A Web HMI Example for ISaGRAF Professional XPAC XP-8xx7-CE6-PRO – by FrontPage

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This document "FAQ-124" can be found at http://www.icpdas.com/faq/isagraf.htm > 124 .
(Or www.icpdas.com > FAQ > Software > ISaGRAF > FAQ-124)

Features of the ISaGRAF PAC Web HMI

ICP DAS ISaGRAF PAC with WinCE OS based series provide Web HMI feature, such as WinPAC WP-8xx7 series, XPAC XP-8xx7-CE6 series and ViewPAC VP-2xW7 series, and the new WinCE OS based ISaGRAF PAC in the future will also provide the Web HMI.

- Control/monitor devices in graphic operating interface: via the user friendly HMI interface to monitor/control the I/O modules and devices of the whole system.
- No extra software installation: just need a normal web browser (ex: I.E…), normal VGA monitor.
- Remote HMI access: login the system HMI even in the remote PC – Web HMI everywhere!
- The same operating interface in local and remote: no extra purchase, designing and training fee. Save time and money! (The local web HMI is for professional version XP-8xx7-CE6-PRO only.)

System Security and Data Protection

ISaGRAF PAC Web HMI provides three levels username and password protection, high/middle/low. Using different level protection for different web pages, user can figure out operator/ manager/ administrator or other access authority managements. Combine with other ISaGRAF PAC protective features, such as VIP communication security (Setting Very Important IP No.), dongle protection…, the system and data will be safe and secured.

Features of Professional OS version ISaGRAF XPAC

The Professional OS version XPAC, XP-8xx7-CE6-PRO, provides built-in Internet Explorer Software. Using the user friendly graphic control HMI, user needs a normal VGA monitor only, not an extra PC or NB. The Professional OS version XPAC providing Internet Explorer, FTP server and Web server functions is more professional and cost-effective.

Easy-to-Design

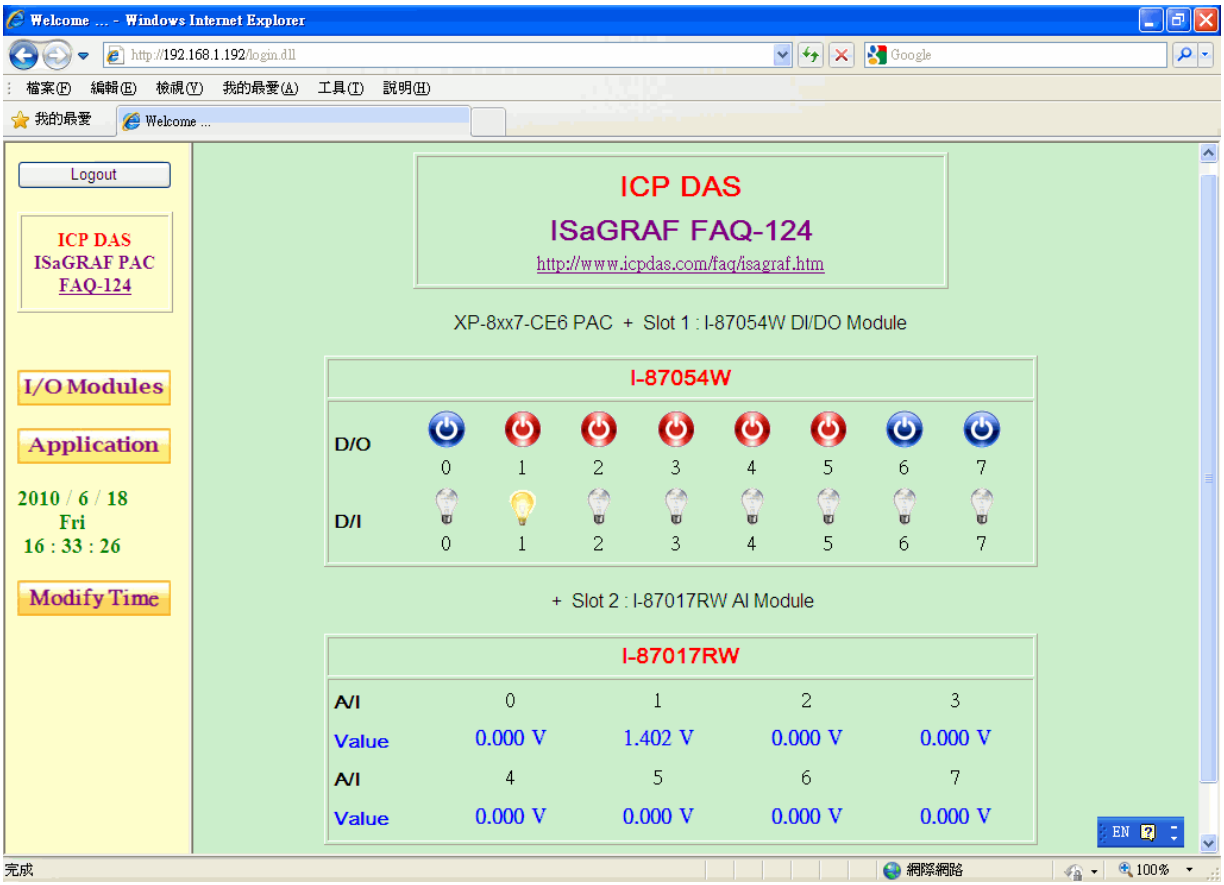
The webpage designer can easily design the Web HMI. Just simply adding the I/O module control tags provided by ICP DAS into the HTML webpage, everyone can design the graphic control Web HMI pages!

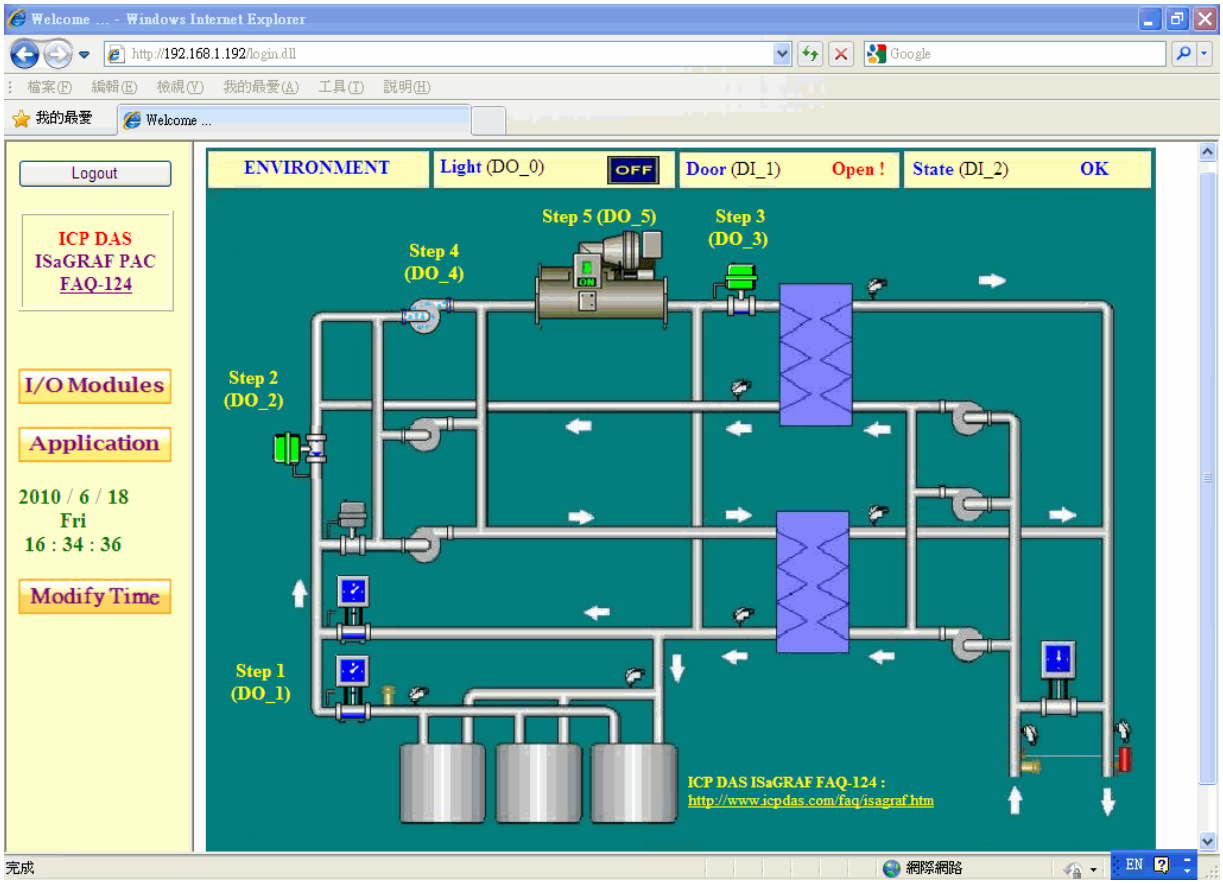
For the user not a webpage designer, he can edit own webpage in a normal webpage editor (Ex: FrontPage, DreamWave …) with own company logo or graphic, then simply add the I/O module control tags, and then it's easily done.

Web HMI Example – by FrontPage

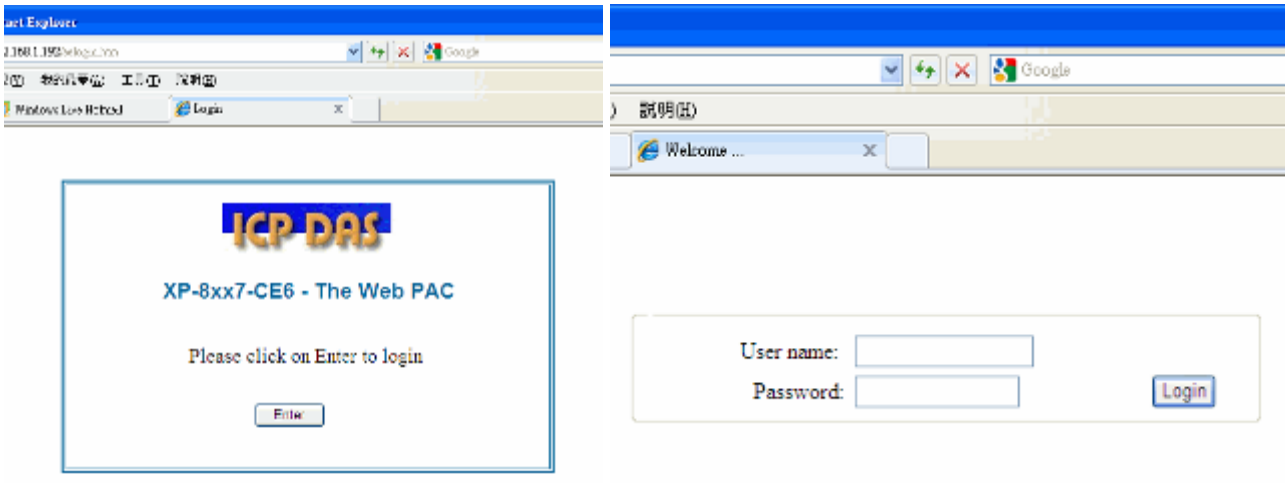
This example webpage is edited by Microsoft Office Frontpage 2003. User can choose your familiar editor. If using the professional version XP-8xx7-CE6-PRO, please plug a monitor in the VGA port to operate the Web HMI via built-in IE browser to control the I/O devices directly. Or, in the local/ remote PC, with the same operating HMI screen, user can also control all deices via internet web browser.

The Web HMI pages are as below:


Welcome ... - Windows Internet Explorer
http://192.168.1.192/login.dll
Logout
ICP DAS
ISaGRAF PAC
FAQ-124
I/O Modules
Application
2010 / 6 / 18
Fri
16 : 33 : 26
Modify Time
ICP DAS
ISaGRAF FAQ-124
http://www.icpdas.com/faq/isagraf.htm
XP-8xx7-CE6 PAC + Slot 1 : I-87054W DI/DO Module
I-87054W
D/O
D/I
0 1 2 3 4 5 6 7
+ Slot 2 : I-87017RW AI Module
I-87017RW
AI 0 1 2 3
Value 0.000 V 1.402 V 0.000 V 0.000 V
AI 4 5 6 7
Value 0.000 V 0.000 V 0.000 V 0.000 V


Welcome ... - Windows Internet Explorer
http://192.168.1.192/login.dll
Logout
ICP DAS
ISaGRAF PAC
FAQ-124
I/O Modules
Application
2010 / 6 / 18
Fri
16 : 34 : 36
Modify Time
ENVIRONMENT
Light (DO_0) OFF
Door (DI_1) Open !
State (DI_2) OK
Step 5 (DO_5)
Step 3
(DO_3)
Step 4
(DO_4)
Step 2
(DO_2)
Step 1
(DO_1)
ICP DAS ISaGRAF FAQ-124 :
http://www.icpdas.com/faq/isagraf.htm

The welcome page and username/password login page :



1.1 Download the FAQ-124 Web HMI Example

The document "FAQ-124" can be found at http://www.icpdas.com/faq/isagraf.htm > 124.
(Or www.icpdas.com → FAQ → Software → ISaGRAF Ver.3(English) → 124

The files after download and decompression:

- **ISaGRAF project file (hmi_ts_1.pia)**
- **HMI webpage files (all files in the folder of "xphmi_t1")**
- **This PDF document.**

The referent document for this example XP-8xx7-CE6 Getting Started can be found at :

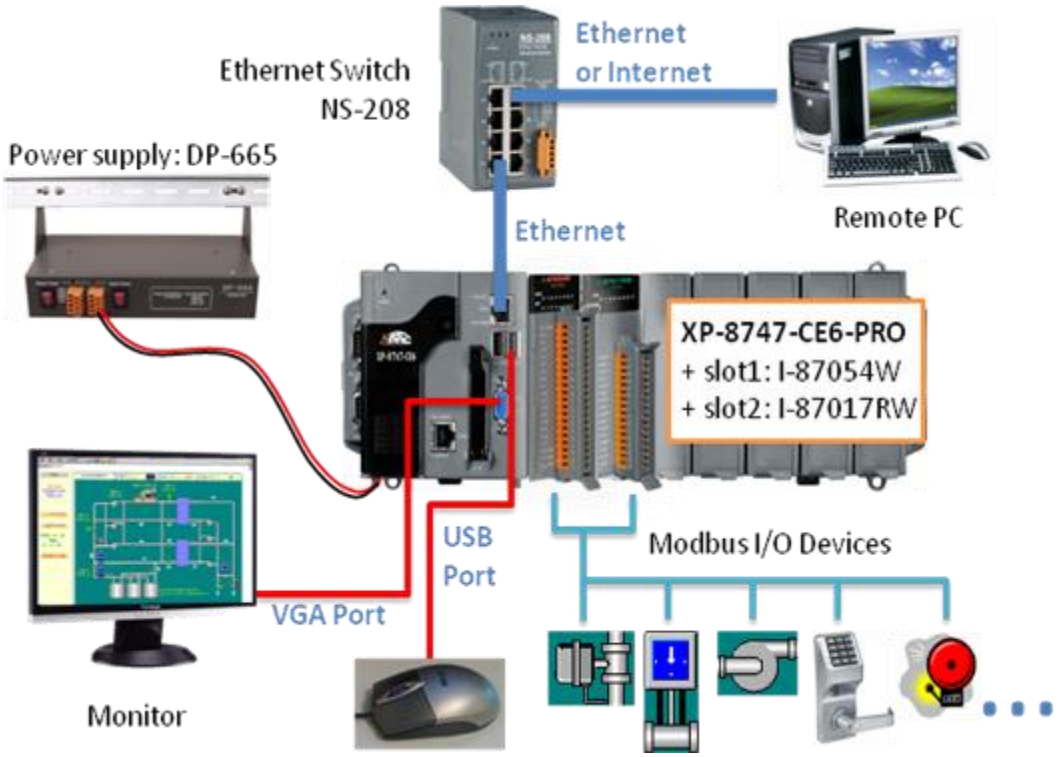
- Website: http://www.icpdas.com/products/PAC/i-8000/getting_started_manual.htm
- CD : cd/xp-8xx7-ce6/napdos/isagraf/xp-8xx7-ce6/english-manu/

1.2 Hardware Requirement and Installation

1.2.1 Hardware Requirement for the example program

Model	Description	Remark
XP-8xx7-CE6-PRO	ISaGRAF professional version XPAC	If using a standard version XP-8xx7-CE6 that without built-in browser IE, user has to operate the Web HMI via the web browser in a PC.
I-87054W	DI/DO module, in slot 1	The leftmost I/O slot number of XP-8xx7-CE6 is 1.
I-87017RW	AI module, in slot 2	When testing, user can add a small battery test tool, the range in this example: -10V ~ +10V
Monitor	VGA port	If using a standard version XP-8xx7-CE6, user cannot show the Web HMI on the monitor of the PAC.
USB mouse	USB port	
NS-208 or NS-205	Industrial Ethernet switch	To login Web HMI from remote PC via internet. In this example, ISaGRAF project and HMI files are downloaded via the Ethernet network. To download project via RS-232, please refer to section 4.3 of XP-8xx7-CE6 Getting Started .
DP-665	Industrial power supply	

1.2.2 Hardware Connection

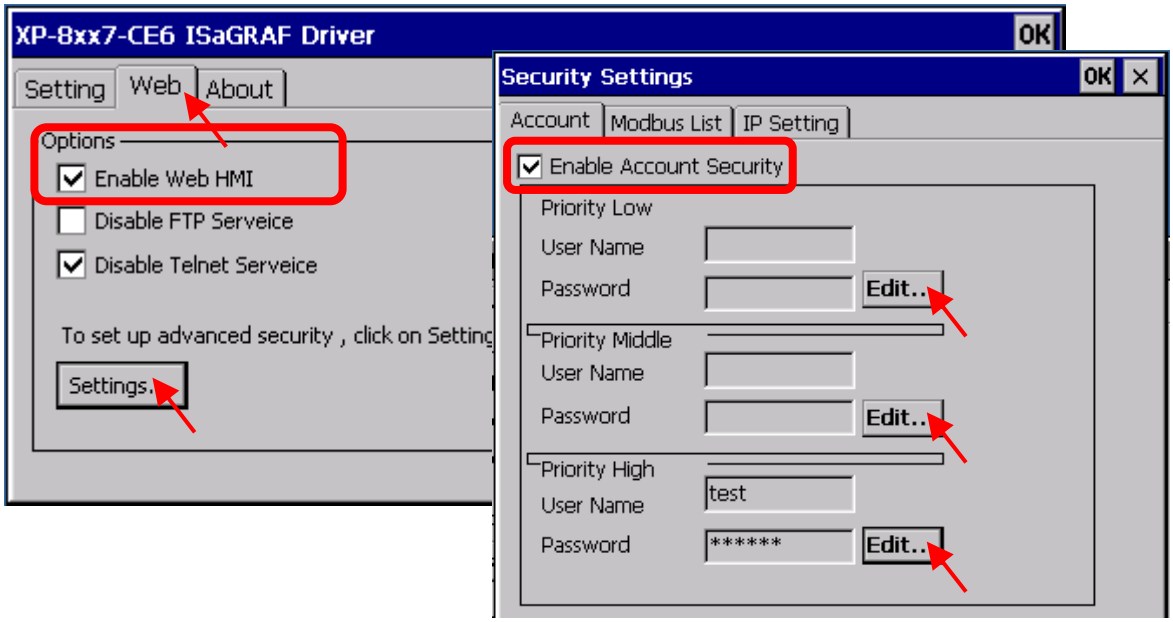


1.2.3 Configuring the XP-8xx7-CE6

After connecting the hardware devices, please power on the XP-8xx7-CE6-PRO to set up the XPAC:

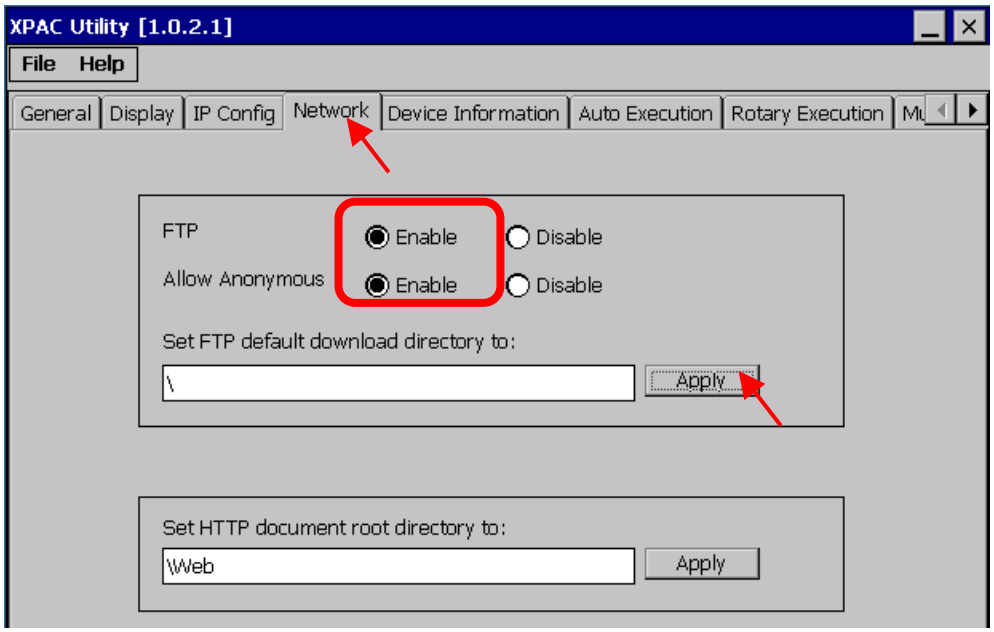
A. Run "isaXPce6" on the desktop 

Enable Web HMI, and setup the three levels username and password according to your need. If this account security is not enabled, everyone can control your XP-8xx7-CE6 without password via a web browser from the network !



B. Run "XPAC_Utility" on the desktop 

Enable FTP function, and set up the default directory for downloading Web HMI files to the XP-8xx7-CE6.

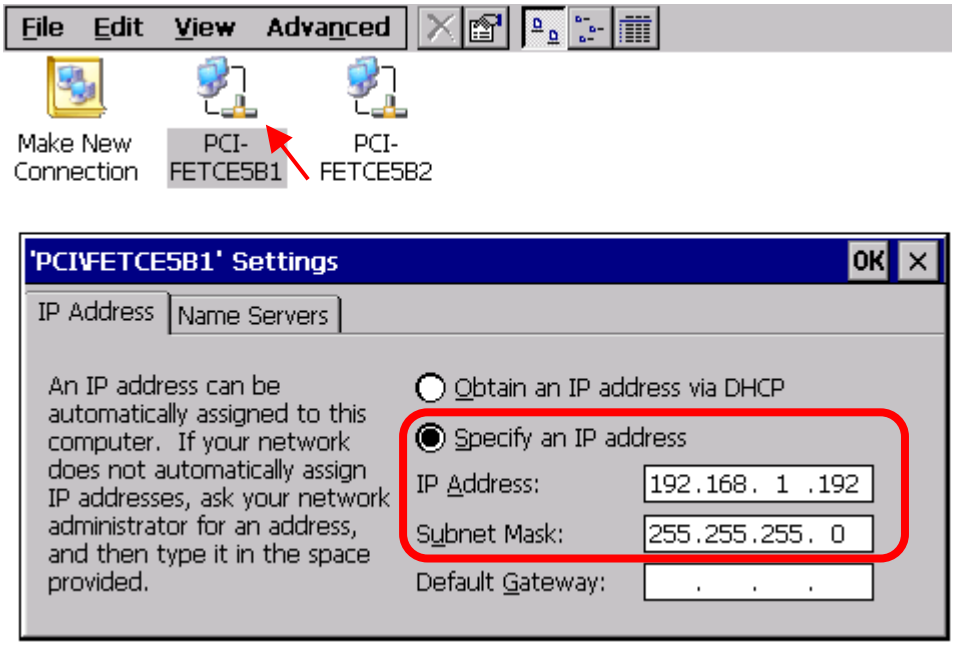


C. Assign the IP address for XP-8xx7-CE6

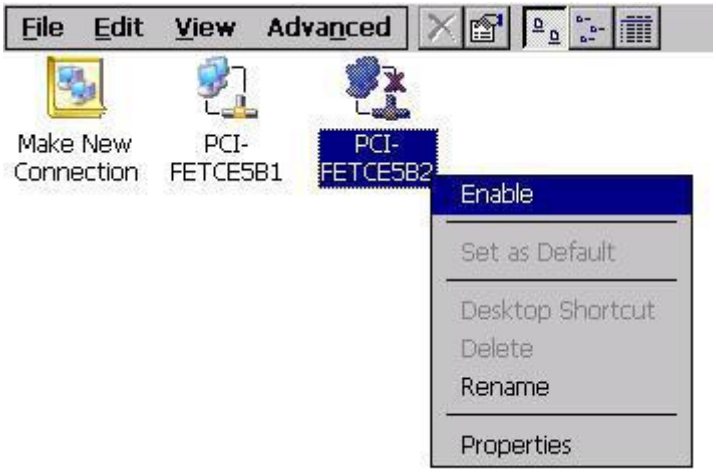
1. In XP-8xx7-CE6, click [Start] > [Settings] > [Network and Dual-up Connections]

2. Double click [PIC-FETCE5B1] can open the LAN1 setting window.
   Double click [PIC-FETCE5B2] can open the LAN2 setting window.

3. Assign IP address, please key in your controller IP address, ex: 192.168.1.192 .
   (ISaGRAF applications need to use fixed IP, do not accept DHCP. If enable LAN2, please use fixed IP also.)。



The LAN1 of XP-8xx7-CE6 is default enabled, if you need to use LAN2 (or the LAN is been disabled), please mouse right click the LAN2 icon, select "Enable" to enable that LAN before setting.



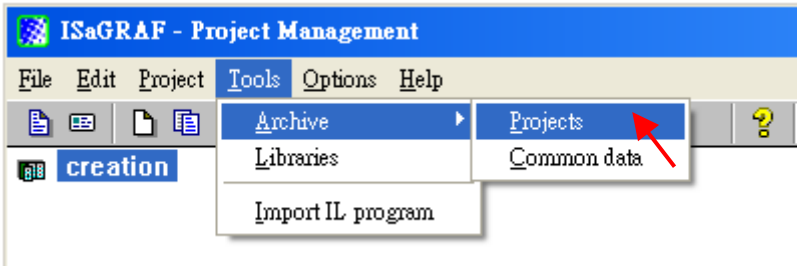
After setting up, please click on "OK", and then reboot the controller.

1.3 ISaGRAF Project in the example

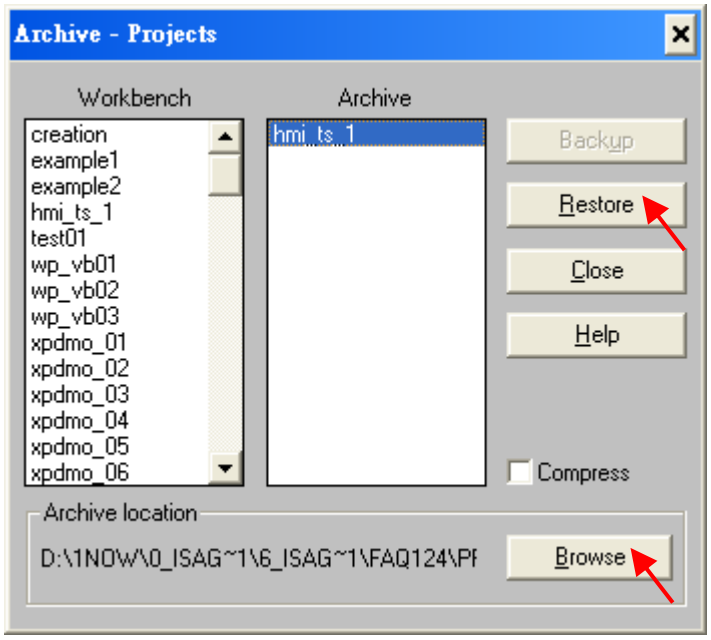
1.3.1 Restore the ISaGRAF Project

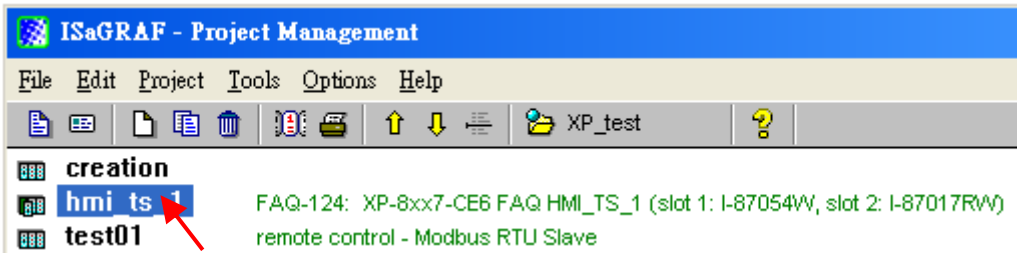
Please follow the steps to restore the ISaGRAF project "hmi_ts_1.pia" into the ISaGRAF in the PC.

1. Run ISaGRAF software, and then click the menu bar: Tool→Archive→Projects



2. In "Archive" window, click on "Browse", switch to the folder that with this demo program file "hmi_ts_1.pia" . Select the file name, click on "Restore" then the project will show in your project folder. Please double click the file name to open the project.



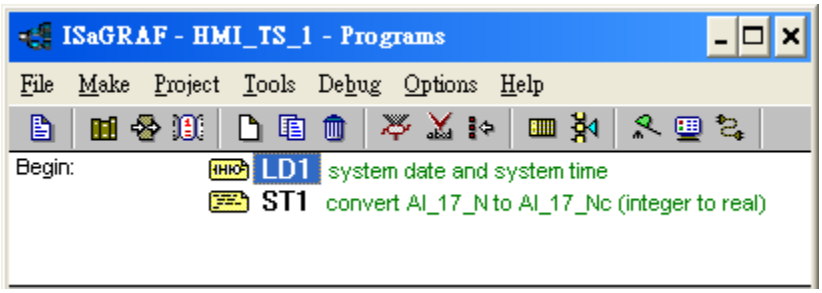


1.3.2 ISaGRAF Program Description

This ISaGRAF demo example is to receive/control the DI/DO module I-87054W and AI module I-87017RW, read/write the system date and time of the XPAC, and use the getting data to apply with three HMI web pages – I/O modules, Application, and Modify Time three Web HMI pages.

Project Structure：

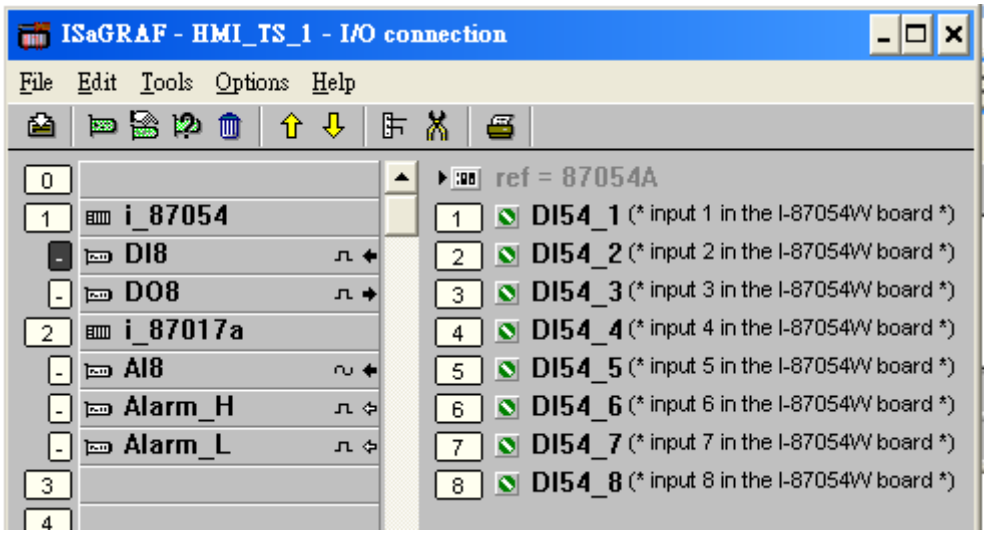
There are two programs in this example project:
LD1: Read/write system date/time, and receive date/time setting from HMI.
ST1 : Convert the Integer value received from AI module to Real value (Range: -10 ~ +10V) for showing the normal voltage value on the HMI.



Variable Definition：

Name	Type	Attribute	Network Address	Description
DO54_1 ~ 8	Boolean	Output	20 ~ 27	I-87054W module digital output: DO
DI54_1 ~ 8	Boolean	Input	30 ~ 37	I-87054W module digital input: DI
To_Set_date	Boolean	Internal	68	Triggered to set the new date (from HMI)
To_Set_time	Boolean	Internal	69	Triggered to set the new time (from HMI)
Year1 Month1 date1 Weekday1 Hour1 Minute1 sec1	Integer	Internal	1 ~ 7	Read the date/time values from system to show on the HMI
Year2 Month2 date2 Hour2 Minute2 sec2	Integer	Internal	61 ~ 63 64 ~ 67	Receive the date/time setting values from HMI to write the new date/time values to the system. (Weekday value is provided by system, so there is no Weekday2, just Weekday1 only.)
AI_14_0 ~ 7	Integer	Input	No	I-87017RW Analog input: AI. Before converting.
AI_14_0c~7c	Real	Internal	40 ~ 55	I-87017RW AI Analog input: AI. After converting to Real.

I/O Connection：

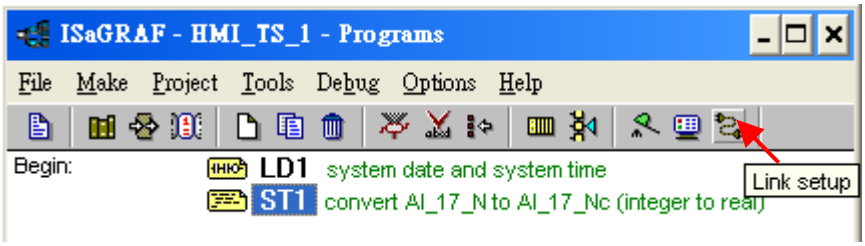


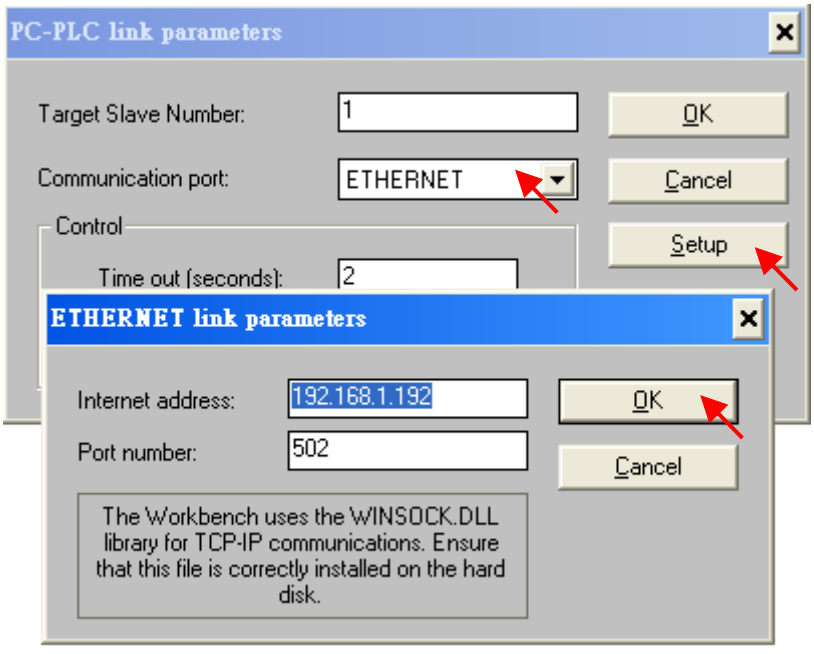
1.3.3 Download the ISaGRAF Project to the XP-8xx7-CE6

1. Link Setup – Setting the Ethernet communication between PC and PAC

Click “Link setup”. Then select “ETHERNET” option. Click “Setup” to set the XPAC’s IP address and Port number 502.

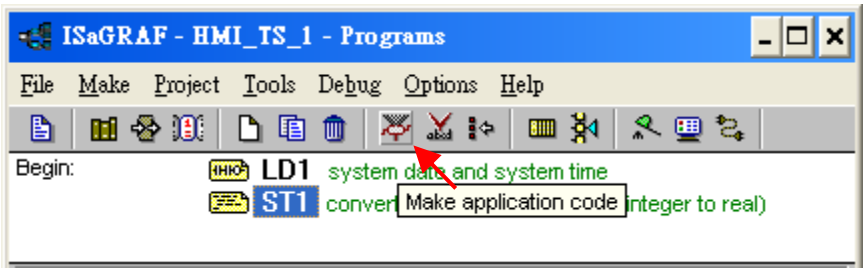
If you use RS-232 to download the ISaGRAF program, please refer to section 4.3 of XP-8xx7-CE6 Getting Started .





2. Make Application – Compile the program

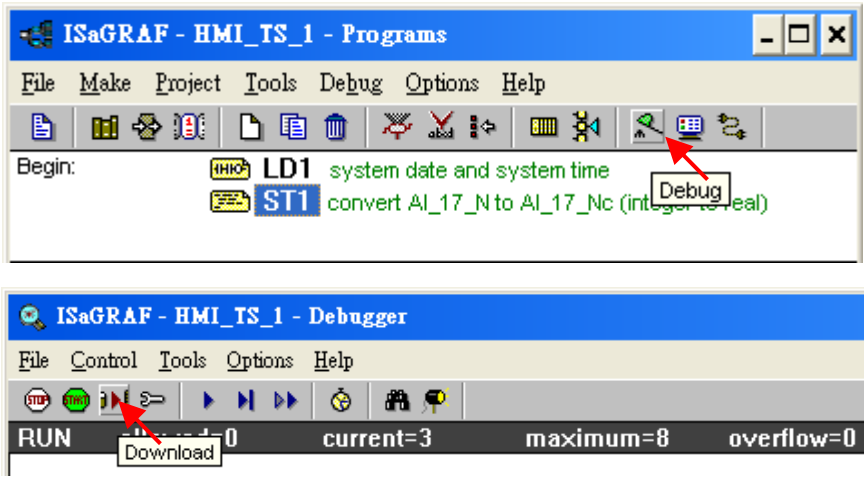
Click “Make application code” of Programs window.



3. Debug → Download – Download the ISaGRAF project to XPAC

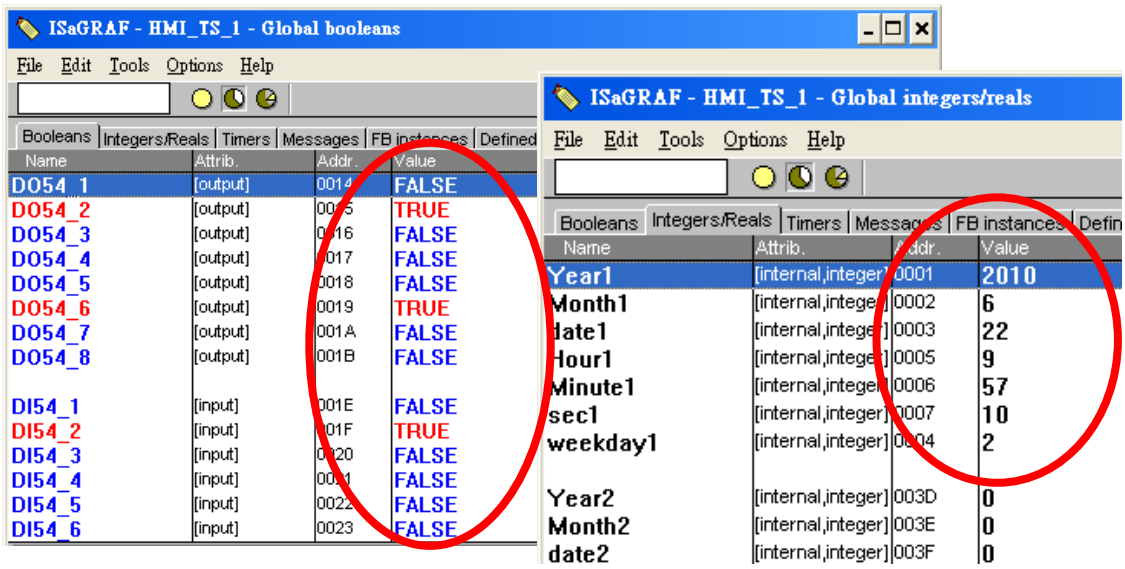
Click “Debug” and then “Download”.

If there is a program running in XPAC already, click “Stop”, then click “Download” again.



4. Test by ISaGRAF

In “Debug” mode, it can be tested in the “Dictionary” window (Can be test in the “I/O connection”, LD1 program windows also.). Close the “Debugger” window after testing.



1.4 HMI webpage in the example

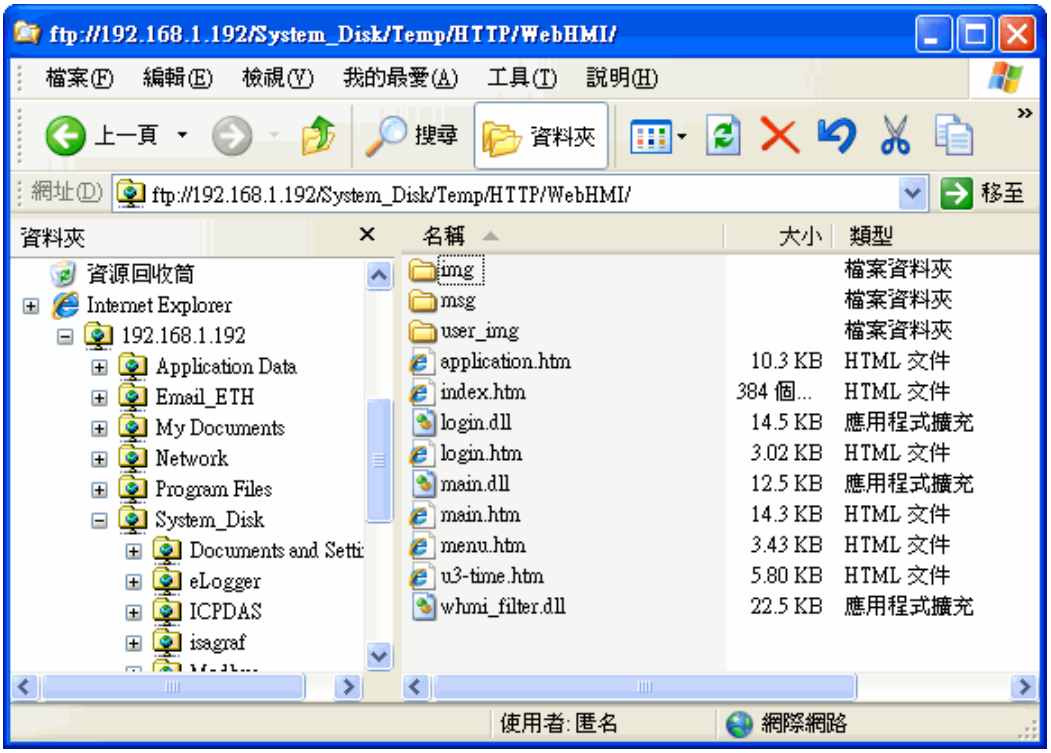
The HMI webpage in this example and XP-8xx7-CE6 getting started are edited by "Microsoft Office FrontPage 2003" software (or later version), you can choose your familiar webpage software to design your Web HMI.

Please make sure you have downloaded and decompressed all the FAQ-124 files following the steps in section 1.1. Now you have the **Web HMI example files: "xphmi_t1" folder**.

1.4.1 Download the Web HMI files to the controller

1. Copy all files in the "xphmi_t1" folder to the controller via ftp

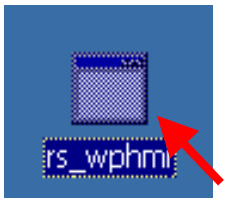
Run "My Documents" on PC, enter your controller IP to the Address column "ftp://Your PAC IP", ex: ftp://192.168.1.192 , it's the same IP you set up in section 1.2.3 for XP-8xx7-CE6. Then switch to the "**System_Disk/Temp/HTTP/WebHMI/"** directory, copy all files in the "**xphmi_t1"** folder to it.



You can check the files under the directory "**\SystemDisk\Temp\HTTP\WebHMI\"** in the XP-8xx7-CE6.

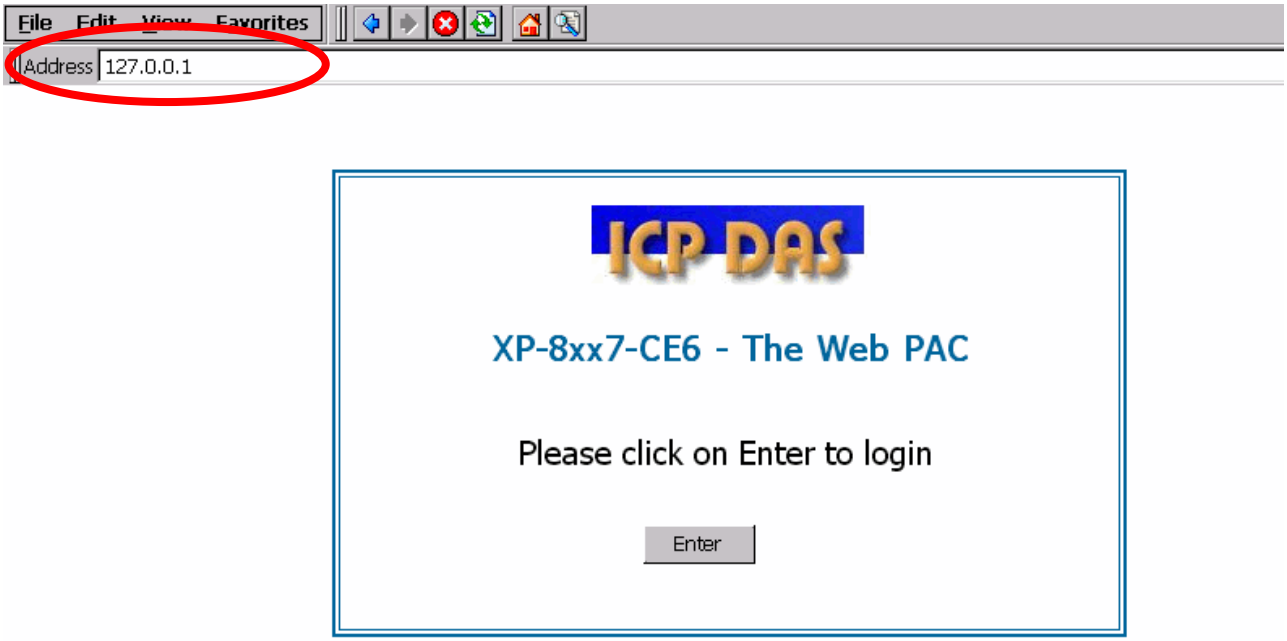
2 Run the "rs_wphmi" in the desktop of the controller

Each time updating the HMI files, you have to run the "**rs_wphmi"** program again. Please double click the "**rs_wphmi"** icon on the VGA monitor of the XP-8xx7-CE6.

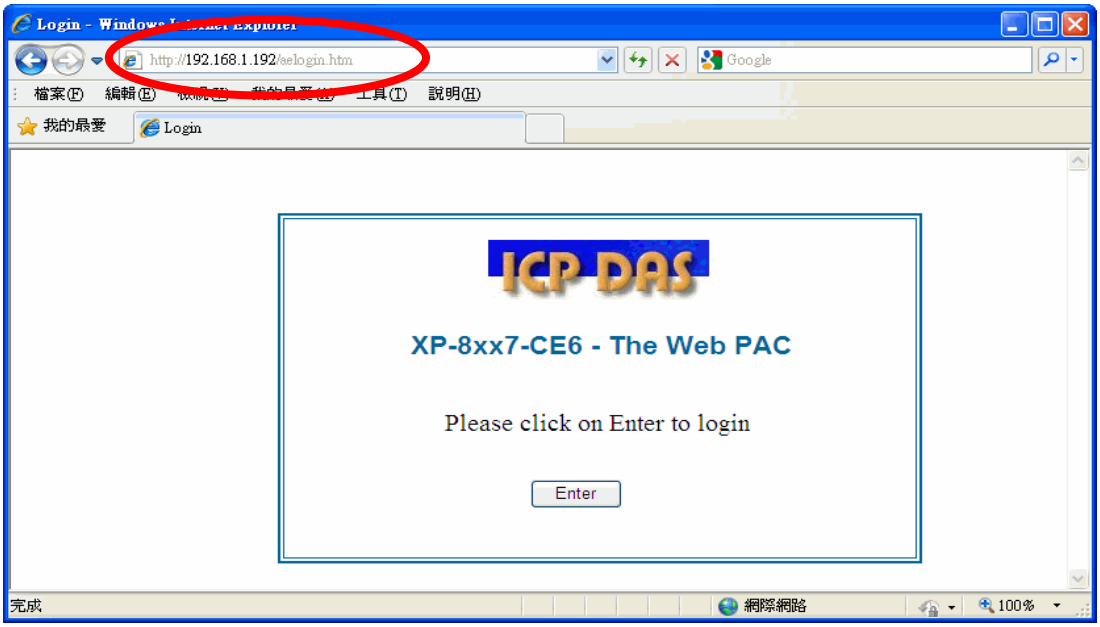


1.4.2 Show Time for Web HMI

If you are using XP-8xx7-CE6-PRO, the professional version ISaGRAF XPAC, you can run the Internet Explorer in the XPAC directly, and just enter the XP-8xx7-CE6-PRO local address "**127.0.0.1**" , the welcome page of this example Web HMI will show up.



If you are not using XP-8xx7-CE6-PRO, the professional version ISaGRAF XPAC, you have to enter the web HMI via the web browser in a PC, and then key in your XP-8xx7-CE6 IP in the Address column to login the welcome page of Web HMI.



From XP-8xx7-CE6-PRO or PC, please click "Enter", and then key in the username and password you setting in the section 1.2.3 to enter the Web HMI.

1.4.3 Web HMI files Descriptions

The basic Web HMI files and user-defined files in this example (The basic files include 4 htm files, 3 DLL files and 2 folders) :

Type	Basic File/Folder	Description
4 htm files	index.htm	The first default page. DO 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.
	login.htm	The Web HMI welcome page
	main.htm	The first page when successfully login. In this example, it's the I/O modules monitor/control page with I-87054W & I-87017RW lamps.
	menu.htm	The page-menu page, normally on the left on the Internet Explorer, such as this example.
3 DLL files	login.dll	
	main.dll	
	whmi_filter.dll	
2 folders	./img/	default provided image files - *.jpg , *.bmp , *.gif
	./msg/	default message files – wincon.js & xxerror.htm
Type	**User-defined file/folder**	**Description**
folder	./user_img/	Put user own image files into this folder. In this example, there are many images and animations for lamps, devices…
folder	./user_msg/	Put user-defined javascript file or css file into this folder.
htm file	Level3 webpage In this example: u3-time.htm	With "u3-" appears in front of the htm file name, ex: "u3-time.htm" in this example is for setting new system date/time, only with High priority username/password can login the Level3 webpage. (Refer to section 1.2.3 for setting username/password)
htm file	Level2 webpage	With "u2-" appears in front of the htm file name, ex: "u2-Page4.htm". Only with High and Middle priority username/password can login the Level2 webpage. (Refer to section 1.2.3 for setting username/password)
htm file	Level1 webpage In this example: application.htm	The page name without "u2-" or "u3-" appears in front and be a valid html file name, ex: "main.htm"; In this example, "application.htm" is a case application. User can change the background and monitor/control images to your own images or buttons for your design. Any user successfully login can access to Level1 page, include low/middle/high priority username/password. (Refer to section 1.2.3 for setting username/password)

The steps to design the Web HMI:

1. Edit the Web HMI pages by your familiar webpage software.

   Please **NOTE** some languages or HTML tags are not supported:
   1. The Web HMI only supports the basic HTML tags. It doesn't support ASP, PHP or JSP or other Page Server language.
   2. Please do not use <frameset> </frameset> , <frame> </frame> in the Web HMI.
   3. The object name, object ID, code, variable name and function name is case sensitive. For example, refresh_data( ) and Refresh_data( ) is different.

   Please refer to the Notes in the Ch-5 of XP-8xx7-CE6 Getting Started for detail information.

2. Add the suitable tags of ISaGRAF Network Address No. to the monitor/control image or text in the webpage

   The different tags are used for different properties and control/monitor functions. Through the I/O Network Address No. set in the ISaGRAF project to connect the Web HMI and the program, and more to control/monitor the I/O modules and devices.

3. Download the Web HMI files from PC to XP-8xx7-CE6 via FTP

   Follow the steps in section 1.4.1 and 1.4.2 .

For more Web HMI demo examples and detail designing descriptions, please refer to the CHAP. 3~5 of XP-8xx7-CE6 Getting Started . This getting started can be also found in the XP-8xx7-CE6 **CD : cd/xp-8xx7-ce6/napdos/isagraf/xp-8xx7-ce6/english-manu/** .