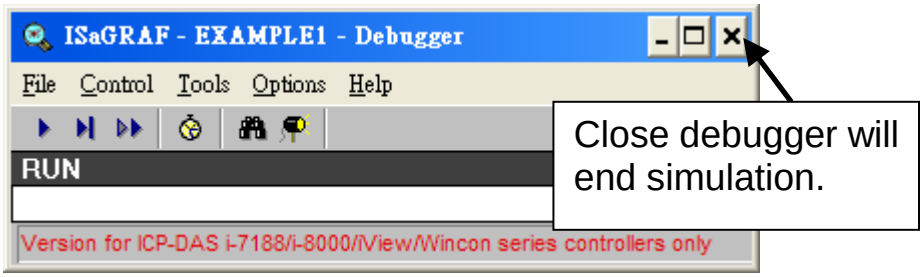
You can adjust the "T1" variable while the program is running. To accomplish this, click on the "Dictionary" icon which will open the "ISaGRAF Global Variables" window as shown in the first two pictures below. Click on “Timers” tab and then double click on “T1” to change the timer value to “T#4000ms” (this means 4000 ms). Then click on “Write”.



Now we are going to simulate the “K1” & “K2” input. Click on “K1” using the left button of the mouse.



To exit simulation, please close the “debugger” window.



4.3 Download & Debug The Example Project

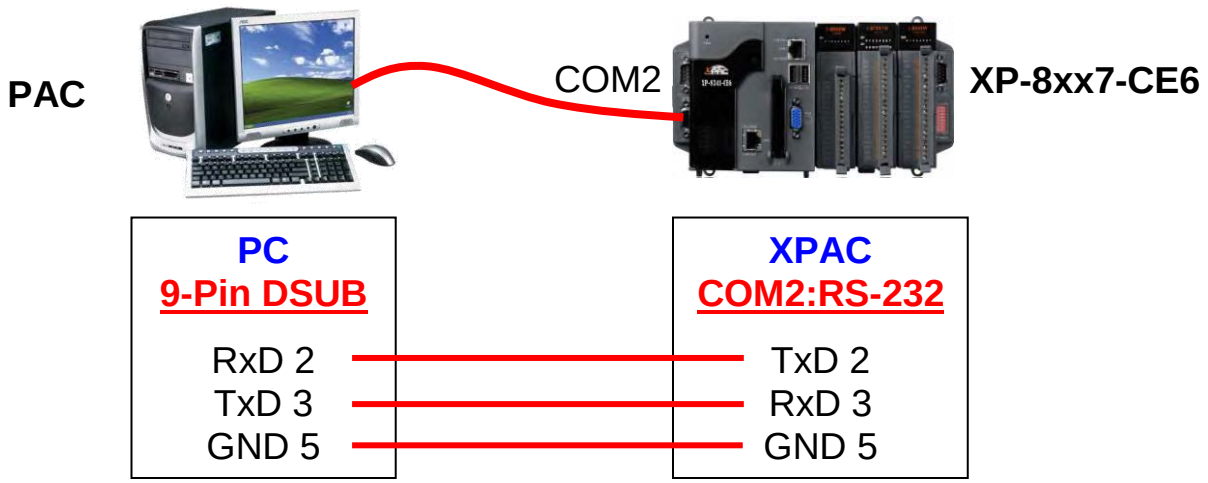
We have two ways to download the project to the XP-8xx7-CE6.

1. Using Ethernet cable
2. Using RS-232 cable

Here will show you the RS-232 way. (**Please refer to Section 3.2.3.1 if you would like to download the project via Ethernet**)

WIRING THE HARDWARE

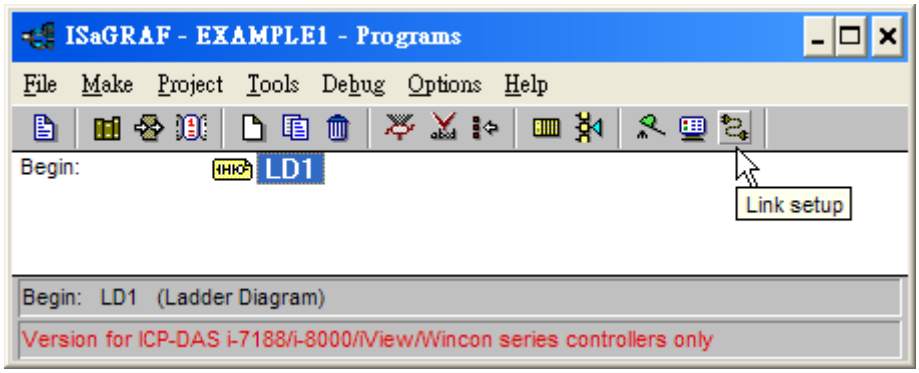
To begin this process, please install the hardware as below. The RS-232 cable wiring should be as below figure.
Please make sure the "Modbus RTU Slave Port" is set as COM2 (refer to Appendix A.2), or it can only be download via Ethernet.



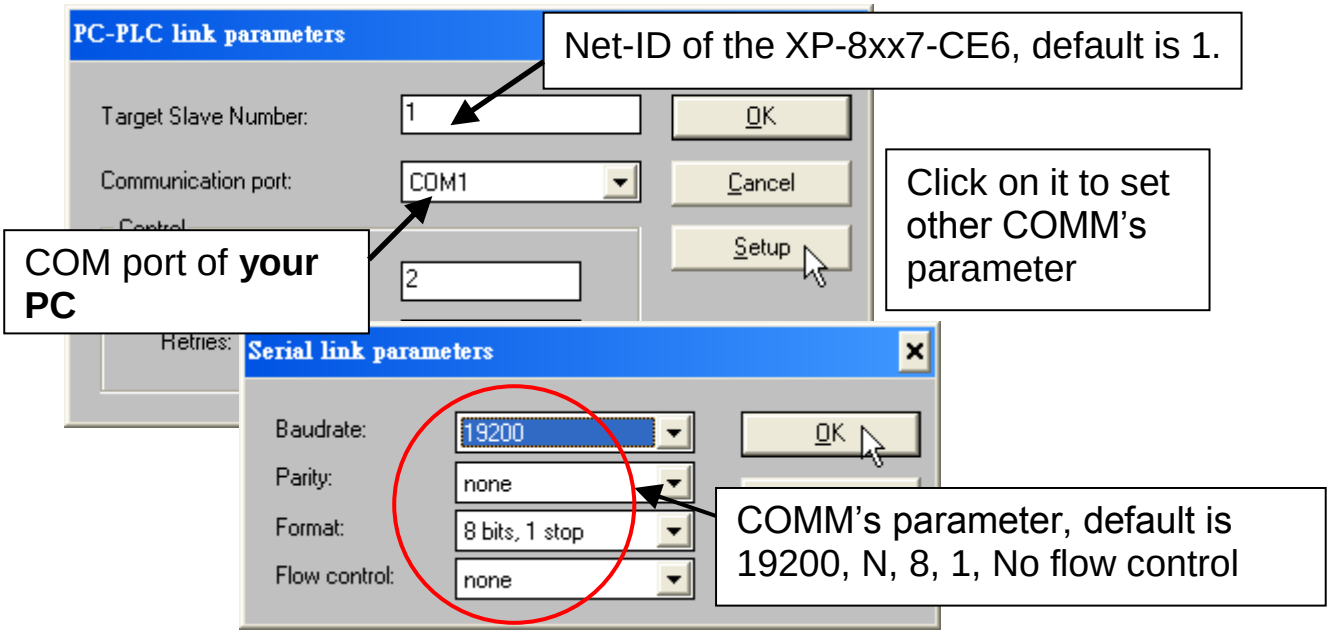
This section lists how to download the ISaGRAF program via RS-232 cable. **However user may also use Ethernet cable to download program to the XP-8xx7-CE6 (please refer to section 3.2.3.1)**

SETUP LINK PARAMETERS

Click on the "Link Setup" icon in the "ISaGRAF Programs" window.



When you click on the "Link Setup" icon, the following window will appear. Please set the proper value.



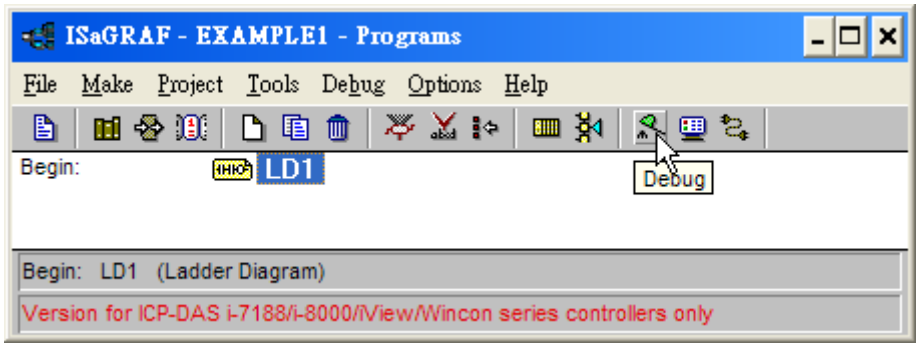
The RS-232 communication parameters for the target XP-8xx7-CE6 controller MUST be set to the same serial communication parameters for the development PC. For XP-8xx7-CE6 controllers (serial port communications), the default parameters for COM2 (RS-232) port are:

Baudrate:	19200
Parity:	none
Format:	8 bits, 1 stop
Flow control:	none

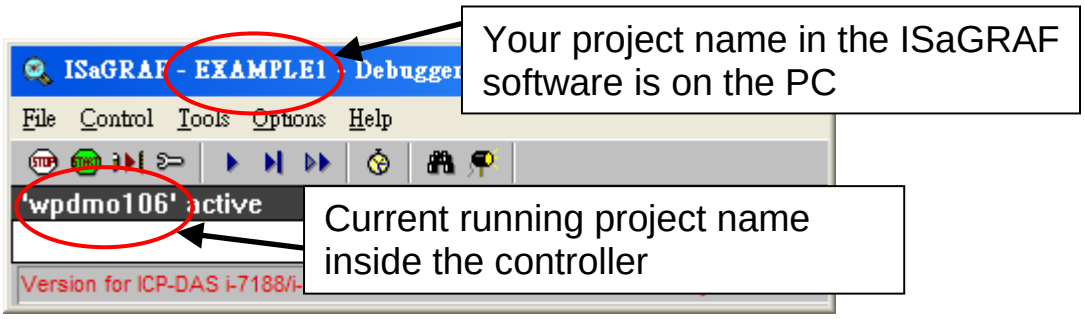
(Please refer to Appendix A.2 to setup COM2 as Modbus RTU slave port)

DOWNLOADING THE EXAMPLE PROJECT

Before you can download the project to the controller, you must first verify that your PC and the controller system are communicating with each other. To verify proper communication, click on the "Debug" icon in the "ISaGRAF Programs" window as shown below.



If the development PC and the XP-8xx7-CE6 controller system are communicating properly with each other, the following window displayed below will appear (or if a program is already loaded in the controller system, the name of the project will be displayed with the word "active" following it.

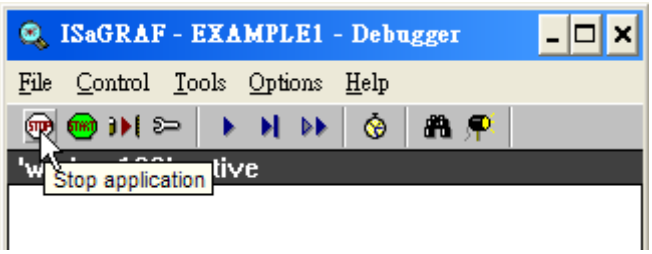


If the message in the "ISaGRAF Debugger" says "**Disconnected**", it means that the development PC and the controller system have not established communications with each other.

The most common causes for this problem is either the serial port cable not being properly configured, or the development PC's serial port communications DO NOT match that of the XP-8xx7-CE6 controller system.

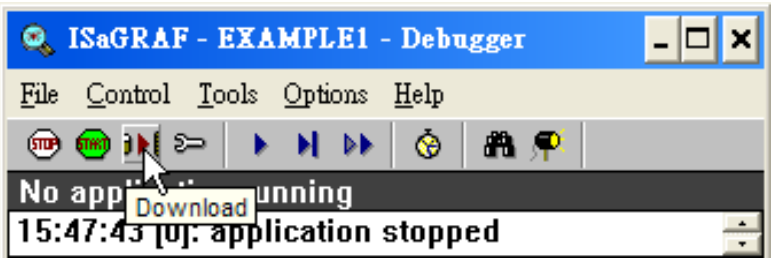
You may have to either change the serial port communication settings for the development PC (which may require changing a BIOS setting) or change the "Serial Link Parameters" in the ISaGRAF program.

If there is a project already loaded in the controller system you will need to stop that project before you can download the example project. Click on the "STOP" icon as illustrated above to halt any applications that may be running.

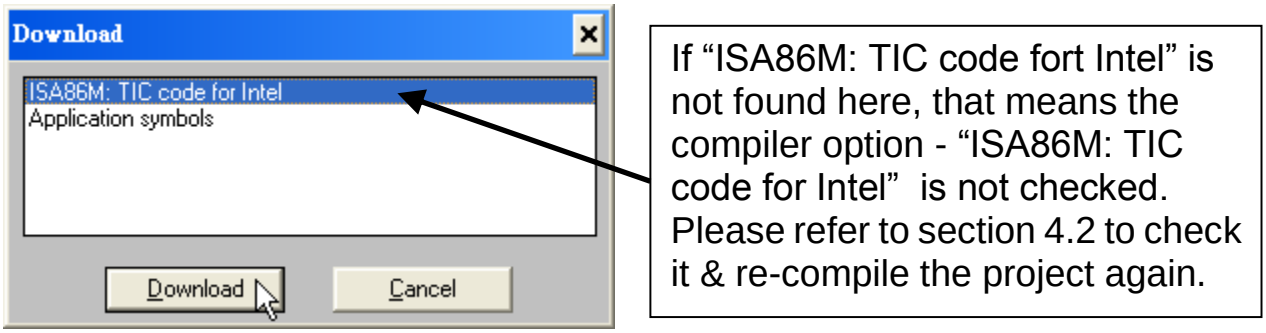


STARTING THE DOWNLOADING PROCESS

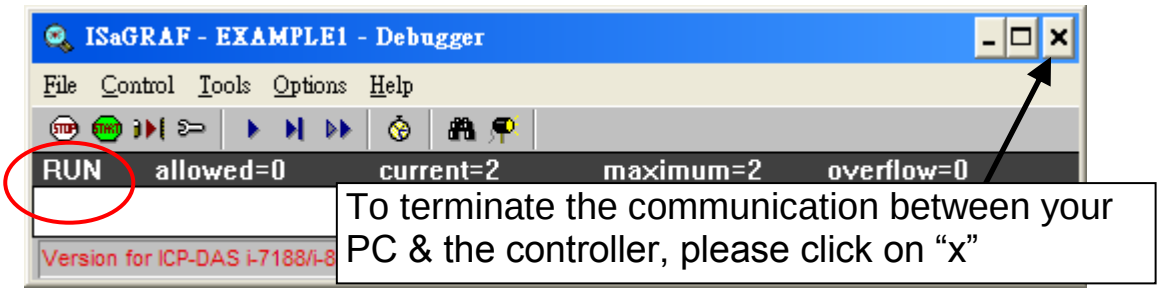
Click on the "Download" icon from the "ISaGRAF Debugger" window.



Then click on "ISA86M: TIC Code For Intel" from the "Download" window as shown below.



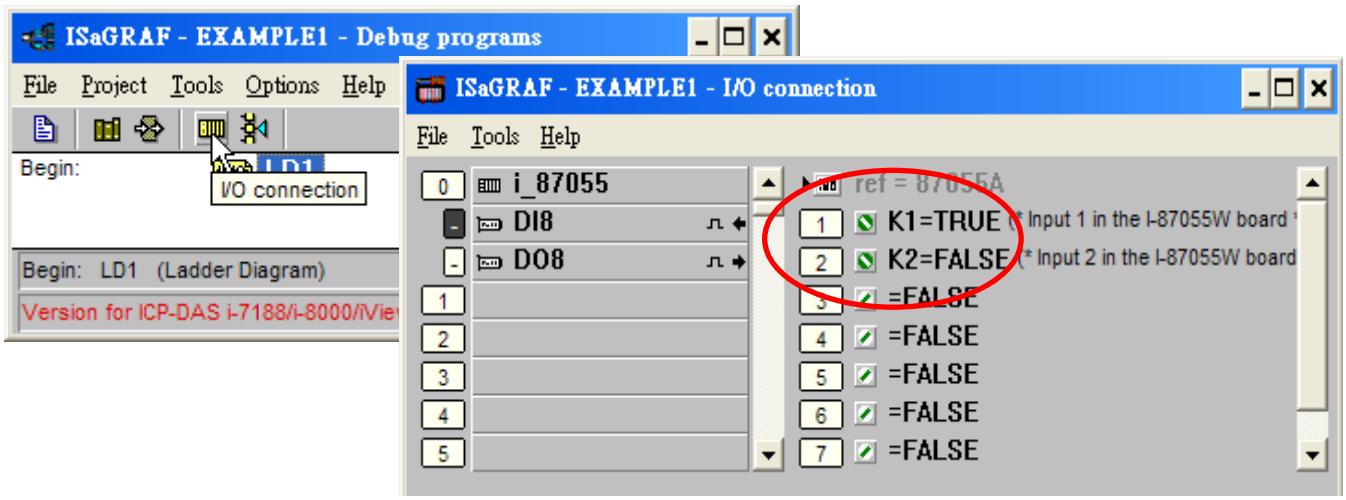
The example project will now start downloading to the XP-8xx7-CE6 controller system. A progress bar will appear in the "ISaGRAF Debugger" window showing the project downloading progress.



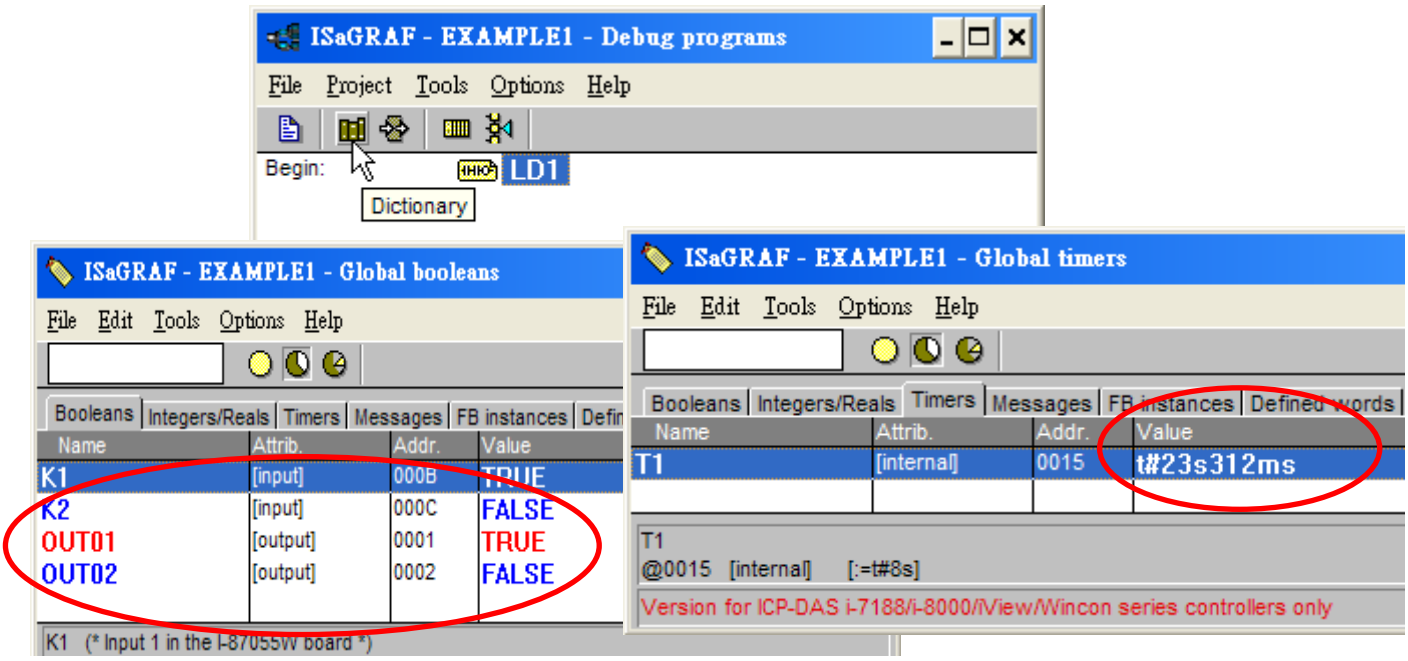
RUNNING THE EXAMPLE LD PROGRAM

You can observe the real time I/O status from several ISaGRAF windows while you are running the example project.

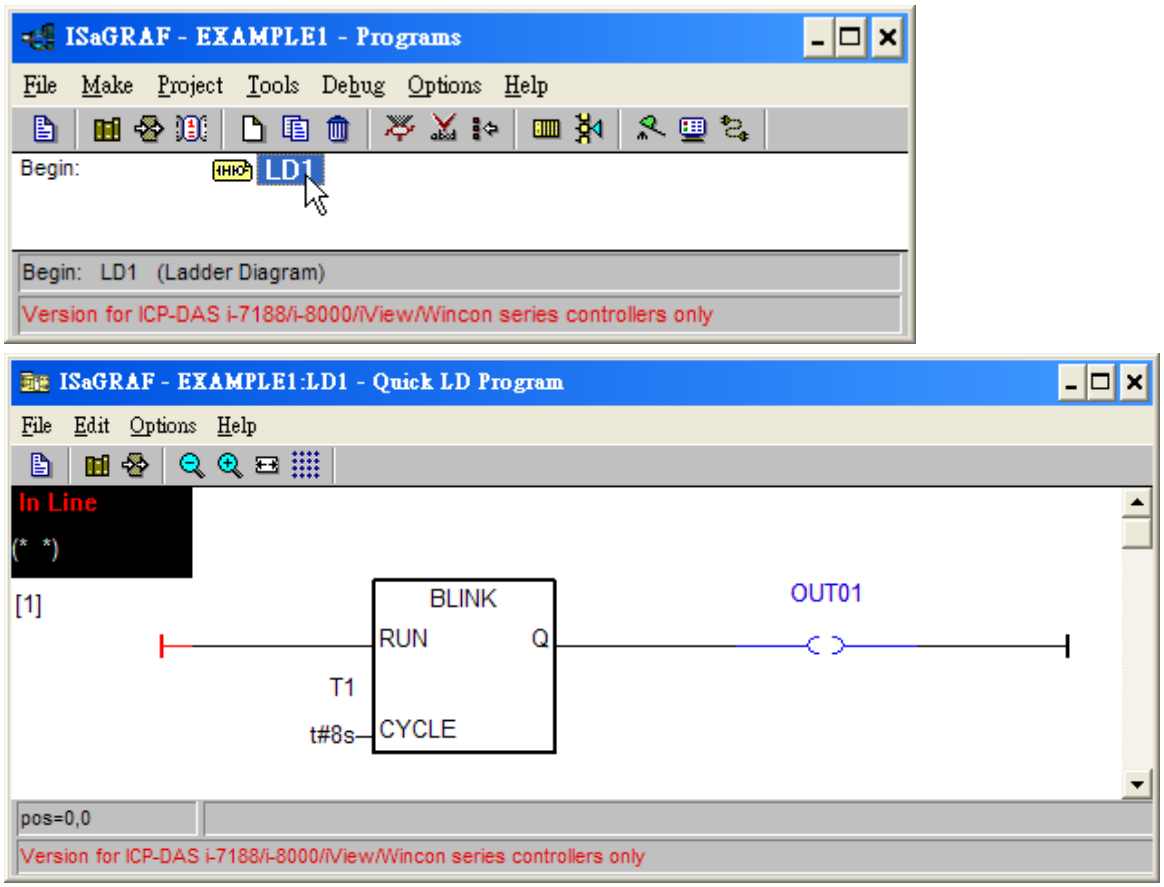
One of the windows is the "I/O Connections" window, which shows each of the inputs and outputs as assigned. Click on the "I/O Connections" icon in the ISaGRAF Debugger window to open the "I/O Connections" screen. You may switch ON/OFF the D/I on the front panel of the I-87055W I/O board to see what happens about “K1” & “K2”



Also, you may click on “Dictionary” icon to see the real time variable state.



Another VERY helpful window you can open is the "Quick LD Program" window. From this window you can observe the LD program being executed in real time.



4.4 Design The Web Page

After finishing the ISaGRAF project & download it to the XP-8xx7-CE6, we are going to design the Web Page for this ISaGRAF project.

If you haven't practiced "Setting Up A Web HMI Demo" listed in the Chapter 3, it's better to do it once to get familiar with it.

We will use "**Microsoft Office FrontPage 2003**" **(or advanced version)** to build web pages in this manual. User may choose your prefer web page editor to do the same thing.

You may refer to the finished web pages of this example in the XP-8xx7-CE6 CD-ROM at design time. However it is better to do it one time by yourself to get more understanding.

4.4.1 Step 1 – Copy The Sample Web HMI pages

This is a sample Web HMI pages in the XP-8xx7-CE6 CD-ROM:
\napdos\isagraf\xp-8xx7-ce6\xpce6-webhmi-demo\sample\

Please copy this "sample" folder to your drive and rename it, for example, "**example1**".

The basic Web HMI files include 2 folders and 3 DLL files and 4 htm files as below.

./img/ (default image files - *.jpg , *.bmp , *.gif)
./msg/ (default message files – wincon.js & xxerror.htm)

whmi_filter.dll (three DLL files)
login.dll
main.dll

index.htm (first default page)
login.htm (the Web HMI welcome page)
menu.htm (the page-menu page, normally on the left on the Internet Explorer)
main.htm (first page when successfully login)

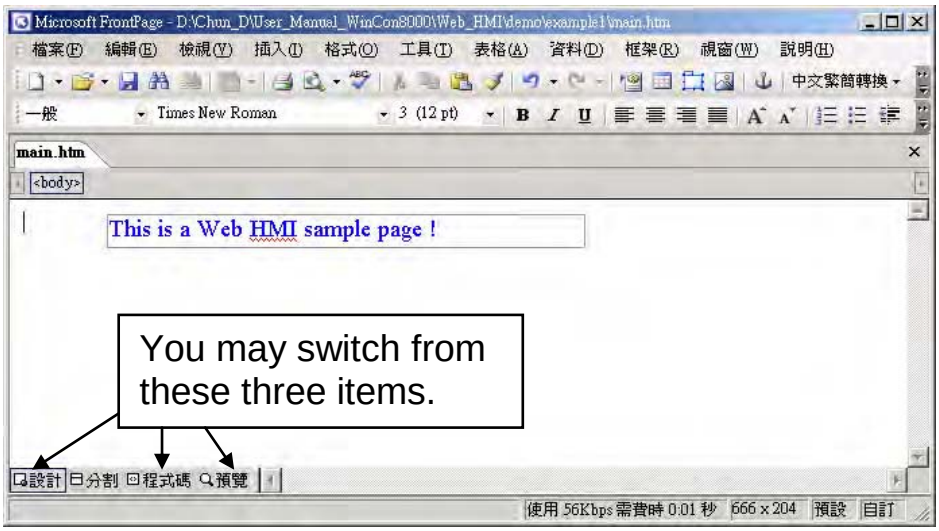
User may put his own image files into the folder named as "user_img". And put user-defined java script file or css file into the folder named as "user_msg". Other folder name is not acceptable by the Wincon Web HMI.

The “**index.htm**” file is the default entry page of the web server. **User should not modify it.** The “index.htm” re-directs to the “login.htm” file in 1 to 2 second when someone visits the XP-8xx7-CE6 via the Internet Explorer.

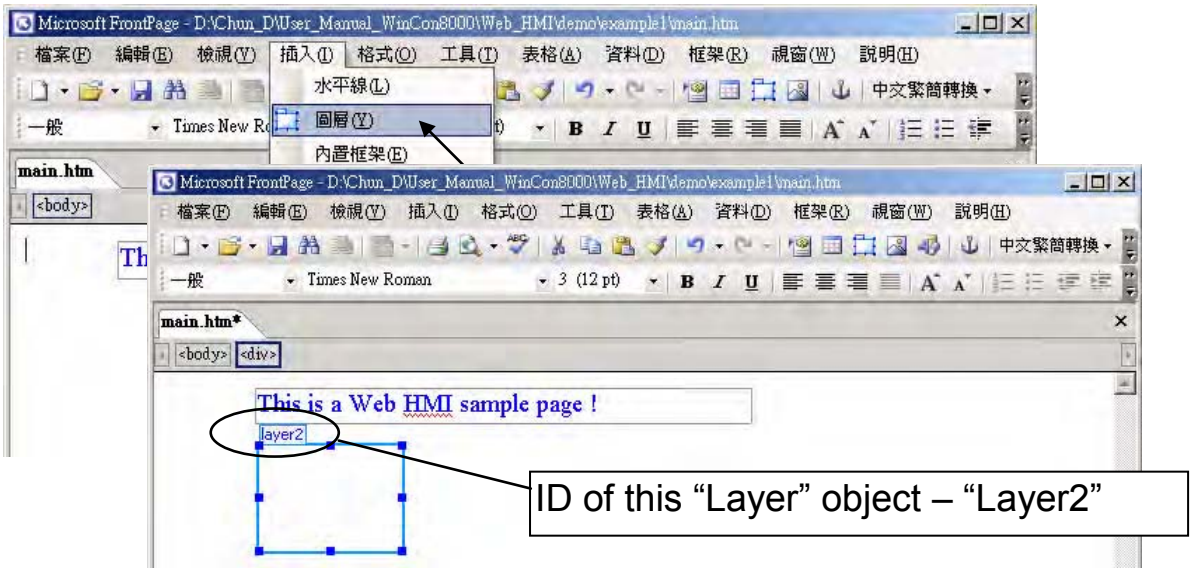
User may modify the “login.htm” , “menu.htm” & “main.htm” to fit his own need. We will only modify the “main.htm” in this example.

4.4.2 Step 2 – Building The Main.htm

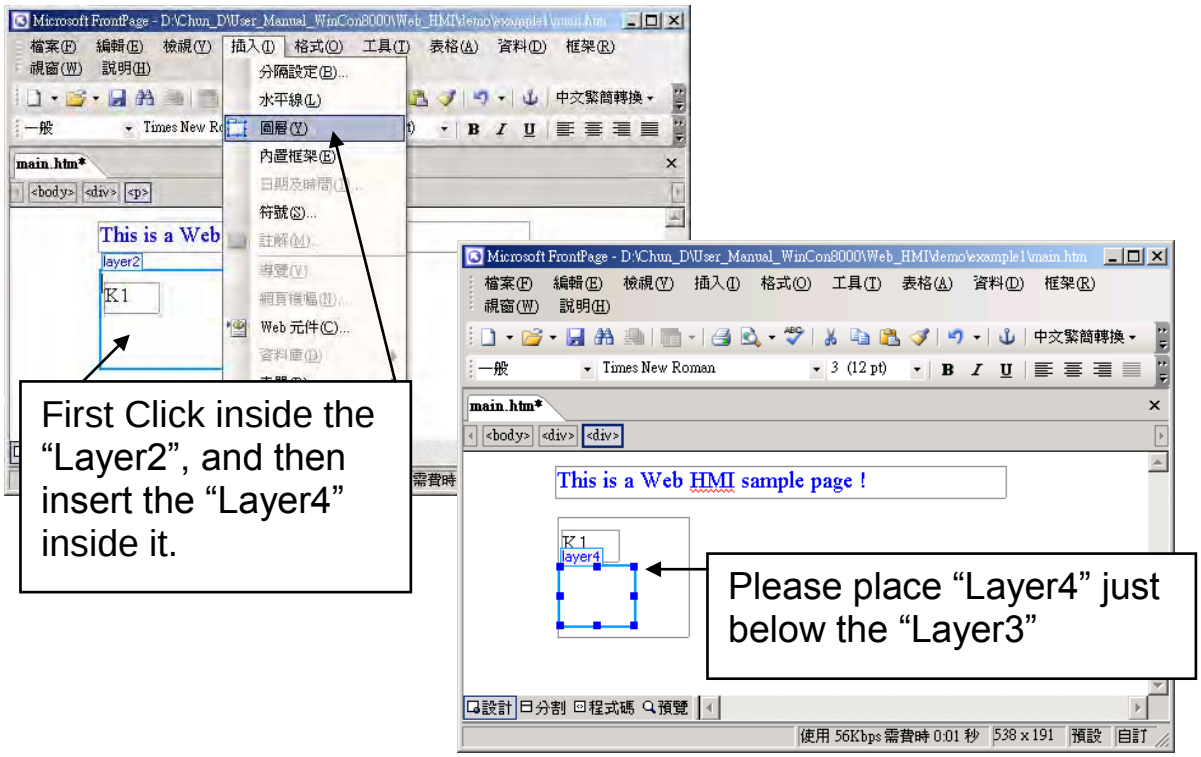
Please run the Microsoft Office FrontPage 2003 (or advanced version) and open the “main.htm”.



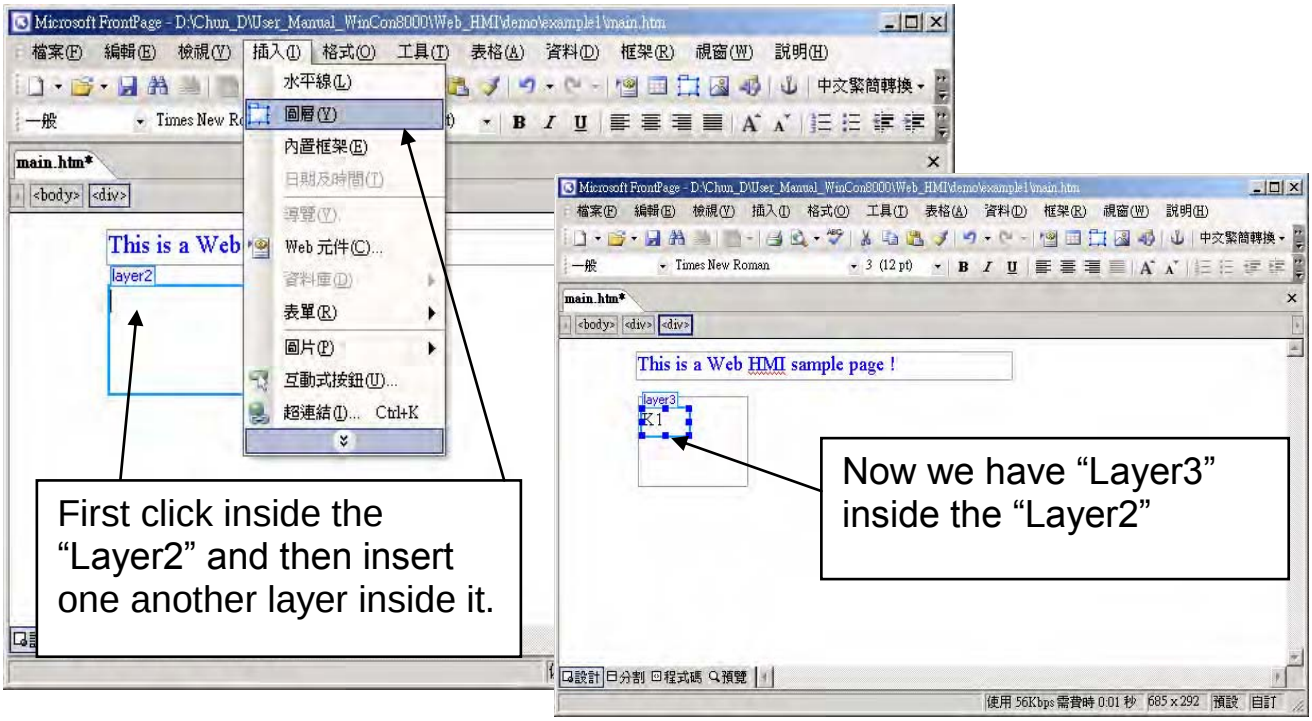
Please switch the window to design the page.
Please insert a layout object – “Layer” as below.



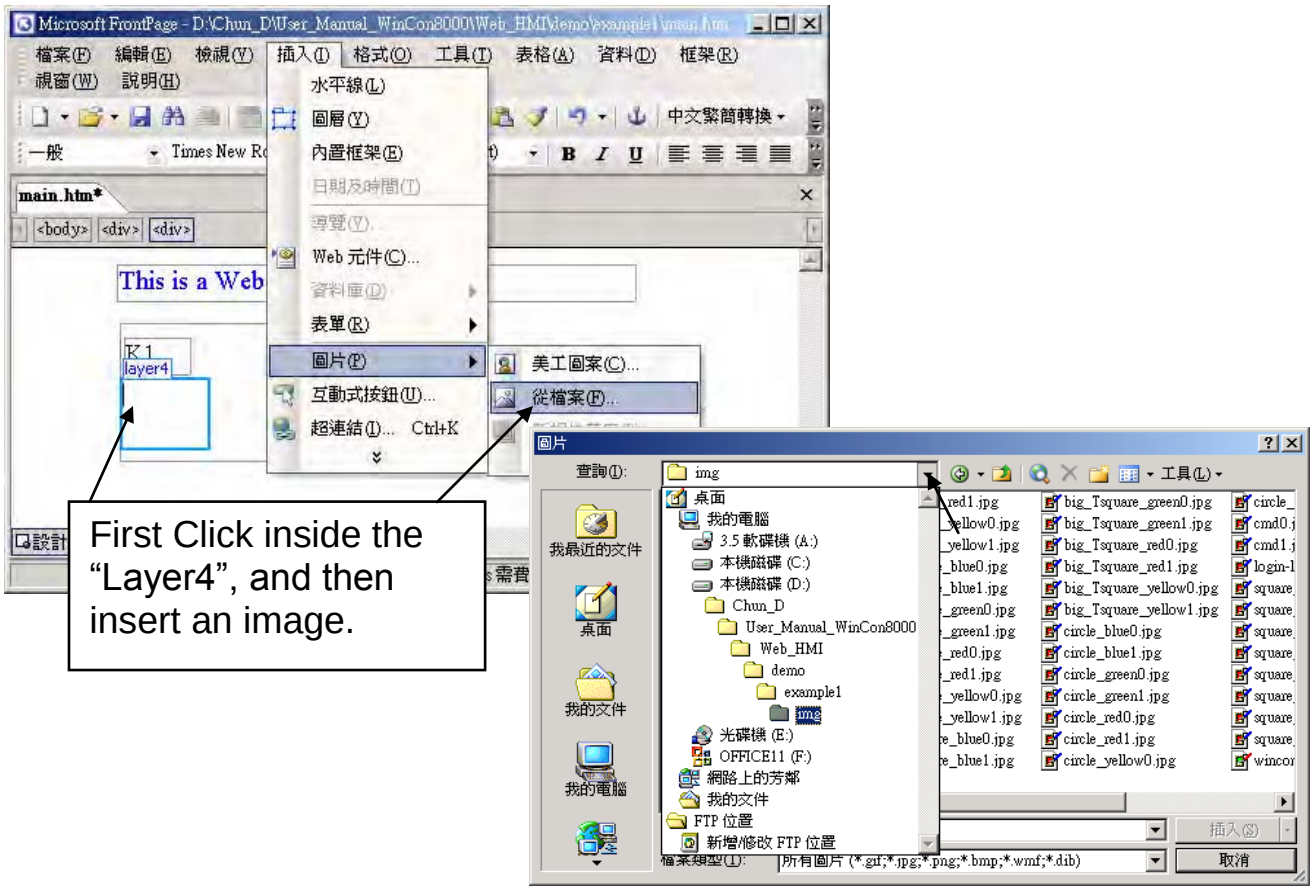
Click inside this “Layer” and then insert one another layer inside it as below. Please enter “K1” into the new created “Layer”.



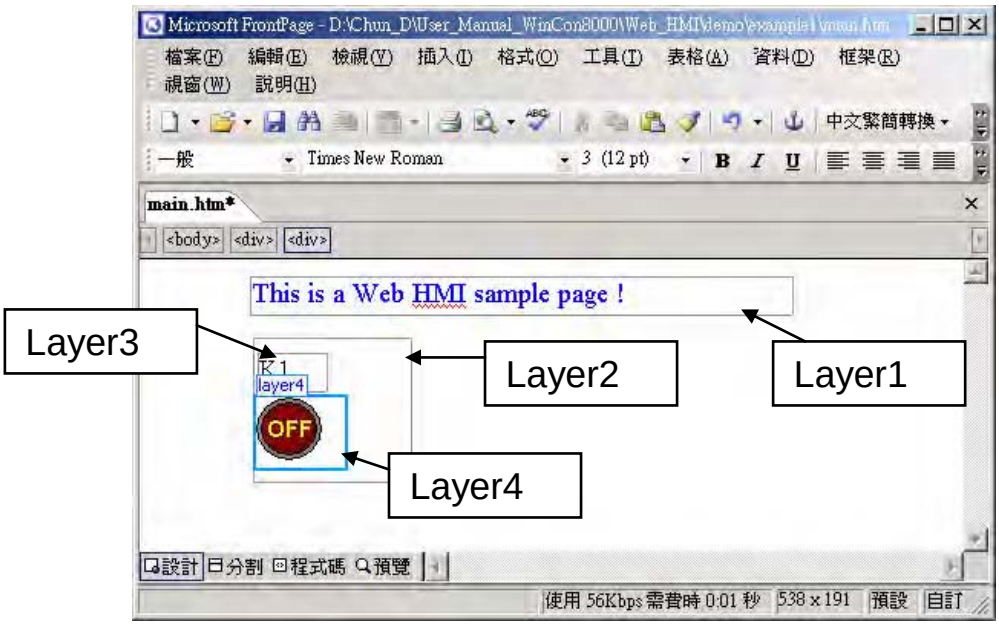
Follow the same former steps to insert one another “Layer” to be in just below the “Layer3” as below.



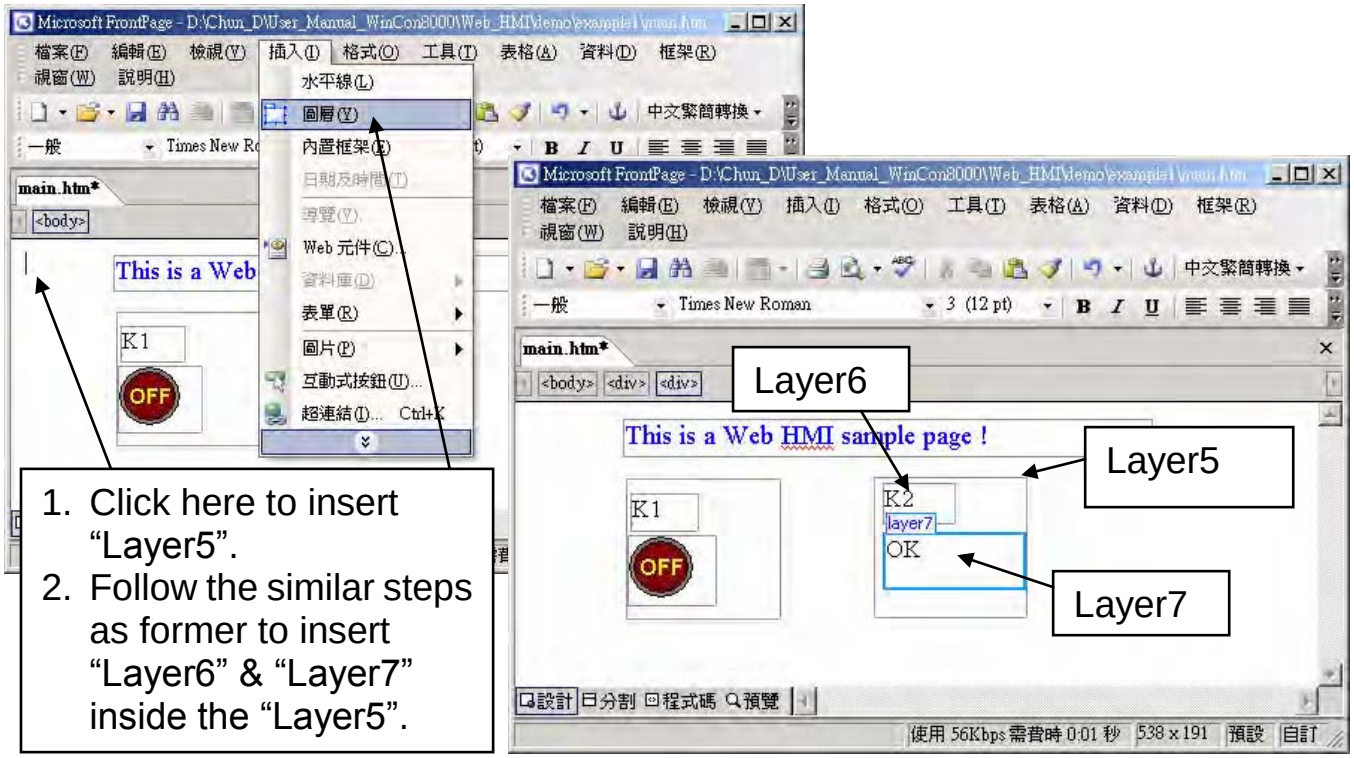
Inside the “Layer4”, we are going to insert one image file to it as below. The image file name is “./img/big_Tcircle_red0.jpg”. Please browse to the correct folder in your hard driver. Here we use “example1/img/” in this example.



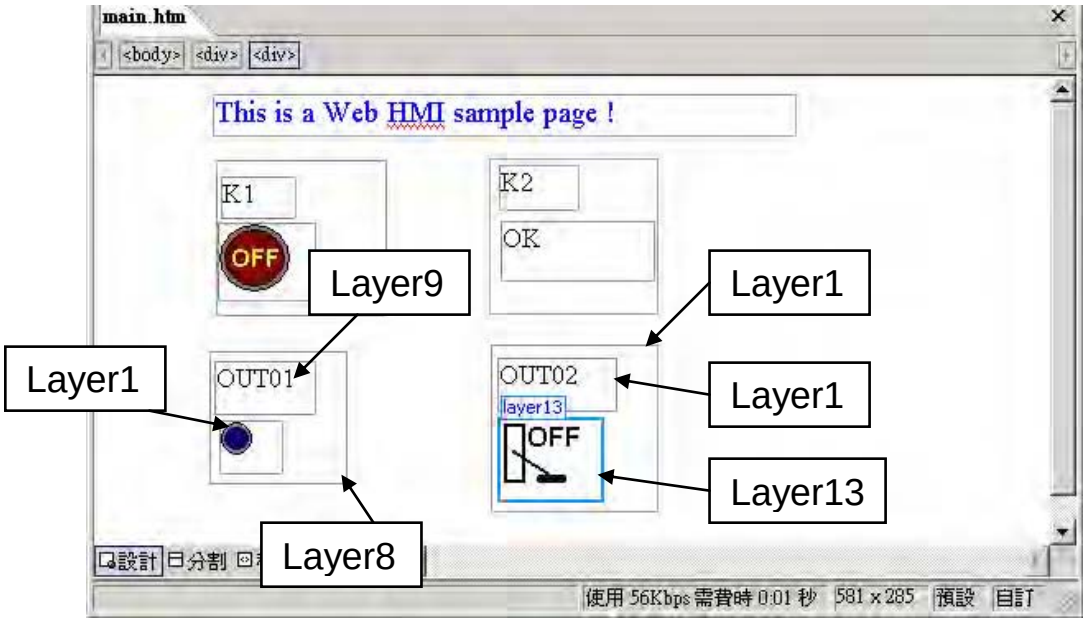
You will see a window as below.



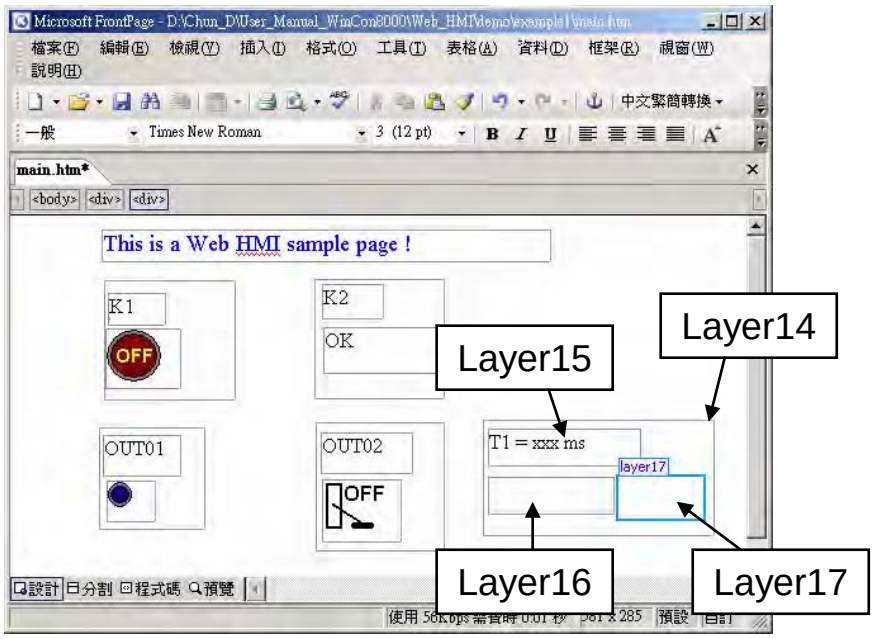
Please follow the similar steps to insert one another “Layer5” and one “Layer6” with a “K2” symbol inside it, and also a “Layer7” with a “OK” symbol inside it as below. We will use “K1” to display the state of the first input of the I-87055W board, and “K2” for its second input.



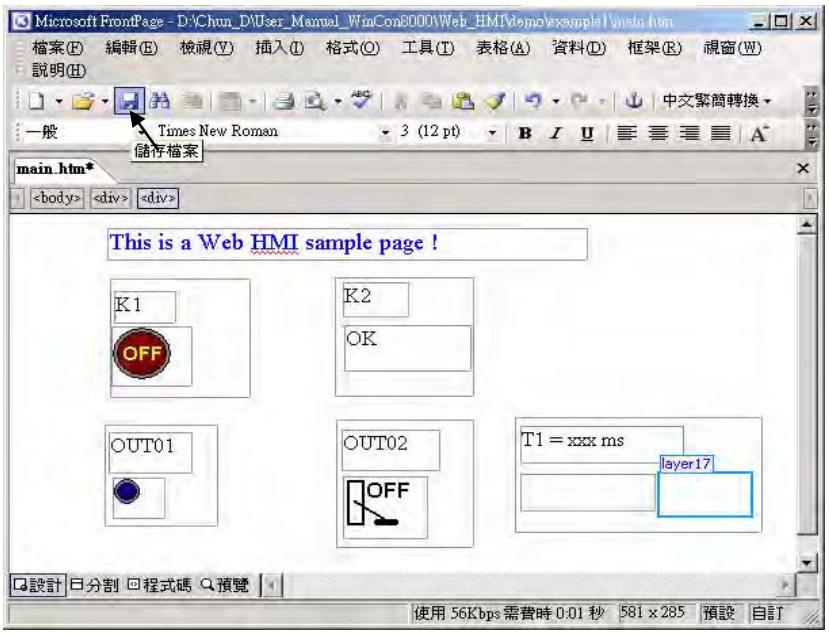
Please follow the similar steps to insert “OUT01” & “OUT02” as below. The OUT01 uses “./img/circle_blue0.jpg” as its image source, while OUT02 using “./img/cmd0.jpg”. We will use OUT01 to display the state of the first output of the I-87055W board, while “OUT02” is for controlling and displaying the second output of the I-87055W.



Now please insert one another “Layer14”. Inside the “Layer14” please insert one “Layer15” with a “T1 = xxx ms” symbol. And two empty Layers – “Layer16” & “Layer17” just below the “Layer15”. We will use T1 to display the Timer value “T1” in the ISaGRAF project.

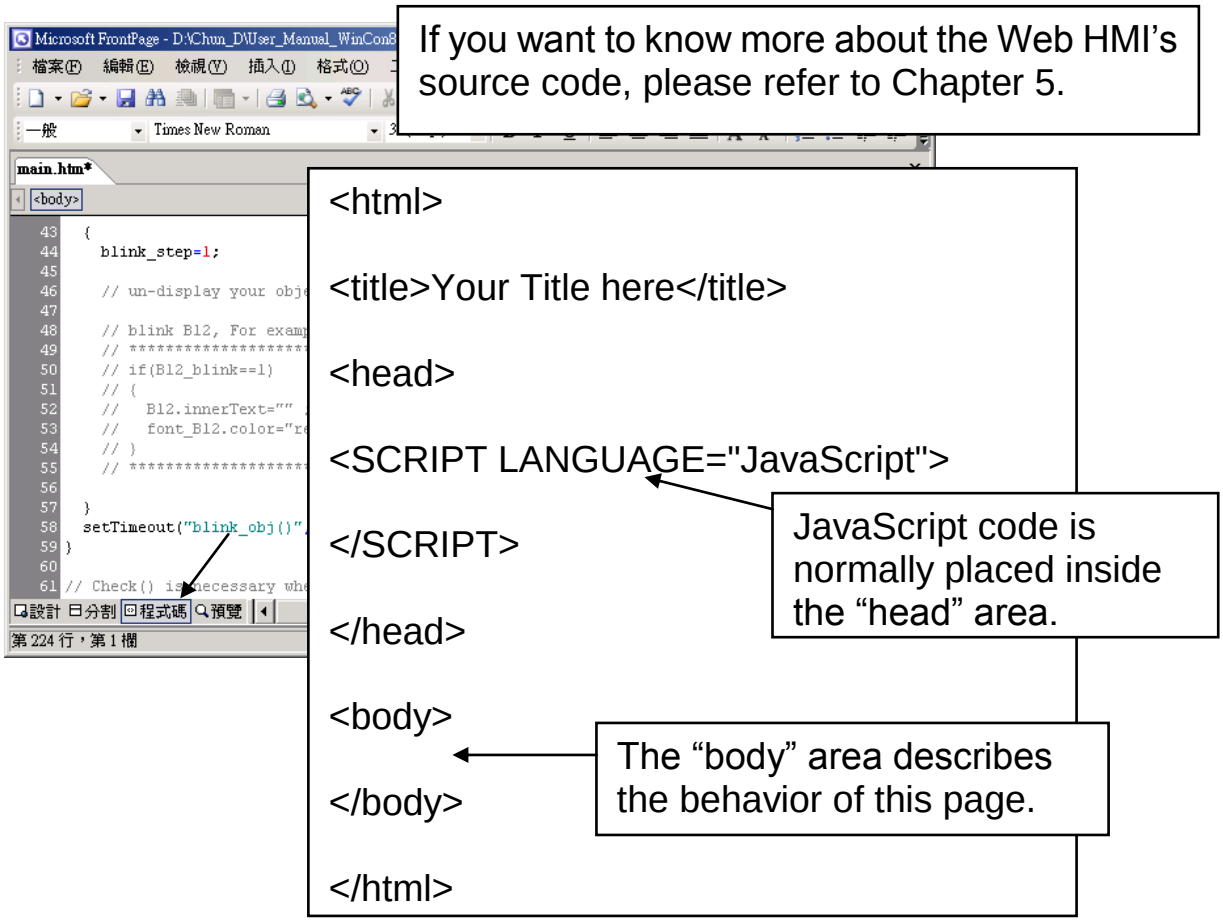


Click on “Save” to save this page.



4.4.3 Step 3 – Adding Control Code To The Main.htm

Please switch the window to the source code. A valid HTML document will contain the basic objects as below.



Please go to the <body> area and then modify the code as below.

Caption Area: Layer1
A Layer is starting with "<div " & ending with " " tag

```
<!-- Caption -->
<font color="blue" size="4">
<div style="position: absolute; width: 353px; height: 24px; z-index: 1; left: 73px;
top: 12px" id="layer1">
This is a Web HMI sample page !</div>
</font>
```

K1 Area: Layer2 to Layer4

```
<div style="position: absolute; width: 102px; height: 93px; z-index: 2; left: 75px;
top: 52px" id="layer2">
<div style="position: absolute; width: 44px; height: 24px; z-index: 1; left: 3px;
top: 10px" id="layer3">
K1</div>
<div style="position: absolute; width: 58px; height: 46px; z-index: 2; left: 1px;
top: 38px" id="layer4">
<img   name="B11"  border="0" src="img/big_Tcircle_red0.jpg" width="43"
height="41"></div>
<p> </div>
```

Please insert name="B11" just after the "<img "

K2 Area: Layer5 to Layer7

```
<div style="position: absolute; width: 101px; height: 93px; z-index: 3; left: 241px;
top: 51px" id="layer5">
<div style="position: absolute; width: 47px; height: 26px; z-index: 1; left: 6px;
top: 4px" id="layer6">
K2</div>
<div style="position: absolute; width: 92px; height: 35px; z-index: 2; left: 7px;
top: 38px" id="layer7">

<font  id="font_B12" color="blue" size="3">
<b  id="B12"> OK </b>
</font> </div>

<p> </div>
```

Please modify "OK " to become

```
<font  id="font_B12" color="blue" size="3">
<b  id="B12"> OK </b>
</font> </div>
```

OUT01 Area: Layer8 to Layer10

```
<div style="position: absolute; width:82px; height:79px;z-index:4; left:71px;
top:168px" id="layer8">
<div style="position: absolute; width: 60px; height: 31px; z-index: 1; left: 3px;
top: 6px" id="layer9">
OUT01</div>
<div style="position: absolute; width: 37px; height: 31px; z-index: 2; left: 6px;
top: 42px" id="layer10">
<img  name="B1"  border="0" src="img/circle_blue0.jpg" width="19"
height="20"></div>
<p> </div>
```

Please insert name="B1" just after the "<img "

OUT02 Area: Layer11 to Layer13

```
<div style="position: absolute; width:100px; height:100px; z-index: 5;
left:242px; top:164px" id="layer11">
<div style="position: absolute; width: 71px; height: 31px; z-index: 1; left: 4px;
top: 8px" id="layer12">
OUT02</div>


<div style="position: absolute; width: 61px; height: 48px; z-index: 2; left: 5px;
top: 45px" id="layer13">
<img    style=”cursor:hand” name=”B2”  onclick="ON_OFF(form_B2,
form_B2.B2, boolean_val[2])"     border="0" src="img/cmd0.jpg" width="50"
height="40"></div>

  <form name="form_B2" method="post" action="./main.dll">
    <input name="BEGIN" type="hidden">
    <input name="B2"    type="hidden" value="0">
    <input name="END"   type="hidden">
  </form>

<p> </div>
```

Please insert
Style=”cursor:hand” name=”B2” onclick="ON_OFF(form_B2, form_B2.B2, boolean_val[2])"
just after the “<img “ tag

Please insert

```
  <form name="form_B2" method="post"
action="./main.dll">
    <input name="BEGIN" type="hidden">
    <input name="B2"    type="hidden" value="0">
    <input name="END"   type="hidden">
  </form>
```

T1 Area: Layer14 to Layer17

```
<div style="position: absolute; width: 181px; height: 90px; z-index: 6; left:
374px; top: 162px" id="layer14">
<div style="position: absolute; width: 119px; height: 28px; z-index: 1; left: 4px;
top: 7px" id="layer15">

T1 = <b id="T1">xxx ms</b></div>
```

Please modify "T1 = xxx ms " to become
T1 = xxx ms

```
<div style="position: absolute; width: 98px; height: 28px; z-index: 2; left: 4px;
top: 45px" id="layer16">

<form name="form_L21" method="post" action="./main.dll">
  <input name="BEGIN" type="hidden">
  <input name="L21" type="text" size="8" value="xxx">
  <input name="END" type="hidden">
</form>

 </div>
```

Please insert below code inside "Layer16"

```
<form name="form_L21" method="post" action="./main.dll">
   <input name="BEGIN" type="hidden">
   <input name="L21" type="text" size="8" value="xxx">
   <input name="END" type="hidden">
  </form>
```

```
<div style="position: absolute; width: 67px; height: 33px; z-index: 3; left: 106px;
top: 44px" id="layer17">
  <input type="button" value="Enter" onclick="Check_L21( )">

 </div>
<p> </div>
```

Inside the "Layser17", please insert
<input type="button" value="Enter" onclick="Check_L21( )">

We have finished the code in the <body> </body> area.

Now please go to the “head” area.
In the “head” area, please modify the sample code to be as below.

```
// variable to record object's blink state, 0:not blink, 1: blink, For example:
// ********************************
var B12_blink=0;  // init as 0:not blink
// ********************************
// function to blink object
var blink_step=0;
function blink_obj()
{
  if(blink_step==1)
  {
    blink_step=0;

    // display your object here
    // blink B12, For example:
    // ********************************
    if(B12_blink==1)
    {
      B12.innerText="Error !" ;
      font_B12.color="red";
    }
    // ********************************
  }
  else
  {
    blink_step=1;

    // un-display your object here
    // blink B12, For example:
    // ********************************
    if(B12_blink==1)
    {
      B12.innerText="" ;
      font_B12.color="red";
    }
    // ********************************
  }
  setTimeout("blink_obj()", blink_period);
}
```

The “Error !” symbol will blink when the K2 = True in this example. Please un-mask the code inside these 3 areas.

We need a function “Check_L21 to check the entered T1 value and post it to the Wincon. Please un-mask the sample code to be as below.

// form sample, to check value of L21 & then post val to controller
// For example:
// **

```
function Check_L21()
{
  var val=form_L21.L21.value;
  if(val>12000 || val<4000)
  {
    alert("T1's value should be in the range of 4000 to 12000");
    return;
  }
  Check(form_L21);  // post value to the controller
}
```

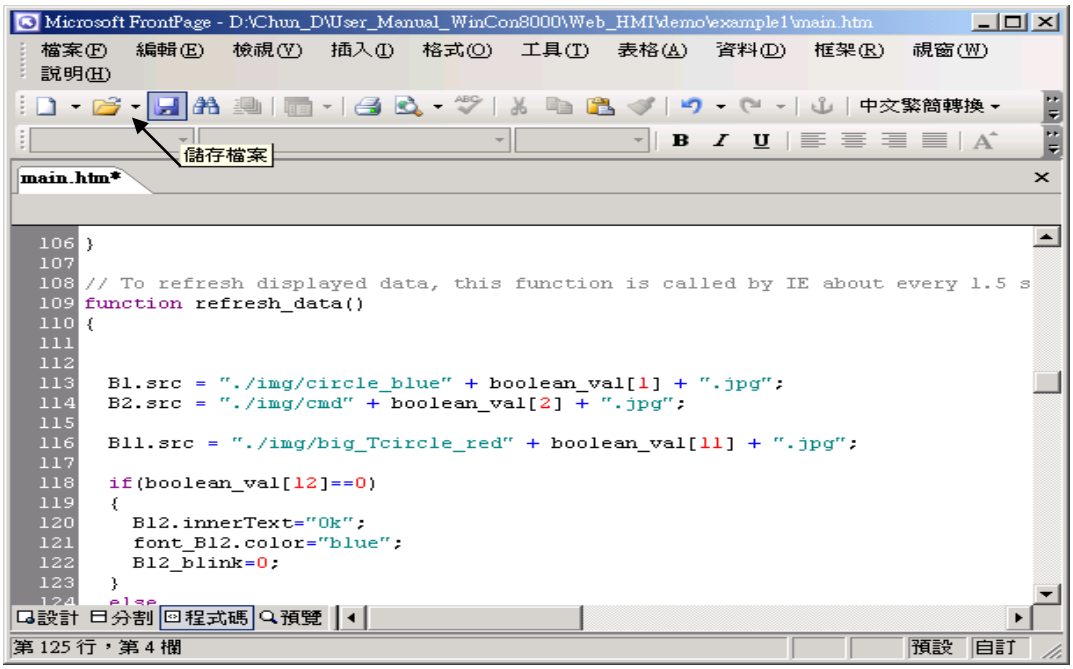
// **

And also inside the “refresh_data() “ function, please insert below code.

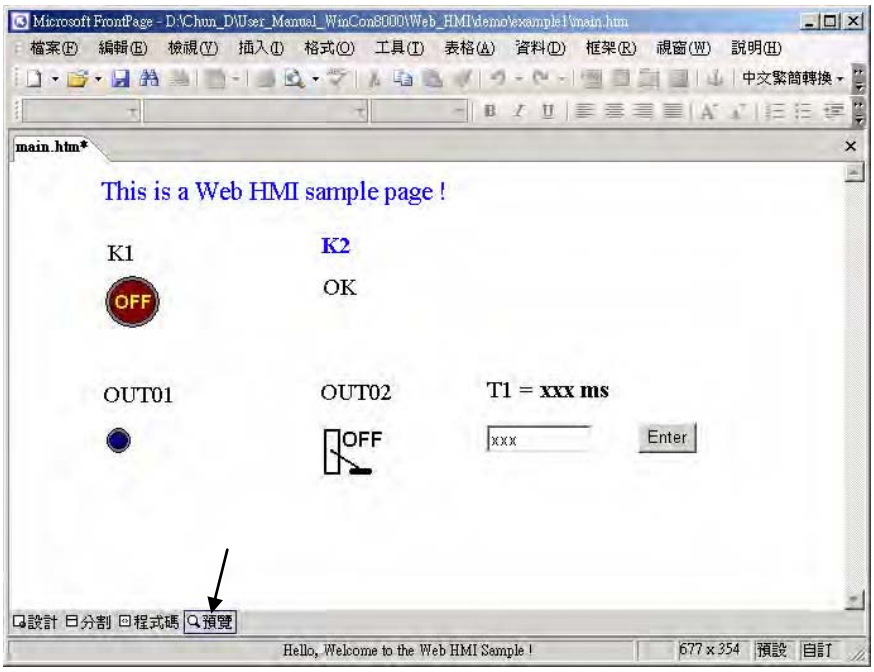
// To refresh displayed data, this function is called by IE about every 1.5 sec later

```
function refresh_data()
{
  B1.src = "./img/circle_blue" + boolean_val[1] + ".jpg";
  B2.src = "./img/cmd" + boolean_val[2] + ".jpg";

  B11.src = "./img/big_Tcircle_red" + boolean_val[11] + ".jpg";

  if(boolean_val[12]==0)
  {
    B12.innerText="Ok";
    font_B12.color="blue";
    B12_blink=0;
  }
  else
  {
    B12_blink=1;
  }
  T1.innerText=timer_val[21] + " ms";
}
```

Now we have finished all the code. Please save it.



You may click on “Preview” to simulate its run time behavior.



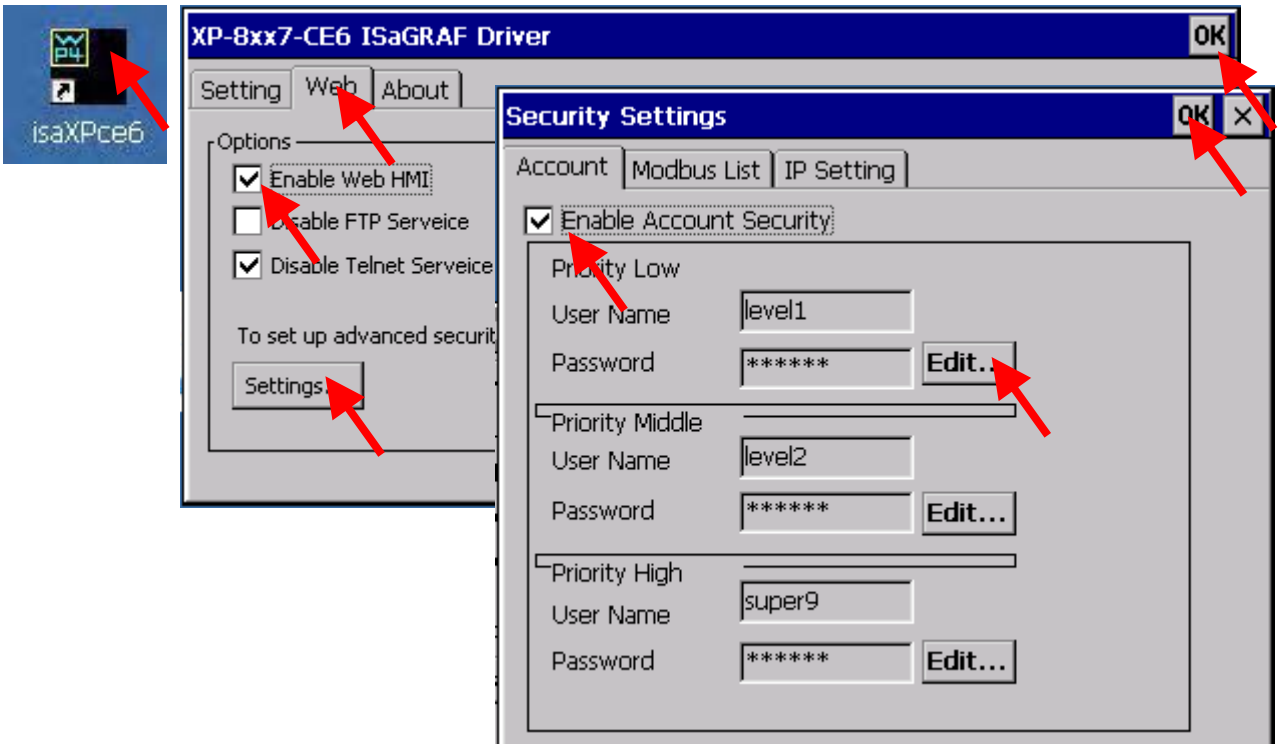
4.4.4 Step 4 – Download Web HMI Pages To The Controller

The steps are similar as listed in Section 3.2. If you haven't practiced "Setting Up A Web HMI Demo" listed in the Chapter 3, it's better to do it once to get familiar with it.

First set the web options

Run "isaXPce6.exe" of XPAC. In "Web" page, check on "Enable Web HMI" and then "Setting". Please check on "Enable Account Security" and then click on "Edit" to set (username , password). **Then remember to click on "OK".**

Note: If "Enable Account Security" is not checked, any user can easily get access to your XP-8xx7-CE6 through the Internet Explorer.



And then, please copy all files in this example1 to the controller

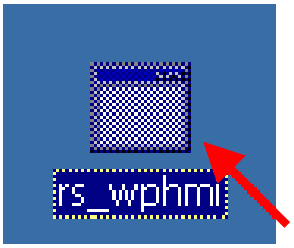
<your hard drive>:\example1\ *.*

to the XP-8xx7-CE6's

\SystemDisk\Temp\HTTP\WebHMI

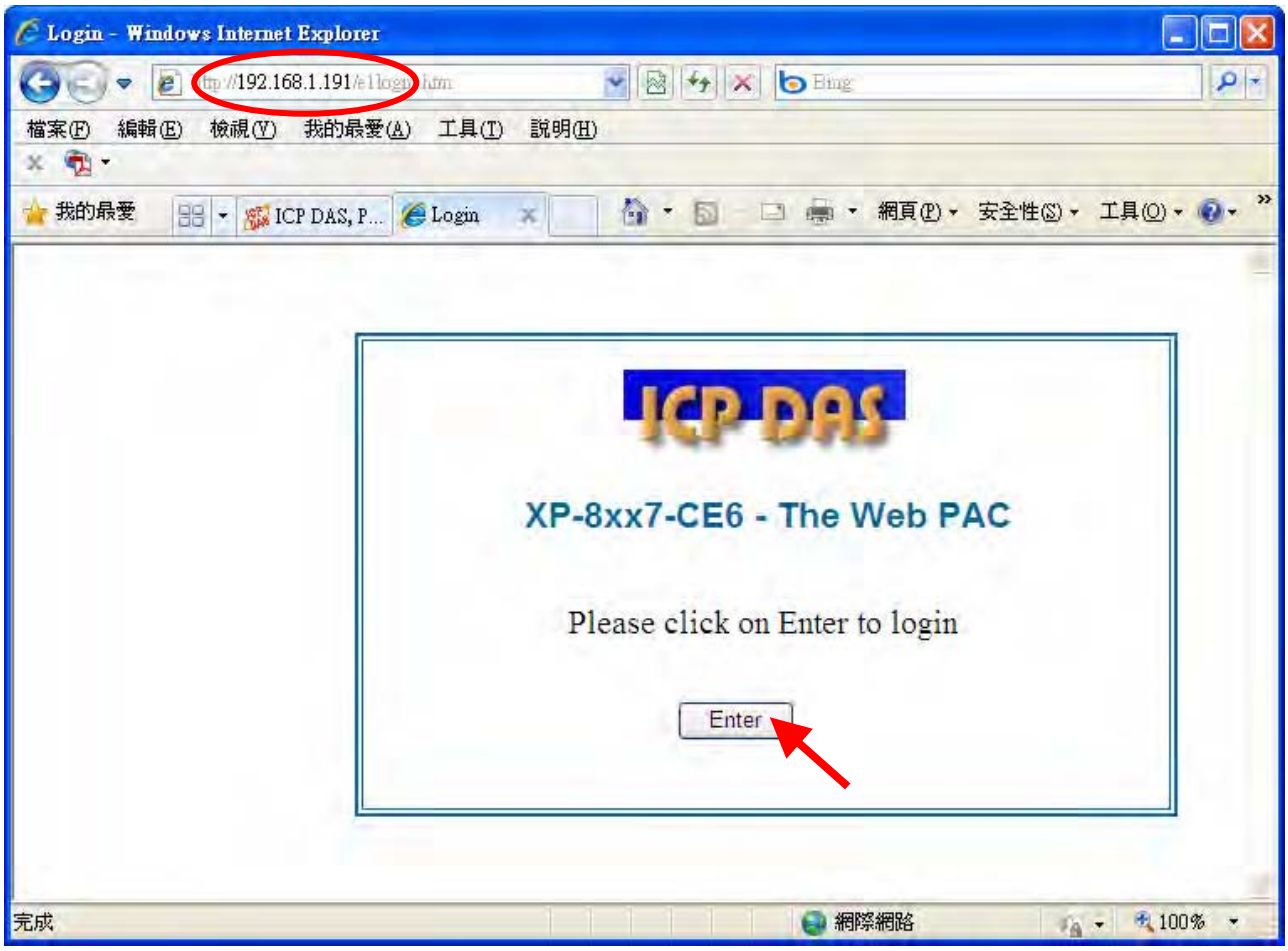
Since the Web Pages are modified or new copied, please run "rs_wphmi.exe" to reset the Web server. **The "rs_wphmi.exe" must be run every time when**

user has modified any file in the XP-8xx7-CE6's \SystemDisk\Temp\HTTP\WebHMI

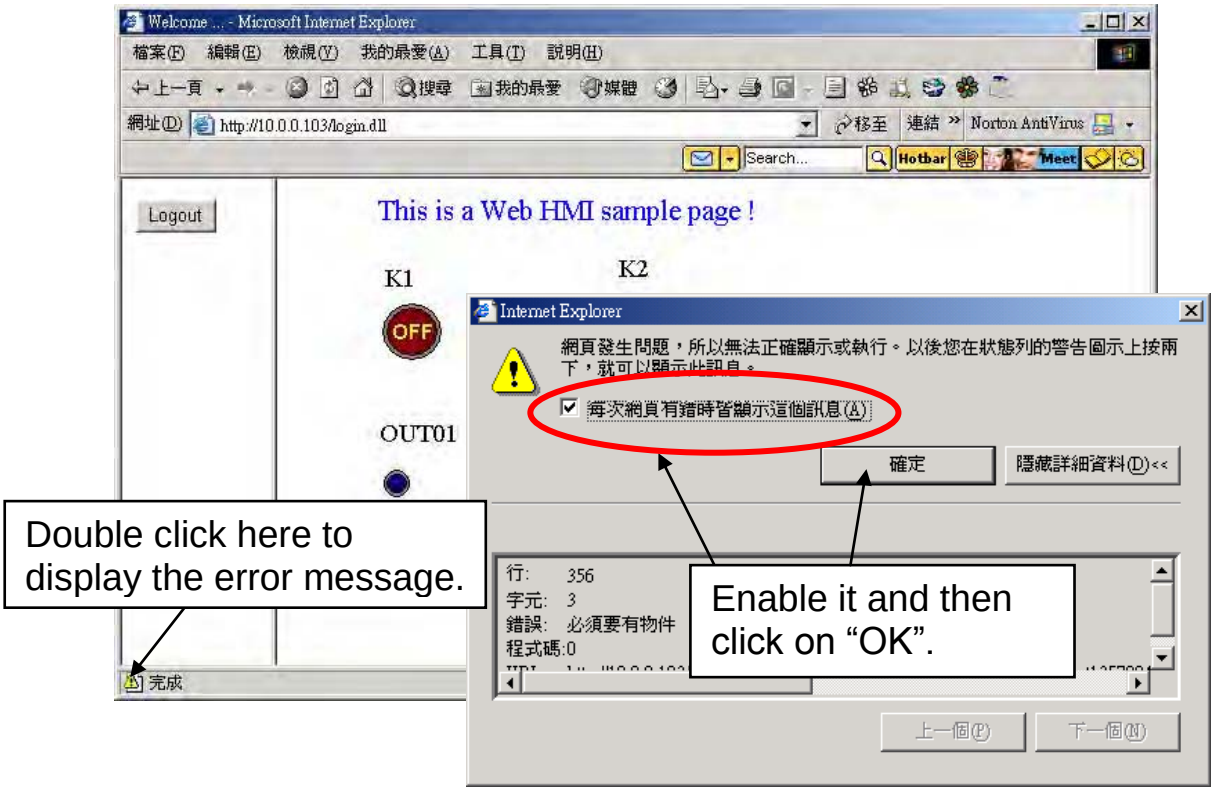


Show Time:

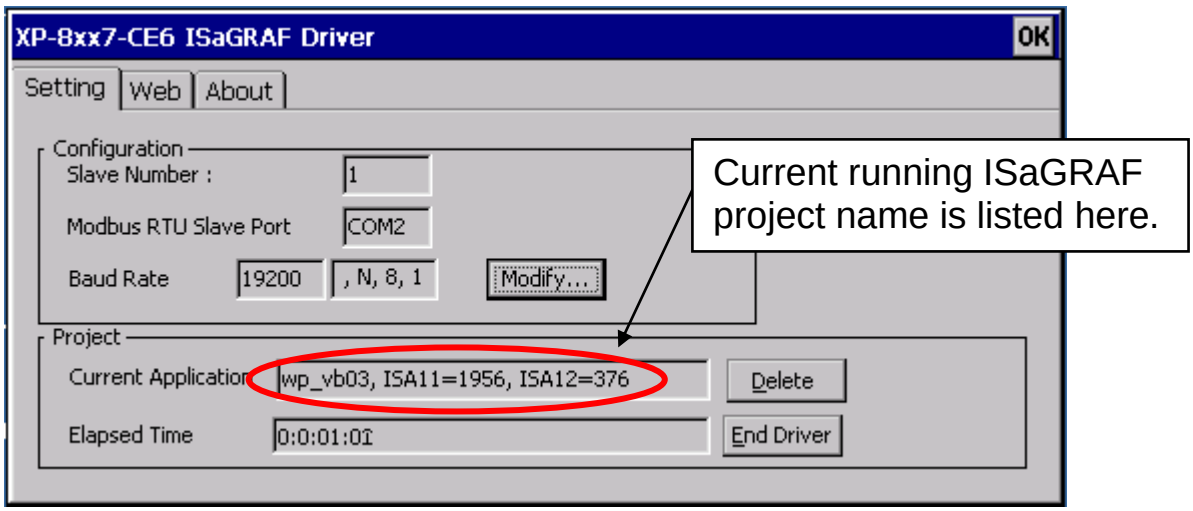
Please run Internet Explorer (Rev. 6.0 or later) on PC, key in the IP address of your XPAC. For example: 61.218.42.10 or http://61.218.42.10



If there is something wrong with the web page. You may enable the below item to display the debug message every time it has error.



And also check if your ISaGRAF project already downloaded to the controller (Section 4.3 or section 3.2.3). And do you assign the correct Modbus Network address to the respective ISaGRAF variables? (Section 4.1.5).



Chapter 5 Web HMI Basics

The XP-8xx7-CE6 is the abbreviation of the XP-8047-CE6/8347-CE6/8747-CE6.
The XP-8xx6-CE6 is the abbreviation of the XP-8046-CE6/8346-CE6/8746-CE6.

Important Notice

1. **XP-8xx7-CE6/8xx6-CE6 supports only the High profile I-8K and I-87K I/O cards in its slot 1 to 7. Please refer to XP-8xx7-CE6 CD: \napdos\isagraf\xp-8xx7-ce6\english-manu\ for Data sheet.**
2. Please always set a fixed IP address to the XP-8xx7-CE6. (**No DHCP**)

Note:

1. This chapter describes the programming basics for the Web HMI. We will not focus on the HTML basics. If you want to know more about the HTML programming, the best way is to "buy a HTML related book" from the bookstore. There are a lot of books doing this job.
2. The Web HMI only supports the basic HTML tags. It doesn't support ASP, PHP or JSP or other Page Server language.
3. Please do not use <frameset> </frameset> , <frame> </frame> in the Web HMI.
4. Note: The object name, object ID, code, variable name and function name is case sensitive. For example, refresh_data( ) and Refresh_data( ) is different.
5. There are more than ten Web HMI examples in the XP-8xx7-CE6's CD-ROM. Please refer to section 3.1.

5.1 Basic Files For The Web HMI

The basic Web HMI files include 2 folders and 3 DLL files and 4 htm files as below.

./img/	(default image files - *.jpg , *.bmp , *.gif)
./msg/	(default message files – wincon.js & xxerror.htm)
whmi_filter.dll	(three DLL files)
login.dll	
main.dll	
index.htm	(first default page)
login.htm	(the Web HMI welcome page)
menu.htm	(the page-menu page, normally on the left on the Internet Explorer)
main.htm	(first page when successfully login)

User may put his own image files into the folder named as “user_img”. And put user-defined javascript file or css file into the folder named as “user_msg”. Other folder name is not acceptable by the Wincon Web HMI.

The “index.htm” file is the default entry page of the web server. User must not modify it. The “index.htm” re-directs to the “login.htm” file in 1 to 2 seconds when someone visits the XP-8xx7-CE6 via the Internet Explorer.

User may modify the “login.htm” , “menu.htm” and “main.htm” to fit the requirement.

5.2 Login.htm

Login.htm is the first welcome page when a user visiting in. It can be modified. Below is the basic code for the login.htm

This line is only for the “Login.htm” , please do not apply to other pages, for example, the “menu.htm” & “main.htm” & other .htm pages.

```
<html>
<head>

<title>Login</title>

<meta http-equiv=pragma content=no-cache>

<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" >

<script language="JavaScript">
var random_val=123;
function get_random_val()
{
  var rightNow = new Date();
  random_val += 323456789*rightNow.getMinutes()
            + 107654321*(rightNow.getTime()%1000);
  setTimeout("get_random_val()", 197); // repeat call
}

//check if username and possword are empty
function validate(fm)
{
  setKey(fm);
  return true;
}

//Embed key whille submitting
function setKey(fm)
{
  var rightNow = new Date();
  cookieVal = random_val+rightNow.getTime();
  fm.key_.value = cookieVal;
}
```

Please apply your charset here.
For example,
English: UTF-8
Traditional Chinese: big5
Simplified Chinese: gb2312
or other language

```
</script>

</head>

<body onload="get_random_val()">

<div style="position: absolute; width: 332px; height: 34px; z-index: 5; left: 147px;
top: 27px" id="layer1">
Welcome !</div>

<div style="position:absolute; width:122px; height:38px; z-index:4; left: 171px;
top: 95px;"  id="layer2">

  <form name="form1" action="./login.dll" method="post">
     <input type="hidden" name="key_">
     <input type="submit" name="Submit" value="  Enter  " style="cursor:hand"
onClick="return validate(this.form)">
  </form>

</div>

</body>


<!-- To ensure no-cache work -->
<head>
<meta http-equiv=pragma content=no-cache>
</head>

</html>
```

get_random_val( ) should be always called at the beginning of the Login.htm . It is the entry point of the Login.htm

Your caption is here.

“form1” is necessary

You may modify “ **Enter** “ to your own word. For example “請進” .This may require user to modify the related “charset” at the beginning of this page.

This code is only for the “Login.htm” , please do not apply to other pages, for example, the “menu.htm” & “main.htm” & other .htm pages.

That’s all the login.htm need. You can insert more images or text to it. Only remember to keep its basic code.

5.3 Menu.htm

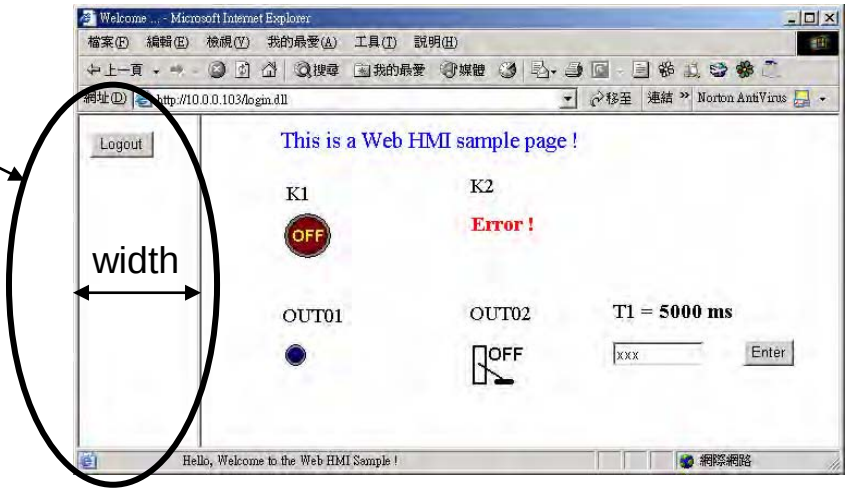
Note:

If you want to know more about the multi-page application, there are two demos in the XP-8xx7-CE6 CD-ROM:
\napdos\isagraf\xp-8xx7-ce6\xpce6-webhmi-demo\xphmi_05 & xphmi_05a .
The “xphmi_05” place its page-menu on the left, while “xphmi_05a” on the top.

The “Menu.htm” defines the Page-menu of the Web HMI especially for the multi-page application. The page-menu can place only on the left or on the top.

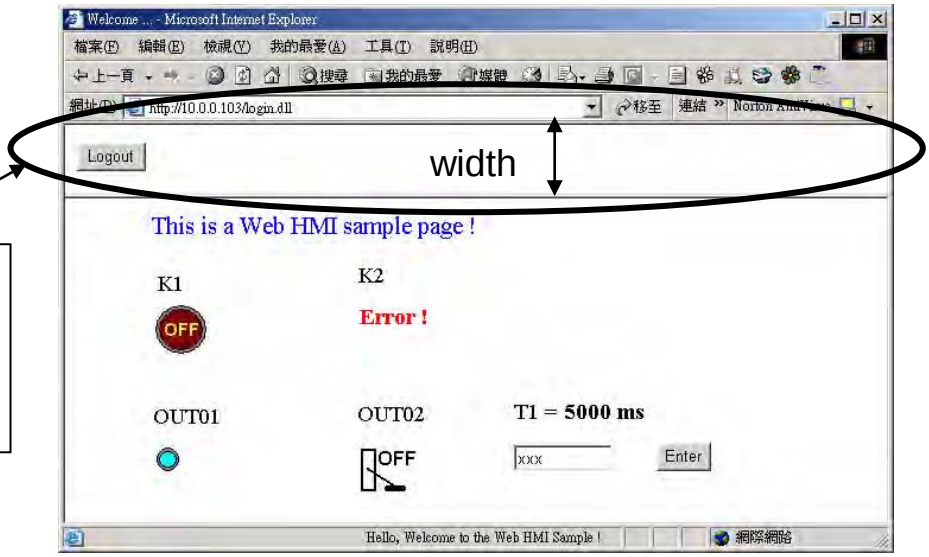
On the left.

The width & scrolling can be modified.



On the top.

The width & scrolling can be modified.



Below is the basic code for the menu.htm

```
<!-- top_or_left=1 , scrolling=0 , width=60 , resize=1 -->
```

The first row is not a comment, it defines the Page-Menu behavior
top_or_left: 1:Top , 0:Left
scrolling: 1:Yes , 0:No
width: width of the Menu Frame, 0 – 999 (unit is pixel)
resize: 1:Yes , 0:No

```
<html>
<head>
<title>Title1</title>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" >
<SCRIPT LANGUAGE="JavaScript" src="./msg/wincon.js"></SCRIPT>
<SCRIPT LANGUAGE="JavaScript">
function start1()
{
  A_11();
}
function refresh_data()
{
  if(run_at_pc==1) return;
}
</SCRIPT>
</head>
<body onload="start1()">
<!-- Logout button -->
<form name="form_logout" method="post" action="./login.dll">
  <input style="cursor:hand" name="CMD" type="submit" value="Logout"
onClick="return logout(this.form)">
</form>
</body>
</html>
```

This row is necessary for menu.htm , main.htm & other multi-pages

Please apply your charset here.
For example,
English: UTF-8
Simplified Chinese: gb2312
Traditional Chinese: big5
or other language

start1( ) is the entry point of the menu.htm

form_logout is for the logout button.

Note:
If you want to know more about the multi-page application, there are two demos in the XP-8xx7-CE6 CD-ROM:
\napdos\isagraf\xp-8xx7-ce6\xpce6-webhmi-demo\xphmi_05 & xphmi_05a .
The “xphmi_05” place its page-menu on the left, while “xphmi_05a” on the top.

5.4 Main.htm

5.4.1 A Simple Main.htm Example

Before going further in the main.htm, first take a look at a simple main.htm example. This example only display a “Hello !” message when successfully login, nothing else.

Please apply your charset here. For example, English: UTF-8, Simplified Chinese: gb2312, Traditional Chinese: big5 , or other language.

```
<html>
<head>
<title>Title1</title>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" >

<SCRIPT LANGUAGE="JavaScript" src="./msg/wincon.js"></SCRIPT>
```

This line is necessary for menu.htm , main.htm & other multi-pages

```
<SCRIPT LANGUAGE="JavaScript">
show_scroll_word(200,"Hello, Welcome to the Web HMI Sample !");

function refresh_data()
{
}


</SCRIPT>
</head>
```

Calling show_scroll_world( ) will display a moving word at the bottom of the Internet Explorer. Here 200 means 200 ms. You may make it slower, for example, using 500.

refresh_data( ) is called when the Internet Explorer has received the requested data from the controller. It is called in the period about 1.25 to 5 seconds depends on the communication quality.

```
<body onLoad="init()">
```

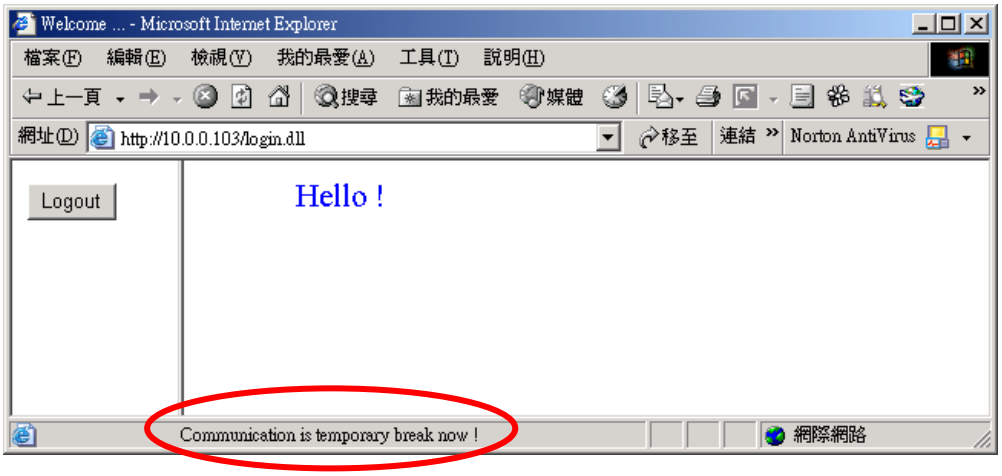
init( ) is the entry pint of the main.htm & other multi-pages.

```
<font color="blue" size="4">
<div style="position: absolute; width: 353px; height: 24px; z-index: 1; left: 73px;
top: 12px" id="layer1">   Hello !</div>
</font>

</body>
</html>
```

A layout object is starting with “<div” & ending at “ ” tags.
Here only show a message “Hello !”

You may replace the main.htm in the XP-8xx7-CE6 CD-ROM:
\napdos\isagraf\xp-8xx7-ce6\xpce6-webhmi-demo\sample
to the above main.htm & download it to the controller (refer to section 4.4.4).
You will see the below window when you login successfully.

User may try to plug out the Ethernet cable of the XPAC or of your PC. You will see it show “Communication is temporary break now !” in about 10 seconds. When you plug the cable back, the communication will be recovered in about 10 to 45 seconds.



If the communication broken time exceeds 120 seconds, it will show the below message. You have to close the Internet Explorer & open it again to re-login.

5.4.2 More About The refresh_data( ) Function And Dynamic Data

Note:
The code, variable name and function name is case sensitive. For example, refresh_data( ) is correct, however Refresh_data( ) is not correct.

The refresh_data( ) function must always apply in the main.htm and other multi-pages. It is called when the Internet Explorer has received the requested data from the controller. The calling period is about 1.25 to 5 seconds depends on the communication quality

The refresh_data( ) is often used for refreshing the dynamic data. For example, the boolean value , integer value, timer value or float value of the variables in the ISaGRAF project.

The Internet Explorer can access to the data in the ISaGRAF project only when they are assigned a unique Modbus Network Address No (refer to section 4.1.5). The Web HMI only accepts Network Address No in the range of 1 to 1024. The data without a Network Address No (No. = 0) or not in the range of (1 to 1024) is not accessible by the Internet Explorer.

The main.htm and other multi-pages can use the below variable array to access to the ISaGRAF's data (case sensitive). The identifier appeared in the [ ] is the related Network Address No. For example boolean_val[2] means the boolean value of the ISaGRAF boolean data which is assigned with the Network Address No. = 2.

boolean_val	boolean value in the ISaGRAF
word_val	word value in the ISaGRAF, -32768 to +32767
float_val	real value in the ISaGRAF, for ex, 1.234 , -0.456E-02
timer_val	timer value in the ISaGRAF, unit is ms, max = 86399999 (< 1 day)
string_val	message value in the ISaGRAF, max string length is 255

To access to long integer value (32-bit integer) please use get_long_val( ) function. For example, get_long_val(11) , get_long_val(13) , get_long_val(15).

get_long_val( )	long integer value in the ISaGRAF, -2147483648 to +2147483647

Note:
The long integer, timer and float variable's Network Address No. must occupy 2 No. in the ISaGRAF project (refer to section 4.2 of "User's Manual of ISaGRAF Embedded Controllers" or in the CD-ROM: \napdos\isagraf\xp-8xx7-ce6\english-manu\ " User_Manual_I_8xx7.pdf").

That means if you assign a Network Address No.= 11 to a Real type variable(or Timer or integer will have 32-bit value – larger than 32767 or smaller than -32768), the next No. 12 should not assigned to any other variable in the ISaGRAF project. However you may assign No.=13 to one another variable.

5.4.2.1 Displaying Dynamic Boolean Data

Demo example: xphmi_02 and xphmi_05 (section 3.1)

Let's look back to the refresh_data function. If user want to display the dynamic boolean value, the below code can be used.

```
…
function refresh_data()
{
  B1.src = "./img/circle_blue" + boolean_val[1] + ".jpg" ;
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px;
top: 79px">
<img name="B1" src="img/circle_blue0.jpg"></div>

…
</body>
```

The action of the image object "B1" is defined here.

if boolean_val[1]=1, it display image "B1" as "img/circle_blue1.jpg"
if boolean_val[1]=0, it display image "B1" as "img/circle_blue0.jpg"

The layout (or location) of the image object "B1" is defined here by the "<div" and " " tags.

The declaration of image "B1" is defined here by the "img" tag & name="B1" src= … ← "src=" defines the initial value of B1

5.4.2.2 Displaying Dynamic Float & Word & Timer Data

Demo example: xphmi_01 , xphmi_03 and xphmi_05 (section 3.1)

If user want to display the dynamic float value, the below code can be used.

```
…
function refresh_data()
{
  F21.innerText = float_val[21] ;
}
…

<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px;
top: 79px">
<b  id="F21"> xxxx </b> </div>
…
</body>
```

The action of the Text object “F21” is defined here.

If want to display Word data, please use “word_val[ ]“
If want to display Timer data, please use “timer_val[ ]“.
For ex, F21.innerText = timer val[21] + “ ms”;

The layout (or location) of the Text object “F21” is defined here by the “<div” “ ” tags.

The declaration of Text object “F21” is defined here by the “<b” tag & id=”F21” & “” tag initial value of this F21 is “xxxx”

5.4.2.3 Displaying Dynamic Long Integer Data

Demo example: xphmi_03 and xphmi_05 (section 3.1)

If user want to display the dynamic long integer value (32-bit format), the below code can be used.

```
function refresh_data()
{
  L11.innerText = get_long_val(11) ;
}
…
<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px;
top: 79px">
<b  id="L11"> xxx </b> </div>

…
</body>
```

The action of the Text object “L11” is defined here.

The layout (or location) of the Text object “L11” is defined here by the “<div” and “ ” tags.

The declaration of Text object “L11” is defined here by the “<b” tag and id=”L21” and “” tag , the initial value of this L11 is “xxx”.

5.4.2.4 Displaying Dynamic String Data

If user want to display the dynamic string value (max length is 255), the below code can be used.

```
…
function refresh_data()
{
  S31.innerText = string_val[31] ;
}
…
<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px;
top: 79px">
<b  id="S31"> empty </b> </div>

…
</body>
```

The action of the Text object “S31” is defined here.

The layout (or location) of the Text object “S31” is defined here by the “<div” and “ ” tags.

The declaration of Text object “S31” is defined here by the “<b” tag and id=”S31” and “” tag, the initial value of this S31 is “empty”.

5.4.2.5 Trigger A Boolean Object To Blink

Demo example: xphmi_02 and xphmi_05 (section 3.1)

Some application may need a message to blink when the boolean value changes.
For example, If boolean_val[12] is False, it means “OK”. However if boolean_val[12] is True, it means “Error !” . User may want to make this “Error !” blink to attract viewer’s attention.

The below code can do this job.

```
…
var blink_period=500;

setTimeout("blink_obj()", blink_period);

var B12_blink=0;   // init as 0:not blink

var blink_step=0;
```

The blinking period, unit is ms

Setup a timer to handle the blinking action

1: to blink , 0: no blink

```
function blink_obj()
{
  if(blink_step==1)
  {
    blink_step=0;

    if(B12_blink==1)
    {
      B12.innerText="Error !" ;
      font_B12.color="red";
    }

  }
  else
  {
    blink_step=1;

    if(B12_blink==1)
    {
      B12.innerText="" ;
      font_B12.color="red";
    }

  }
  setTimeout("blink_obj()", blink_period);
}
```

Blink step 1:
To display “Error !” in red color.

Blink step 2:
To display “” (nothing) in red color.

```
…function refresh_data()
{

  if(boolean_val[12]==0)
  {
    B12.innerText="Ok";
    font_B12.color="blue";
    B12_blink=0;
  }
  else
  {
    B12_blink=1;
  }
}
…
```

The action of the Text object “B12” is defined here.
If boolean_val[12]=0, no blink.
If boolean_val[12]=1, blink.

The layout (or location) of the Text object “B12” is defined here by the “<div” and “ ” tags.

```
<body onLoad="init()">
…

<div style="position: absolute; width: 214px; height: 53px; z-index: 2; left: 102px;
top: 79px">

<font  id="font_B12" color="blue" size="3">

<b  id="B12">OK</b>

</font>

</div>
…
</body>
```

The "" & "" tags can be used for controlling the font's color and font's size.

The declaration of Text object "B12" is defined here by the "<b" tag and id="B12" and "" tag, the initial value of this B2 is "OK"

5.4.2.6 Displaying Float Value With Fixed Digit Number Behind The "." Symbol

Demo example: xphmi_06 and xphmi_07 (section 3.1)

The float_str1(para1 , para2) function can convert float value to a string with fixed digit number behind the dot "." symbol

para1 is the float value to be converted, for ex, 1.234567
para2 is the digit number behind the "." dot symbol, 0 to 6
for ex, float_str1(1.234567, 3) return "1.234" ,
float_str1(1.234567, 2) return "1.23"

```
…
function refresh_data()
{
  F21.innerText = float_str1( float_val[21] , 3) ;
}
```

Convert float val at Network Address 21 to a string with digit number = 3 behind the "." dot symbol.

5.4.3 Post Data To The Controller

The former section 5.4.2 listing how to get and display data from the controller. This section focuses on posting data to the controller, in other word to control the XPAC via the Internet Explorer.

To set a new value to the boolean, word, long integer, float , timer and string variables in the ISaGRAF project, we need “form” object appeared in the main.htm or other multi-pages. A “form” object looks like as below.

name of this form

method should be “post” , action should be “./main.dll”

```
<form  name="form_L21"  method="post"  action="./main.dll">
  <input  name="BEGIN"  type="hidden">
  <input  name="L21"  type="text"  size="8"  value="xxx">
  <input  name="END"  type="hidden">
</form>
```

Inside the form, the first “<input>” must name as “BEGIN” (case sensitive) and type as “hidden”

Inside the form, the last “<input>” must name as “END” (case sensitive) and type as “hidden”

All the other “<input>” appeared between “BEGIN” & “END” are the data to post to the controller.

The “<input>” name to control the WinPAC’s data must follow below format. The number followed behind the first letter should be in the range from 1 to 1024. This number is point to the variable name in the ISaGRAF project with the same Modbus Network Address No.

B	point to the ISaGRAF boolean data , for ex, B5 , B109
W	point to the ISaGRAF word data (-32768 to +32767), for ex, W9 , W1001
L	point to the ISaGRAF long integer data (-2147483648 to +2147483647), for ex, L21. This “L” Also point to the ISaGRAF timer data
F	point to the ISaGRAF real data, for ex, F13 , F235
S	point to the ISaGRAF message data , for ex, S18

Note:
The long integer, timer and float variable’s Network Address No. must occupy 2 No. in the ISaGRAF project. (refer to section 4.2 of “User’s Manual of ISaGRAF Embedded Controllers” or in the CD-ROM: \napdos\isagraf\xp-8xx7-ce6\english-manu\ ” User_Manual_I_8xx7.pdf”)

That means if you assign a Network Address No.= 11 to a Real type variable(or Timer or integer will have 32-bit value – larger than 32767 or smaller than -32768), the next No. 12 should not assigned to any other variable in the ISaGRAF project. However you may assign No.=13 to one another variable.

5.4.3.1 Post Boolean Value to The Controller

A. To post by the image

ON_OFF function is used for posting Boolean value to the controller by refer to the current Boolean value.

```
…

function ON_OFF(form_obj, obj, current_boo_value)
{
  if(current_boo_value==0)
  {
    flag = confirm("turn ON ?");
    if(flag) obj.value=1;
  }
  else
  {
    flag = confirm("turn OFF ?");
    if(flag) obj.value=0;
  }
  if(flag)
  {
   if(GetUserID(form_obj)==true) form_obj.submit();
  }
}
function refresh_data()
{
  B2.src = “img/cmd” + boolean_val[2] + “.jpg” ;
}
…
<body onLoad="init()">
…
<div style="position: absolute; width:100px;height:100px; z-index: 5; left: 242px;
top: 164px" >

<img style="cursor:hand" name="B2"  onclick="ON_OFF(form_B2, form_B2.B2,
boolean_val[2])"   src="img/cmd0.jpg">
```

The first parameter is the name of the “form”. The second parameter is the “<input>” name inside the form.

Demo example: xphmi_02 and xphmi_05

Display the current boolean image. In this example,

The layout (or location) of the image object “B2” is defined here by the “<div” and “ ” tags.

“cursor:hand” will display the mouse arrow as a hand when entering the image area

Name of the image object

The onclick will call ON_OFF( ) when the mouse click on it.
The first parameter is the name of the “form”. Here is “form_B2”.
The second parameter is the “<input>” name inside the form. Here is “form_B2.B2”.
The last is the current Boolean value. Here is boolean_val[2].

```
<form name="form_B2" method="post" action="./main.dll">
   <input name="BEGIN"  type="hidden">
   <input    name="B2"     type="hidden" value="0">
   <input name="END"      type="hidden">
</form>

</div>
…
</body>
```

Name of the form

Name of “<input>” inside the form. Here is “B2”. Because it is inside “form_B2”, then we must use the name of “form_B2.B2” to identify it.

B. To post by buttons

Demo example: xphmi_02 and xphmi_05

```
function ON_(form_obj, obj)
{
  flag = confirm("turn ON ?");
  if(flag)
  {
    obj.value=1;
    if(GetUserID(form_obj)==true) form_obj.submit();
  }
}
function OFF_(form_obj, obj)
{
  flag = confirm("turn OFF ?");
  if(flag)
  {
    obj.value=0;
    if(GetUserID(form_obj)==true) form_obj.submit();
  }
}
function refresh_data()
{
  B2.src = "img/big_Tcircle_red" + boolean_val[2] + ".jpg" ;
}
…

<body onLoad="init()">
…
<div style="position: absolute; width: 56px; height:40px; z-index: 5; left: 82px;
top: 69px" >
<img name="B2" src="img/big_Tcircle_red0.jpg">
</div>
<div style="position:absolute; left:85px; top:124px; width:42px; height:27px;">
```

ON_ function is used for posting boolean value as “True” to the controller .

OFF_ function is used for posting boolean value as “Fasle” to the controller .

Display the current Boolean image. In this EX,
0: “img/big_Tcircle_red0.jpg” ,
1: “img/ big_Tcircle_red1.jpg”

The layout (or location) of the image object “B2” is defined here by the “<div” and “ ” tags.

```
<input type="button" value="ON" style="cursor:hand" onClick="ON_(form_B2,
form_B2.B2)">
```

A button to call ON_( )
First parameter is the name of the form. Here is “form_B2”
The second is the name of the “<input>” inside the form.
Here is “form_B2.B2”

```
<form name="form_B2" method="post" action="./main.dll">
   <input name="BEGIN"  type="hidden"  value="">
   <input  name="B2"        type="hidden"  value="1">
   <input name="END"     type="hidden"  value="">
</form>
</div>
```

Name of “<input>” inside the form. Here is “B2”. Because it is inside “form_B2”, then must use the name of “form_B2.B2” to identify it.

```
<div style="position:absolute; left:85px; top:166px; width:47px; height:31px">
<input type="button" value="OFF" style="cursor:hand" onClick="OFF_(form_B2,
form_B2.B2)">
</div>
…
</body>
```

A button to call OFF_( )
First parameter is the name of the form. Here is “form_B2”.
The second is the name of the “<input>” inside the form. Here is “form_B2.B2”

5.4.3.2 Post Word & Long & Float & Timer & String Value to The Controller

…

```
function Check(form_obj)
{
  flag = confirm("Are you sure?");
  if(flag)
  {
    if(GetUserID(form_obj)==false) { return false; }
    form_obj.submit();
    return true;
  }
  else
  {
    return false;
  }
}
```

Check( ) is used for posting any “form”.

Demo example:
xphmi_03, xphmi_04, xphmi_05, xphmi_06 and xphmi_07

```
function refresh_data()
{
  L15.innerText=get_long_val(15);
  F17.innerText=float_val[17];
}
…
<body onLoad="init()">
…
<div style="position: absolute; width: 195px; height: 25px; z-index: 2; left: 45px;
top: 52px" >
L15 = <b id="L15">xxxx</b></div>
<div style="position: absolute; width: 196px; height: 29px; z-index: 3; left: 45px;
top: 82px" >
F17 = <b id="F17">xxxx</b></div>

<div style="position:absolute; left:47px; top:131px; width:204px; height:60px">

  <form name="form1" method="post" action="./main.dll">
    <input name="BEGIN"  type="hidden"  value="">
    <input name="L15"    type="text"    value="Enter long val (L15)">
    <input name="F17"    type="text"    value="Enter float val (F17)">
    <input name="END"    type="hidden"  value="">
  </form>
</div>

<div style="position:absolute; width:74px; height:31px; left: 234px; top:
150px;">
  <input type="button" style="cursor:hand" onClick="return Check(form1)"
value="Enter">
</div>
…
</body>
```

Display dynamic value here.
If data is word , please use word_val[ ]
If data is timer, please use timer_val[ ]
If data is string, please use string_val[ ]

The layout (or location) of the text object “L15” & “F17” are defined here by the “<div” “ ” tags.

Text input L15 & F17 inside the “form1”.
If data is timer, please use “L”; And “W” for word; “S” for string.

“cursor:hand” will display the mouse arrow as a hand when entering the button area

When mouse click on this button, it calls Check( ) to post to the controller

5.5 Multi-Pages

The Web HMI in the XP-8xx7-CE6 supports multi-pages application. You may refer to Chapter 3 to setup the multi-page demo – “xphmi_05” to see how it works.

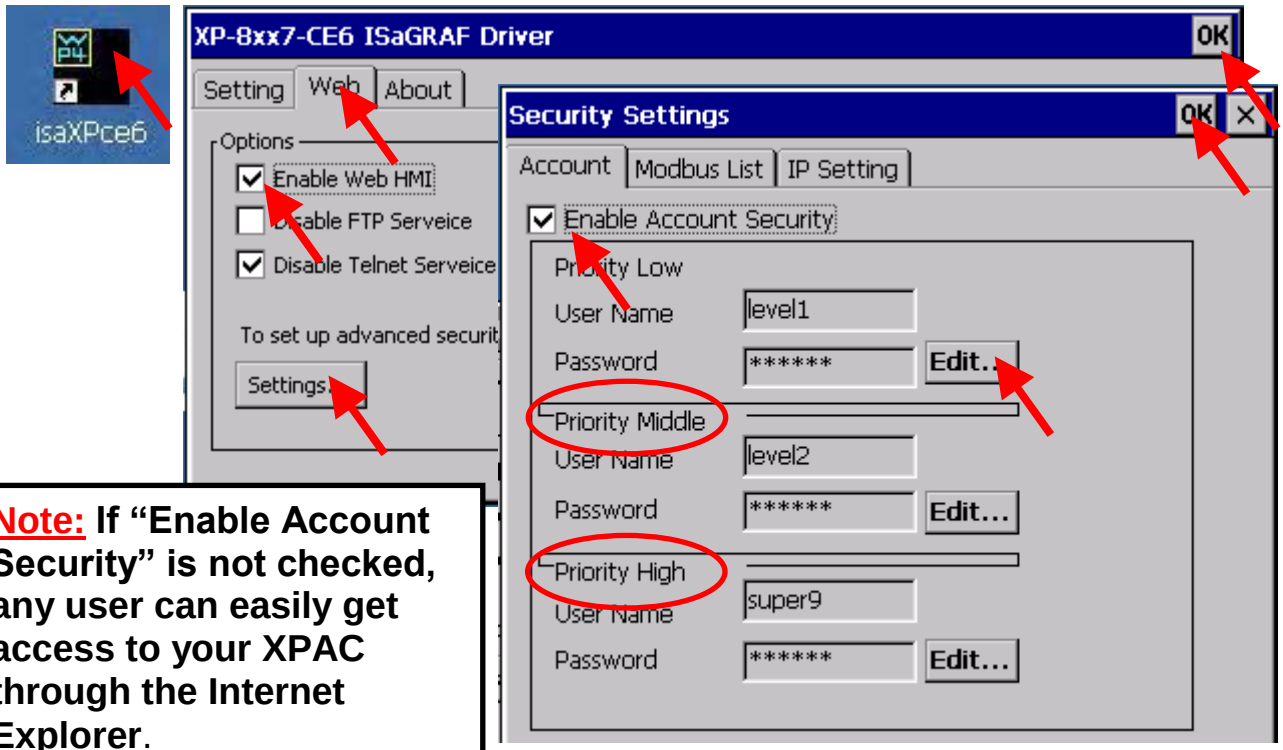
5.5.1 Level 2 And Level 3 Page

The multi-page name can be any valid html file name. For example, “page2.htm”, “kitchen.htm” , “u2-page4.htm” .

If “u2-” appear in front of the page name, the page will become a Level 2 page.
For example, the “u2-Page4.htm” in the “xphmi_05” demo.
If “u3-” appear in front of the page name, the page will become a Level 3 page.
For example, the “u3-time.htm” in the “xphmi_05” demo.

What is a Level2 page? Only users login with the Middle or High priority can get access to it. To access to the Level3 page, users have to login as a High priority user. The page name without “u2-“ and “u3-“ is identified as Level 1 page. That means any user successfully login can access to it. For example: the “main.htm”.

The other rules for multi-pages are almost the same as “main.htm” (section 5.4)



Note: If “Enable Account Security” is not checked, any user can easily get access to your XPAC through the Internet Explorer.

5.5.2 Switch One Page To One Another Page

Please take a look at the “menu.htm” of the “xphmi_05” demo as below. The “goto_R_page( )” function can be used for switching to other page.

```
<!-- top_or_left=0 , scrolling=0 , width=110 , resize=1 -->

<html>
<head>
<title>Title1</title>
<meta http-equiv="Content-Type" content="text/html; charset=big5" >
<SCRIPT LANGUAGE="JavaScript" src="./msg/wincon.js"></SCRIPT>

<SCRIPT LANGUAGE="JavaScript">
function start1()
{
  A_11();
}
function refresh_data()
{
  if(run_at_pc==1) return;  // if simulate at the PC, just return
  …
}
</SCRIPT>
</head>
<body onload="start1()">

<!-- Logout button -->
<form name="form_logout" method="post" action="./login.dll">
  <input style="cursor:hand" name="CMD" type="submit" value="Logout"
onClick="return logout(this.form)">
</form>
<br/>
<br/>

<!-- Goto main.htm -->
<A style="cursor:hand" onClick="goto_R_page('main.htm')">第 1 頁</A>
<br/>
<br/>

<!-- Goto kitchen.htm -->
<A style="cursor:hand"
onClick="goto_R_page('kitchen.htm')">Kitchen</A><br/>
<br/>
<br/>
```

“cursor:hand” will display the mouse arrow as a hand when entering the button area

Switch page to “main.htm”

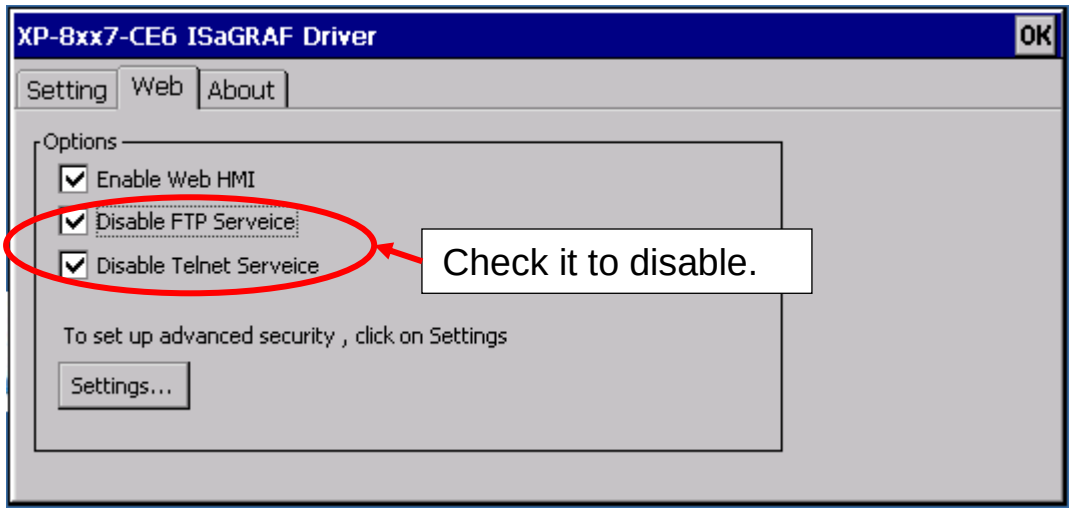
Switch page to “kitchen.htm”

5.6 Web Security

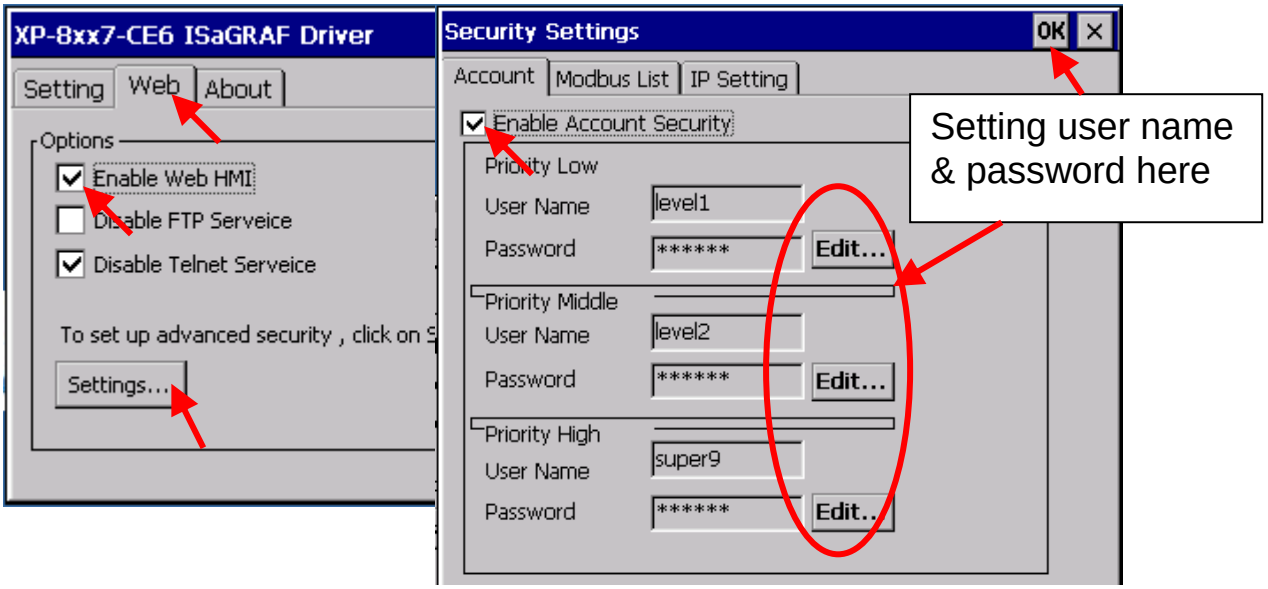
There are some ways user can get access to the XP-8xx7-CE6 via Ethernet port.

1. Using Modbus TCP protocol at port No.= 502. (ISaGRAF & other HMI do this)
2. Using ftp (for example, key in “ftp://10.0.0.103” on the Internet Explorer)
3. Using telnet (for example, key in “telnet 10.0.0.103 in the “command” window)
4. Using the Web server (The Web HMI does)

For safety, recommend to disable item 2 and 3 at run time.

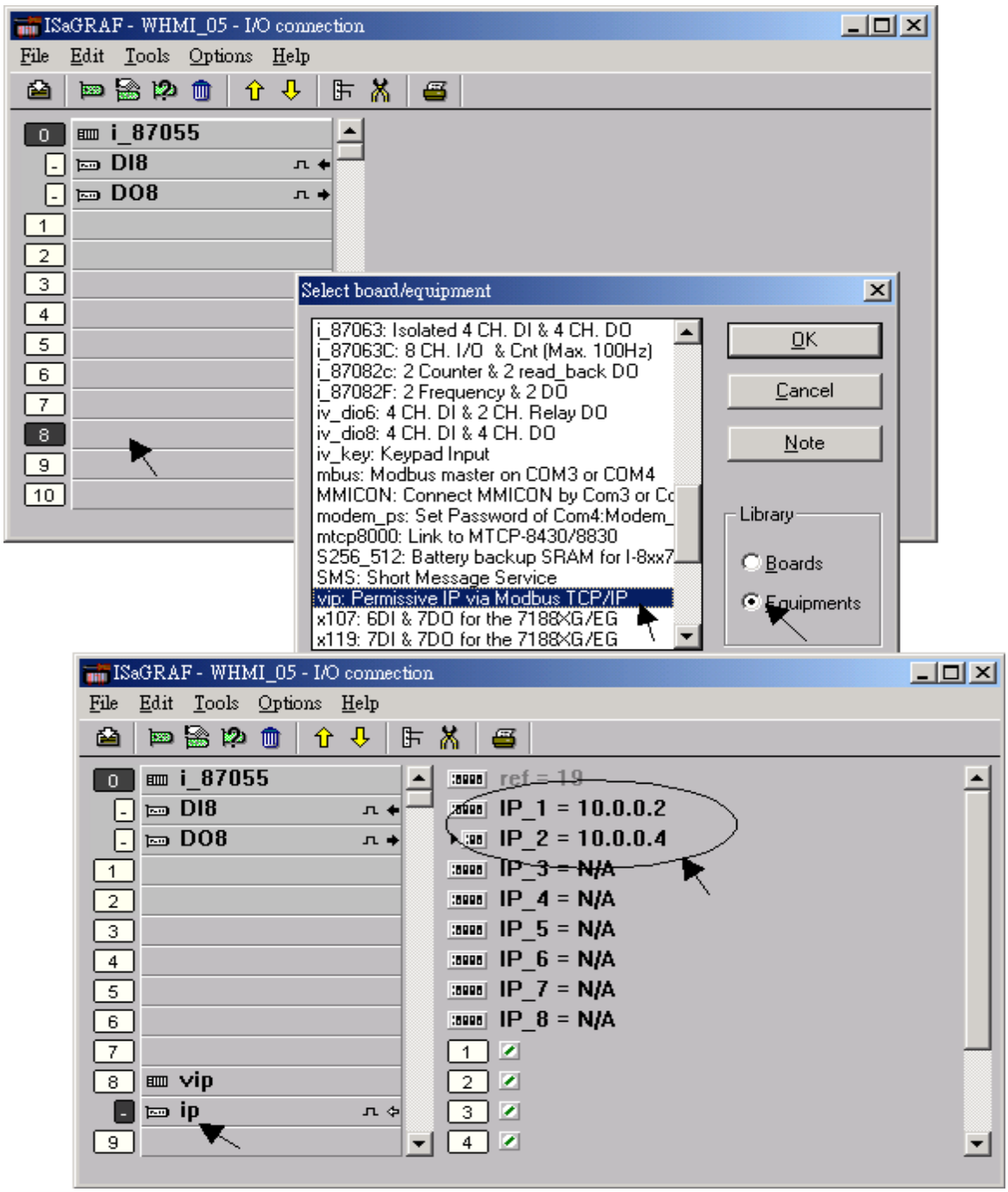


And about item 4, please set proper username & password for the Web HMI.



About item 1, user may set up to 8 IP address for ISaGRAF or other HMI to get access to the XP-8xx7-CE6 via the Modbus TCP/IP protocol as below.
On the “IO connection” window of ISaGRAF, please connect “vip” and entering the IP which can get access to the XPAC via Modbus TCP/IP protocol. If “vip” is

not connected, any remote IP can get access to your XPAC via Modbus TCP/IP protocol. If “vip” is connected and No IP is entered (all assigned as “N/A”), No HMI and ISaGRAF can get access to it anymore.



Please re-compile your ISaGRAF project and download it to the controller if you have modified the IO connection.