How to automatically synchronize the time of XP-8xx7-CE6 / WP-8xx7 / VP-2xW7 over a network?

XP-8xx7-CE6, WP-8xx7 and VP-2xW7 support SNTP (Simple Network Time Protocol) Client for Network Time Synchronization. The available versions of the OS image and Utility for SNTP Network Time Synchronization are listed below.

The available versions of the OS image and Utility files

The SNTP Network Time Synchronization is supported since the following versions:

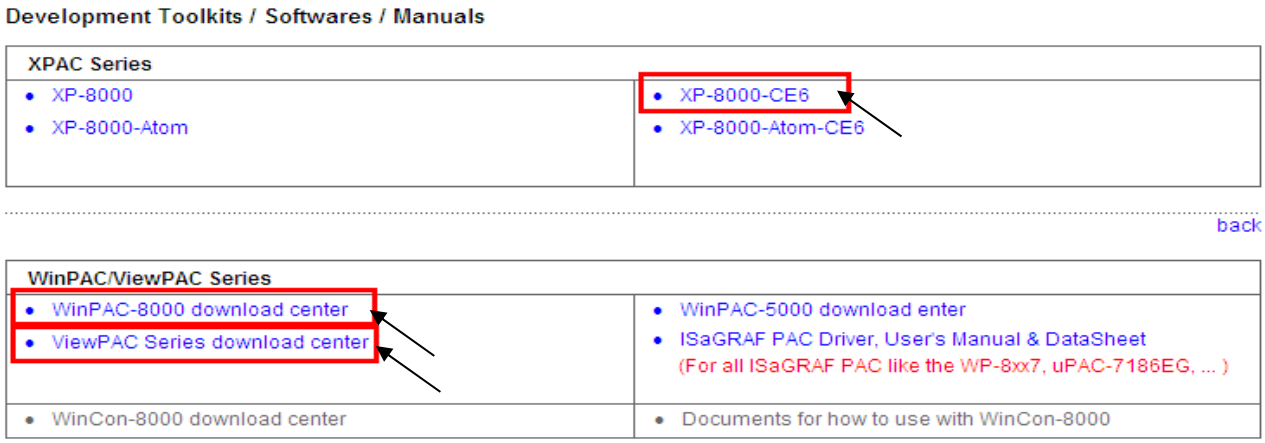
PAC Series	Model	OS image Version	Utility Version
XPAC	XP-8xxx-CE6	Ver.1.3.2.0	XPAC Utility 1.0.2.3
WinPAC	WP-8x3x	Ver.1.2.0.3	WinPAC Utility 2.0.2.0
WinPAC	WP-8x4x	Ver.1.6.0.0	WinPAC Utility 2.0.1.5
ViewPAC	VP-23Wx	Ver.1.1.0.2	ViewPAC Utility 2.0.1.6
ViewPAC	VP-25Wx	Ver.2.0.0.1	ViewPAC Utility 2.0.2.0

Steps to setup the SNTP Client Network Time Synchronization

1. Check OS image version (download new version first and update it as Ch.1.1)
2. Check Utility version (download new version first and update it as Ch.1.2)
3. Setup the SNTP time synchronization (if above version is available, go to Ch.1.3)

Download Center

If it is not available version, please download the newest OS image or Utility at:
https://www.icpdas.com/en/download/index.php?kind=23
According to your PAC to click on "XP-8000-CE6", "WinPAC-8000 download center" or “ViewPAC Series download center”, and download the suitable OS image or Utility.



The setting steps for the XPAC, WinPAC and ViewPAC are similar. In the next section, we use the WP-8x47 as an example to show how to set up the WP-8x47 as a SNTP Client for Network Time Synchronization and how to test it after setting up.

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Setting up WP-8x47 as an SNTP Client for Network Time Synchronization

1.1. The steps to update the WP-8x47 OS image

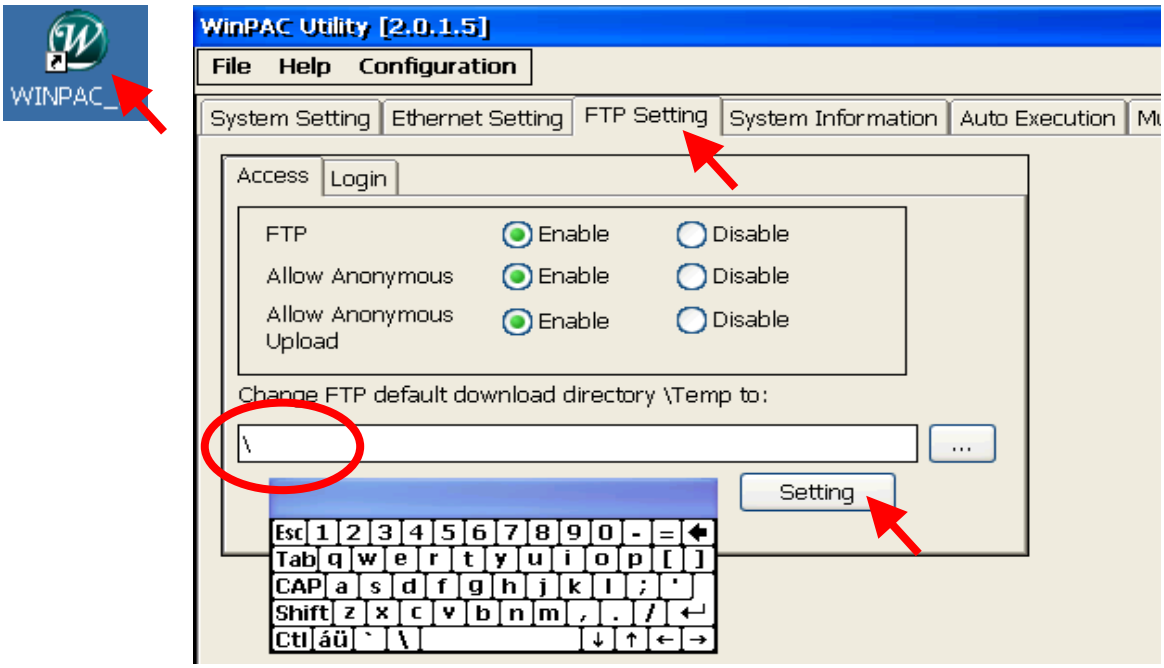
There are two ways to update the WinPAC OS:
1. Update from file: copy the package file (.exe) into the WinPAC and install on WinPAC (easier);
2. Update from Eshell tool program.

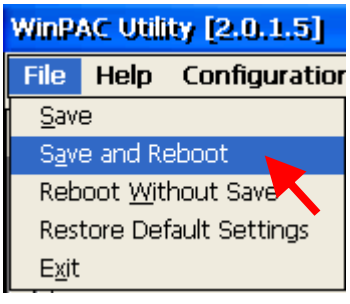
Here we use the first method: copy the package file (.exe) into the WinPAC to run the installation.

Please refer to the following website for the other method information:
http://www.icpdas.com/en/download/show.php?num=2065&model=WP-8121-CE7

1. Set up the root folder as the WP-8x47 FTP directory for easy updating

Run the WINPAC_Utility on the WinPAC desktop to set up the FTP Setting. When finishing, click [File] > [Save and Reboot] to restart the WP-8x47.

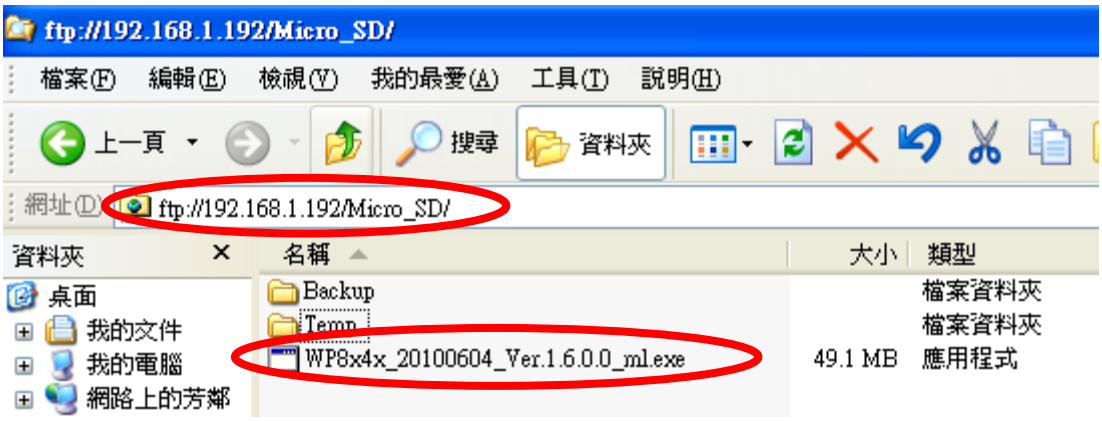




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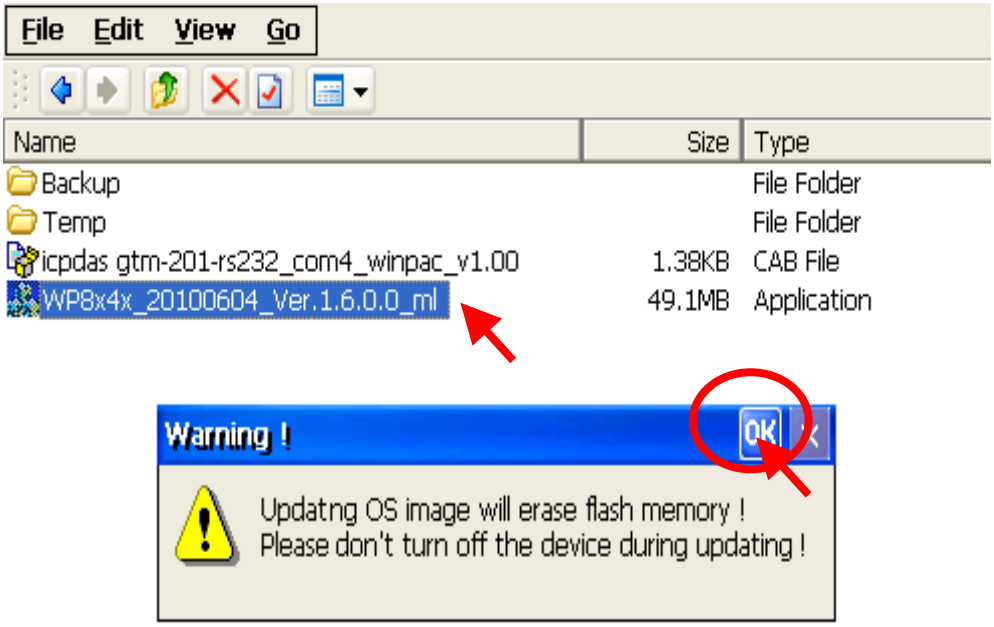
2. Copy the OS image file to the folder "Micro_SD" of the WP-8x47 PAC

On the PC, run the "Windows Explorer" and key in the FTP IP address of the WP-8x47 in the web address column, Ex: ftp://192.168.1.192/ , please enter your WP-8x47's IP address. Change to the folder of "Micro_SD", then copy the OS image file into the PAC.

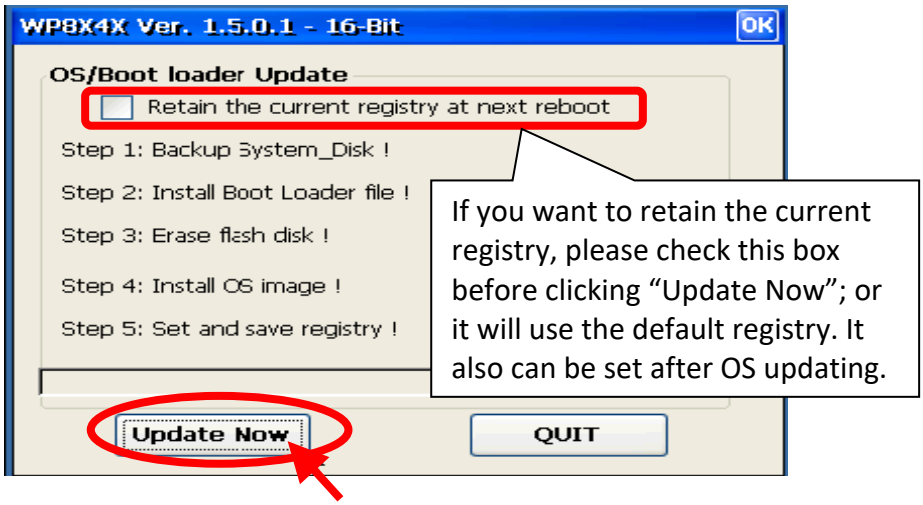


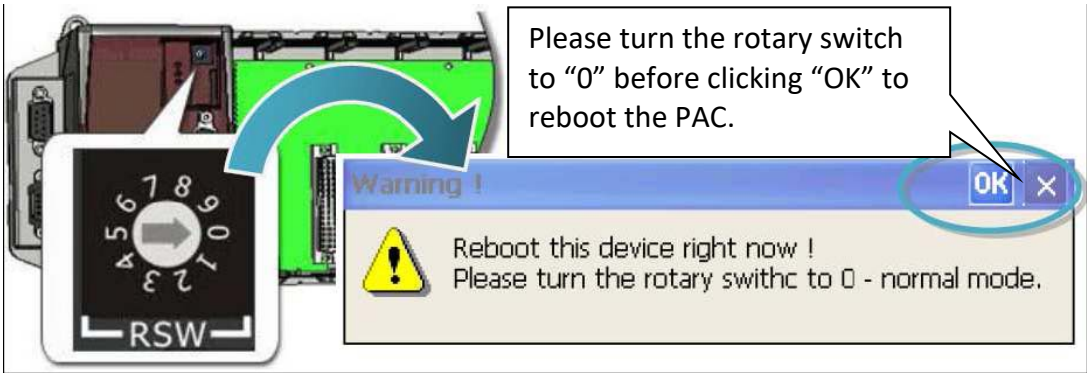
3. Double click the OS image file of WP-8x47:

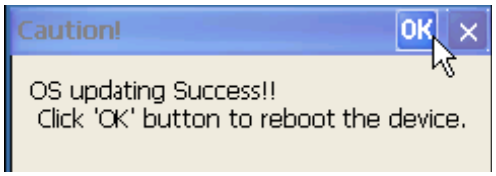
http://www.icpdas.com/en/download/show.php?num=2070&nation=US&kind1=6&kind2=17&model=&kw=OS+image+



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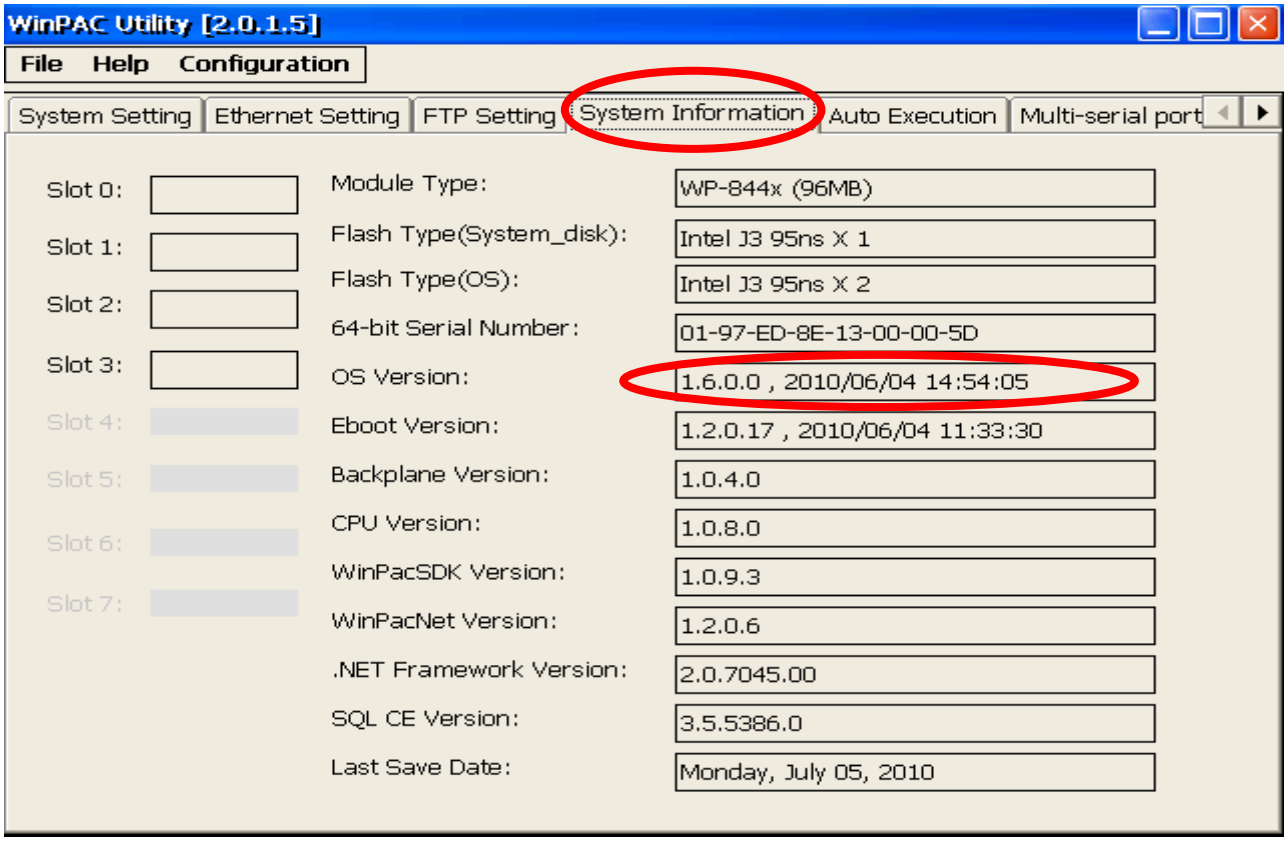


NOTE: If using ViewPAC, after updating the OS, please reboot the ViewPAC twice, let it format the Flash disk automatically. If not, please run “Control panel” > “Storage Manager” to format manually.

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1.2 The steps to update the WinPAC Utility

1. On WP-8x47 desktop, run the "WinPAC_Utility" to check the WinPAC new OS version.



2. If not, Download the WinPAC_Utility.zip and decompress the file into a folder
http://www.icpdas.com/en/download/show.php?num=2489&nation=US&kind1=&model=&kw=wince5

3. Copy the decompressed folder into the WinPAC under the directory **"\System_Disk\tools\"**
(refer to Section 1.1 for the ftp method)

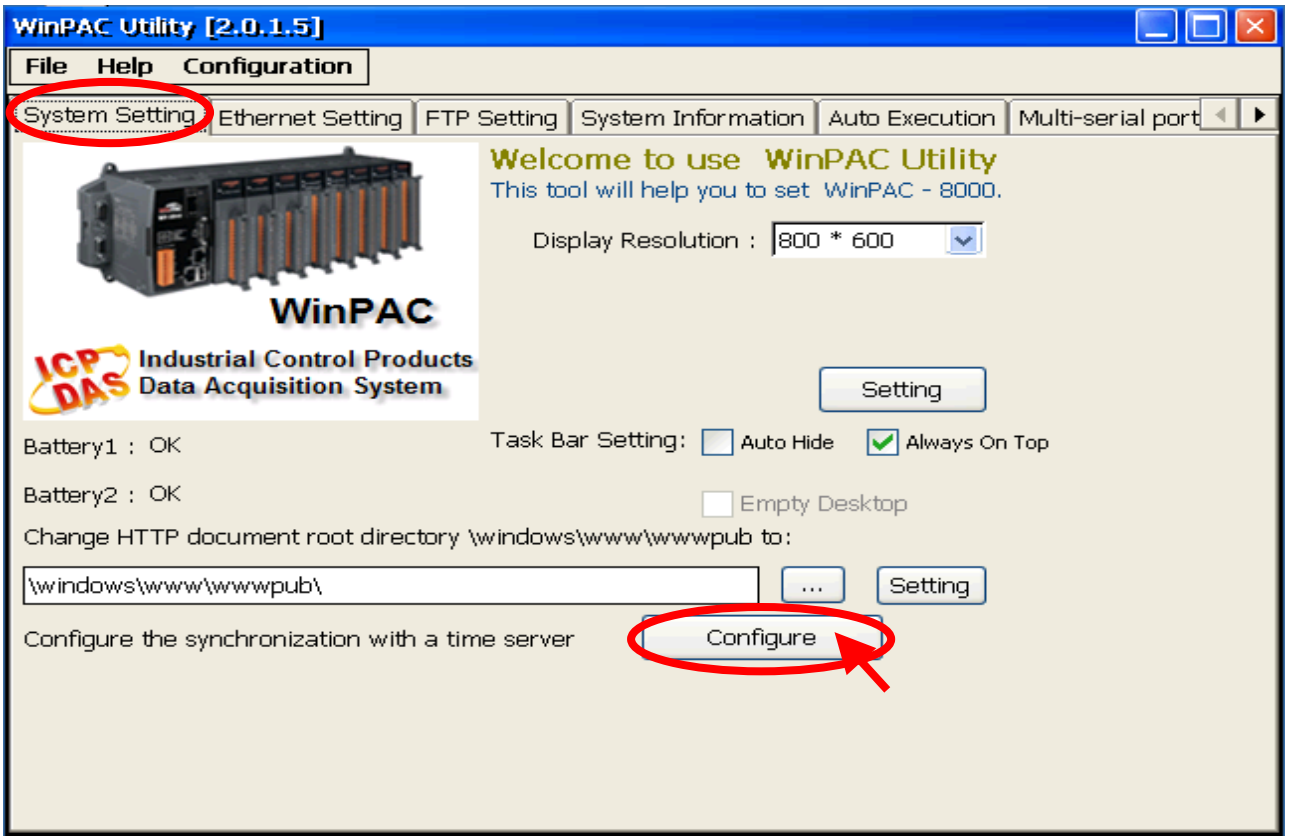
4. Run the WINPAC_Utility on the WinPAC desktop. Now it's the new version WinPAC Utility.



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1.3 Set up the WinPAC as an SNTP Client for the SNTP network time synchronization

Run the WinPAC Utility. Select “System Setting” tab and click the “Configure” button to open the “Internet Time” setting window.



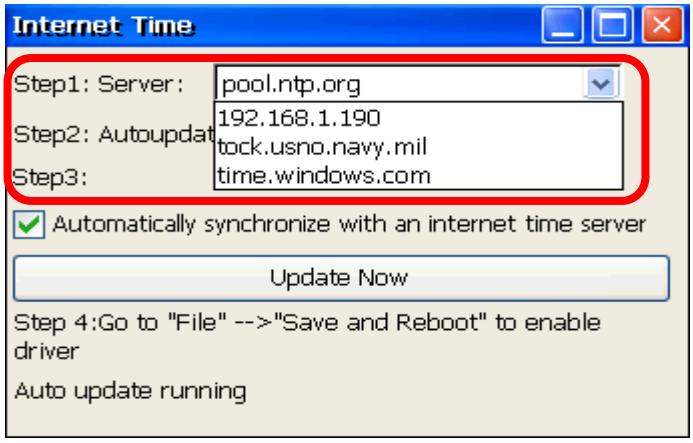
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STEP 1 : Assign an internet NTP Server

The WinPAC Utility lists some NTP Server IP addresses (as the picture below), user can select the suitable one as the NTP Server to synchronize the time.

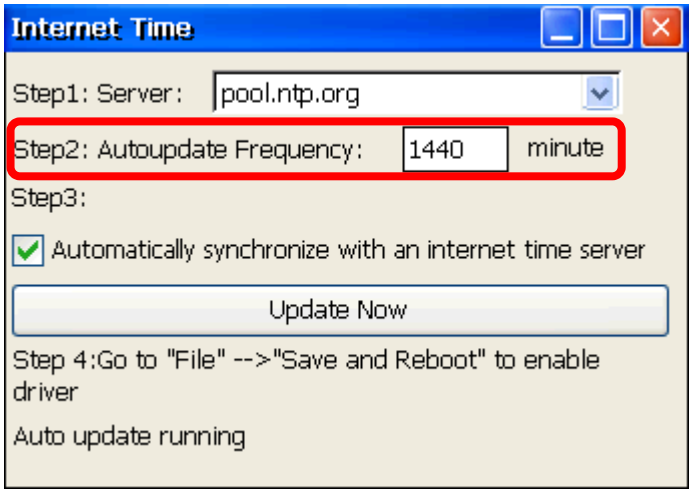
If user wants to use his own PC as the NTP Server to be synchronized by the controller, please key in that PC's IP address (Must be a fixed IP), and that PC must be set up as a Time Server. For the information about setting a PC as a NTP Server, please refer to the next section (Section 1.4).

If the assigned NTP Server for time synchronization is over the Internet in a different network domain, the user has to set up the "Default Gateway" for the WinPAC controller. Please refer to the Section 1.5 for the setup information.



STEP 2 : Assign the auto-update frequency

The unit for the update frequency time is minute. If setting to update once a day (24 hours), please enter 1440 minutes. The minimum update frequency is 5 minutes.

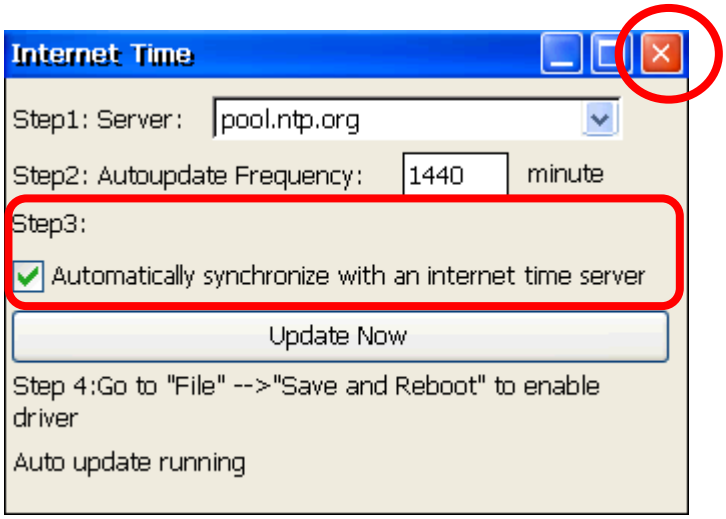


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STEP 3 : Check the box for automatically synchronization

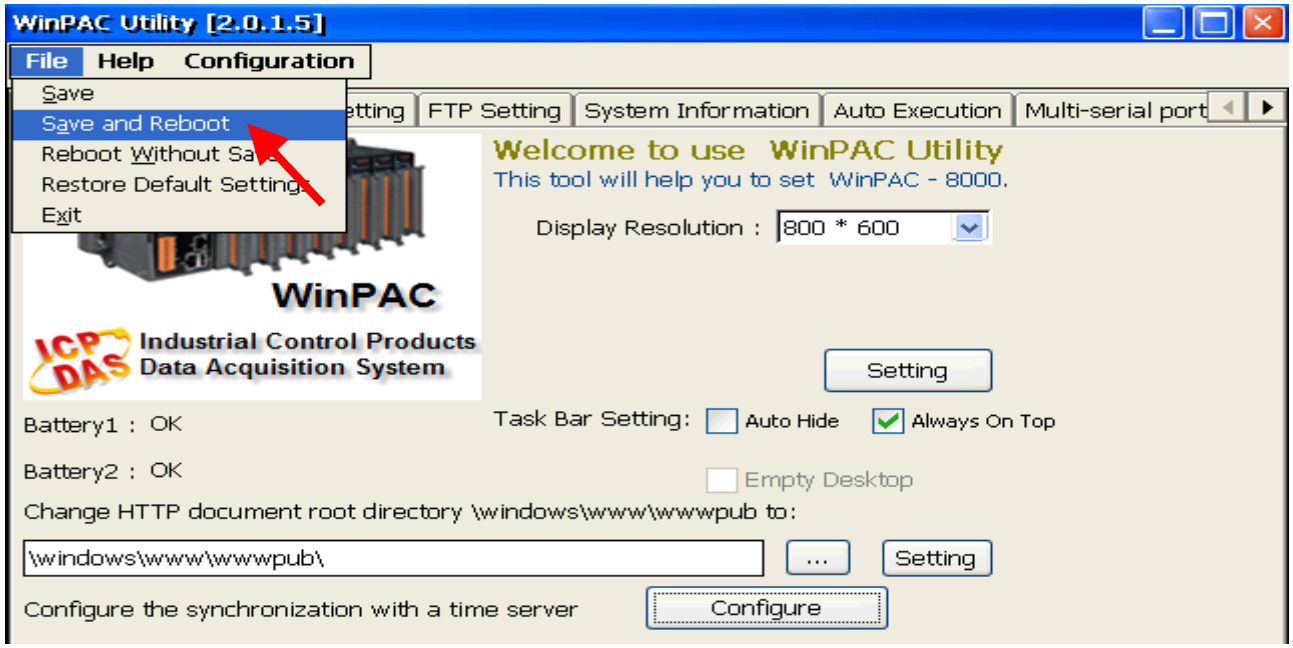
1. Check the box for automatically synchronizing with the internet time server set above (Step1). If uncheck the box, that will stop the SNTP network time synchronization function for the PAC.

2. Click “Update Now” to update the setting, and then close the window.



STEP 4 : Save and reboot the controller

Select [File] > [Save and Reboot] of the WinPAC Utility to save the setting and restart the controller. After restarting, the WinPAC will automatically synchronize with the internet time server and update frequently as the setting.

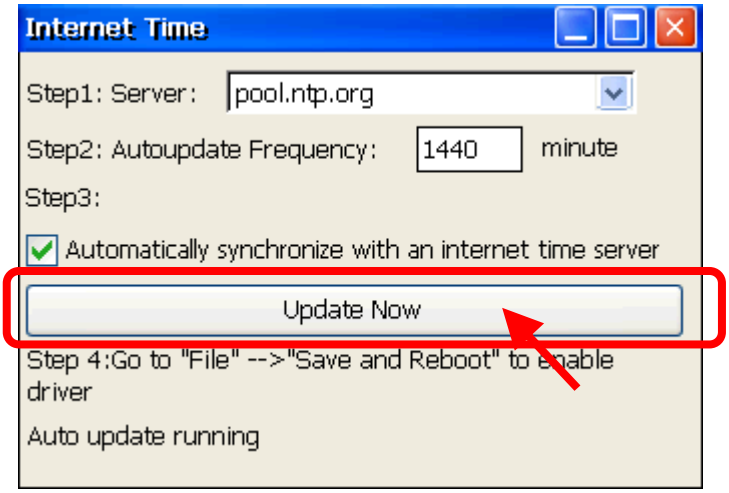


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STEP 5 : After rebooting, test the SNTP Automatically Synchronize

After rebooting, the service for automatically synchronizing with the internet time server will execute and update the system time after connecting to the internet.

If you need to update the time immediately, please click ”Update Now” button to update the system time immediately.



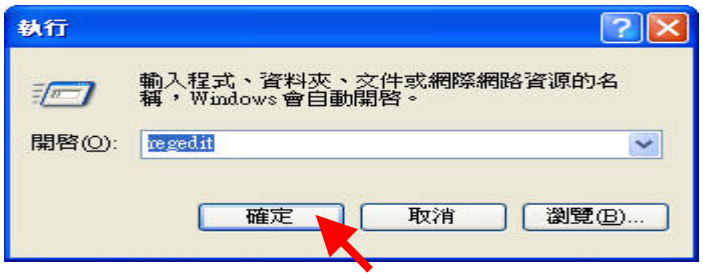
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1.4 How to set up a Windows XP PC as the SNTP Server to test the WinPAC SNTP Client

Prepare a Windows XP PC for the WinPAC SNTP client to synchronize the time.

STEP 1 : Enable and set up the NTP Server of Windows XP PC

1. Run "Registry Editor"
   On PC, select [Start] > [Run] and enter " regedit ", then click "OK".

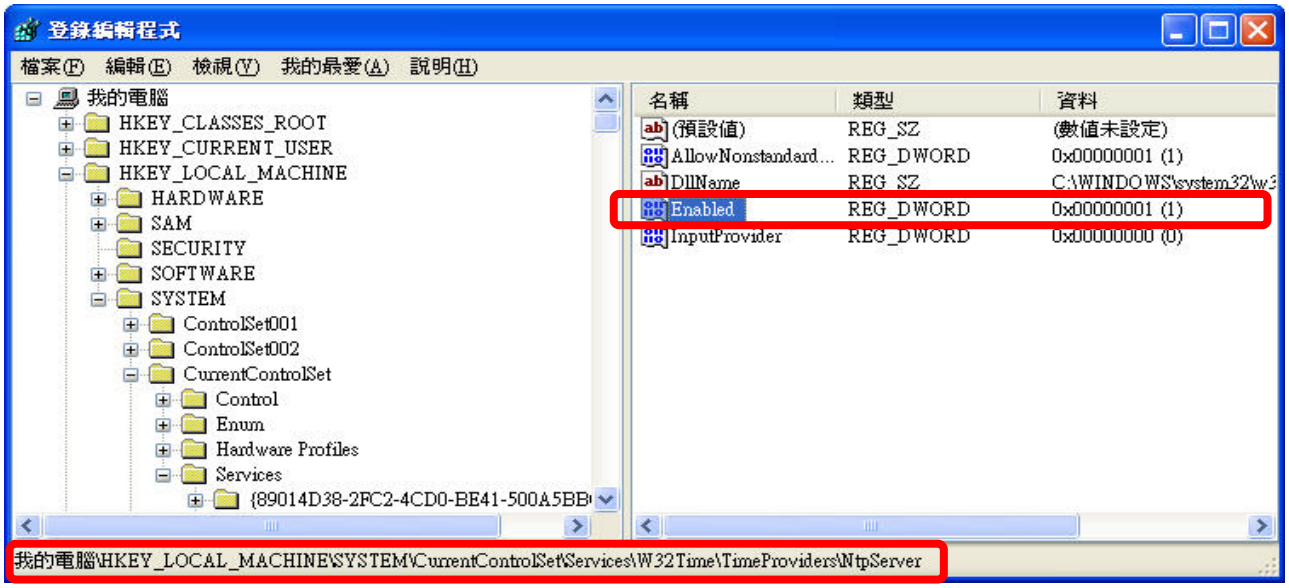


2. Enable NTP Server

   The NTP Server in a normal Windows XP PC is default enabled.

   Left window:
   Please change to the following directory.
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpServer\

   Right window:
   The most right "Data" number of "**Enabled**" is (1). It means the NTP Server is enabled.
   If it is (0), it means the NTP Server is disabled. Please right click "Enabled", select "Modify".
   Change "Value" to become "**1**", and then click "OK".

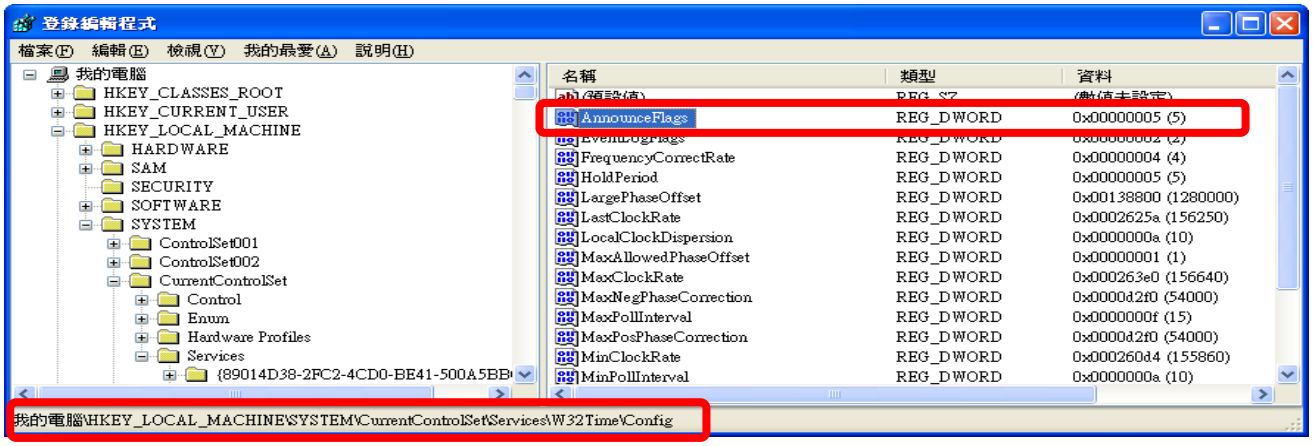


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3. Set the Windows time to use the internal hardware clock

Left window:
Please change to the following directory.
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config\

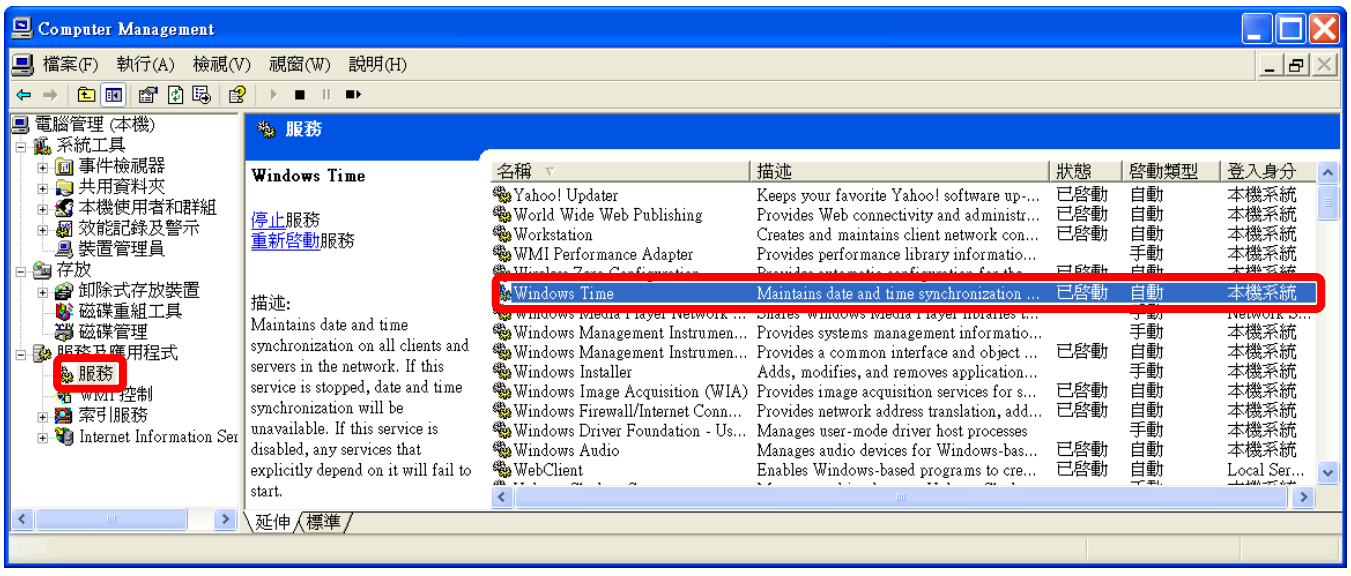
Right window:
Please right click "**AnnounceFlags**", select "Modify".
Change "Value" to become "**5**", and then click "OK". Exit the "Registry Editor".



STEP 2 : Restart Windows Time Service

1. On Windows XP PC Desktop, click [Start] > [Run]
2. Enter "**net stop w32time && net start w32time**", then click "OK".

User also can operate by mouse in the window. Please right click [My Computer] > left click [Computer Management] > [Service] > double click [Windows Time] to stop/start the "Windows Time Service", and set it to "Automatically".

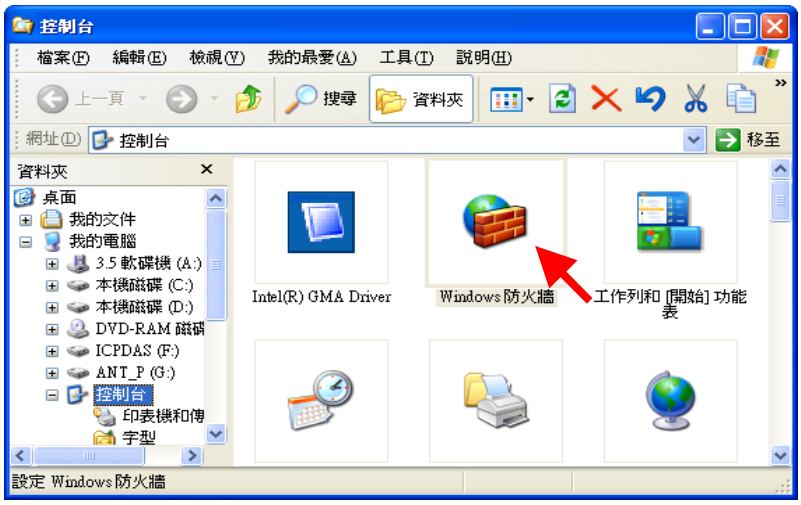


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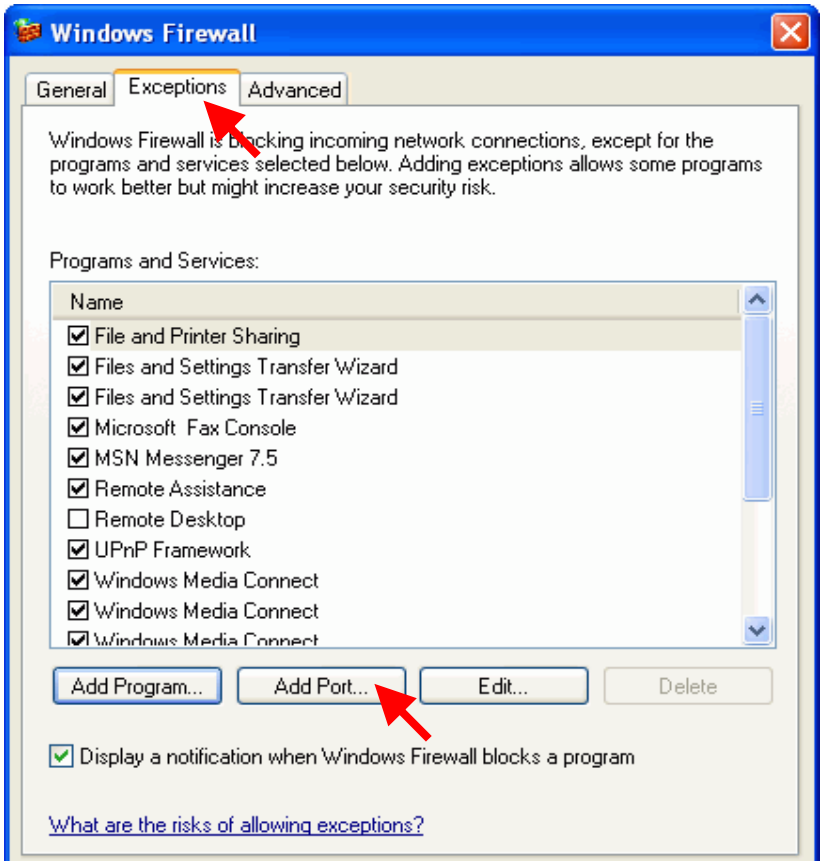
STEP 3 : About the Windows Firewall

If the Windows Firewall is enabled in the communication, the user needs to open the UDP123 communication port.

1. In Windows XP, select [Start] > [Control Panel] > [Windows Firewall]



2. On the “Exceptions” tab, click “Add Port…”.



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3. Give a name “NTP Server”, set up the port number “123” and select “UDP”. Click “OK” to exit.



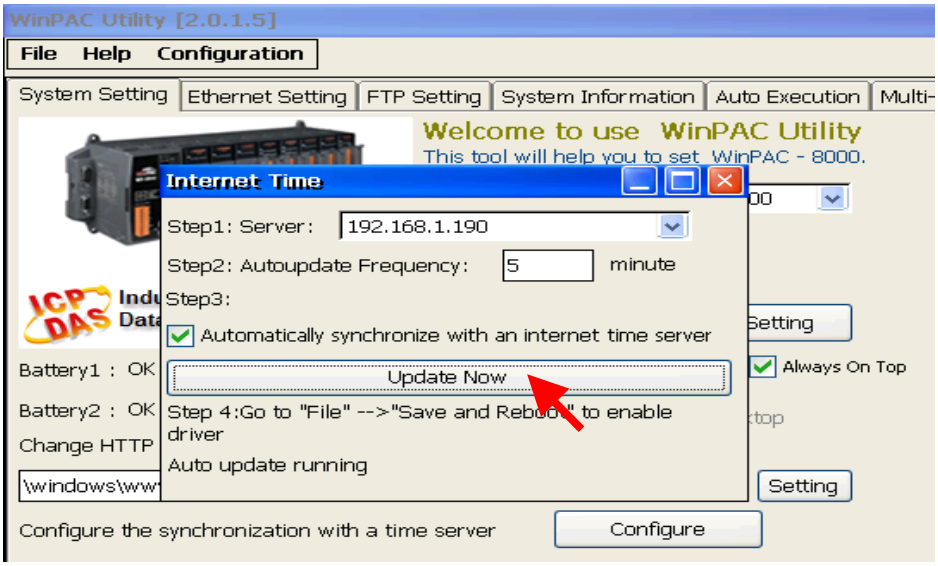
STEP 4 : Assign the fixed IP address to the Time Service PC

As the Time Service computer of the network time synchronization for the WP-8x47, the PC must use the fixed IP, and must has the same IP address as the IP assigned in setting the Server of WP-8x47. Only when the setting is the same, the Server and the Client can communicate with each other to achieve the network time synchronization.

For instance, in this example, the SNTP Server is set a fixed IP address, “192.168.1.190”; therefore, the assigned IP in setting WinPAC the client’s server is the same as “192.168.1.190”.

STEP 5 : Testing

After setting SNTP Server, we can test with the SNTP Client – WP-8x47. Please refer to the Section 1.3, the setting IP of “Server” column must be the IP of this Server PC and then test WP-8x47.



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1.5 How to set up the Gateway, IP and DNS Server for PAC

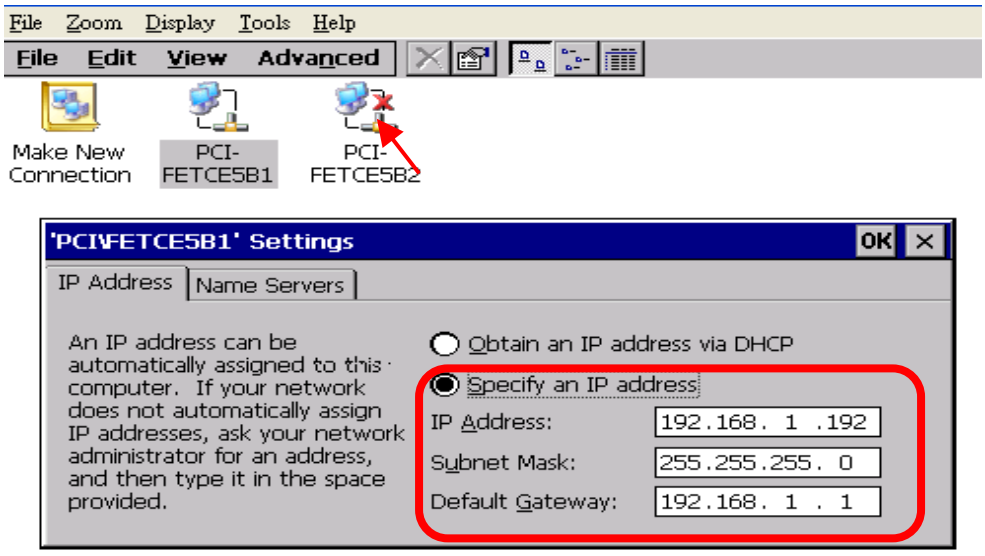
If the PAC's SNTP Client is synchronizing the time with the Time Server over the Internet in a different network domain, the user has to set up the "Default Gateway" and "DNS Server" for the controller.

The Steps: ** Using the XPAC as the example

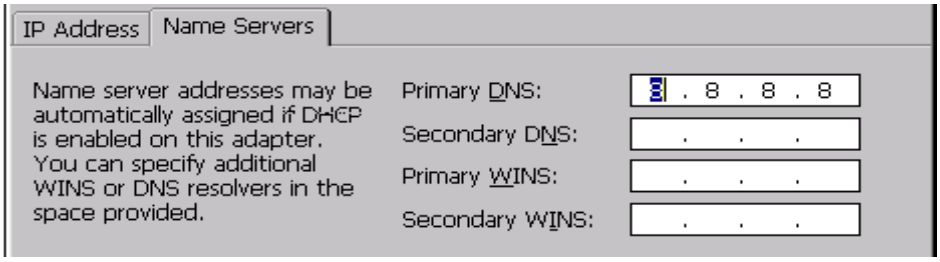
1. On the desktop of WinPAC, click [Start] > [Settings] > [Network and Dual-up Connections]

2. Double click [PCI-FETCE581] (XPAC's LAN1) to open the LAN1 setting window.
   Double click [PCI-FETCE582] can setup LAN2. For normal setting, one LAN is enough.

3. The PAC's IP and "Default Gateway" can be set here. Please set up your "Default Gateway" according to your PAC, in this example: 192.168.1.1. (ISaGRAF application must use the fixed IP address, no DHCP accepted. If the LAN2 is enabled, please set it as a fixed IP also.)



4. Click "Name Servers" page to set the "Primary DNS". The DNS Server address of Google is "8.8.8.8", and the DNS Server address of Chunghwa Telecom Co., Ltd. is "168.95.1.1". You can fill a suitable address for your PAC.



After setting up, click "OK" and restart the controller.

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