

WinPAC-5000 User Manual (WinCE Based, eVC & .net)

Version 1.0.2, December 2010



Service and usage information for

WinPAC-5141

WinPAC-5441

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1. Introduction



WinPAC-5000 Series is the new generation PAC (Programmable Automation Controller). It is equipped a PXA270 CPU (520 MHz) running a Windows CE.NET 5.0 operating system, various connectivity (VGA, USB, Ethernet, RS-232/485) and I/O expansion bus.

The WinPAC-5000 series has many advantages, including hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level, achievable deterministic control and low cost. Using Windows CE.NET 5.0 gives it the ability to run PC-based control software such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, SoftPLC ...etc. It give users all of the best features of both traditional PLCs and Windows capable PCs.

For hardware expansion, it also supports an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as D/I, D/O,A/ D, D/A, Timer/Counter, UART, and other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. But the bus can support only one board. There are more than 10 boards available for WinPAC-5000 series, users can choose one of them to expand hardware features.

1.1. WinPAC-5000 Family

The WinPAC-5000 family is divided into two main types according to Audio port.

- WP-5141 (without Audio port)
- WP-5441 (with Audio port)

For more detailed comparison information, please refer to “1.1.2. WinPAC-5000 Comparison”

1.1.1. WinPAC-5000 Naming Convention

As you examine this manual, you'll notice there are many different models available. Sometimes it is difficult to remember the specifications for any given model.

However, if you take a few minutes to understand the module naming conventions, it may save you some time and confusion. The figure below shows how the module naming conventions work for each WinPAC-5000 model.



1.1.2. WinPAC-5000 Comparison

The following table shows the comparison in all the features of WinPAC-5000 family.

Model	OS	CPU	Flash	SDRAM	Ethernet	VGA Resolution	RS-232/ RS-485	I/O Expansion Bus	Audio Port
WP-5141	CE5.0	PXA270 520 MHz	64 MB	128 MB	2	800 x 600	2	Yes (for XW-board only)	No
WP-5441									Yes

1.2. Features

The key features of WinPAC-5000 include:

► Windows CE.Net 5.0



Microsoft
Windows CE.net

- Supports PC based software: eVC and VS.NET
- Web server, FTP server, Telnet server
- ISaGRAF version for IEC 61131-3 programming
- InduSoft version for SCADA solution

► Local I/O and Communication Expansion Board



WinPAC-5000 series equip an I/O expansion bus to support one optional expansion board, called XW-board. It can be used to implement various I/O functions such as DI, DO, A/D, D/A, Timer/Counter and various communication interface, such as RS-232/422/485, CAN, FRnet, etc.

► Various Memory Expansions

WinPAC-5000 provides various memory storage options, such as EEPROM and microSD. Customers can choose the memory based on their characteristics.



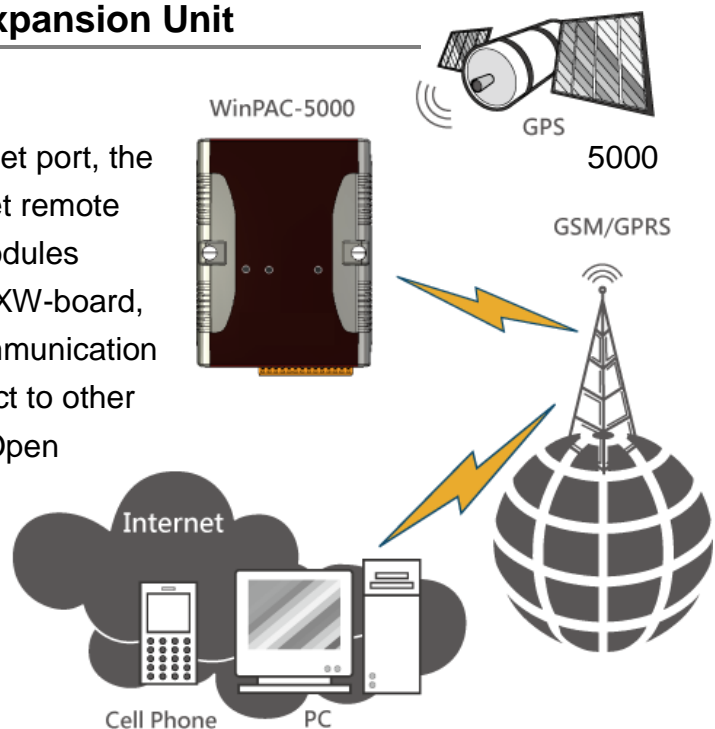
- 16 KB EEPROM: to store not frequently changed parameters.
- microSD/microSDHC: to implement portable data logging applications.

► Unique 64-bit Hardware Serial Number to Protect Your Program

A unique 64-bit serial number is assigned to each hardware device to protect your software against piracy.

► Remote I/O Module and Expansion Unit

With the built-in RS-485 and Ethernet port, the series can connect RS-485/Ethernet remote I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). With an XW-board, the 5000 series can have more communication ports or different interface to connect to other type of devices, for example: CANOpen devices, DeviceNet devices, or FRnet I/O modules.



► Plastic and Metal Casing

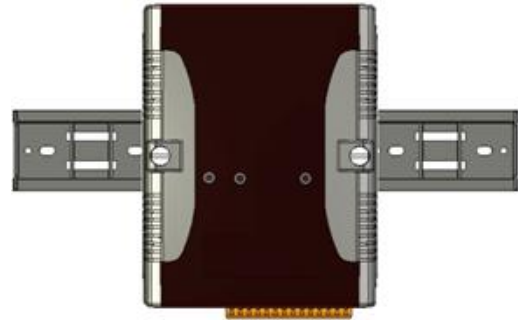
The default case is plastic material, customers can choose metal case if they want.

► Multi-Communication Interface

There are several of communication interfaces to expand I/O and connect to external devices:

► Small and Easy Installation

WinPAC-5000 Series have a palm-size shape (91 mm x 132 mm x 52 mm) to be installed in a narrow space with DIN-Rail.



► Highly Reliable Under Harsh Environment

Our WinPACs operate in a wide range of temperature and humidity.

- Operating Temperature: -25 ~ +75 °C
- Storage Temperature: -40 ~ +80 °C
- Humidity: 5% ~ 95% RH, non-condensing



1.3. Specifications

Models	WP-5141	WP-5441
System Software		
OS	Windows CE 5.0	
.Net Compact Framework	2.0	
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server	
SDK provided	DII for eVC, DII for Visual Studio.Net 2003/2005/2008	
CPU Module		
CPU	PXA270 or compatible (32-bit and 520 MHz)	
SDRAM	128 MB	
Flash	64 MB (32 MB for OS, 32 MB for System_Disk and System Registry)	
EEPROM	16 KB Data Retention: 40 Years; 1,000,000 erase/write cycles	
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 16 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes	
Dual Watchdog Timers	Yes	
LED Indicator	3 LEDs (RUN/PWR, L1 ~ L2; RUN/PWR for status indications, L1 ~ L2 for user programmable)	
Rotary Switch	Yes (0 ~ 9)	
VGA & Communication Ports		
VGA	640 x 480 or 800 x 600	
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 1.1 (client)	1	
USB 1.1 (host)	1	
Audio Port (Microphone-In and Earphone-Out)	-	Yes

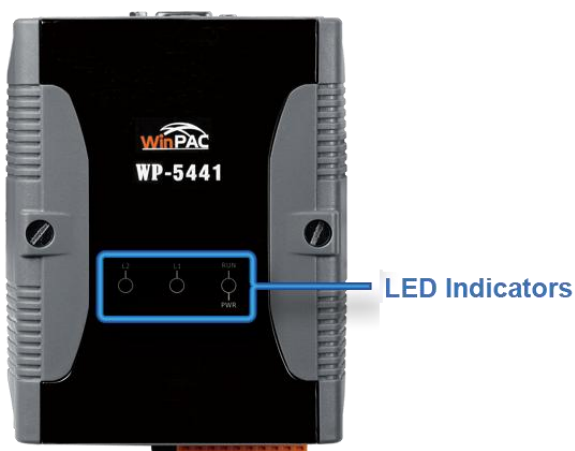
COM1	RS-232 (RxD, TxD and GND); Non-isolated	
COM2	RS-485 (D2+, D2-); 2500 V _{DC} ; isolated	
COM3	RS-232 (RxD, TxD and GND); Non-isolated	
I/O Expansion		
I/O Expansion Bus	Yes, to mount one optional XW-board	
Mechanical		
Dimensions (W x L x H)	91 mm x 132 mm x 52 mm	
Installation	DIN-Rail Mounting	
Environmental		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-30 ~ +80 °C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 V _{DC}	
Isolation	1 kV	
Consumption	4.8 W (0.2 A @ 24 V _{DC})	6 W (0.25 A @ 24 V _{DC})

1.4. Overview

Here is a brief overview of the components and its descriptions for module status.

Front Panel

The front panel includes programmable LED indicators.



► LED Indicators

LED indicators provide a very convenient way of status indications for faster, easier diagnostics.

LED Name	Color (ON State)	Meaning
RUN/PWR	Green	Power is on
	Orange	Power on and OS is running
L1	Green	User programmable control LED
L2	Green	User programmable control LED

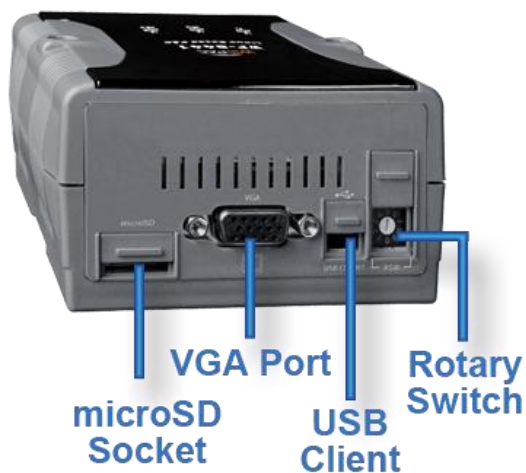
Tips & Warnings



The LED indicators can be programmed with WinPAC API. If do not necessary, do not use RUN that is assigned to the OS-status indicators.

Top Panel

The top panel includes a microSD socket, VGA port, USB client and rotary switch.



► microSD socket

The microSD socket provides an easy way to expand the available storage with a microSD card up to 16 GB maximum.

➤ VGA port

External VGA port provides an easy connection to a monitor or touch panel.

➤ USB Client



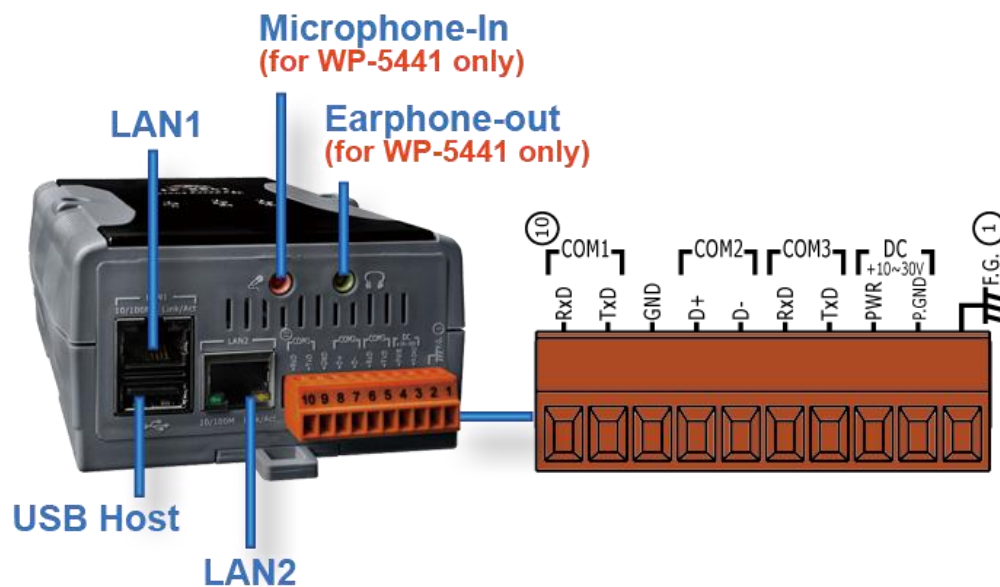
USB Client is used to for ActiveSync application. An accessory USB cable is available to connect the client port with USB mini-B type to USB. Type a plug on a PC for ActiveSync application.

➤ Rotary Switch

The rotary switch is used to select the operating mode. For more information about the operating mode, please refer to section **2.3. Configuring the Boot Mode**.

Bottom Panel

The bottom panel includes a microphone, an earphone, a USB host, a connector and two Ethernet ports



► Microphone-in and Earphone-out (for WP-5441 only)

USB Client provides a fast, flexible networking connection with unmatched ease of installation and use

► Ethernet Port (LAN1 and LAN2)

The Ethernet ports are the opening on WinPAC-5000 network equipments that Ethernet cables plug into. Ethernet ports accept cables with RJ-45 connectors.

➤ USB Host

A USB host controller is a machine with a root hub which allows several input devices to be connected to it, such as mice and keyboards.



➤ Connector

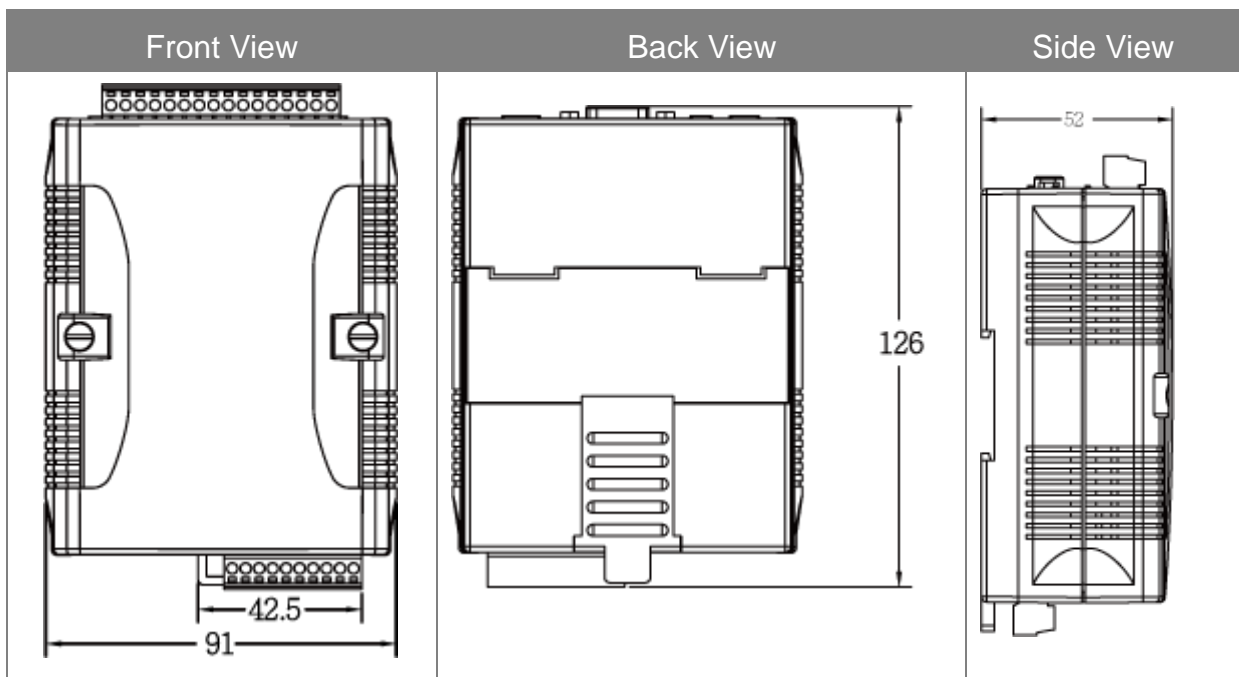
The pin assignments of the connector are as follows:

	Pin	Signal	Description
A diagram of a 10-pin connector, showing a vertical row of ten pins. The pins are numbered 1 through 10 from top to bottom. The connector is shown in a perspective view, with the pins protruding from a rectangular housing.	1	F.G	Frame Ground
	2	GND	Power Input
	3	PWR	
	4	TxD	COM3: RS-232
	5	RxD	
	6	D-	COM2: RS-485
	7	D+	
	8	GND	COM1: RS-232
	9	TxD	
	10	RxD	

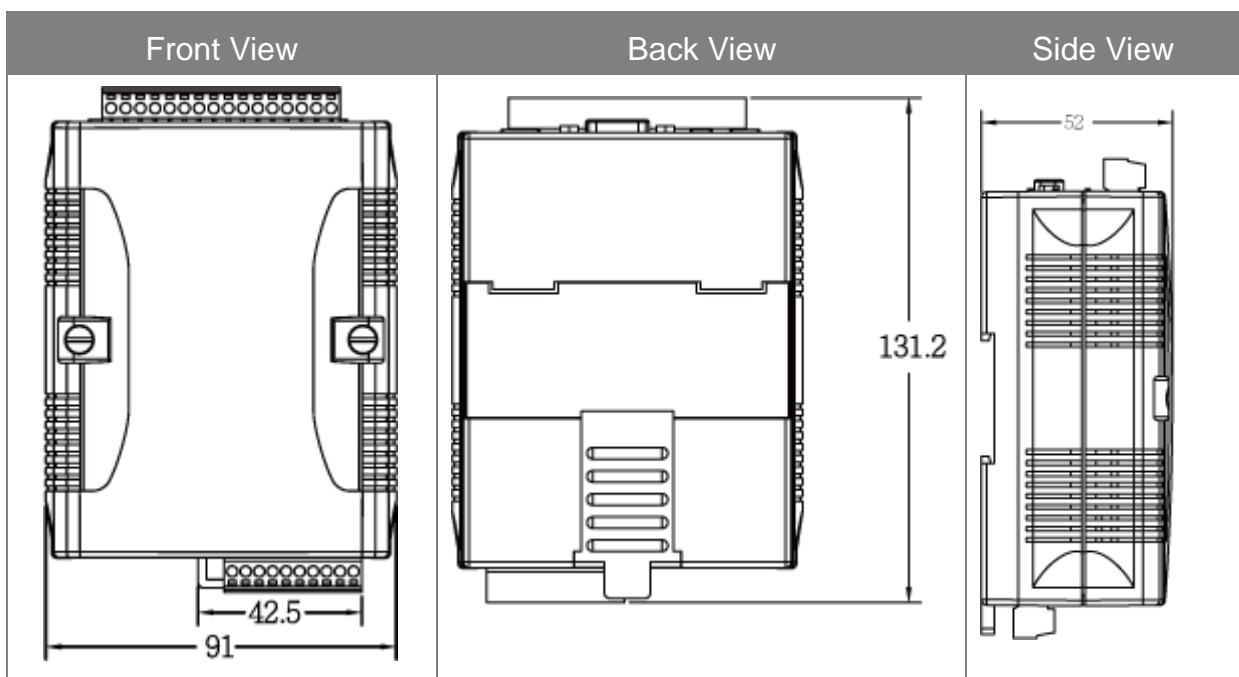
1.5. Dimension

All dimensions are in millimeters.

► WP-5000

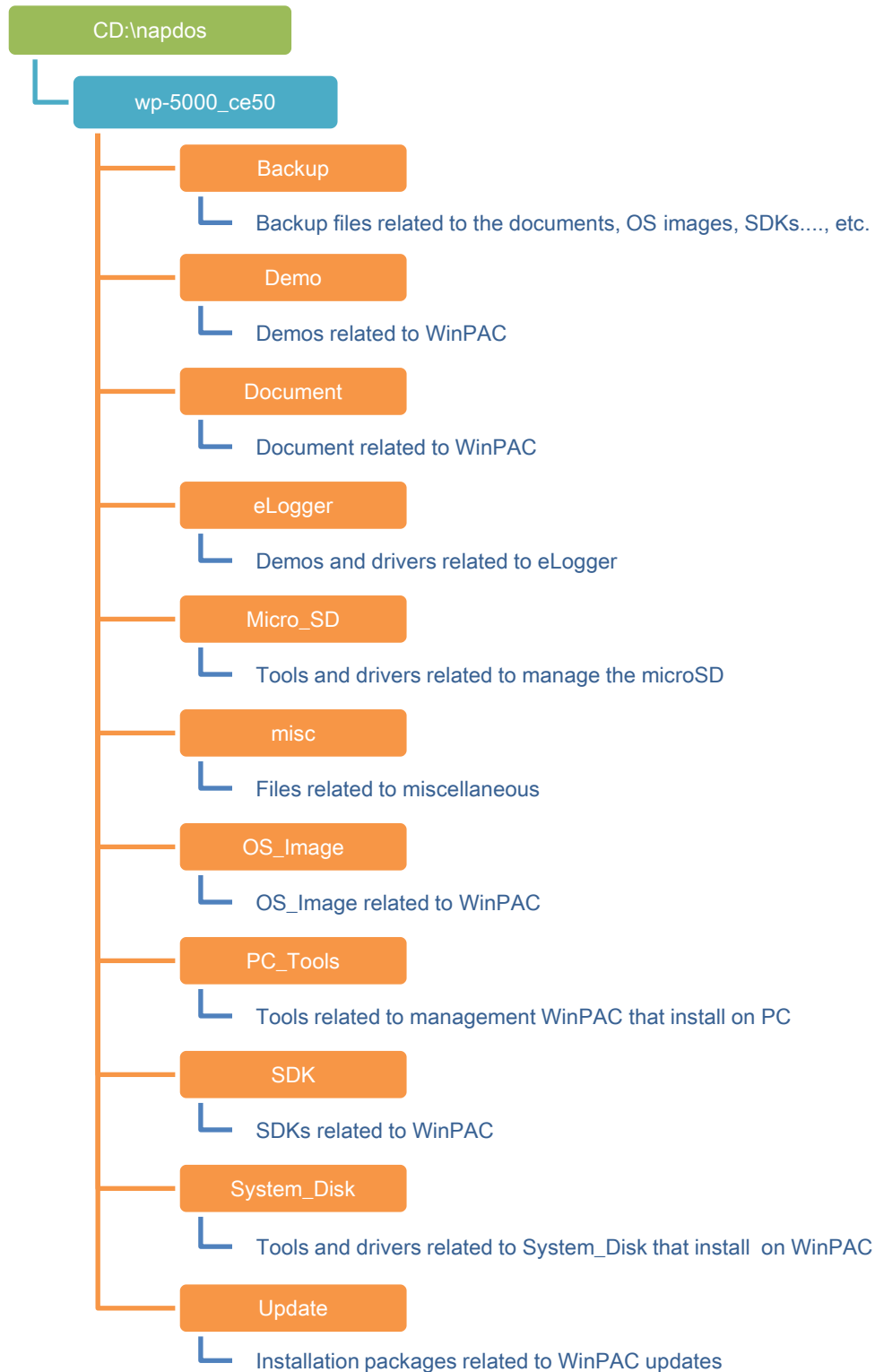


► WP-5000 with the XW-board



1.6. Companion CD

This package comes with a CD that provides drivers, software utility, all of the required documentations..., etc. All of them are listed below.



2. Getting Started

If you are a new user, begin with this chapter, it includes a guided tour that provides a basic overview of installation and configuration.

In addition to Quick Start Guide, the package includes the following items, if any items are damaged or missing, please contact us.



Win PAC Module

WP-5141

WP-5441



microSD Adapter



Software Utility CD



Screw Driver

(1C016)

2.4 mm

2.1. Mounting the Hardware

Before installing the hardware, you should have a basic understanding of hardware specification, such as the size of hard drive, the usable input-voltage range of the power supply, and the type of communication interfaces.

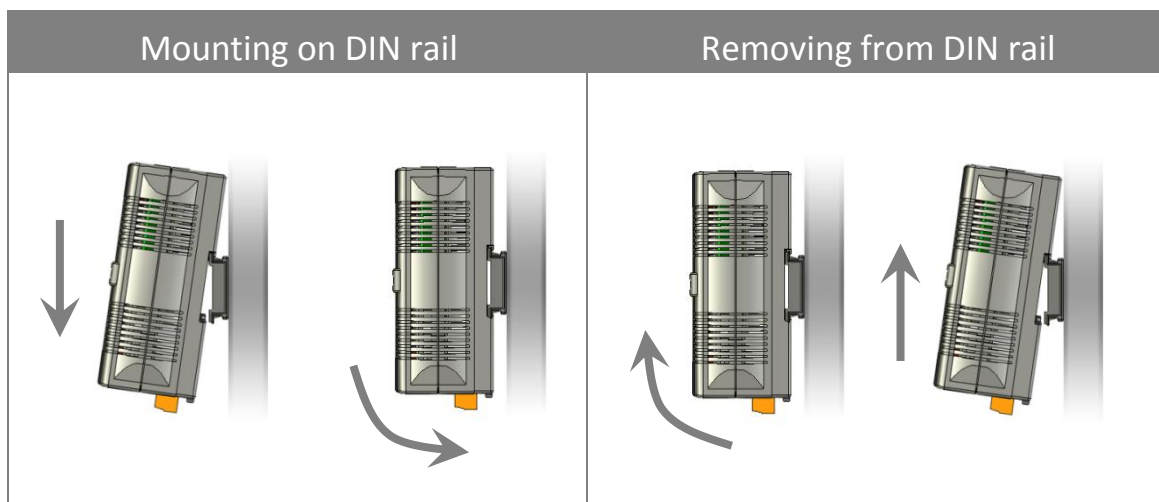
For complete hardware details, please refer to section “1.2. Specifications” You also need to know the expansion capacities in order to choose the best expansion module for achieving maximal efficiency.

For more information about expansion module that are compatible with the unit, please refer to

http://www.icpdas.com/products/PAC/up-5000/XW-board_Selection_Guide.htm

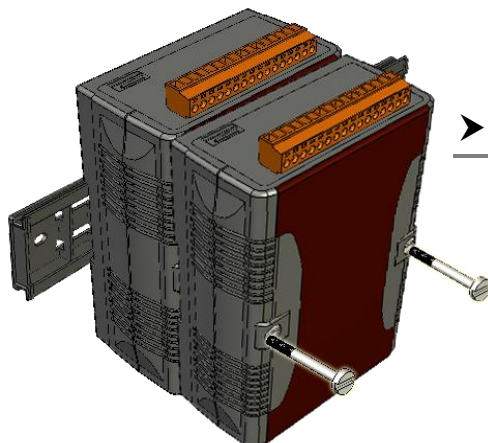
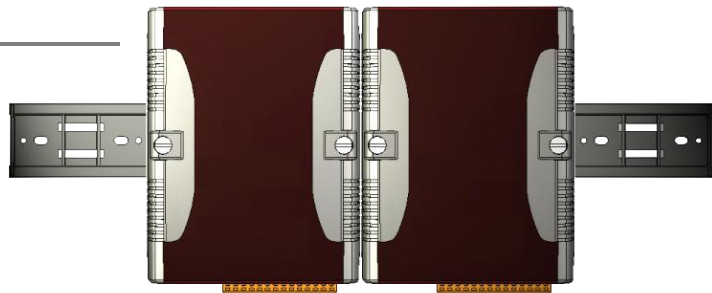
Step 1: Mounting WinPAC-5000

- The WinPAC-5000 can be mounted with the bottom of the chassis on the DIN rail, the wall or piggyback.
- To clean the unit, wipe it with a clean, dry cloth.
- Maintain the following conditions:
 - Operating Temperature: -25 °C to +75 °C
 - Storage Temperature: -30 °C to +80 °C
 - Relative Humidity: 10 to 90 non-condensing



► DIN rail mounting

The WinPAC-5000 has simple rail clips for mounting reliably on a standard 35 mm DIN rail.

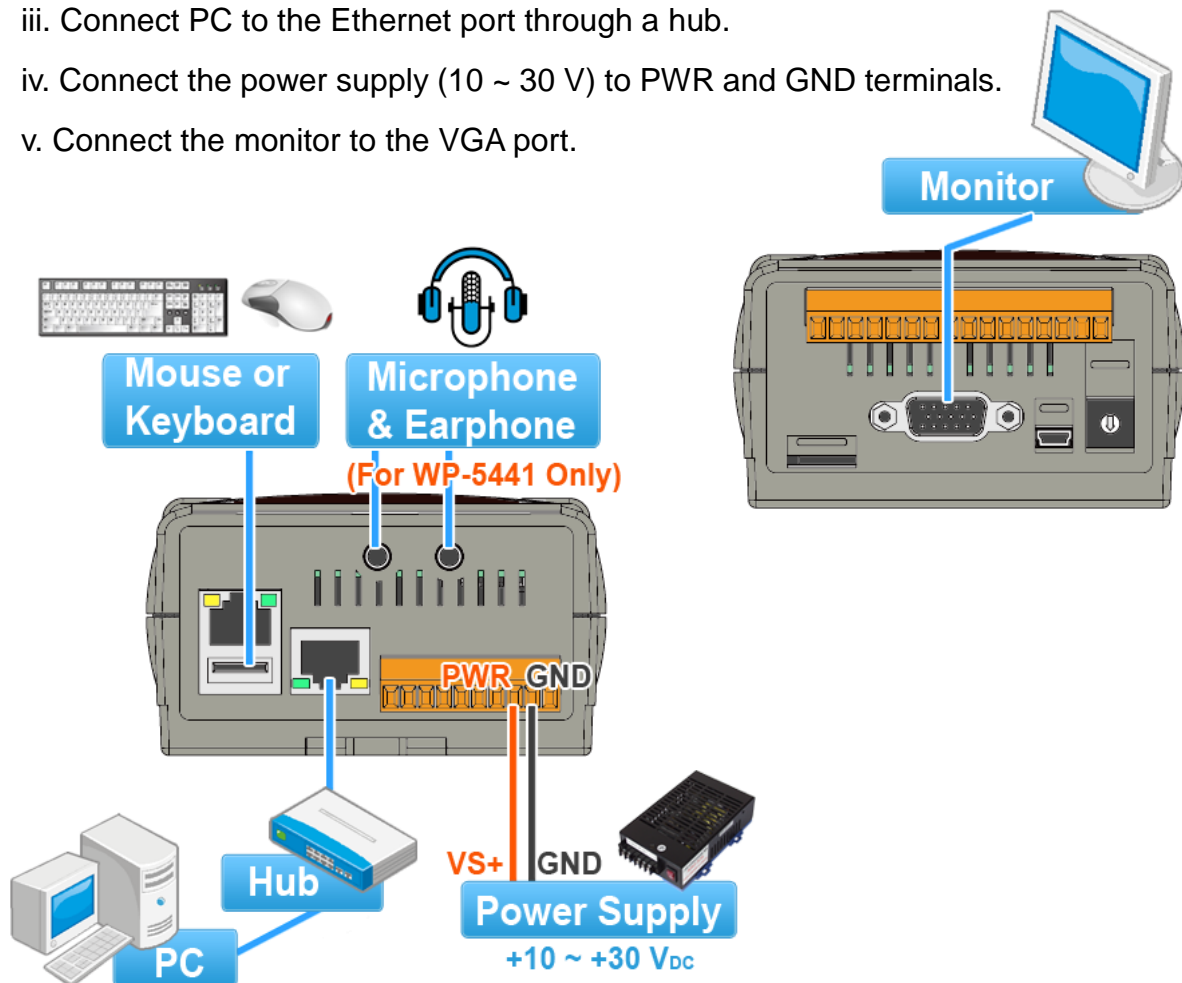


► Piggyback mounting

The WinPAC-5000 has two holes on both sides for piggyback mounting.


Step 2: Connecting to a microphone, an audio, a PC, the USB device, and the power supply

- i. Connect the mouse or keyboard to the USB port.
- ii. Connect the microphone and earphone to the microphone-in and earphone-out (for WP-5441 only)
- iii. Connect PC to the Ethernet port through a hub.
- iv. Connect the power supply (10 ~ 30 V) to PWR and GND terminals.
- v. Connect the monitor to the VGA port.



2.2. Configuring the Boot Mode

The WinPAC-5000 has the following six main operating modes, which can be selected by a rotary switch.

	Rotary switch position	Modes of operation
	0	Normal mode (Default)
	1	Safe mode
	2	Debug mode
	3	OS update mode
	4	Development mode
	5	DCON_CE
	6	VCEP
	7 ~ 9	(For user)

The following is an overview of the six modes.

Normal Mode (Default mode)

Normal mode is the default mode of operation and the one you will use most of the time. Use this mode for more tasks and configurations. Programs also are executed in this mode.

Safe Mode

Safe mode is a trouble shooting. The mode loads the minimum required device drivers and system services to boot the WinPAC-5000.

If you have malicious software or a program caused the WinPAC-5000 cannot be boot or run the normal mode, you can boot in safe mode to solve the problem.

Debug Mode

Debug mode is a special environment in which program debug functions can be used in addition to normal system functions.

Debug mode is unsupported.

OS Update Mode

OS update mode is a way used to update OS. For more information on updating the WinPAC-5000 OS image, please refer to section 6.1. OS updates

Development Mode

DCON_CE

In this mode, the VCEP will be run automatically, and other settings are same as the normal mode.

For more information about the VCEP, please refer to section 3.3. DCON_CE.

VCEP

In this mode, the VCEP will be run automatically, and other settings are same as the normal mode.

For more information about the VCEP, please refer to section 3.12 VCEP.

User Mode

The positions 7, 8, 9 of rotary switch are reserved for user's applications.

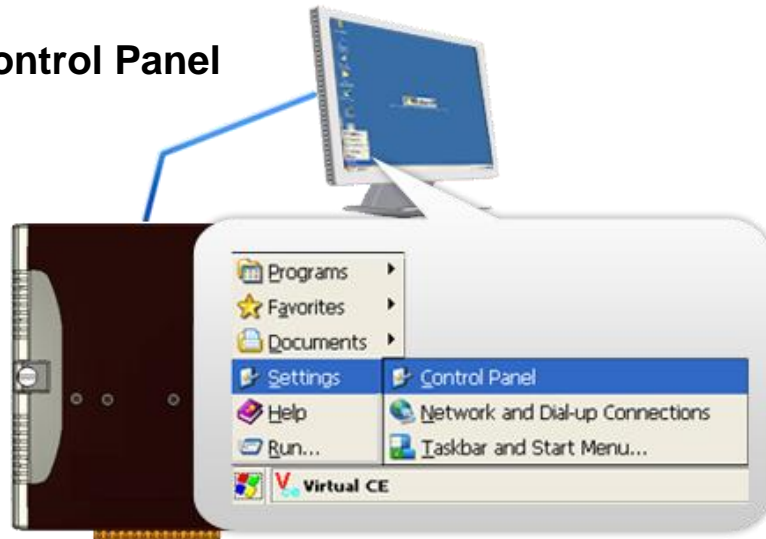
When WinPAC-5000 is boot with one of these positions, it is boot at normal mode.

User's application can check the rotary switch position to run at different mode.

2.3. Changing the Language of the User Interface

The WinPAC-5000 is a Windows CE-based operating system which provides multilingual user interface and the user interface can be set to one of multi languages.

Step 1: Open the Control Panel



Regional
Settings

Step 2: Run the Regional Settings

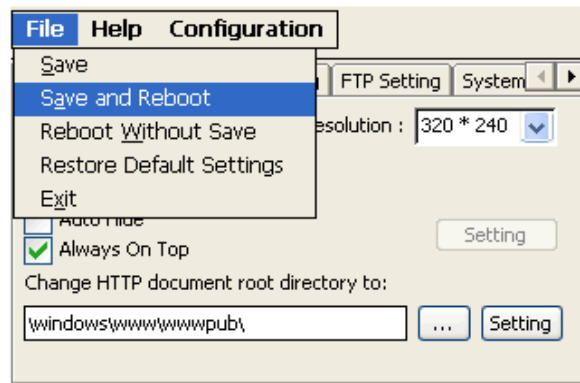


Step 3: Choose the display language, and then click OK

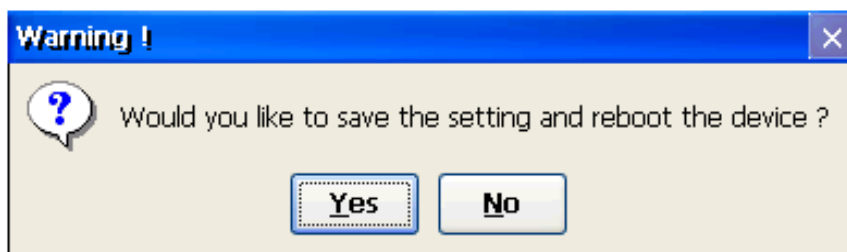




Step 5: On the File menu, click Save and Reboot



Step 6: Click Yes to reboot the WinPAC-5000



2.4. Using WinPAC Utility to Configure WinPAC-5000 Basic Functionality

WinPAC Utility is a tool that provides ability to configure the WinPAC-5000 services.



For more information on how to use the WinPAC Utility, please refer to section 3.13. WinPAC Utility.

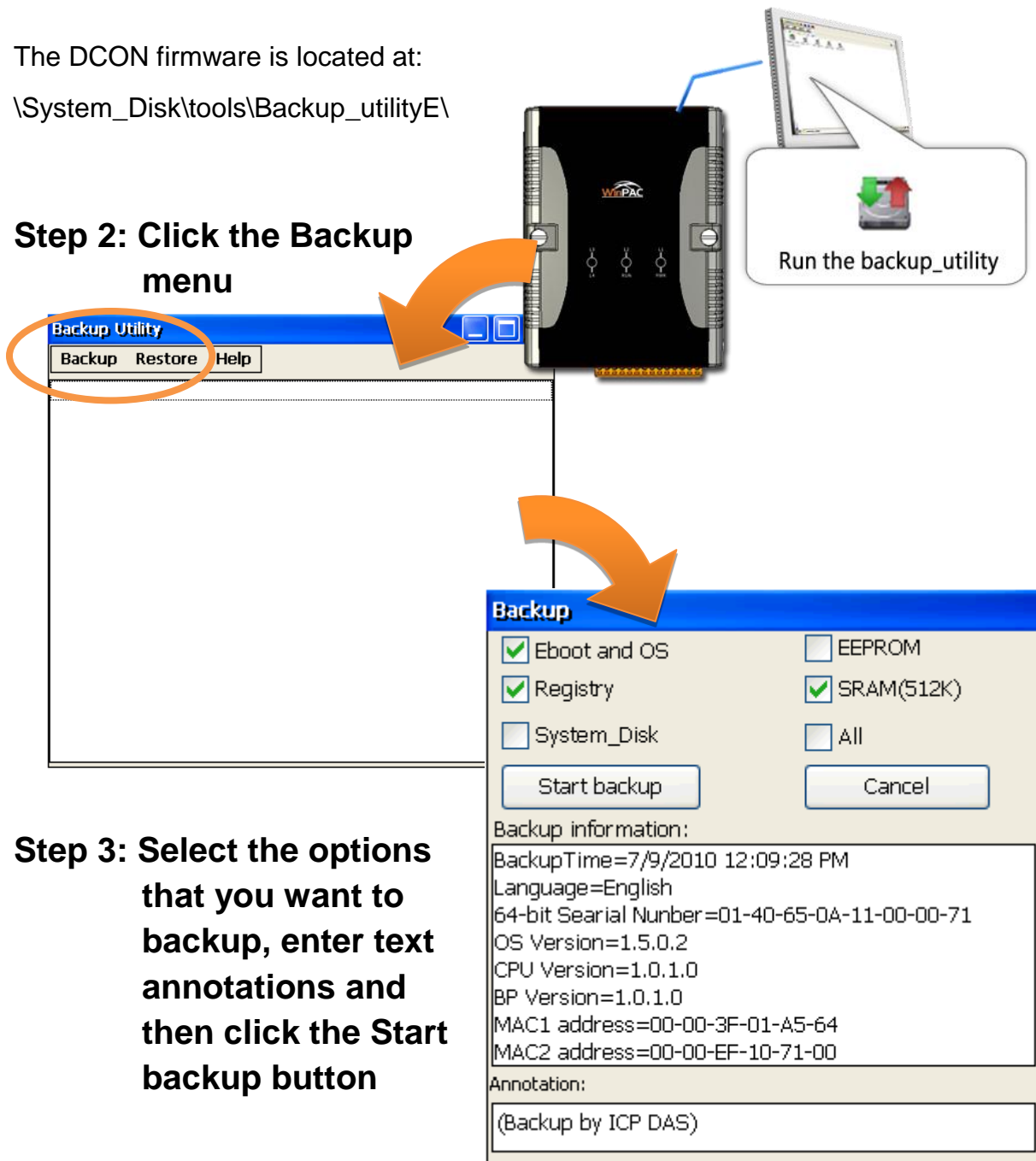
2.5. Using Backup Utility to back up the settings and files

After saving the configuration settings for a WinPAC device following the first use, it is recommended to use the Backup utility to back up all the data (settings and files).

Step 1: Run the Backup Utility on the WinPAC

The DCON firmware is located at:
\\System_Disk\tools\Backup_utilityE\

Step 2: Click the Backup menu



The diagram illustrates the process of running the Backup Utility on a WinPAC device. It shows the WinPAC device with a callout box indicating to 'Run the backup_utility'. The Backup Utility software interface is shown with the 'Backup' menu highlighted. The 'Backup' dialog box is open, showing options for backup content and location. The 'Start backup' button is highlighted.

Backup

<input checked="" type="checkbox"/> Eboot and OS	<input type="checkbox"/> EEPROM
<input checked="" type="checkbox"/> Registry	<input checked="" type="checkbox"/> SRAM(512K)
<input type="checkbox"/> System_Disk	<input type="checkbox"/> All

Start backup Cancel

Backup information:

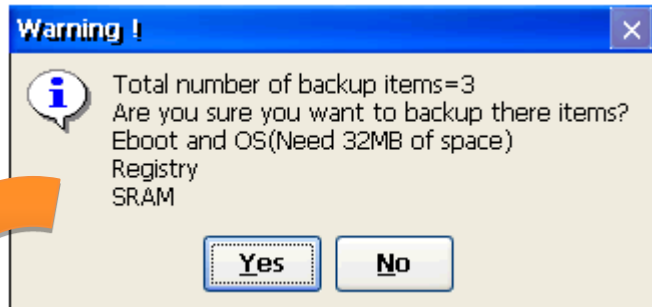
BackupTime=7/9/2010 12:09:28 PM
Language=English
64-bit Serial Number=01-40-65-0A-11-00-00-71
OS Version=1.5.0.2
CPU Version=1.0.1.0
BP Version=1.0.1.0
MAC1 address=00-00-3F-01-A5-64
MAC2 address=00-00-EF-10-71-00

Annotation:

(Backup by ICP DAS)

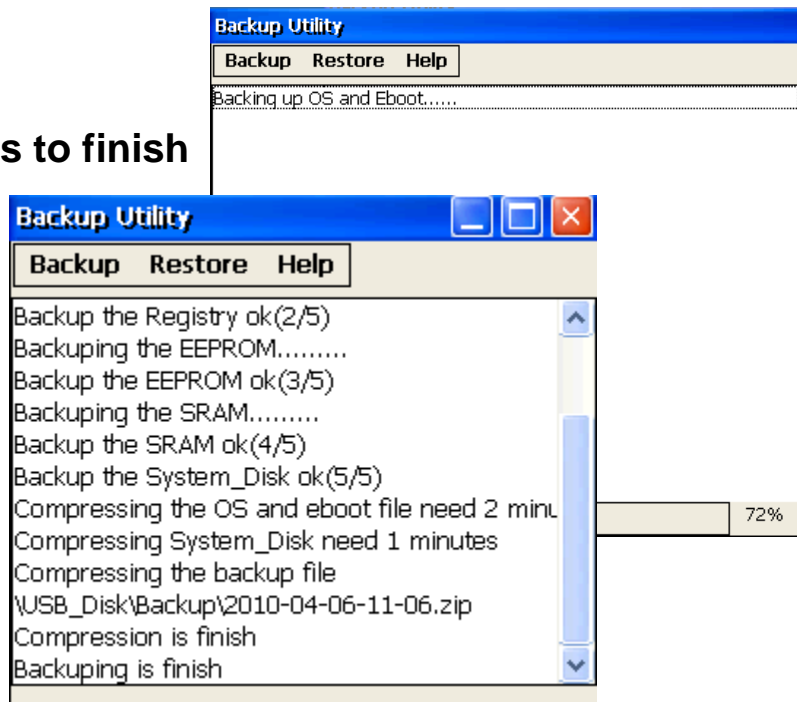
Step 3: Select the options that you want to backup, enter text annotations and then click the Start backup button

Step 4: Confirm the backup options and then click Yes button



Step 5: Choose the folder that you want to save backup file and click the Ok button

Step 6: Wait for process to finish



2.6. A caution about using System_Disk

The System_disk is an authoritative storage device, but is not suitable for frequent copying and deleting of files and is only suitable for storing important files that are not changed frequently.

If files are copied and deleted frequently, the system will automatically perform a System_Disk defragment action, which will consume the total resources of the CPU and cause the OS not to function correctly.

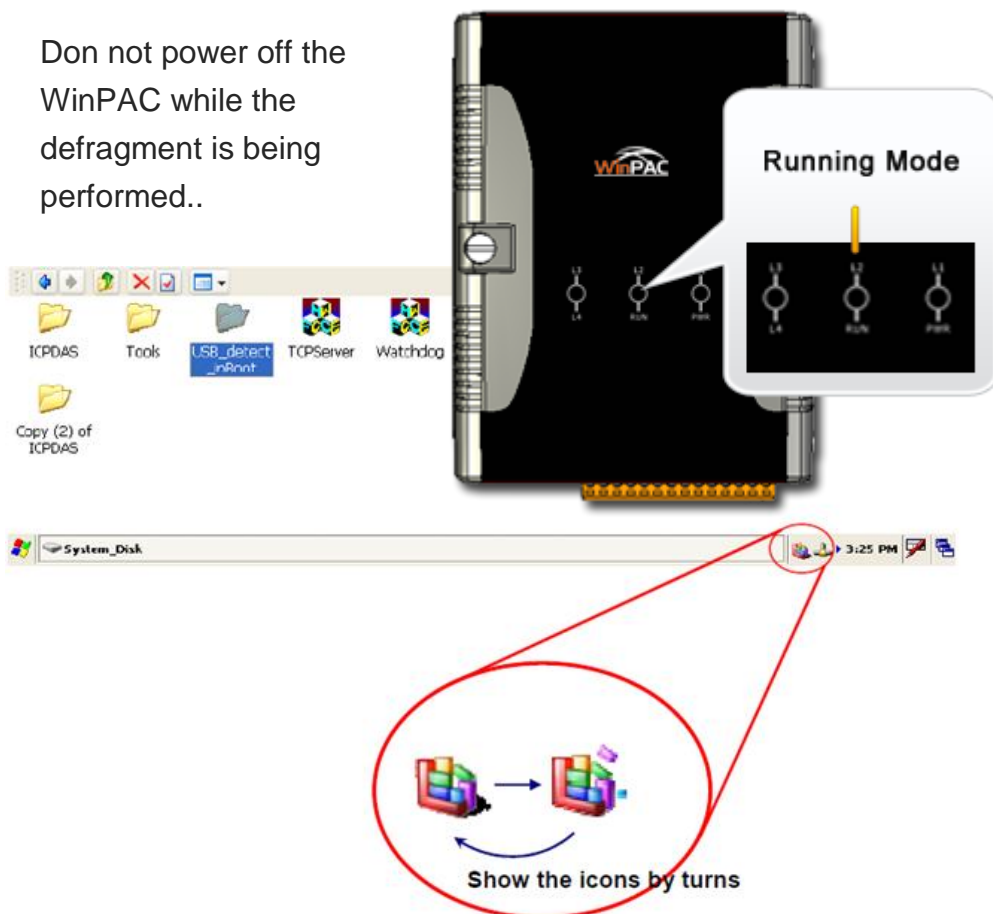
When the OS System_Disk defragment action is being performed, the run LED will blink and the defragment action icon will show in the system tray in the bottom right-hand of the pc screen.

Note: Do not power off the WinPAC while the defragment is being performed.

Tips & Warnings

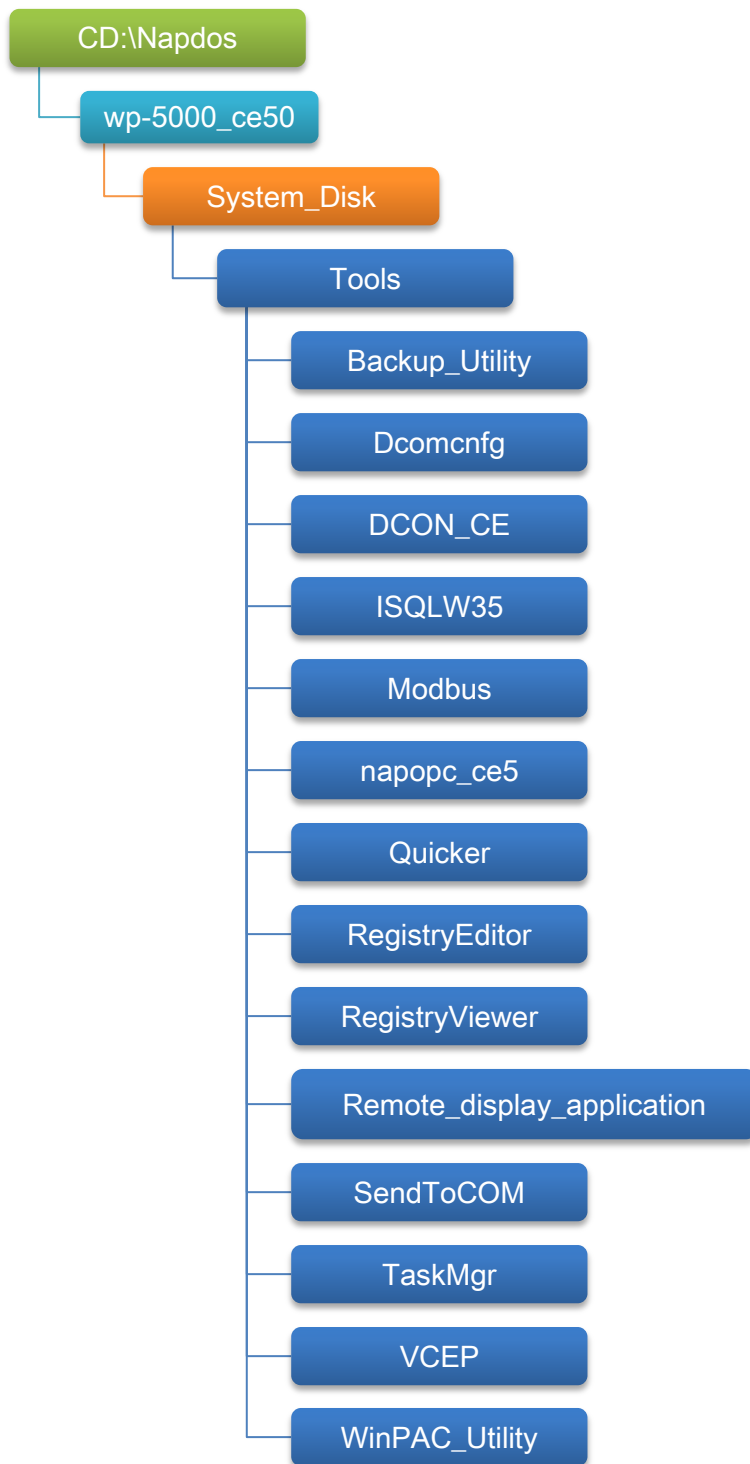


Don not power off the WinPAC while the defragment is being performed..



3. Tools and Tasks

Following tools has been installed on WinPAC-5000.



► **Backup_Utility**

The Backup_Utility is a system backup/restore tool used to backup/restore all the data (OS, settings and files) from/to the WinPAC/ViewPAC device.

► **Dcomcnfg**

dcomcnfg.exe for Windows CE to configure your DCOM settings.

NTLMUser.exe for Windows CE to create local NTLM accounts on the Windows CE Device.

► **DCON_CE**

With Host PC running the DCON Utility, on the WinPAC, the DCON_CE program allows user to view and monitor the status of the DCON Utility.

► **ISQLW35**

The ISQLW35 implements SQL server compact 3.5 Query Analyzer.

► **Modbus**

The Modbus provides various applications of Modbus protocol for configuring the WinPAC.

► **NAPOPC_CE5**

NAPOPC_CE5 is an integrated omnibus software package, it allows user to quickly establish a DCS control system.

► **RegistryEditor**

The RegistryEditor allows user to editor the registry value of Windows CE Operating System.

➤ **Remote display application**

The remote display application allows user to view the display remotely of the WinPAC on a Host PC.

➤ **SendToCOM**

The SendToCOM allows user to send/receive data to/from the expansion module via serial port.

➤ **TaskMgr**

The TaskMgr provides details about programs and processes running on the WinPAC.

➤ **VCEP**

The VCEP allows user to manage the WinPAC remotely on a Host PC.

➤ **WinPAC Utility**

The WinPAC Utility provides various useful functions such as configuring Ethernet settings, monitoring system settings and FTP services .etc for easy and quick management.

3.1. Backup Utility

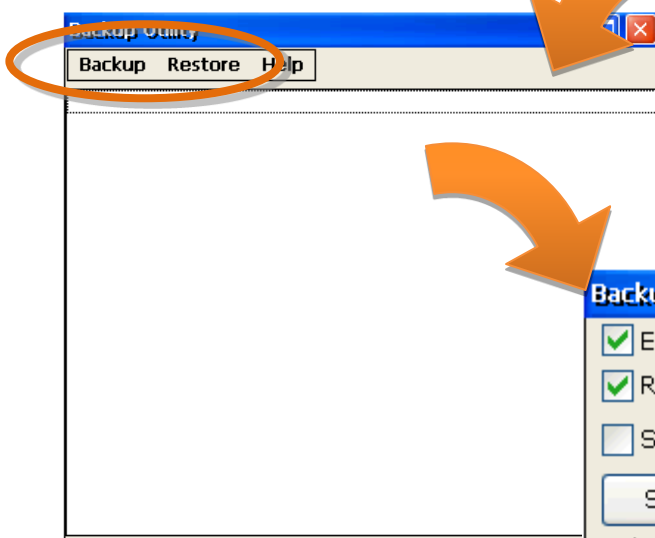
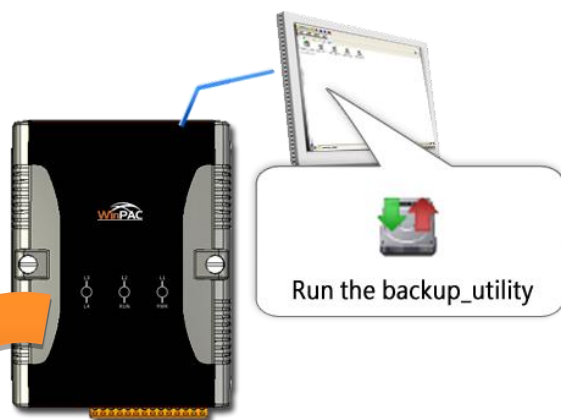
Backup Utility is an application program for backing up data.

With this utility, you can easily back up not only the files and folders you have created on your WinPAC-5000 but also the entire partition(s) including your WinPAC-5000 operating environment and its settings and dictionaries.

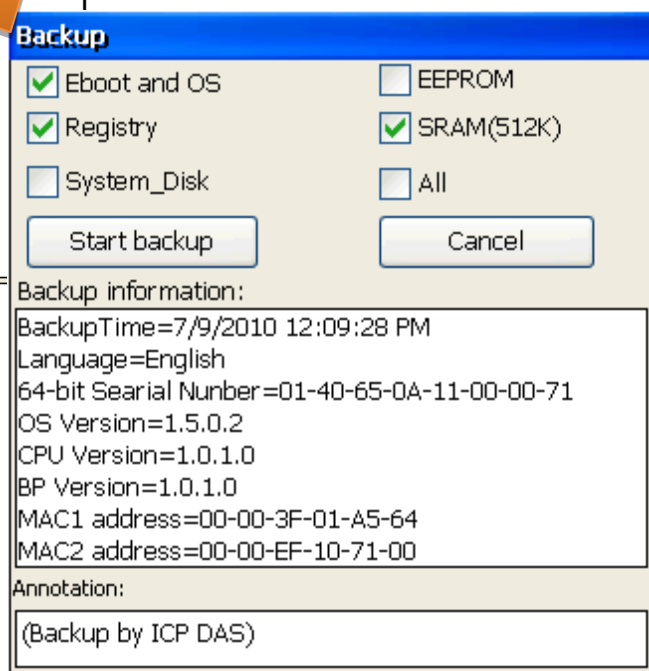
Below are the step-by-step procedures to use the Backup utility to back up data.

Step 1: Run the Backup Utility on WinPAC-5000

The DCON firmware is located at:
\\System_Disk\tools\Backup_utilityE\

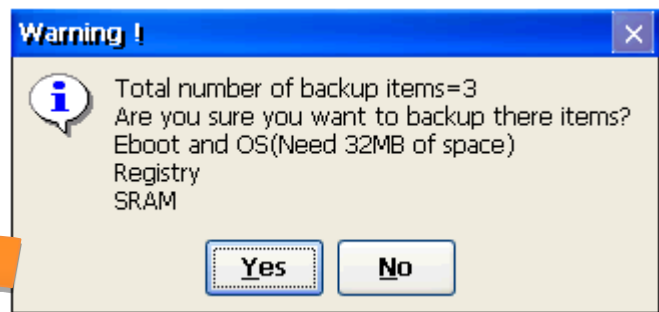


Step 2: Click Backup menu



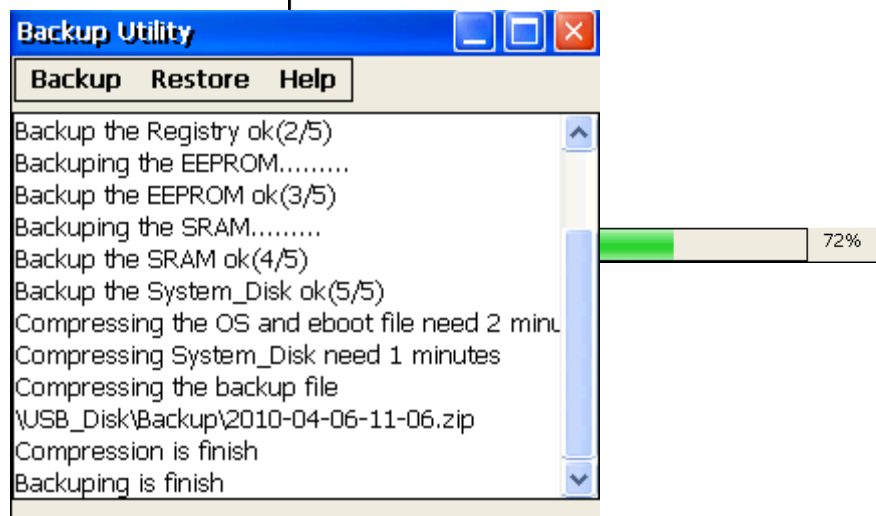
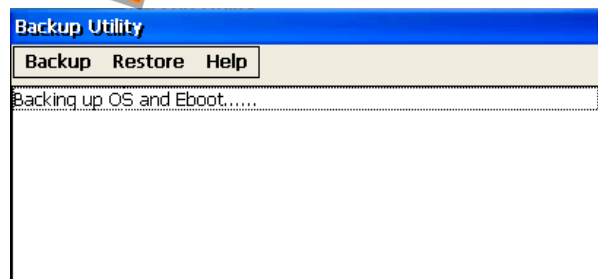
Step 3: Select the options that you want to backup, enter text annotations and then click the Start backup

Step 4: Click Yes to confirm the backup options



Step 5: Choose the folder that you want to save backup file and click the Ok

Step 6: Wait for process to finish



3.2. Dconmcnfg

DCOMCNFG is a utility included with Microsoft Windows CE operating system and is used to configure various DCOM-specific settings in the registry. You can use the registry to specify default permissions for objects on the system, such as Access, Launch, and Configuration.

3.3. Napopc_ce5



NAPOPC_CE5 DA Server is a free OPC DA Server (The "OPC" stands for "OLE for Process Control" and the "DA" stands for "Data Access") working on WinPAC, ViewPAC & WinCon controllers provided by ICP DAS Ltd. The first standard (originally called simply the OPC Specification and now called the Data Access Specification) resulted from the collaboration of a number of leading worldwide automation suppliers working in cooperation with Microsoft. Originally based on Microsoft's OLE COM (component object model) and DCOM (distributed component object model) technologies, the specification defined a standard set of objects, interfaces and methods for use in process control and manufacturing automation applications to facilitate interoperability. NAPOPC_CE5 DA Server integrates OPC, Modbus TCP Slave and Modbus RTU Slave three kind Slave services, as well as integrates Modbus TCP Master, Modbus RTU Master and DCON three kind Master communication protocols. It also provides one advanced function "Rule Script" for use in the I/O integration and transformation, and some conditional Logic operation.

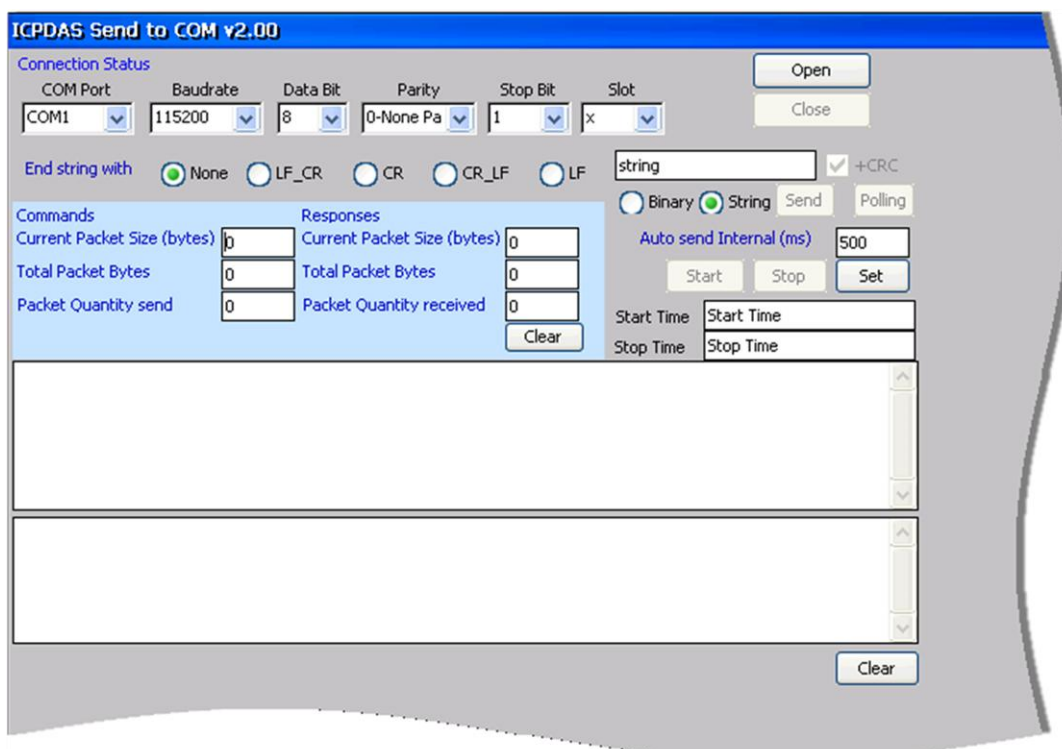
Any version before 2.1.0 of the NAPOPC_CE5 was named "Quicker"

3.4. SendToCOM

The SendToCOM uses the serial port to communicate with expansion module. To use the SendToCOM, you can send data to expansion module through the serial port, and receive data from other device through the serial port.

For more information about these commands for communicating with expansion module, please refer to:

CD:\Napdos\io_module\87k_high_profile_modules.htm



3.5. VCEP



ICPDAS VCEP is designed for managing your WinPAC anywhere. No matter where you are, ICPDAS VCEP provides a convenient environment on the Desktop PC and allows you control your WinPAC remotely.

ICPDAS VCEP is composed of two main components:

The “Server” which runs on WinPAC.

The “Client” which runs on a Desktop PC.

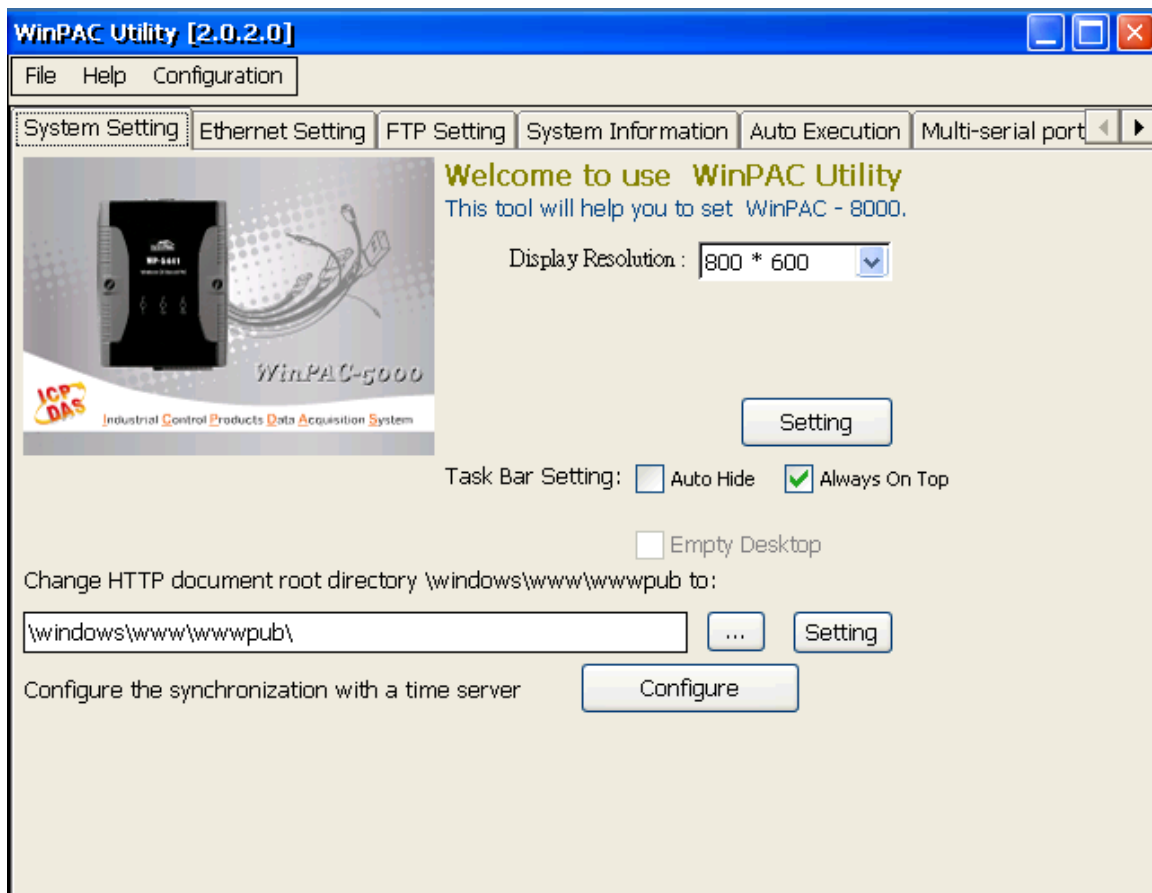
Once a connection is established between the client and server (initiated by the client), the client will periodically send requests for screen updates and send mouse/key click information to the server to simulate. Each video frame is inter-compressed against the previous frame and then intra-compressed with a modified LZW scheme to minimize the amount of data transmitted from server to client.

For more detailed information on VCEP application, please refer to

http://www.icpdas.com/products/PAC/wincon-8000/wincon_VirtualCE.htm

3.6. WinPAC_Utility

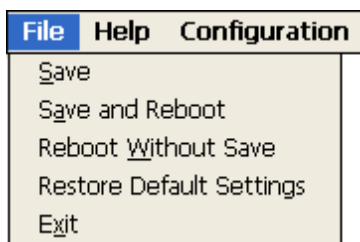
The WinPAC Utility is a tool which is designed to quickly control and manage the WinPAC.



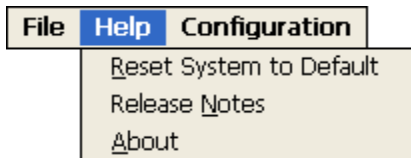
3.6.1. Menu Bar

The WinPAC Utility includes the following function menu. All function menu will be explained later.

File Menu



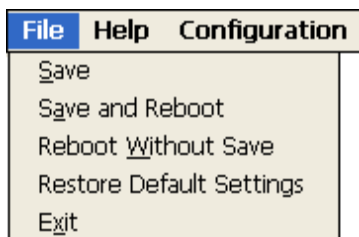
Help Menu



Configuration Menu

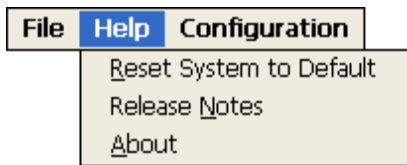


► File Menu



The menu commands	Use to
Save	Saves the settings into Flash. The new settings don't take effect until the WinPAC restart.
Save and Reboot	Saves the settings into Flash and restart the WinPAC. The new settings will take effect after the WinPAC restart.
Reboot Without Save	Restarts the WinPAC without save the settings into Flash.
Restore Default Settings	Restarts the settings of WinPAC to its factory default values. The settings include configuration setting, network setting, auto execution, etc.
Exit	Exits the WinPAC Utility.

► Help Menu



The menu commands	Use to
Reset System to Default	Resets the system interrupt status to default. The operation used in the situation when the interrupt crash. You can select this operation to reset the interrupt status without rebooting the device.
Release Notes	Checks out what's new and the know issues.
About	Displays a dialog box with information about WinPAC Utility, including the current version and copyright information.

► Configuration Menu

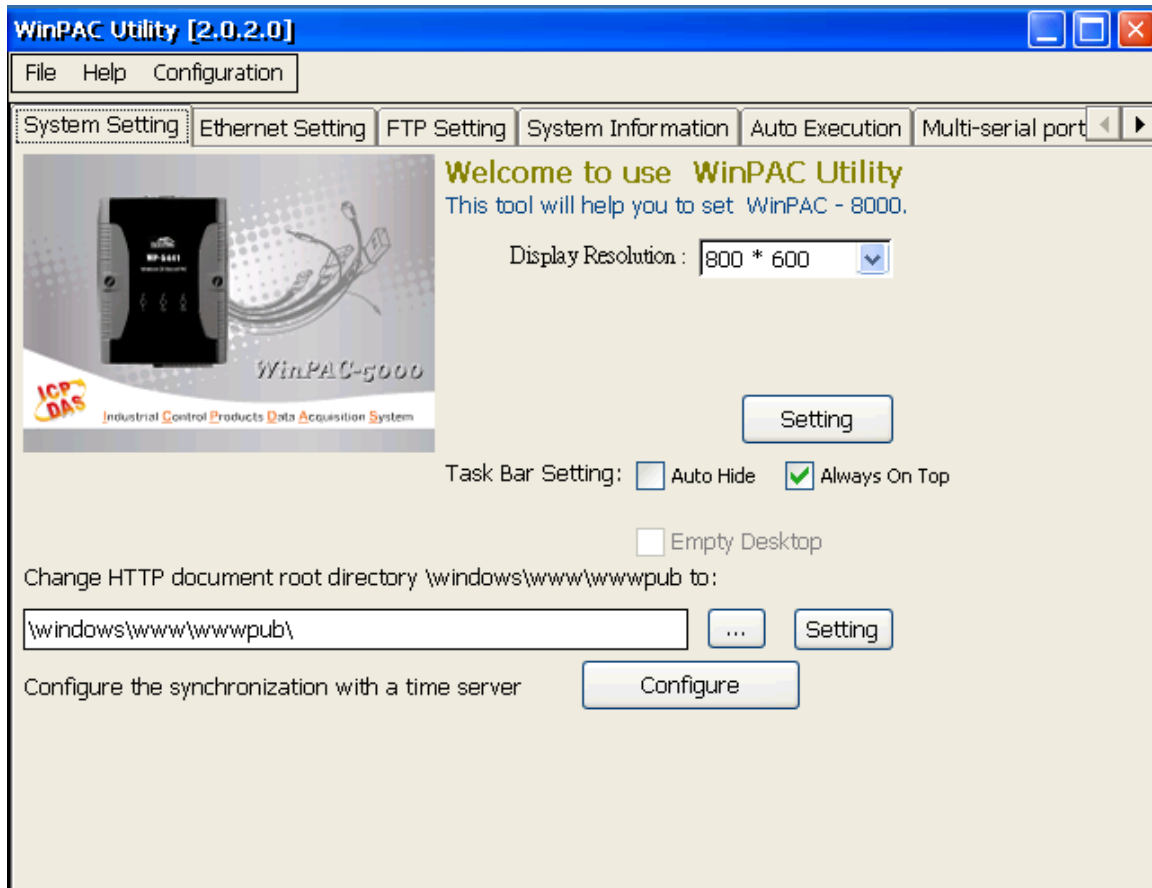


The menu commands	Use to
Import Registry Key	<p>Backs up a sub-key of registry by using a registration entry (.reg) file.</p> <p>How to use:</p> <p>Step 1: Select the “Import Registry Key”, then the “Open” dialog box will appear</p> <p>Step 2: On the “Open” dialog box, select a specific .reg file to import</p> <p>Warning:</p> <ol style="list-style-type: none"> 1. The .reg file which should be saved by “Export Registry Key”. 2. It will not save automatically after import a .reg file.
Export Registry Key	<p>Makes a back up of a registry sub-key</p> <p>How to use:</p> <p>Step 1: Select the “Export Registry Key”, then the “Export Registry” box will appear</p> <p>Step 2: Select a specific root key</p> <p>Step 3: Input a specific path of sub-key</p> <p>Step 4: Push the “OK” button, then the “Save As”</p>

The menu commands	Use to
	<p>dialog box will appear prompting you to select a location where you want to save this exported file</p> <p>Warning: The export operation will export all the sub-keys of the specific key which you input.</p>
<p>Store All Registry Setting</p>	<p>Stores all registry setting to flash from .das file which is saved by “Dump All Registry Setting”.</p> <p>How to use: Step 1: Select the “Store All Registry Setting” , then the “Open” dialog box will appear Step 2: On the “Open” dialog box, select a specific .das file to store</p> <p>Warning: 1. The .das file which should be saved by “Dump All Registry Setting”. 2. It will save automatically after store .das file.</p>
<p>Dump All Registry Settings</p>	<p>Dump all registries setting to .das file.</p> <p>How to use: Select the “Dump All Registry Setting”, then the “Save As” dialog box will appear prompting you to select a location where you want to save this exported file.</p>

3.6.2. Property Tabs

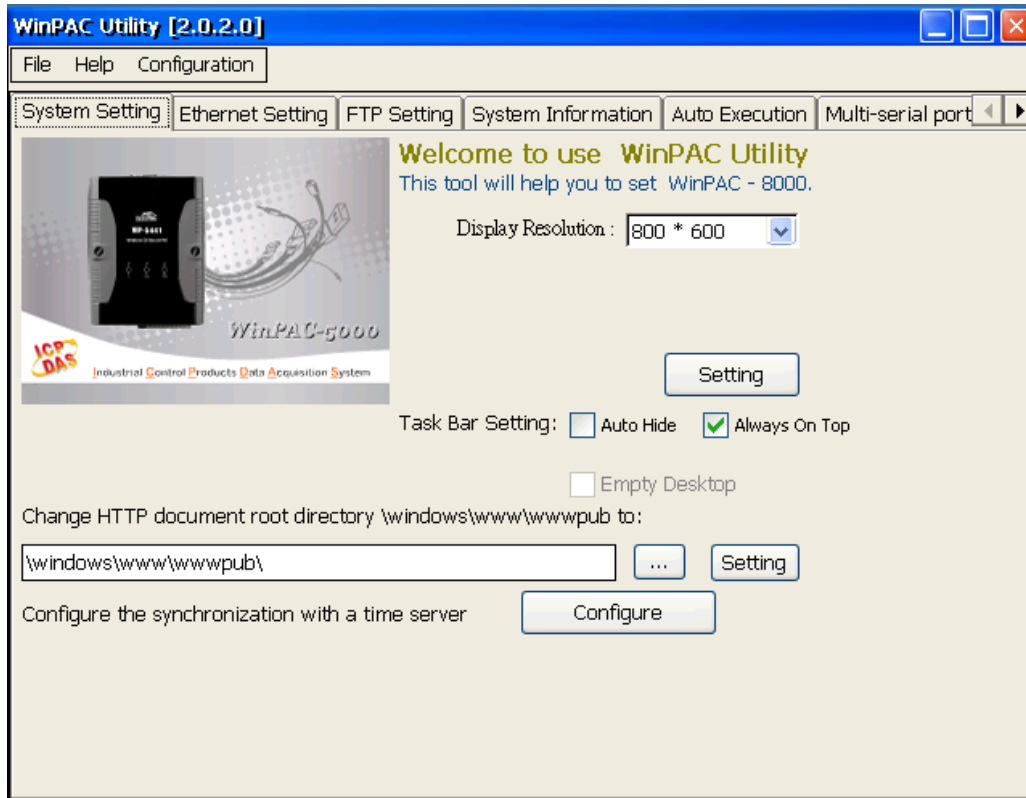
The WinPAC Utility includes the following property tabs, all property tabs will be explained later.



- ✓ System Setting
- ✓ Ethernet Setting
- ✓ FTP Setting
- ✓ System Information
- ✓ Auto Execution
- ✓ Multi-serial port wizard
- ✓ System Memory Setting

► System Setting Tab

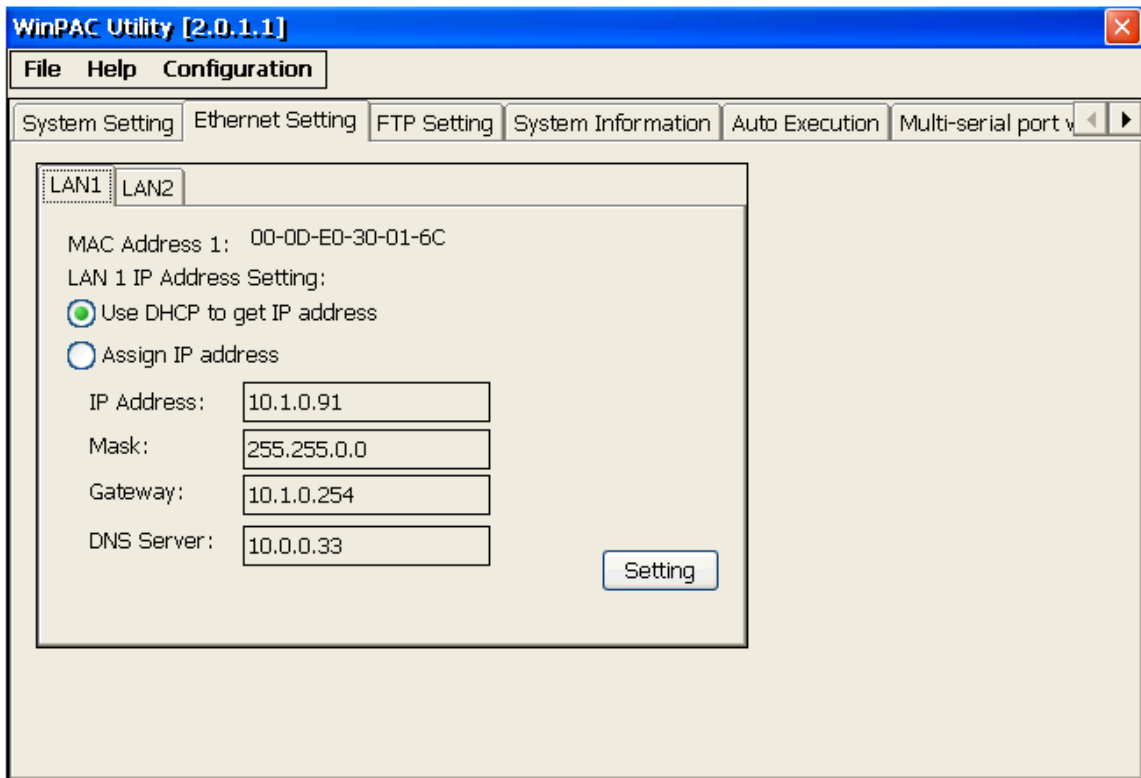
The System Setting tab provides functions to configure the task bar HTTP directory path.



The tab use to	How to use
Adjust the size of the desktop	Select a display resolution from the Resolution list.
Lock or Auto-Hide the taskbar	Auto-Hide: Select the Auto Hide check box Lock: Select the Always On Top check box.
Check the status of the battery	See the Battery1 and Battery2 field that displays the battery status.
Change the HTTP directory path	Enter a new path in the Change HTTP document root directory \windows\www\wwwpub to field, and then press the Setting button.
Automatic synchronization of system time	Refer to the Appendix A.6 How to configure the service for automatically synchronizing with the internet time server

► Ethernet Setting Tab

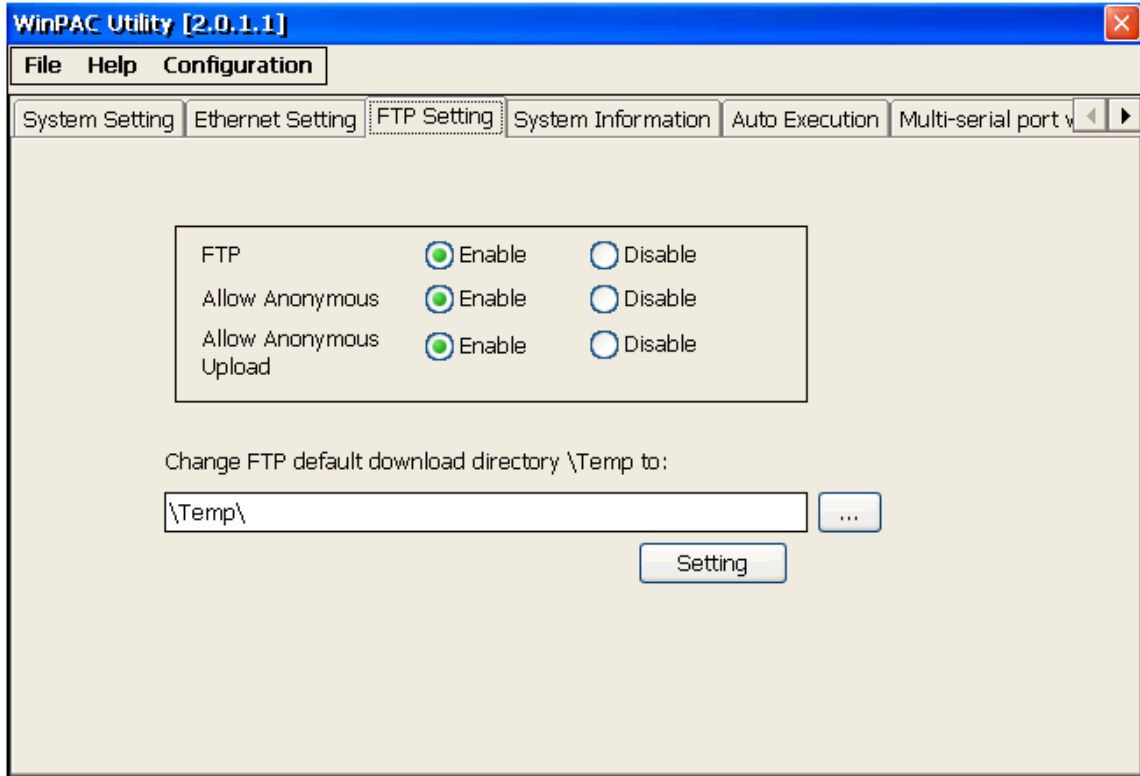
The Ethernet Setting tab provides functions to configure either DHCP (Roaming) or manually configured (Static) network settings and to monitor the MAC address. Generally, DHCP is the default settings, but if you don't have a DHCP server, you must configure the network settings by using manual configuration.



The tab use to	How to use
Configure the network settings	<p>Obtaining an IP address automatically from DHCP: Select the Use DHCP to get IP address option.</p> <p>Manually assign an IP address: Select the Assign IP address option.</p>
Monitor the MAC address	See the MAC Address 1 and MAC Address 2 fields that display the physical address of LAN1 and LAN2.

► FTP Setting Tab

The FTP Setting tab provides functions to enable/disable the FTP access, enable/disable anonymous FTP access, and configure the FTP directory path.

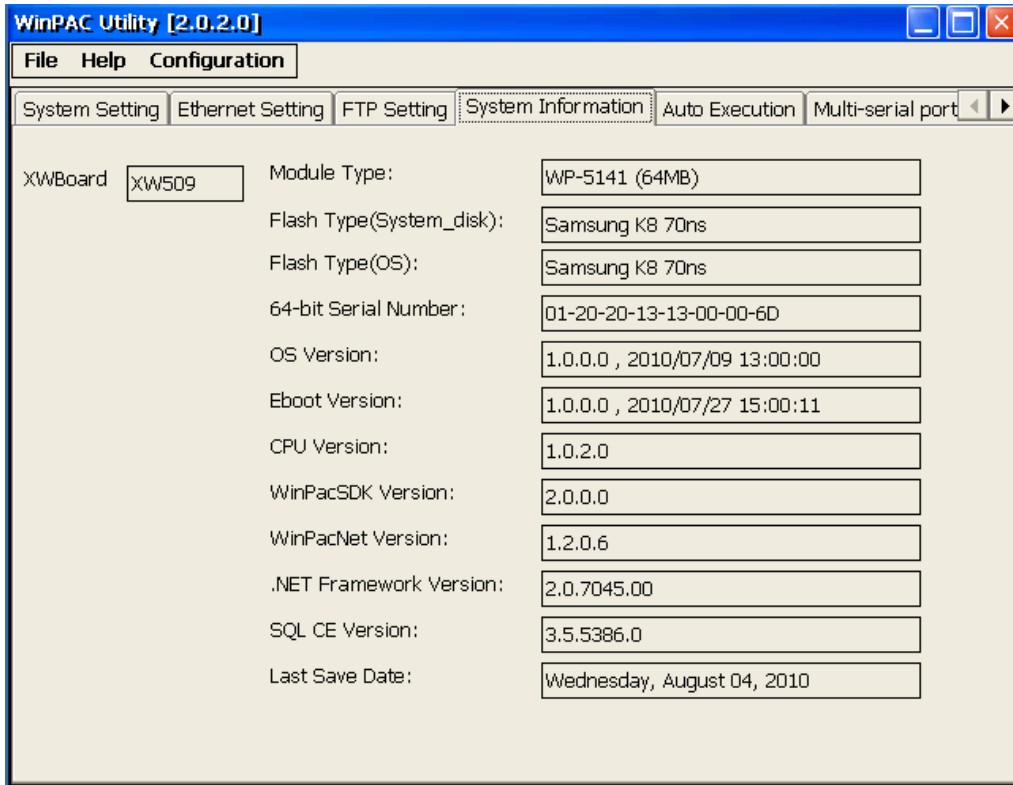


The tab use to	How to use
Enable or disable the FTP access	<p>Enable: Select the Enable check box in the FTP field.</p> <p>Disable: Select the Disable check box in the FTP field.</p>
Enable or disable anonymous FTP access	<p>Enable: Select the Enable check box in the Allow Anonymous field.</p> <p>Disable: Select the Disable check box in the Allow Anonymous field.</p>
Enable or disable anonymous FTP upload	<p>Enable: Select the Enable check box in the Allow Anonymous Upload field.</p> <p>Disable:</p>

The tab use to	How to use
	Select the Disable check box in the Allow Anonymous Upload field.
Change the FTP directory path	Enter a new path in the Change FTP default download directory field, and then press the Setting button.
FTP/Telnet authentication	Refer to the Appendix A.1

► System Information Tab

The System Information tab provides functions to monitor necessary system information of the WinPAC. The system information is the most important note of version control for upgrading system.



The screenshot shows the WinPAC Utility [2.0.2.0] window with the System Information tab selected. The window has a menu bar with File, Help, and Configuration. Below the menu bar are tabs for System Setting, Ethernet Setting, FTP Setting, System Information, Auto Execution, and Multi-serial port. The System Information tab displays the following data:

XWBoard	XW509	Module Type:	WP-5141 (64MB)
		Flash Type(System_disk):	Samsung K8 70ns
		Flash Type(OS):	Samsung K8 70ns
		64-bit Serial Number:	01-20-20-13-13-00-00-6D
		OS Version:	1.0.0.0 , 2010/07/09 13:00:00
		Eboot Version:	1.0.0.0 , 2010/07/27 15:00:11
		CPU Version:	1.0.2.0
		WinPacSDK Version:	2.0.0.0
		WinPacNet Version:	1.2.0.6
		.NET Framework Version:	2.0.7045.00
		SQL CE Version:	3.5.5386.0
		Last Save Date:	Wednesday, August 04, 2010

Tips & Warnings



The XW-board series are for uPAC-5000, LP-5000, and WP-5000 series.

One PAC can only plug only one XW-board. The System Information tab show the module name for XW-board.

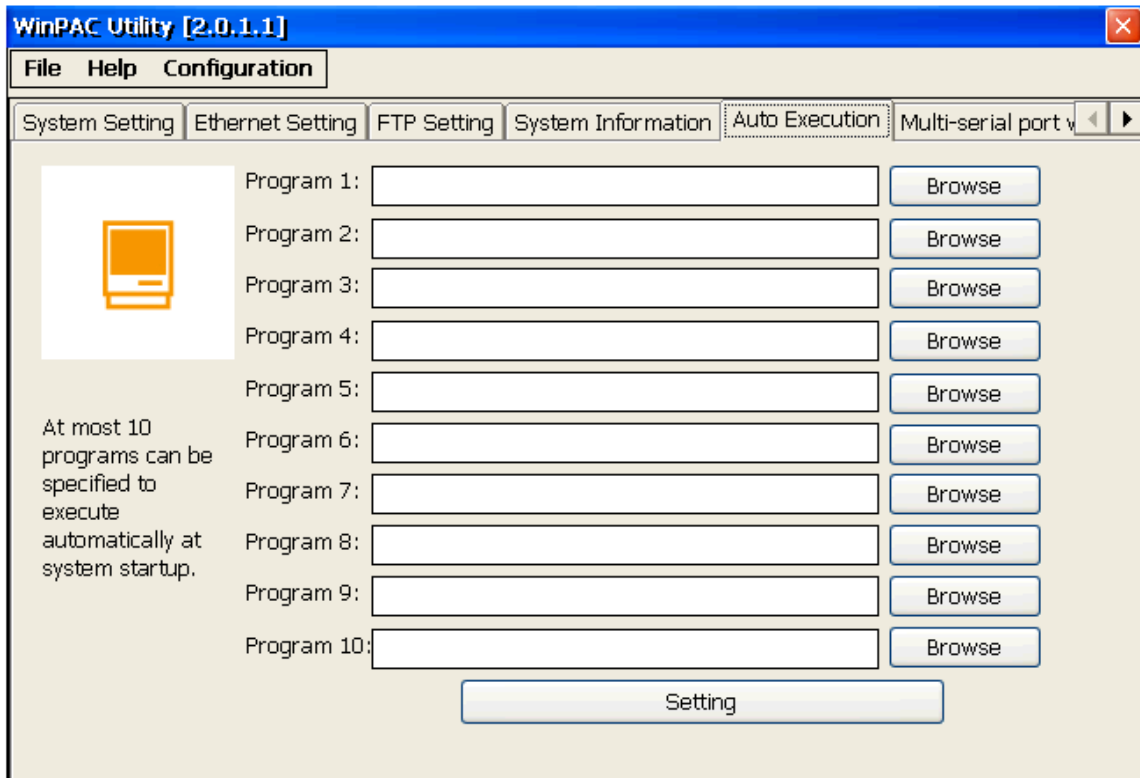
► Auto Execution Tab

The Auto Execute tab provides functions to configure programs running at WinPAC startup, it allows users to configure ten execute files at most.

Tips & Warnings



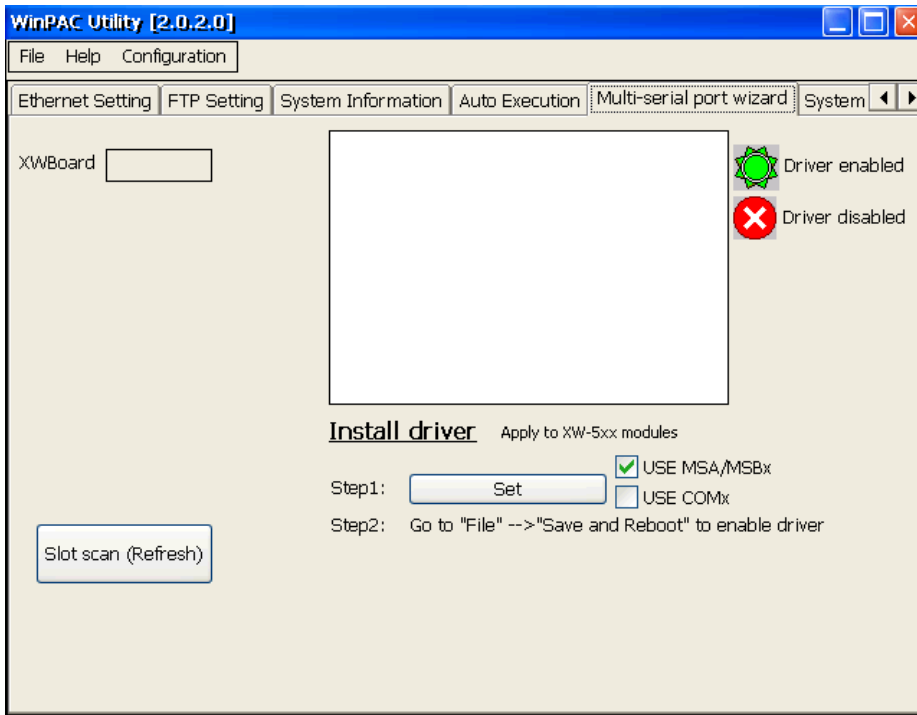
The allowed file types are .exe and .bat, and they are executed in order of program 1, program 2, etc.



The tab use to	How to use
Configure programs running at startup	Press the Browse button to select the execute file which you want, and then press the Setting button.

► Multi-Serial Port Wizard Tab

The Multi-serial port provides functions for installation of the XW-board driver.



The table below shows the expansion communication modules that are compatible with the WinPAC-5000.

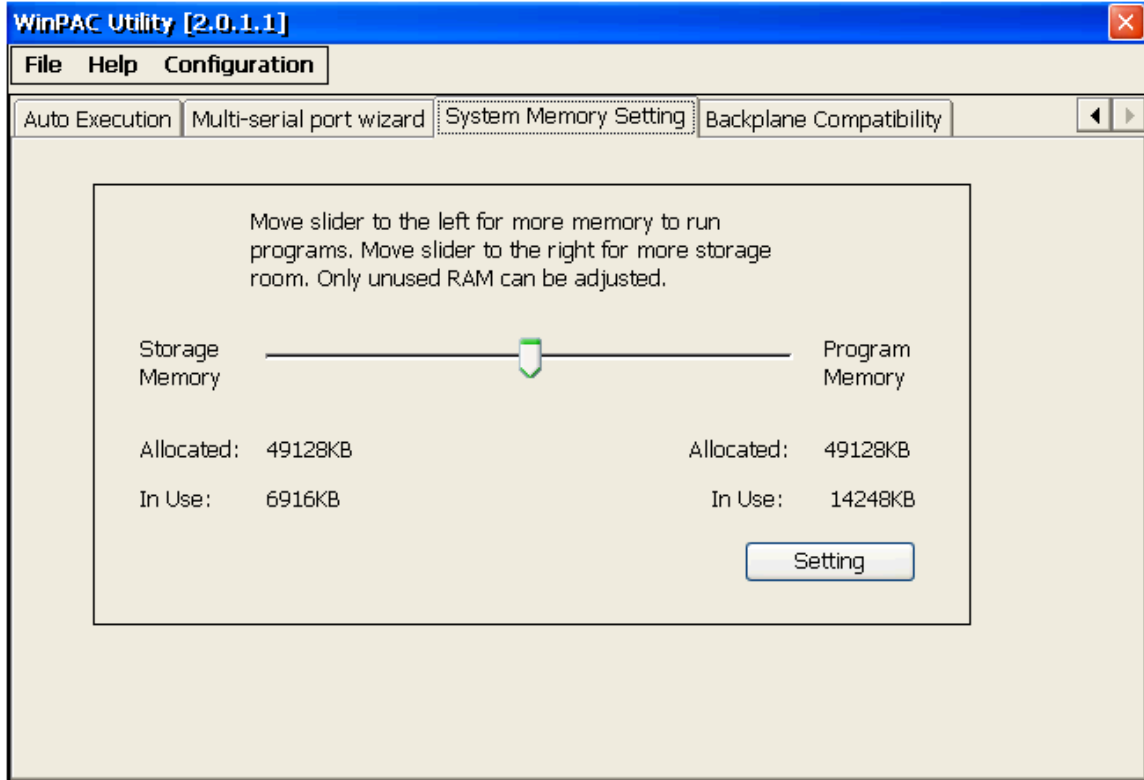
RS-232/422/485, DI, DO Boards

Model	Serial Port			DI	DO	Isolation
	Type	Ch	Wire			
XW506	RS-232	6	3-wire	-	-	-
XW507	RS-422/RS-485	1	4/2-wire	6	4	
XW509	RS-232	2	5-wire	6	4	
XW511i	RS-422/RS-485	3	4/2-wire	-	-	2500 Vrms

For more detailed information about these support modules, please refer to http://www.icpdas.com/products/PAC/up-5000/XW-board_Selection_Guide.htm

► System Memory Setting Tab

The System Memory Setting tab provides functions to adjust and monitor the unused RAM.



The tab use to	How to use
Adjust display	Move the slider left to release more memory running programs or move the slider right to release more storage room, and then press the Setting button

4. Your First Program

When you learn every computer programming language you may realize that the first program to demonstrate is "Hello World", it provides a cursory introduction to the language's syntax and output.

Before writing your first program, ensure that you have the necessary development tools and the corresponding WinPAC-5000 SDKs are installed on your system.

4.1. Preparing the Development Tools

WinPAC-5000 is a Windows CE-based unit. Windows CE is a mature embedded operating system which supports rapid development. Two standard development tools are listed as follows which are highly integrated, with comprehensive support for developing applications of Windows CE-based WinPAC-5000.

► Visual Studio



Visual Studio

WinPAC-5000 has .NET Compact Framework 2.0 installed. Visual Studio takes full advantage of the .NET Compact Framework, which uses public Internet standards to enable integration with new and existing applications running on any platform. Supported languages include Visual C#, and Visual Basic .NET.

► Microsoft Embedded Visual C++



eMbedded Visual C++

eMbedded Visual C++ is a standalone integrated development environment (IDE) that brings a new level of productivity to Windows CE development without compromising flexibility, performance, or control.

4.2. Installing WinPAC-5000 SDK

The WinPAC SDK is a Software Development Kit (SDK) that contains C header files, C libraries and documents.

Step 1: Insert the CD into your CD-ROM drive

Step 2: Execute the “PAC270_SDK_YYYYMMDD.msi”

- The PAC270_SDK_YYYYMMDD.msi can be obtained from:

CD:\Napdos\wp-5000_ce50\SDK\

ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/sdk/

Step 3: Follow the prompts until the installation is complete

4.3. Your First Program in C#

Here we will demonstrate how to create a C# program running on WinPAC-5000 with the C# development tool, which including the following topics:

1. Create a new project
2. Add WinPAC-5000 reference
3. Add the control to the form
4. Add the event handling for the control
5. Upload the application to WinPAC-5000
6. Execute the application on WinPAC-5000

In this tutorial, we will assume that you have installed WinPAC-5000 SDK on PC and used the Visual Studio 2005 for application development.

4.3.1. Creating a New Project

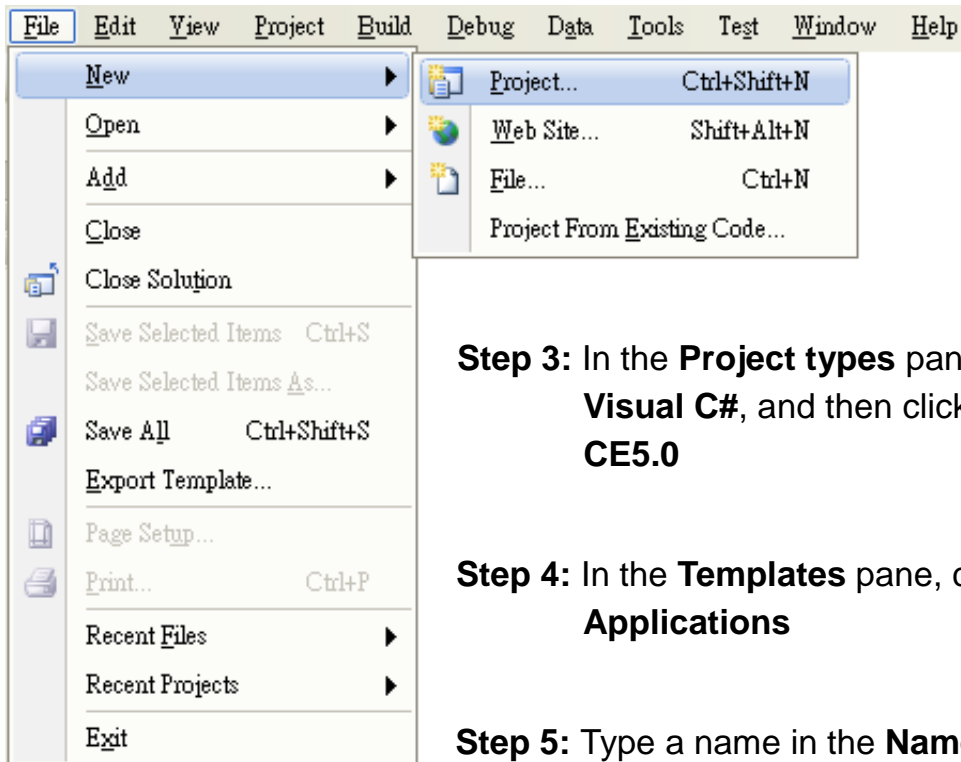
The Visual C# project template is a composite control that you use in this example creates a new project with this user control.

Step 1: Start Visual Studio 2005



Visual Studio 2005

Step 2: On the **File** menu, point to **New**, and then click **Project...**

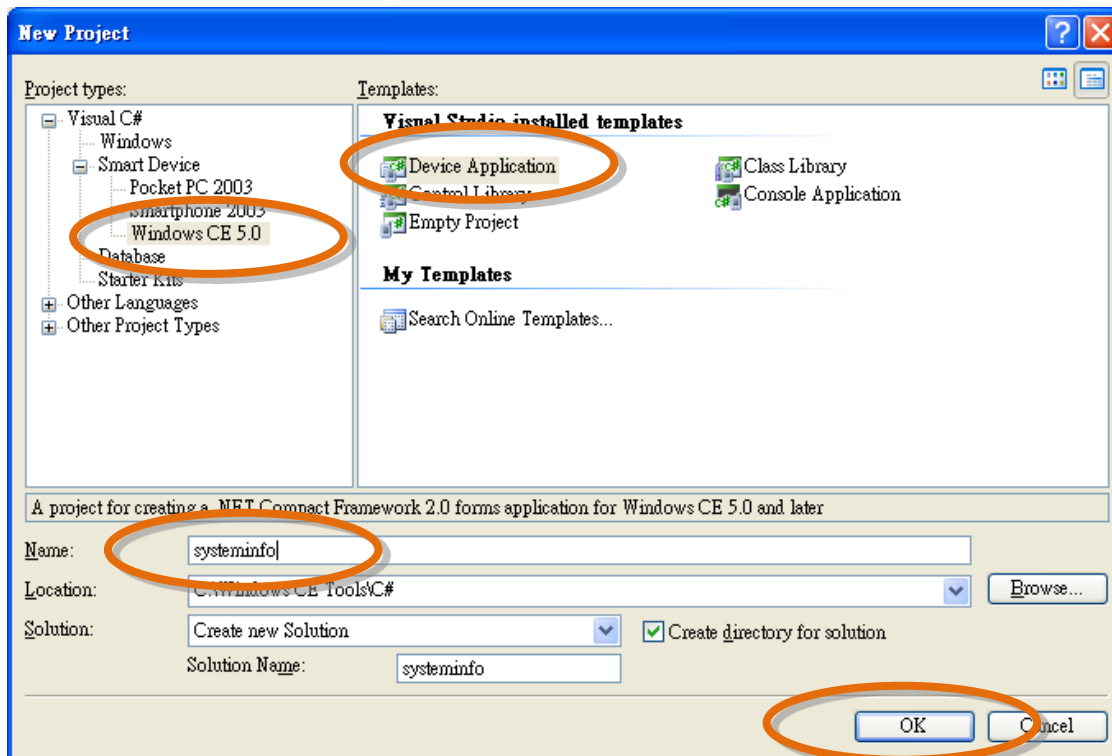


Step 3: In the **Project types** pane, expand **Visual C#**, and then click **Windows CE5.0**

Step 4: In the **Templates** pane, click **Device Applications**

Step 5: Type a name in the **Name** field, and then click **OK**

Here we will enter the name “systeminfo” and a different location for the project if you wish

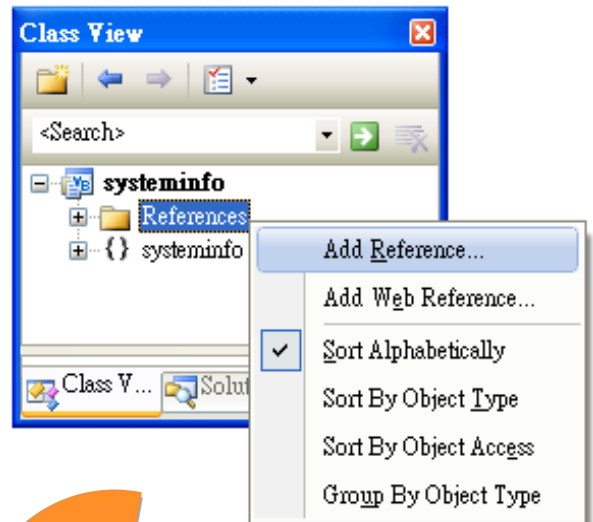


4.3.2. Adding the WinPAC-5000 Reference

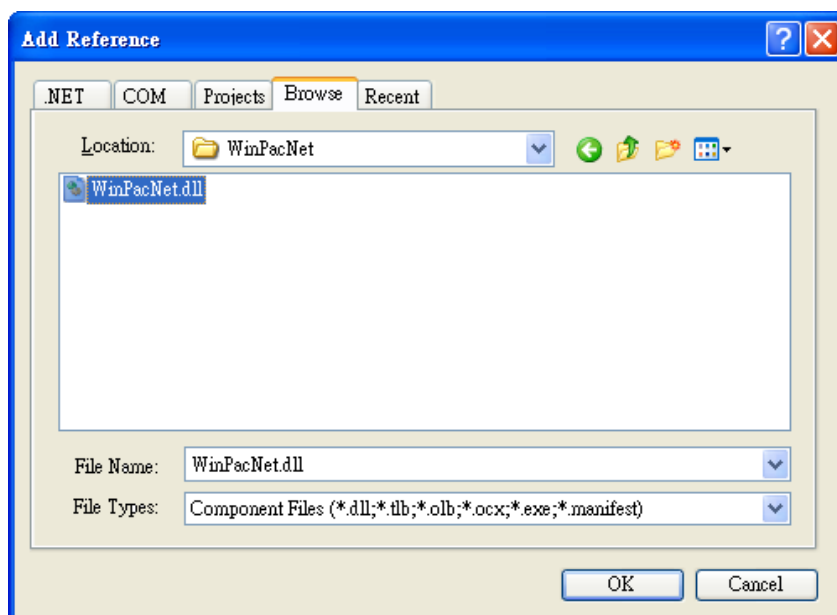
The WinPAC-5000 SDKs provides a complete solution to integrate with WinPAC-5000. Compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

Step 1: In Solution Explorer, right-click the **References** node and click **Add Reference** on the shortcut menu

The Add Reference dialog box appears.



Step 2: Click the **Browse** tab, and then select **WinPacNet.dll**



➤ The “WinPacNet.dll” file can be obtained from:

CD:\Napdos\wp-5000_ce50\SDK\WinPacNet\

ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/sdk/winpacnet/

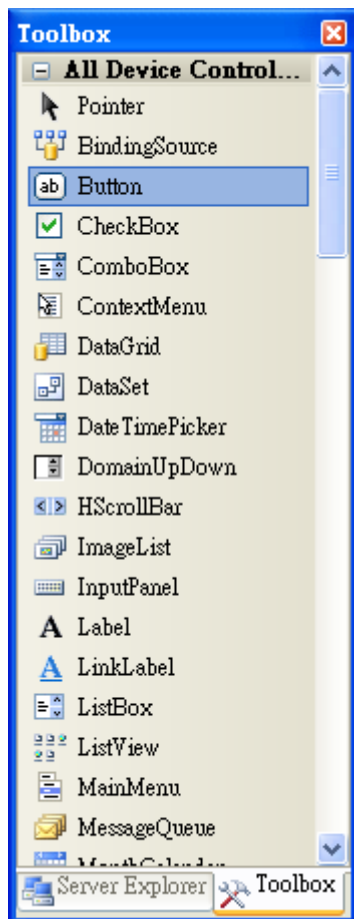
Step 3: Click **OK** to close the **Add Reference** dialog box

4.3.3. Adding the Control to the Form

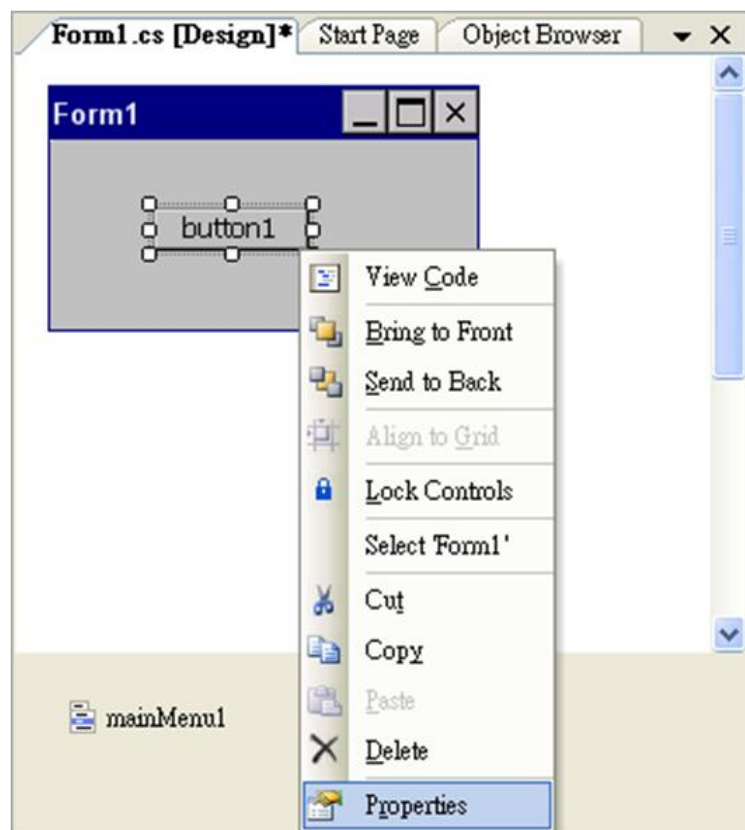
You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

After you add a control to your form, you can use the **Properties** window to set its properties, such as background color and default text. The values that you specify in the **Properties** window are the initial values that will be assigned to that property when the control is created at run time.

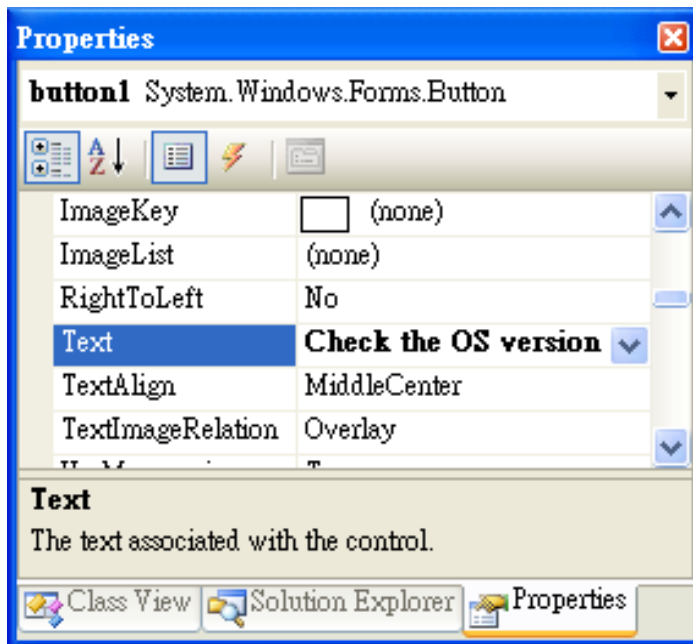
Step 1: From the **Toolbox**, drag a **Button** control onto the form



Step 2: Right-click the **Button** control, and then click **Properties**



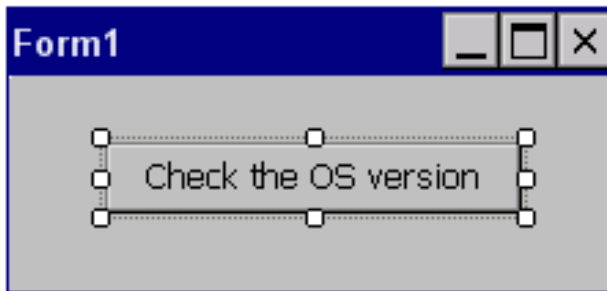
Step 3: In the **Properties** window, type Check the OS version, and press ENTER to set the **Text** property



4.3.4. Adding the Event Handling to the Control

You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

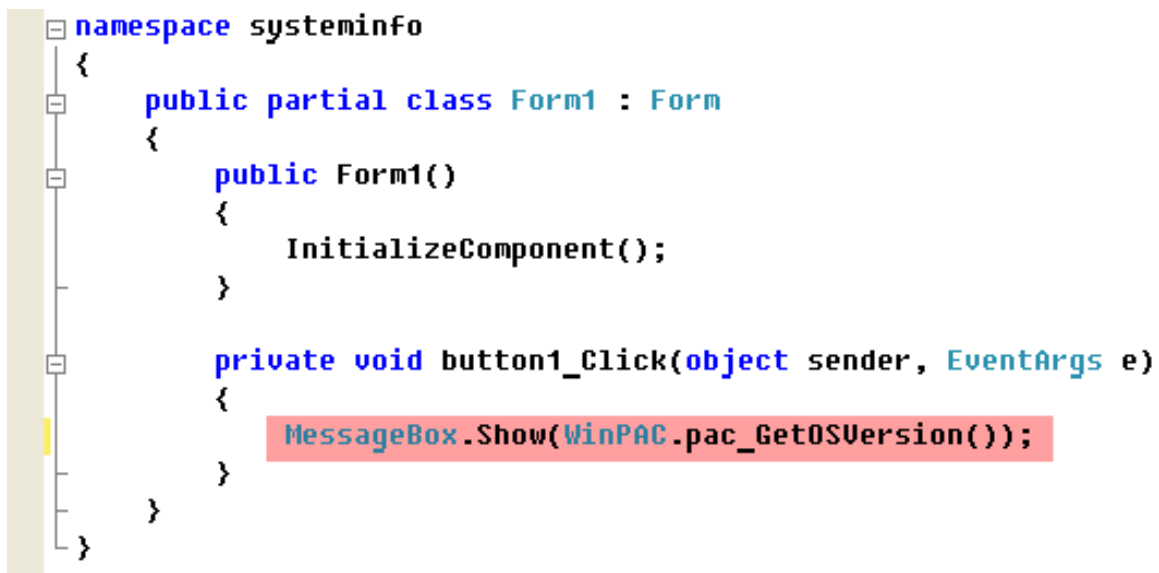
Step 1: Double-click the **button** on the form



The Code Editor opens with the cursor positioned in the event handler.

Step 2: Inserting the following code

```
MessageBox.Show(WinPAC-5000.pac_GetOSVersion());
```

A screenshot of a code editor showing the implementation of the button click event handler. The code is written in C# and is part of a namespace named 'systeminfo'. The class 'Form1' is a partial class that inherits from 'Form'. The 'Form1' class has a constructor 'Form1()' that calls 'InitializeComponent()'. The event handler is a private void method named 'button1_Click' that takes an 'object sender' and 'EventArgs e' as parameters. The code for the event handler is highlighted in red: `MessageBox.Show(WinPAC.pac_GetOSVersion());`.

```
namespace systeminfo
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            MessageBox.Show(WinPAC.pac_GetOSVersion());
        }
    }
}
```


Step 3: Inserting the following code into the header area

```
vusing WinPacNet;
```

```
using System;  
using System.Collections.Generic;  
using System.ComponentModel;  
using System.Data;  
using System.Drawing;  
using System.Text;  
using System.Windows.Forms;  
using WinPacNet;  
  
namespace systeminfo  
{  
    public partial class Form1 : Form  
    {  
        public Form1()  
    }  
}
```

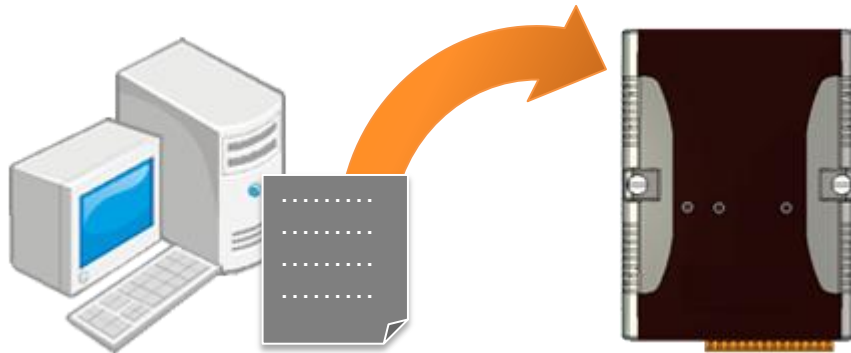
Tips & Warnings



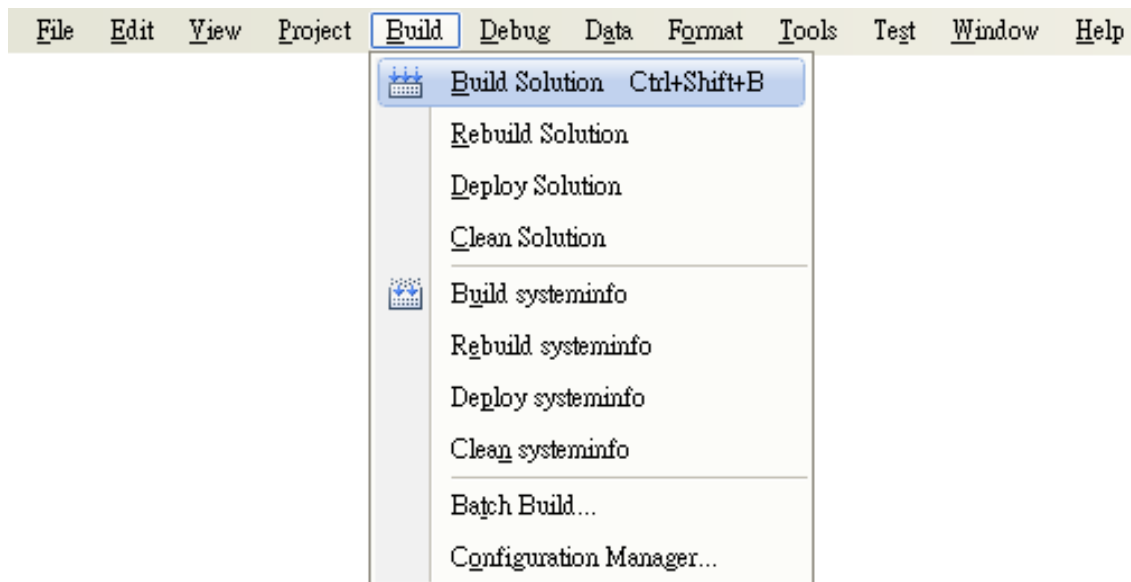
The “WinPacNet” of “unsing WinPacNet” is case- sensitive..

4.3.5. Upload the Application to WinPAC-5000

WinPAC-5000 provide FTP server service, you can upload files to WinPAC-5000 or download files from a public FTP server.



Step 1: On the **Build** menu, click **Build Solution**



Step 2: Open the browser and type the IP address of WinPAC-5000

Step 3: Upload the systeminfo.exe application and the corresponding **Winpacnet.dll** file to the WinPAC-5000

Tips & Warnings

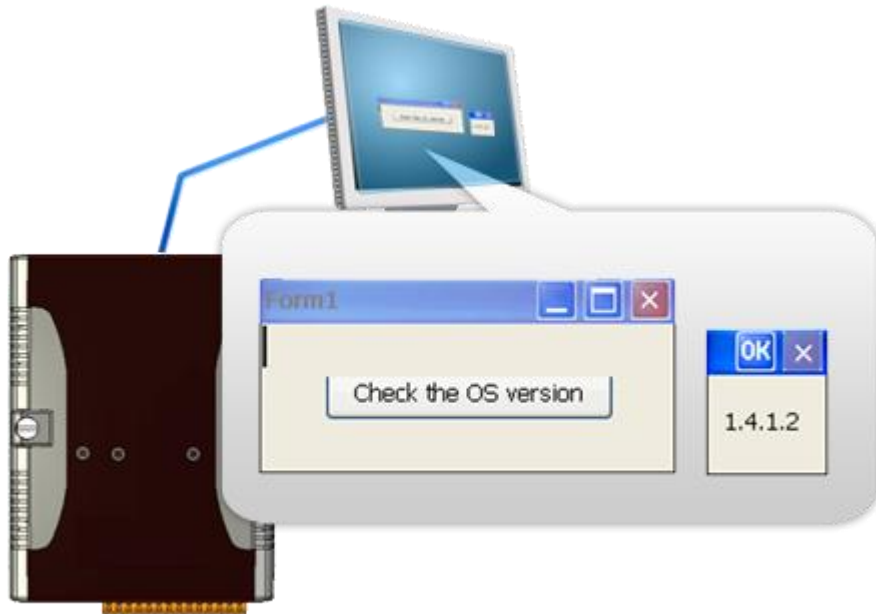


For applications programming in C# and VB.net with .net framework, when executing these application on the WinPAC-5000 controller, the corresponding “Winpacnet.dll” file must be in the same directory as the .exe file.



4.3.6. Executing the Application on WinPAC-5000

After uploading the application to WinPAC-5000, you can just double-click it on WinPAC-5000 to execute it.



4.4. Your First Program in VB.net

Here we will demonstrate how to create a VB.net program running on WinPAC-5000 with the VB.net development tool, which including the following topics:

1. Create a new project
2. Add WinPAC-5000 reference
3. Add the control to the form
4. Add the event handling for the control
5. Upload the application to WinPAC-5000
6. Execute the application on WinPAC-5000

In this tutorial, we will assume that you have installed WinPAC-5000 SDK on PC and used the Visual Studio 2005 for application development.

4.4.1. Creating a New Project

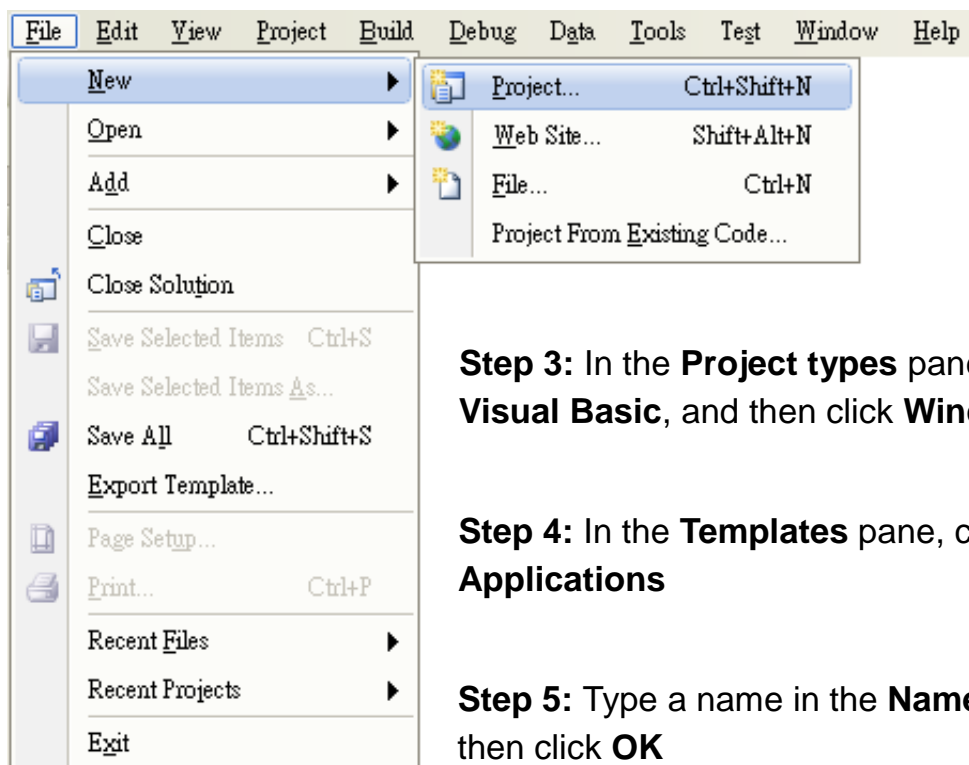
The VB.net project template is a composite control that you use in this example creates a new project with this user control.

Step 1: Start Visual Studio 2005



Visual Studio 2005

Step 2: On the **File** menu, point to **New**, and then click **Project...**

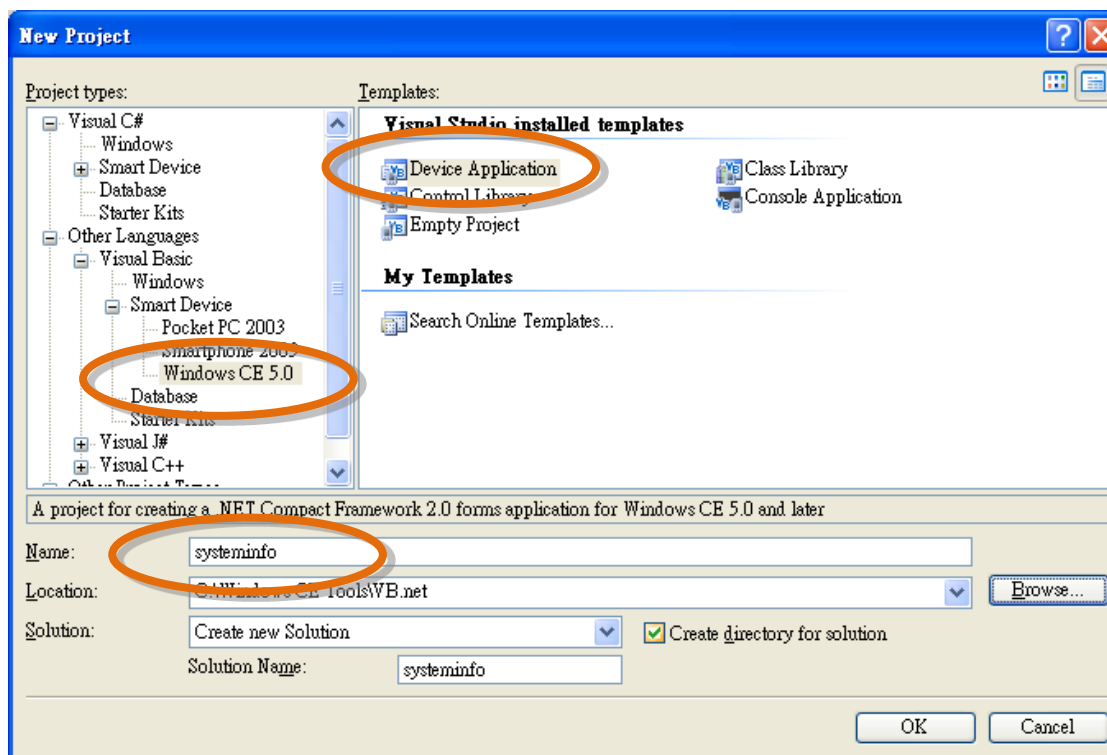


Step 3: In the **Project types** pane, expand **Visual Basic**, and then click **Windows CE5.0**

Step 4: In the **Templates** pane, click **Device Applications**

Step 5: Type a name in the **Name** field, and then click **OK**

Here we will enter the name “systeminfo” and a different location for the project if you wish

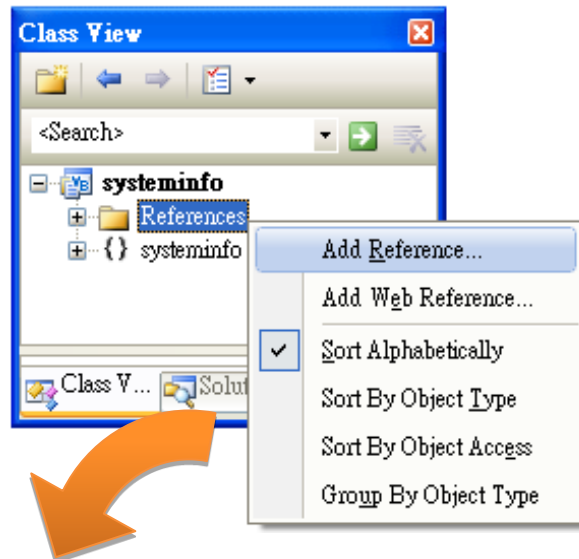


4.4.2. Adding the WinPAC-5000 Reference

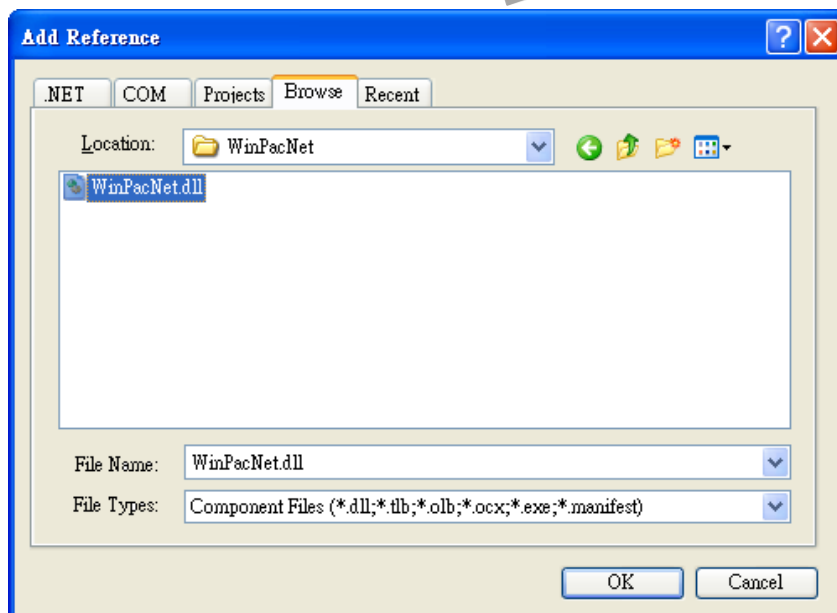
The WinPAC-5000 SDKs provides a complete solution to integrate with WinPAC-5000. Compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

Step 1: In Solution Explorer, right-click the **References** node and click **Add Reference** on the shortcut menu.

The Add Reference dialog box appears.



Step 2: Click the **Browse** tab, and then select **WinPacNet.dll**



- The “WinPacNet.dll” file can be obtained from:
CD:\Napos\wp-5000_ce50\SDK\WinPacNet\
ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/sdk/winpacnet/

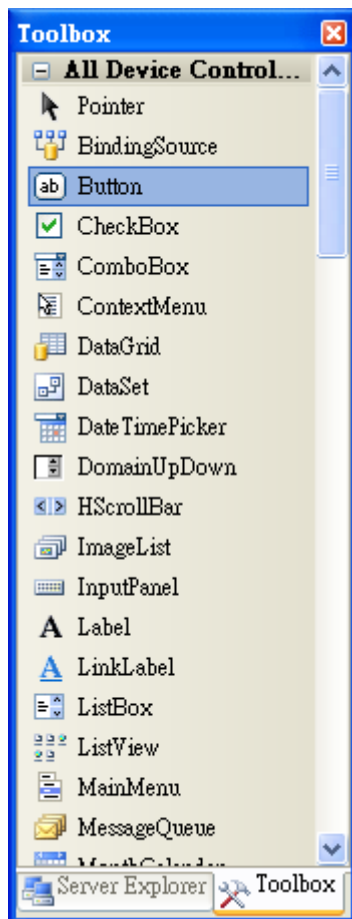
Step 3: Click **OK** to close the **Add Reference** dialog box

4.4.3. Adding the Control to the Form

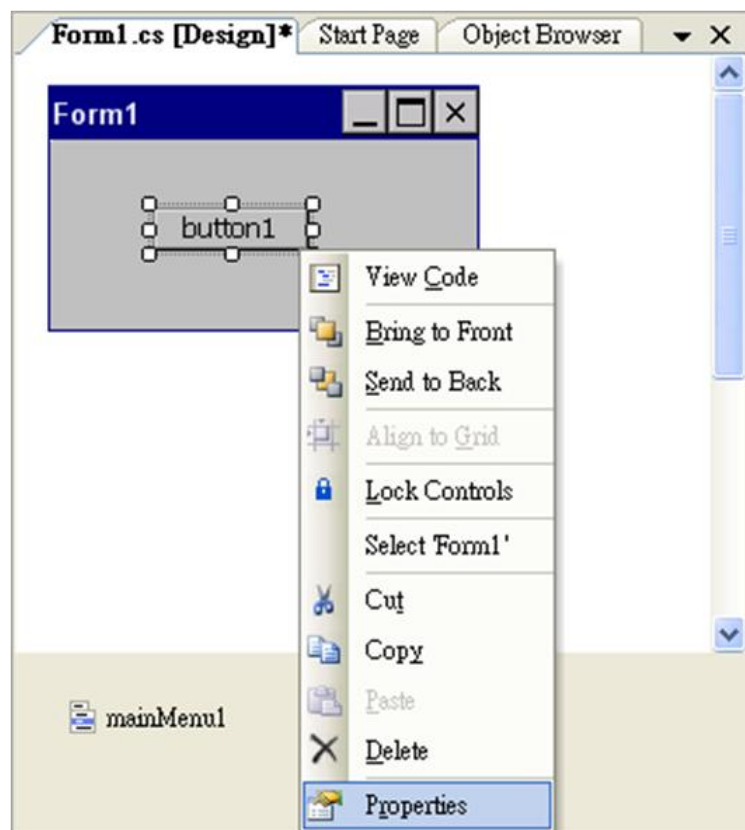
You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

After you add a control to your form, you can use the **Properties** window to set its properties, such as background color and default text. The values that you specify in the **Properties** window are the initial values that will be assigned to that property when the control is created at run time.

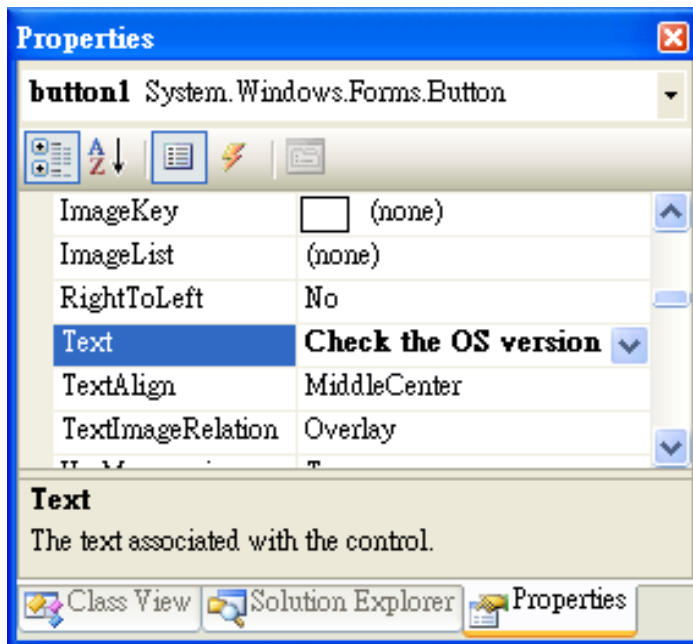
Step 1: From the **Toolbox**, drag a **Button** control onto the form



Step 2: Right-click the **Button** control, and then click **Properties**



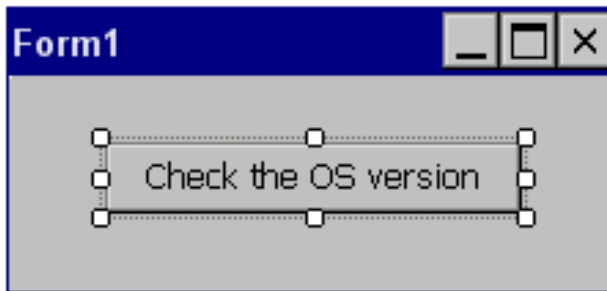
Step 3: In the **Properties** window, type Check the OS version, and press ENTER to set the **Text** property



4.4.4. Adding the Event Handling to the Control

You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

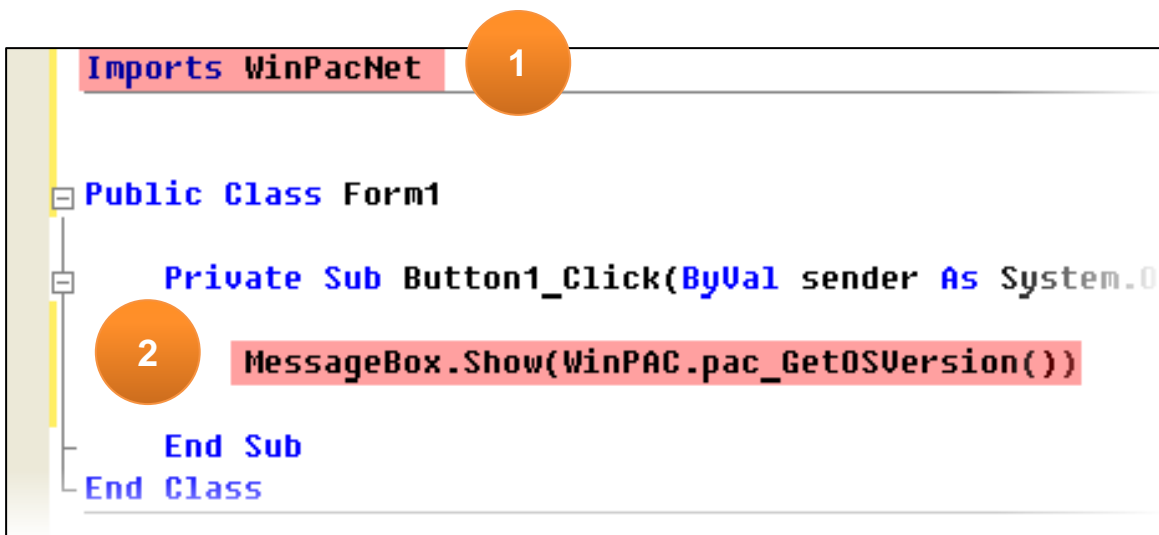
Step 1: Double-click the **button** on the form



The Code Editor opens with the cursor positioned in the event handler.

Step 2: Inserting the following code

1. Imports WinPacNet
2. MessageBox(WinPAC-5000.pac_GetOSVersion())



```
Imports WinPacNet  
  
Public Class Form1  
    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click  
        MessageBox.Show(WinPAC.pac_GetOSVersion())  
    End Sub  
End Class
```

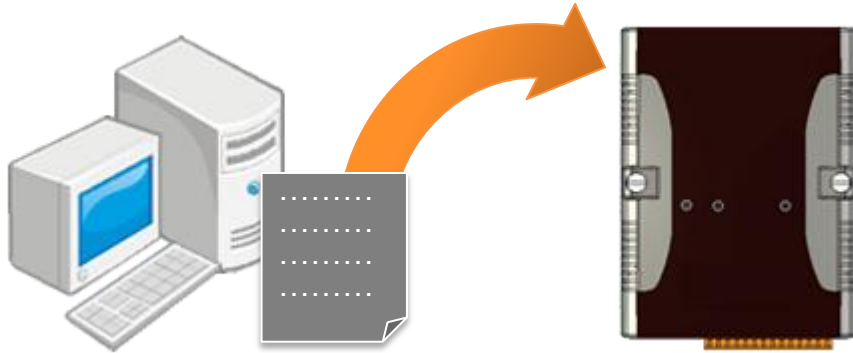
Tips & Warnings



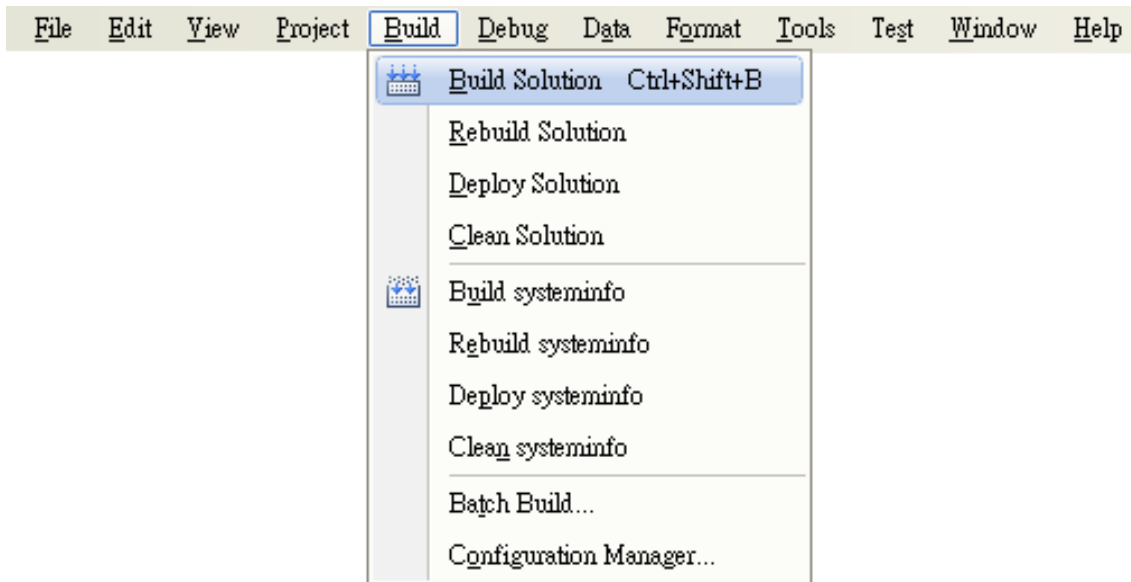
The "WinPacNet" of "unsing WinPacNet" is case- sensitive..

4.4.5. Upload the Application to WinPAC-5000

WinPAC-5000 provide FTP server service, you can upload files to WinPAC-5000 or download files from a public FTP server.



Step 1: On the **Build** menu, click **Build Solution**



Step 2: Open the browser and type the IP address of WinPAC-5000

Step 3: Upload the systeminfo.exe application and the corresponding **Winpacnet.dll** file to the WinPAC-5000

Tips & Warnings

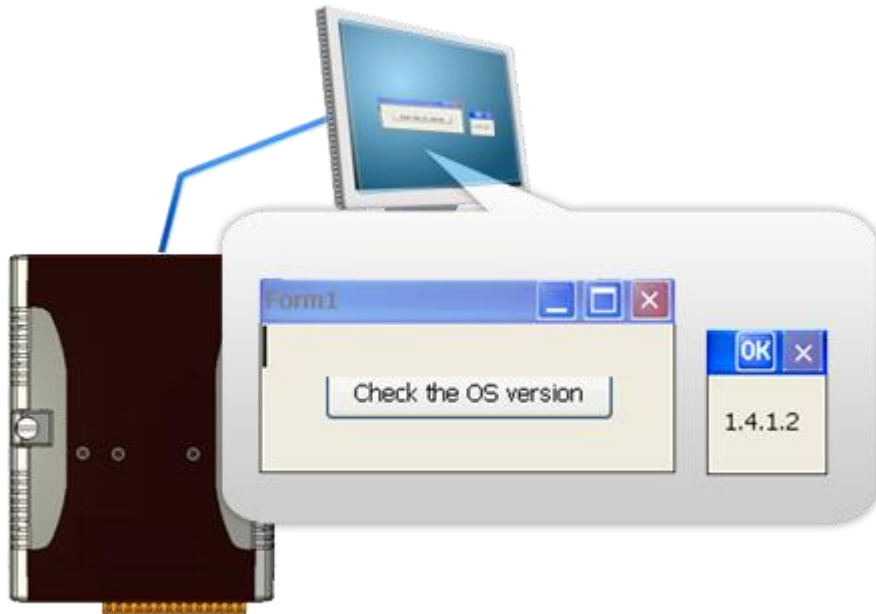


For applications programming in C# and VB.net with .net framework, when executing these application on the WinPAC-5000 controller, the corresponding “Winpacnet.dll” file must be in the same directory as the .exe file.



4.4.6. Executing the Application on WinPAC-5000

After uploading the application to WinPAC-5000, then you can just double-click it on WinPAC-5000 to execute it.



4.5. Your First Program in eMbedded Visual C++

Here we will demonstrate how to create a eVC++ program running on WinPAC-5000 with the eVC++ development tool, which including the following topics:

1. Create a new Forms-Based project
2. Configure the platform
3. Specify the path of the WinPAC-5000 reference
4. Add the control to the form
5. Add the event handling for the control
6. Upload the application to WinPAC-5000
7. Execute the application on WinPAC-5000

In this tutorial, we will assume that you have installed WinPAC-5000 SDK on PC and used the eMbedded Visual C++ 4.0 for application development.

4.5.1. Creating a Forms-Based Project

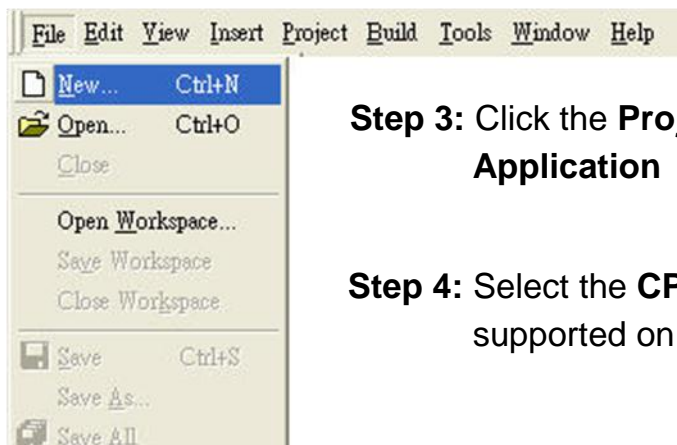
The eVC++ project template is a composite control that you use in this example creates a new project with this user control.

Step 1: Start eMbedded Visual C++



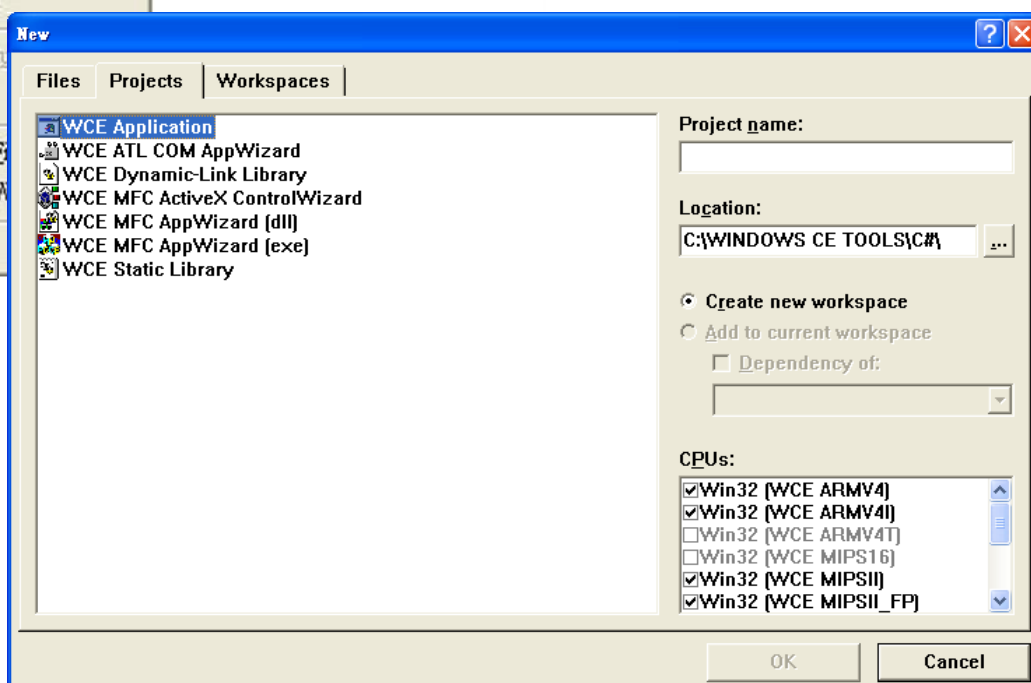
eMbedded Visual C++

Step 2: On the **File** menu, and then click **New**



Step 3: Click the **Projects** tab, and then select **WCE Application**

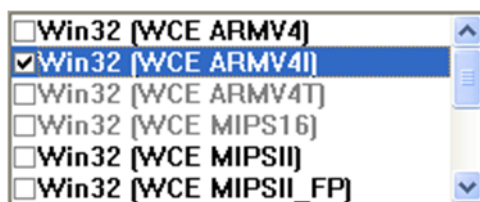
Step 4: Select the **CPUs** that WinPAC-5000 is supported on from the **CPUs** list box



Tips & Warnings

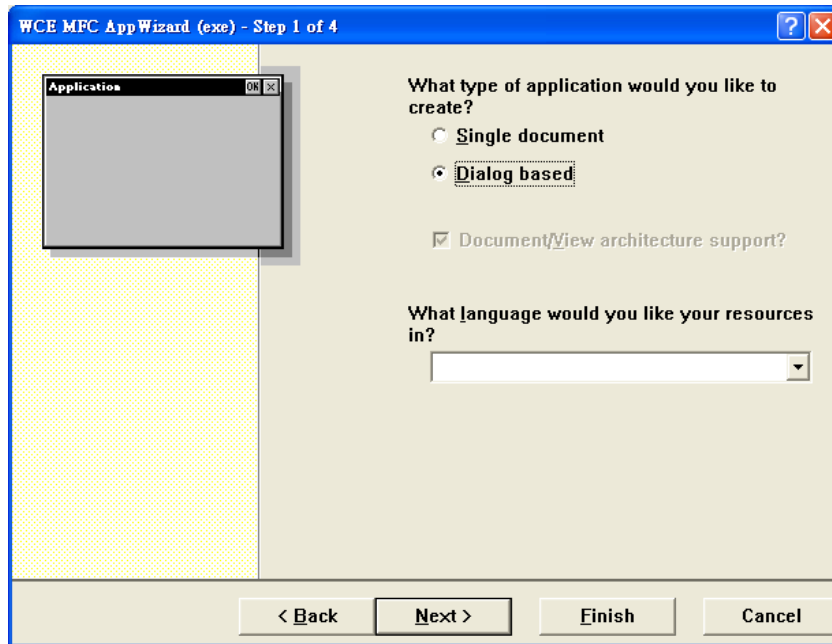


Ensure that **Win32 (WCE ARMV4I)** is selected in the **CPUs** list box and click **OK**.

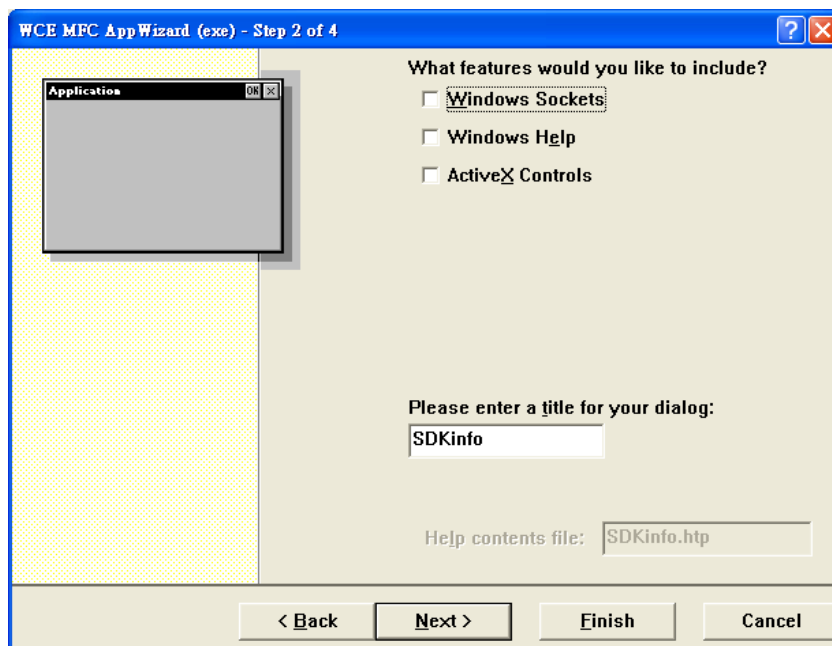


Step 5: Click **OK** to start the wizard

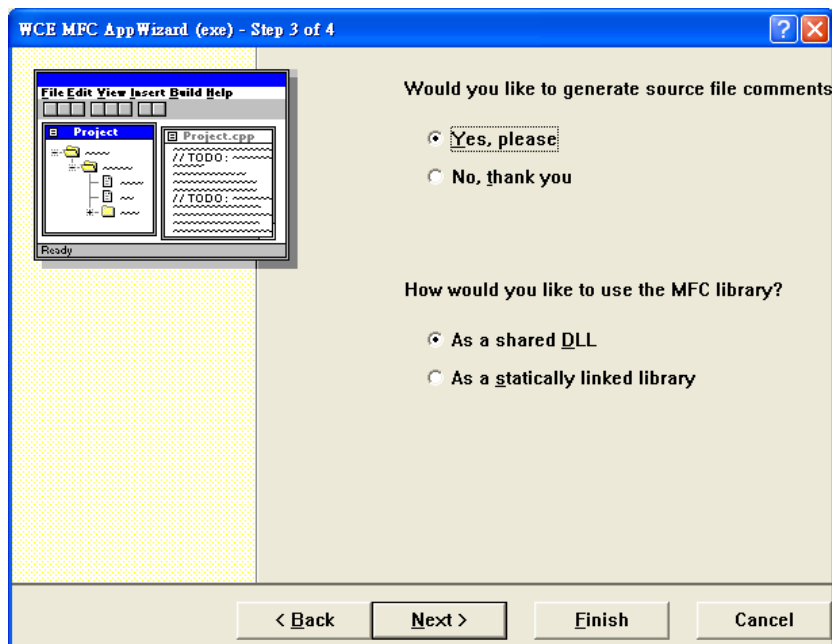
Step 6: On the first page of the wizard, click **Dialog based** and then click **Next**, as shown in the following illustration



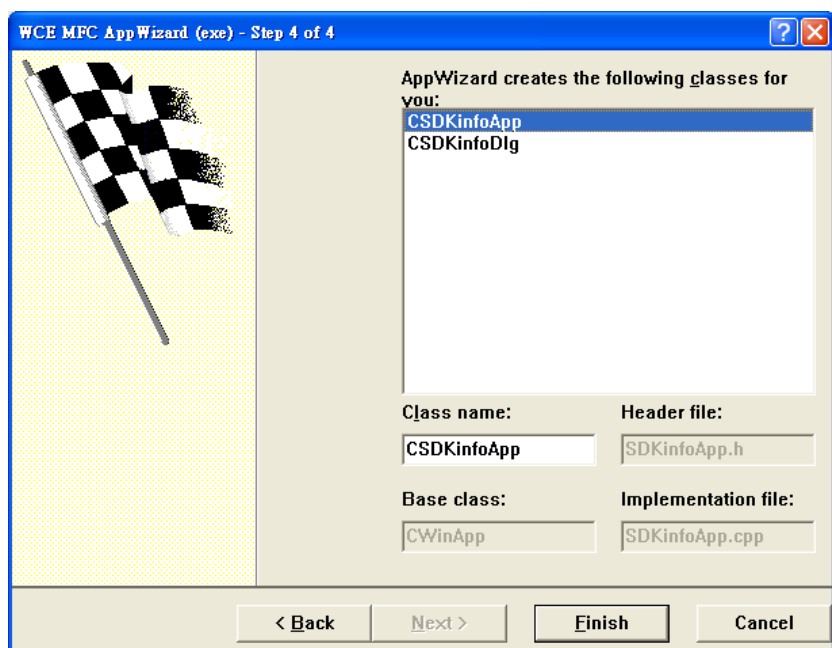
Step 7: On the next page of the wizard, leave all the options as they are, and then click **Next**, as shown in the following illustration



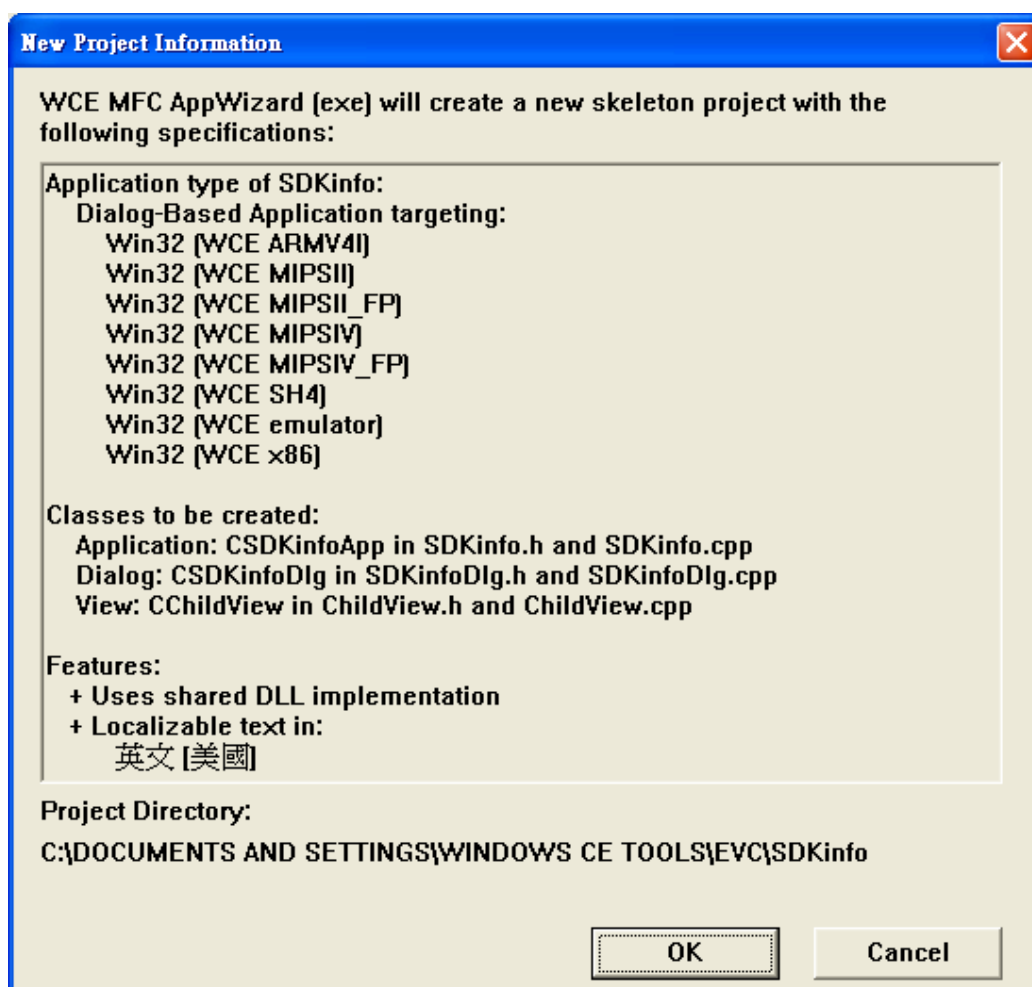
Step 8: On the next page of the wizard, click **Next**, as shown in the following illustration



Step 9: On the next page of the wizard, Click **Finish**, as shown in the following illustration



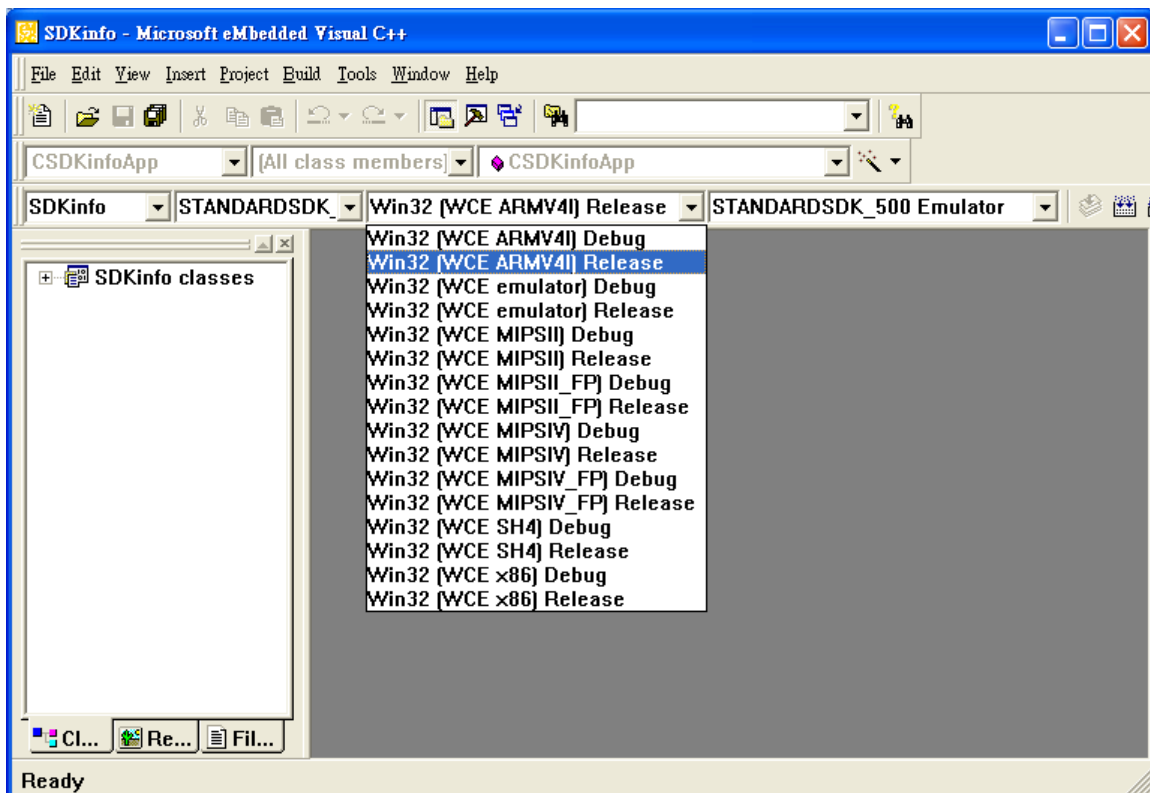
Step10: When the summary appears, click **OK** to complete the wizard, as shown in the following illustration



4.5.2. Configuring the Platform

When developing applications by using eMbedded Visual C++, you must configure the Platform to indicate what platform and device you intend to download the application to. Before you deploy your project, check the platform.

On the **Win32 [WCE ARMV4I] Debug** configuration toolbar, select **Win32 [WCE ARMV4I] Release**, as shown in the following illustration.

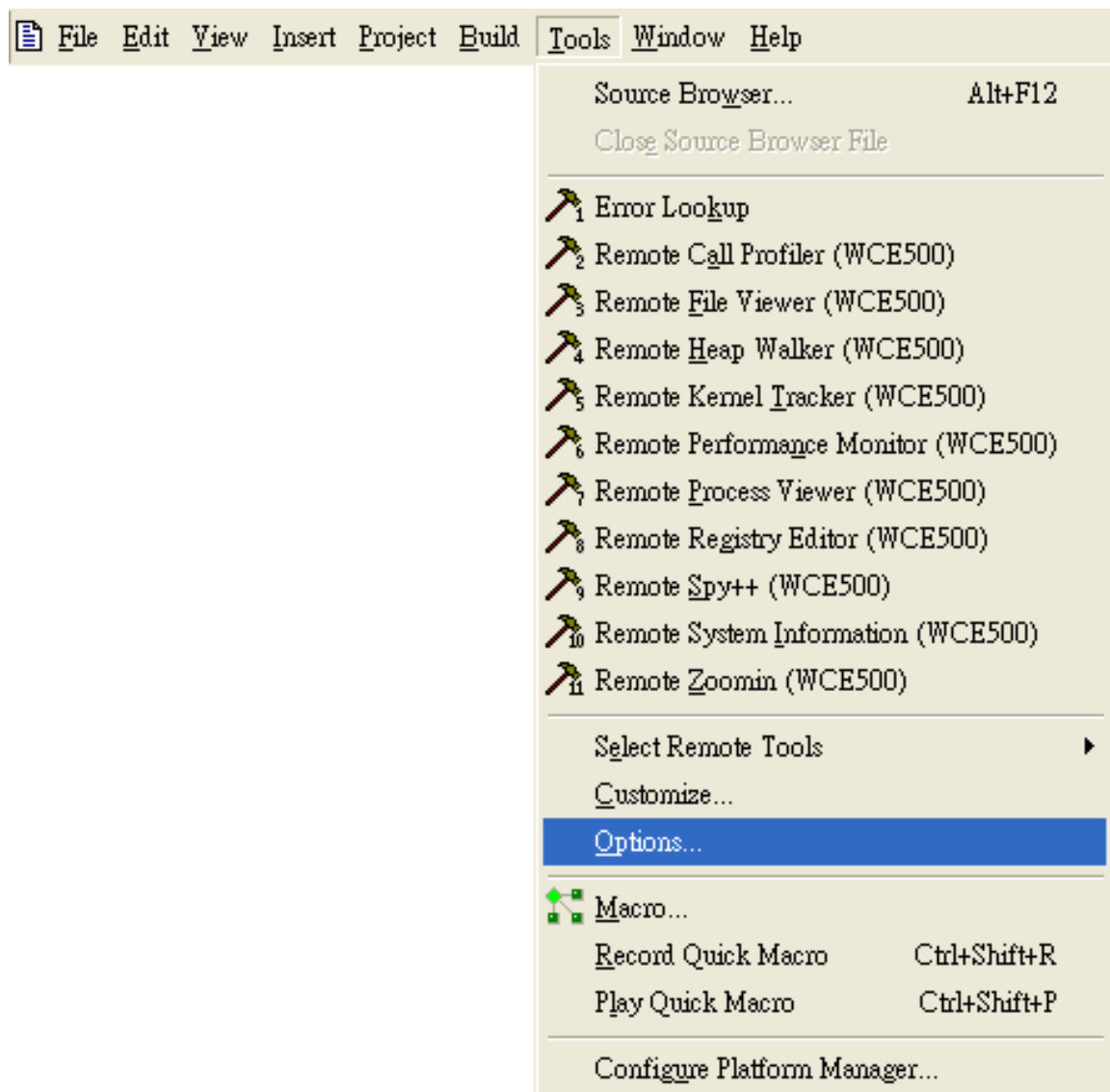


4.5.3. Specifying the Path of the WinPAC-5000 Reference

The WinPAC-5000 SDKs provides a complete solution to integrate with WinPAC-5000. Compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

Step 1: On the **Tools** menu, and then click **Options**

The **Options** dialog box appears.



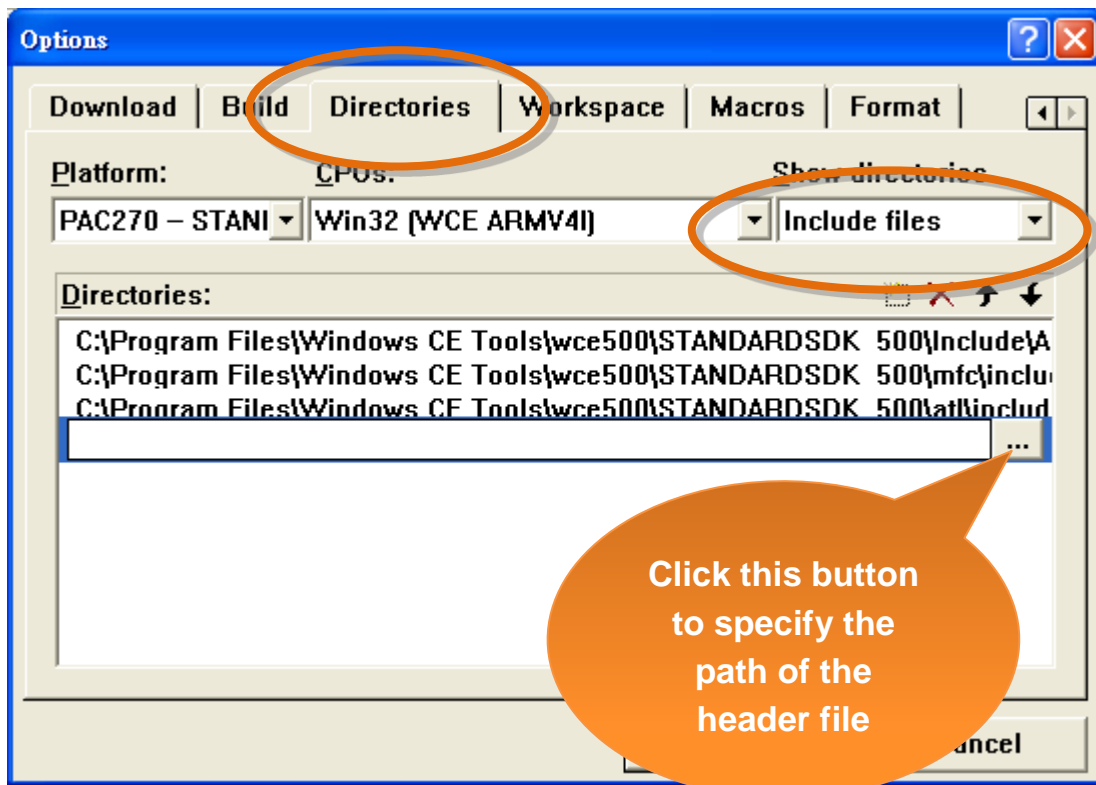
Step 2: On the **Directories** tab, in the Show directories for list, select Include files

Step 3: Under **Directories**, type the path of the heard file

► The specified include path of the header file is default located at:

C:\Program Files\Windows CE

Tools\wce500\PAC270\lcpdas\Include\ARMV4\inPacNet.dll



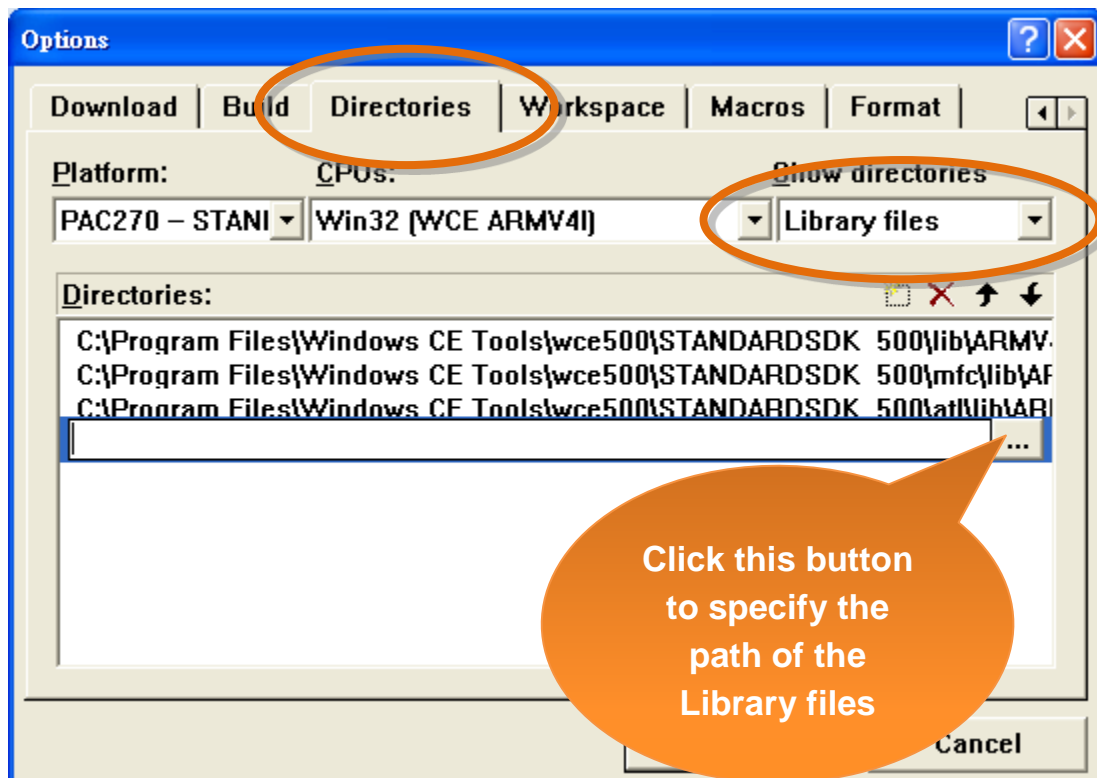
Step 4: In the **Show directories** for list, select Library files

Step 5: Under **Directories**, type the path of the heard file

► The specified include path of the header file is default located at:

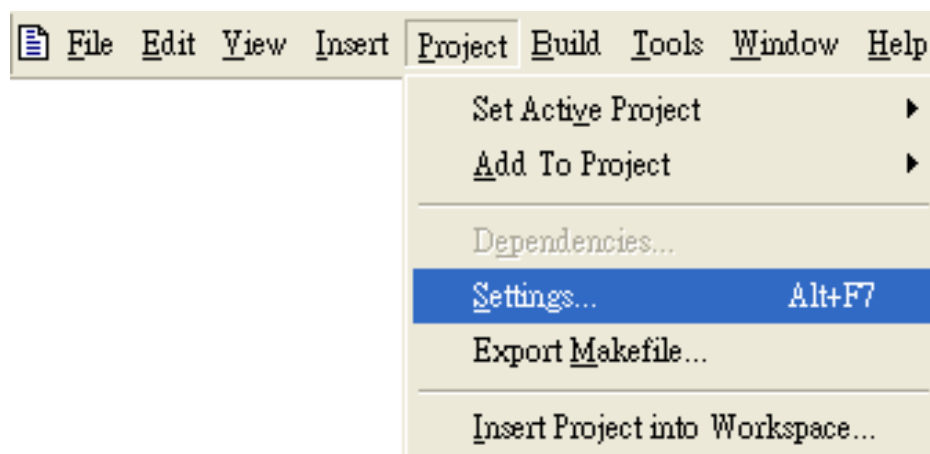
C:\Program Files\Windows CE

Tools\wce500\PAC270\Icpdas\Include\ARMV4\InPacNet.dll

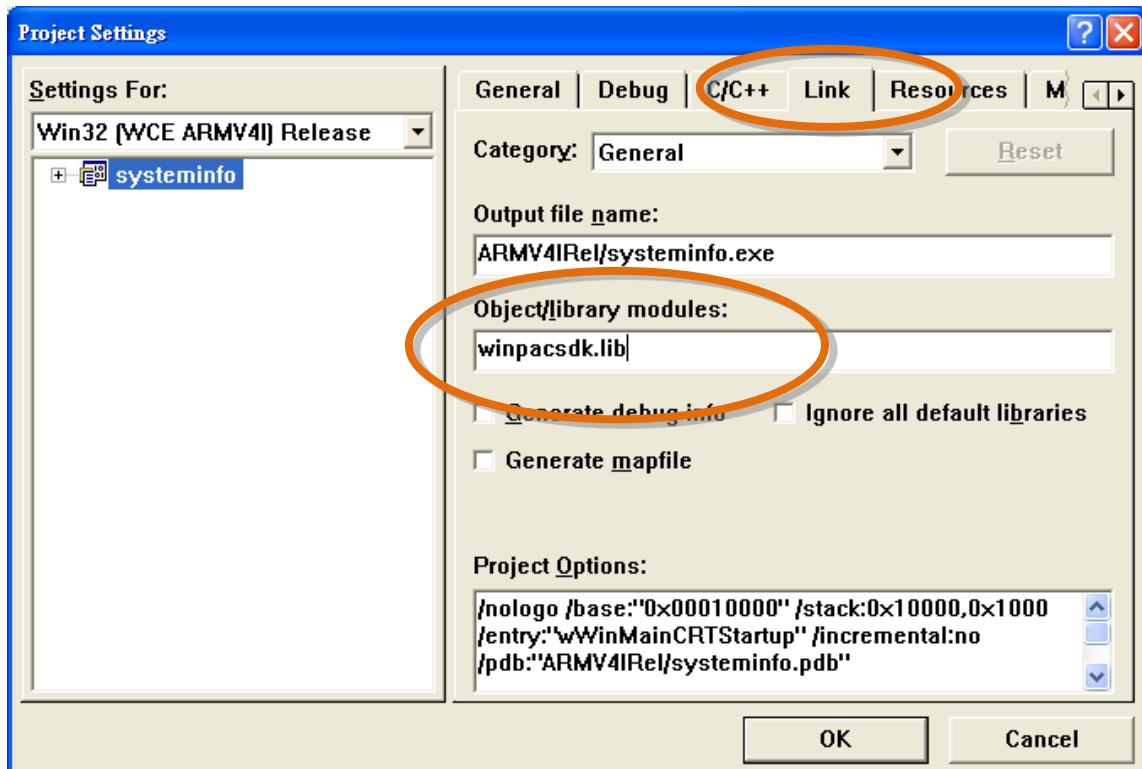


Step 6: On the **Project** menu, and then click **Settings**

The **Project Settings** dialog box appears.



Step 7: On the **Link** tab, type the **winpacsdk.lib** in the **Object/library module** field, and then click **OK**



4.5.4. Adding the Control to the Form

You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

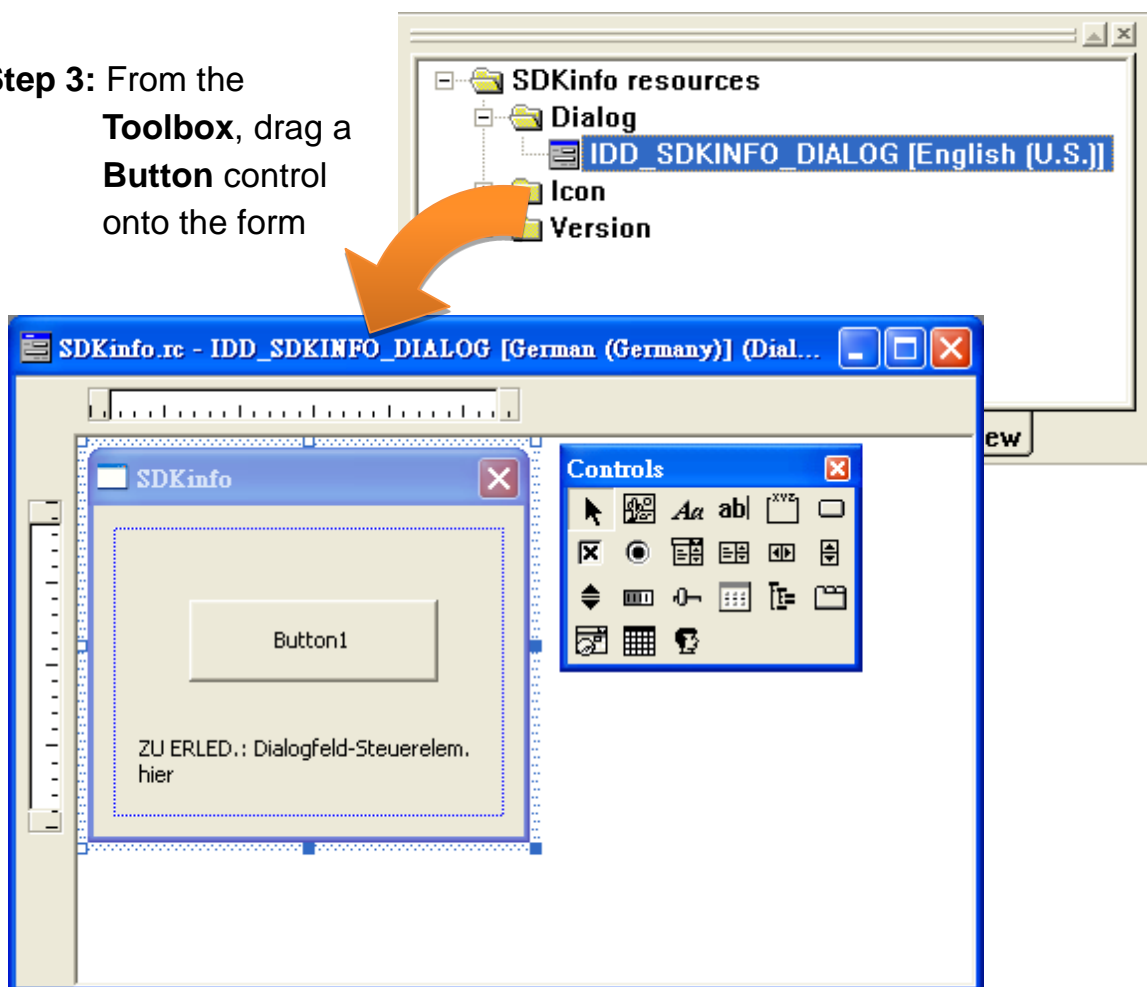
After you add a control to your form, you can use the **Properties** function to set its properties, such as background color and default text.

Step 1: Click **ResourceView** in the **Project Workspace** pane and expand the resources tree by opening the top level folder

Step 2: Open the **Dialog** folder and then double-click the dialog resource name **IDD_SDKINFO_DIALOG**

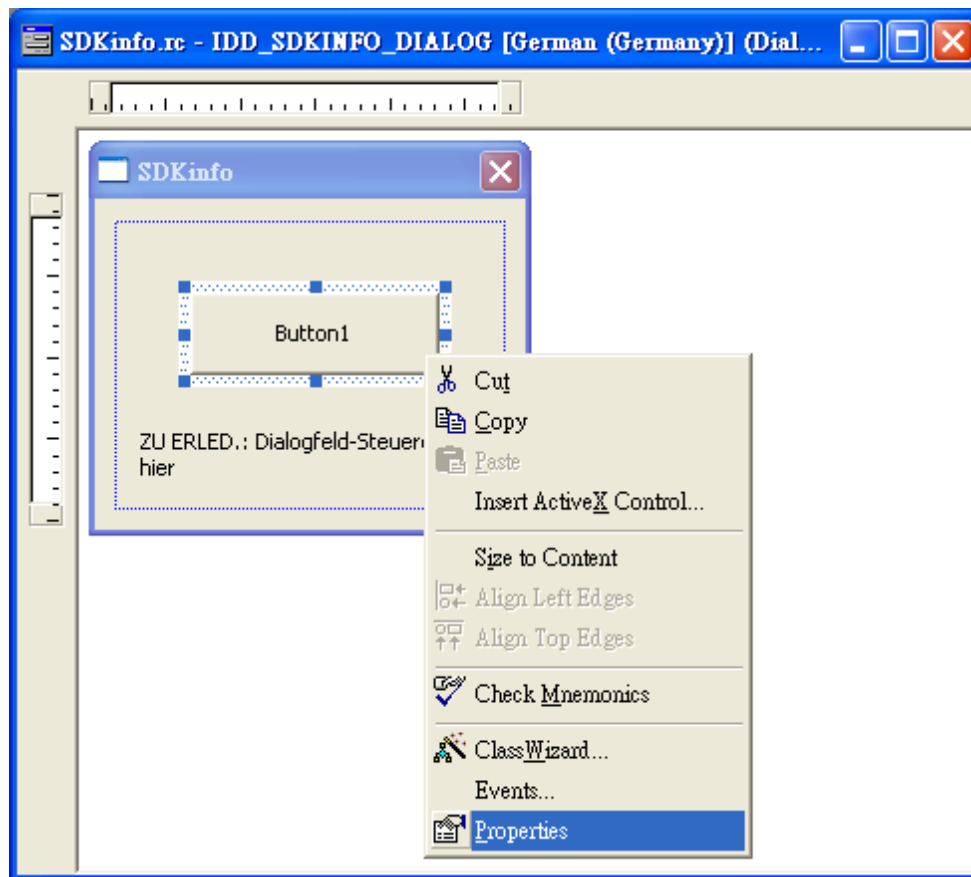
The resource editor appears in the right pane.


Step 3: From the **Toolbox**, drag a **Button** control onto the form

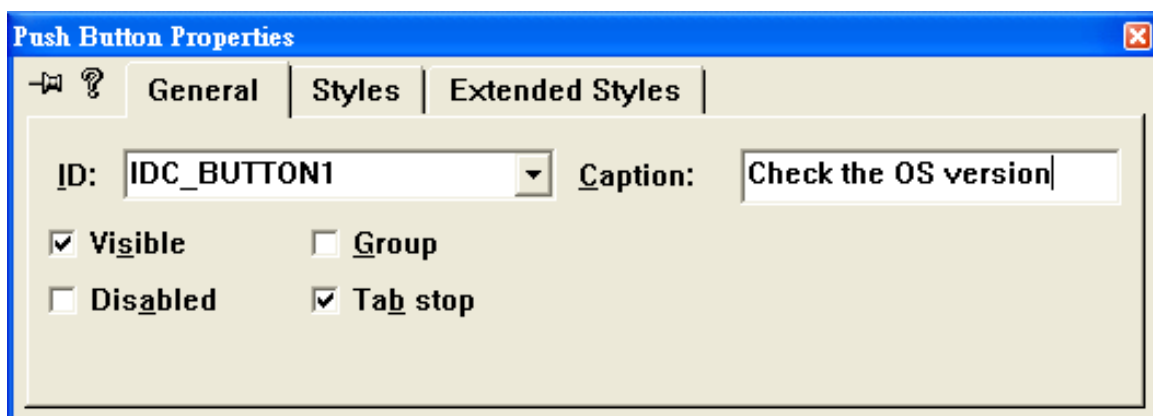


Step 4: Right-click the **Button** control, and then click **Properties**

The **Push Button Properties** dialog box appears.



Step 5: Type Check the OS version in the **Captions** field, and then click 

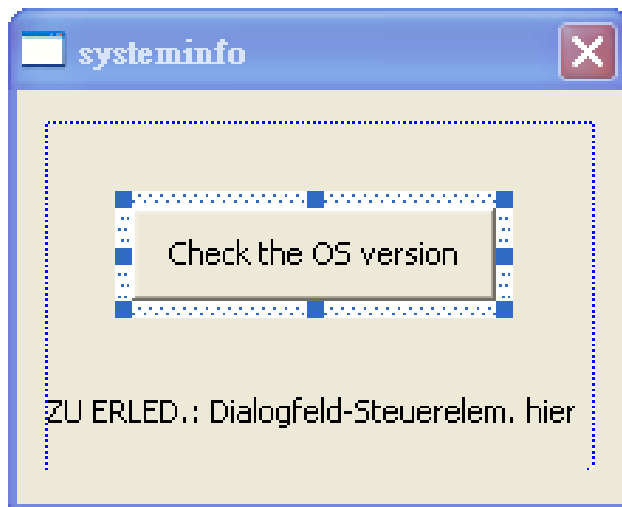


4.5.5. Adding the Event Handling to the Control

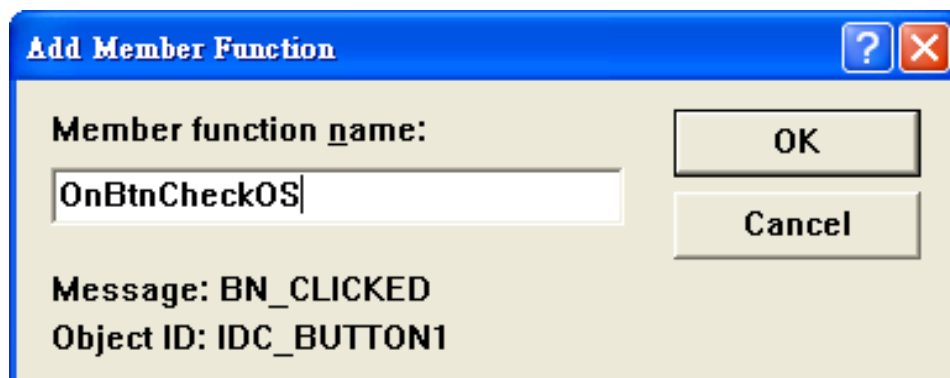
You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

Step 1: Double-click the button on the form

The **Add Member Function** dialog box appears.



Step 2: Type the **onBtnCheckOS** in the Member **function name** field, and then click **OK**



The Code Editor opens with the cursor positioned in the event handler.

Step 3: Inserting the following code

```
char OS[32];
TCHAR buf[32];
pac_GetOSVersion(OS);
pac_AnsiToWideString(OS, buf);
MessageBox(buf,0,MB_OK);
```

```
void CSysteminfoDlg::OnBtnCheckOS()
{
    // TODO: Add your control notification ha
    char OS[32];
    TCHAR buf[32];
    pac_GetOSVersion(OS);
    pac_AnsiToWideString(OS, buf);
    MessageBox(buf,0,MB_OK);
}
```

Step 4: Inserting the following code into the header area

```
#include "winpacsdk.h"
```

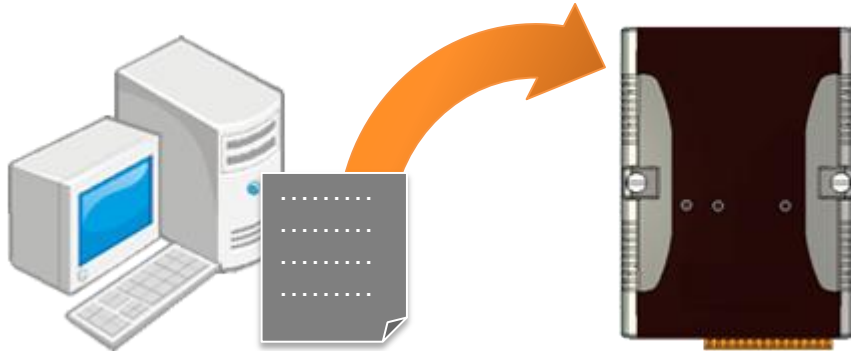
```
#include "stdafx.h"
#include "systeminfo.h"
#include "systeminfoDlg.h"

#include "winpacsdk.h"

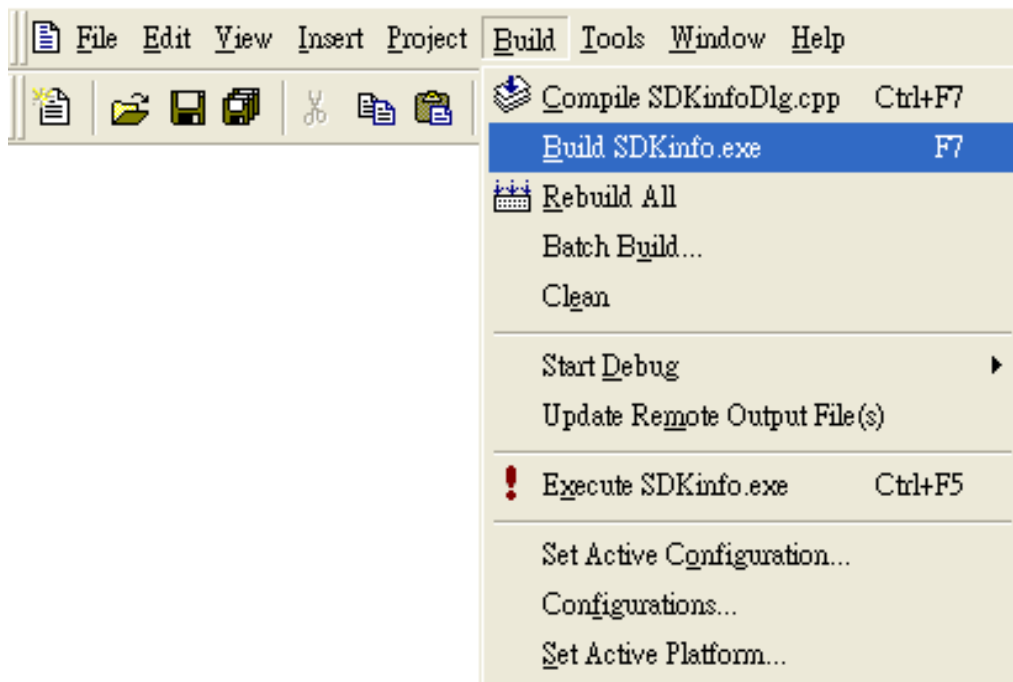
#ifdef _DEBUG
#define new DEBUG_NEW
#undef THIS_FILE
static char THIS_FILE[] = __FILE__;
#endif
```

4.5.6. Upload the Application to WinPAC-5000

WinPAC-5000 provide FTP server service, you can upload files to WinPAC-5000 or download files from a public FTP server.



Step 1: On the **Build** menu, click **Build SDKInfo.exe**



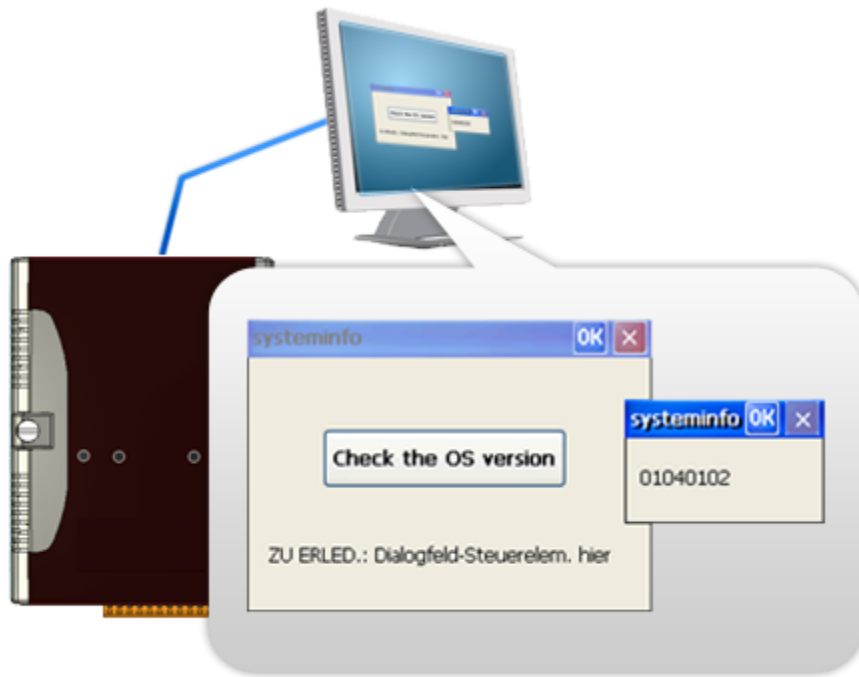
Step 2: Open the browser and type the IP address of WinPAC-5000

Step 3: Upload the systeminfo.exe application



4.5.7. Executing the Application on WinPAC-5000

After uploading the application to WinPAC-5000, you can just double-click it on WinPAC-5000 to execute it.



5. APIs and Demo Programs

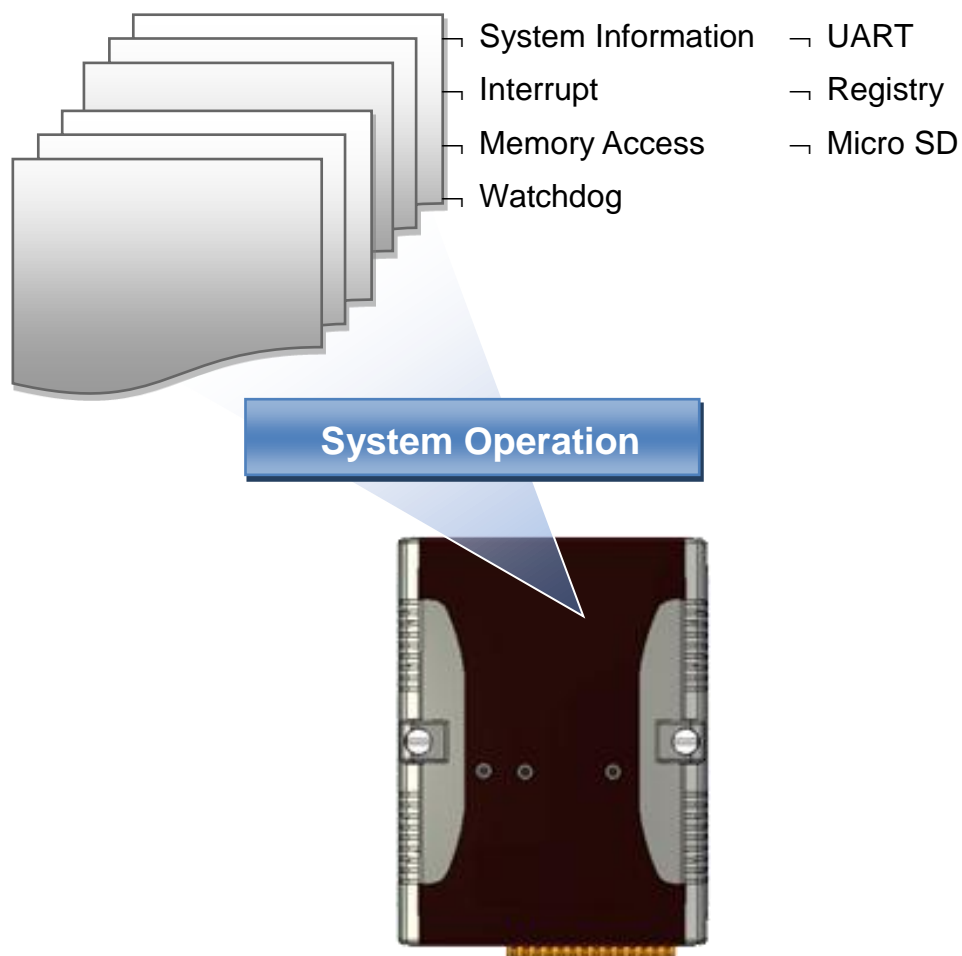
There are several APIs and demo programs that have been designed for WinPAC-5000. You can examine the APIs and demo source code, which includes numerous functions and comments, to familiarize yourself with WinPAC-5000 APIs and quickly develop your own applications quickly by modifying these demo programs.

5.1. Demo Programs with C#

The following C# demos have been designed to demonstrate the various features of the WinPAC.

5.1.1. C# Demo Programs for WinPAC Standard API

The table below describes the WinPAC-5000 demos that have been designed to demonstrate the standard operation features of the WinPAC-5000.



Folder	Demo	Explanation
system	systeminfo	Retrieves information about the OS version, CPU version, SDK version, etc.
memoryaccess	memory	Shows how to read/write date values from/to EEPROM
	battery_backup_sram	Shows how to read or write to the battery backup
watchdog	watchdog	Displays how the watchdog operate
microsd	microsd_management	Shows how to enables/disables Micro SD
registry	registry	Shows how to read/write date values from/to registry
uart	diag	Shows how to read the name of local I/O modules via UART

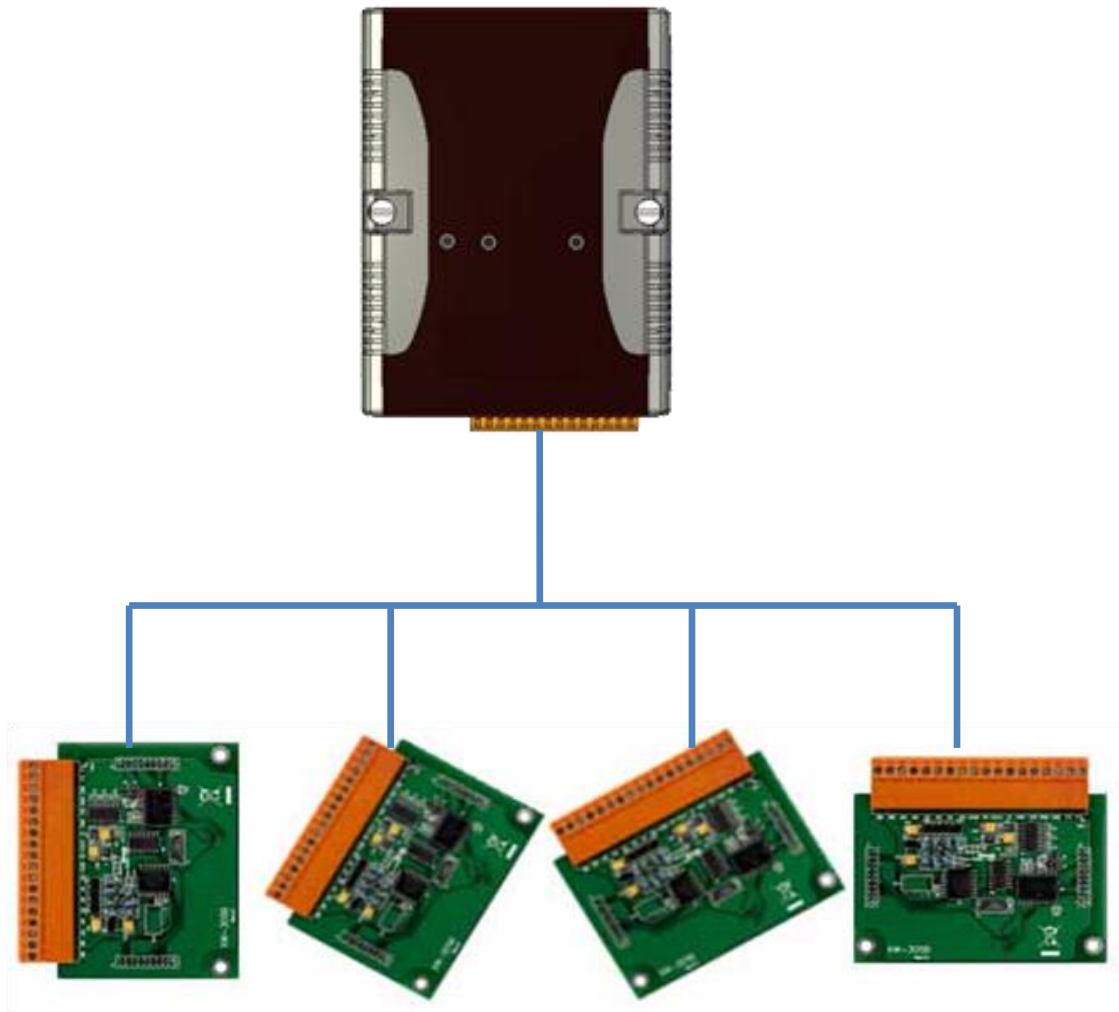
For C# application, these demo programs can be obtained from:

CD:\Napdos\wp-5000_ce50\Demo\WinPAC\DotNET\C#.NET\Standard\

ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/demo/winpac/dotnet/c%23.net/standard/

5.1.2. C# Demo Programs for PAC I/O API

The table below describes the WinPAC-5000 demos that have been designed to demonstrate the expansion I/O module features of the WinPAC-5000.



Folder	Demo	Explanation
GPIO	GPIO	Shows how to connect and control the XW-board series modules.
XW107	XW107_demo	
XW506	XW506_demo	
XW507	XW507_demo	
XW509	XW509_demo	
XW511i	XW511i_demo	

For C# application, these demo programs can be obtained from:

CD:\Napdos\wp-5000_ce50\Demo\WinPAC\DotNET\C#.NET\PAC_IO\XWBoard\

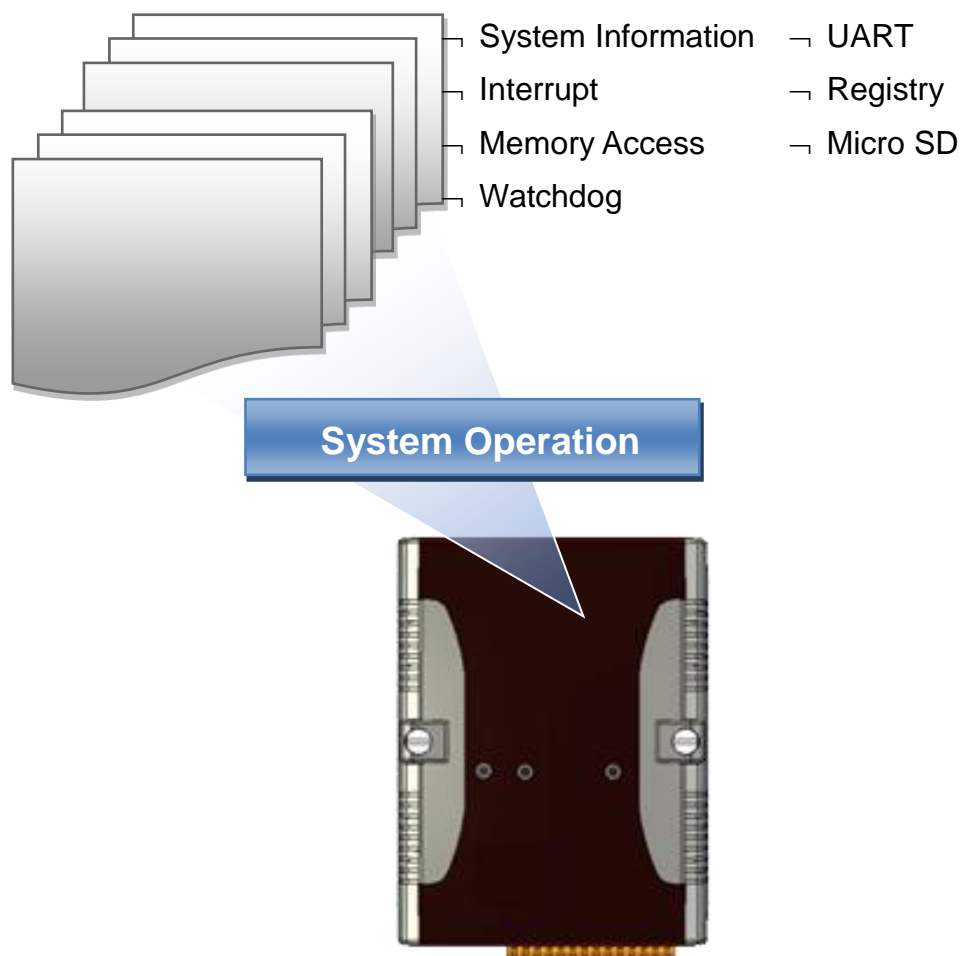
ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/demo/winpac/dotnet/c%23.net/pac_io/xwboard/

5.2. Demo Programs with eVC++

The following eVC++ demos have been designed to demonstrate the various features of the WinPAC.

5.2.1. eVC++ Demo Programs for WinPAC Standard API

The table below describes the WinPAC-5000 demos that have been designed to demonstrate the standard operation features of the WinPAC-5000.



Folder	Demo	Explanation
system	systeminfo	Retrieves information about the OS version, CPU version, SDK version, etc.
memoryaccess	memory	Shows how to read/write date values from/to EEPROM
	battery_backup_sram	Shows how to read or write to the battery backup
watchdog	watchdog	Displays how the watchdog operate
microsd	microsd_management	Shows how to enables/disables Micro SD
registry	registry	Shows how to read/write date values from/to registry
uart	diag	Shows how to read the name of local I/O modules via UART

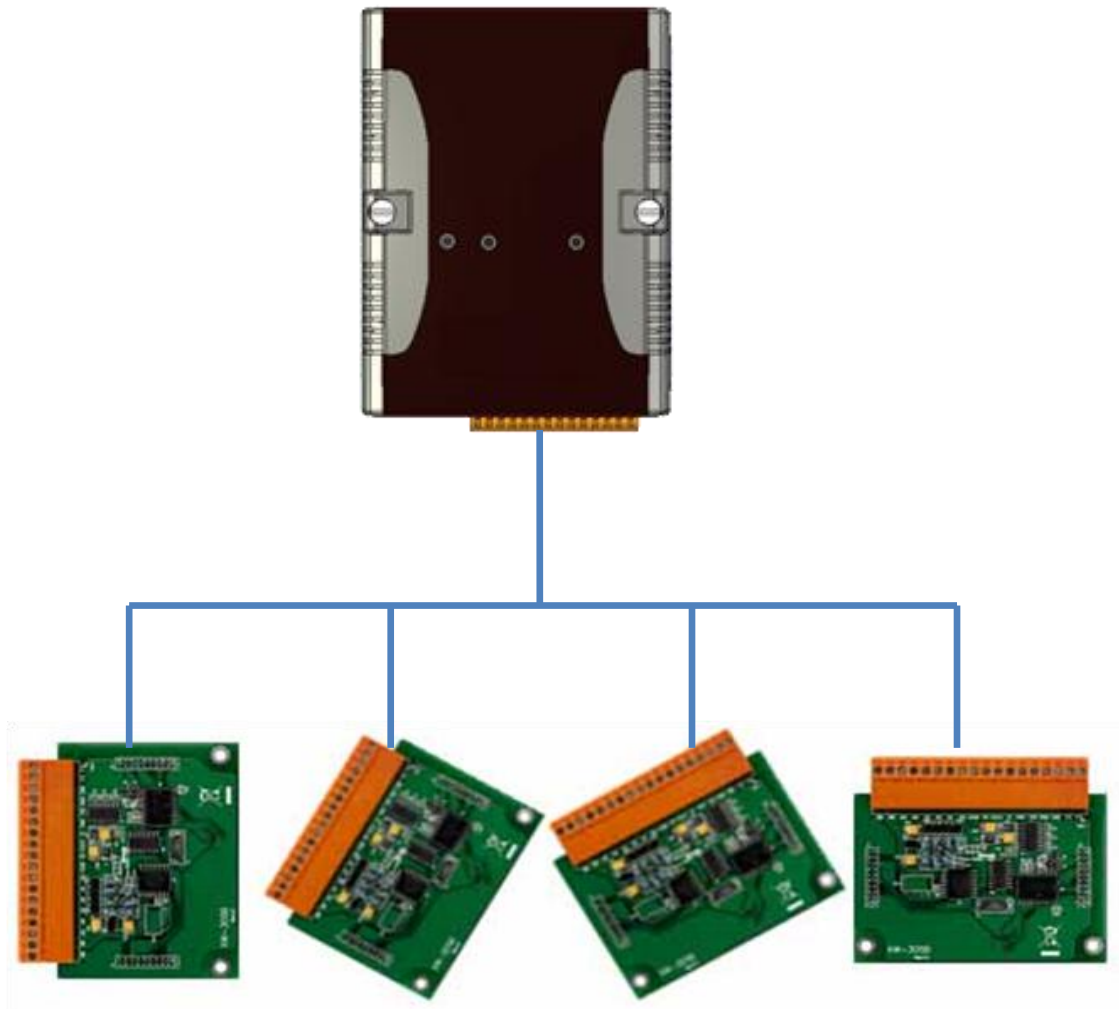
For C# application, these demo programs can be obtained from:

CD:\Napdos\wp-5000_ce50\Demo\WinPAC\evCT\Standard\

ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/demo/winpac/evc/standard/

5.2.2. eVC++ Demo Programs for PAC I/O API

The table below describes the WinPAC-5000 demos that have been designed to demonstrate the expansion I/O module features of the WinPAC-5000.



Folder	Demo	Explanation
GPIO	GPIO	Shows how to connect and control the XW-board series modules.
XW107	XW107_demo	
XW506	XW506_demo	
XW507	XW507_demo	
XW509	XW509_demo	
XW511i	XW511i_demo	

For C# application, these demo programs can be obtained from:

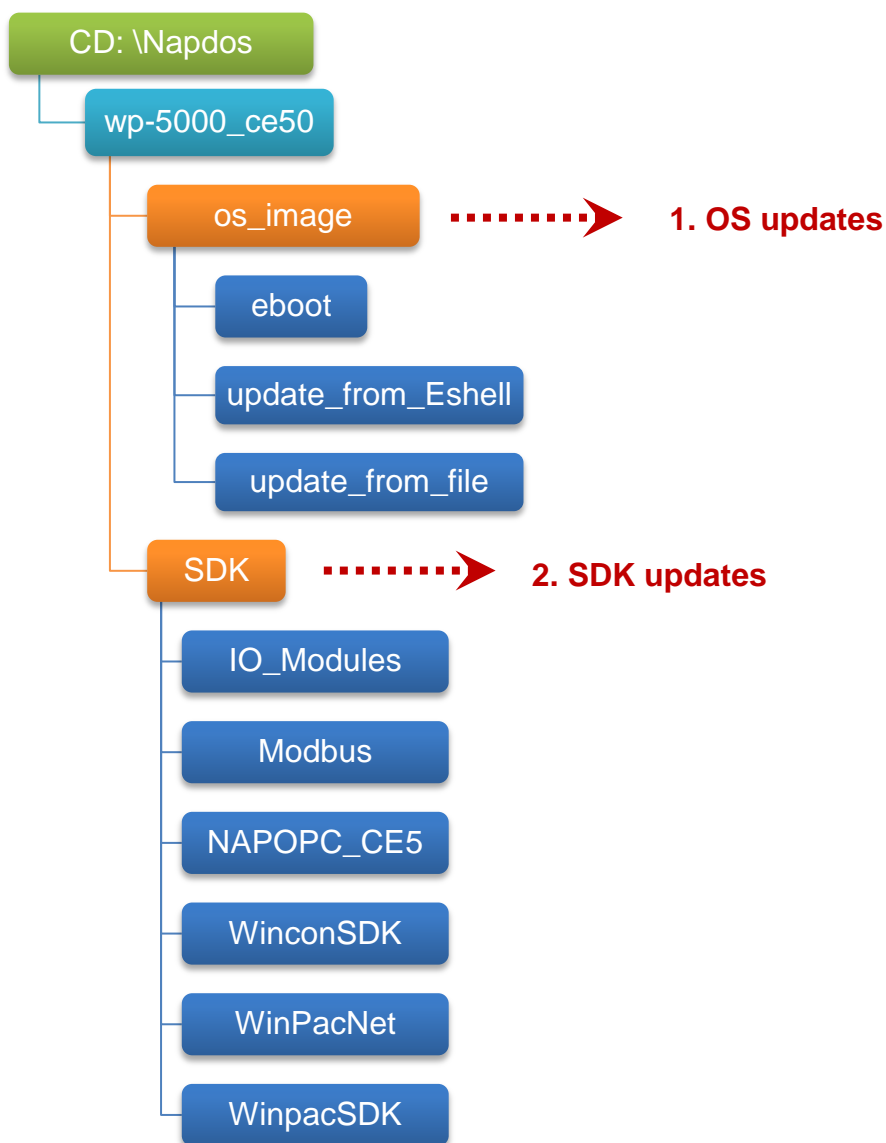
CD:\Napdos\wp-5000_ce50\Demo\WinPAC\VC\PAC_IO\XWBoard\

ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/demo/winpac/evc/pac_io/xwboard/

6. WinPAC-5000 Updates

ICP DAS will continue to add additional features to WinPAC-5000 SDK and OS in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

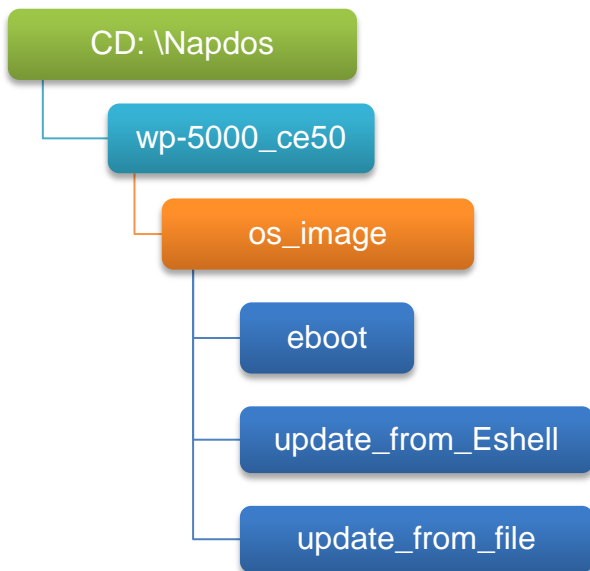
WinPAC-5000 updates services can be divided into the following two main categories:



6.1. OS Updates

The updates files of OS image are located on:

CD:\Napdos\wp-5000_ce50\OS_Image\

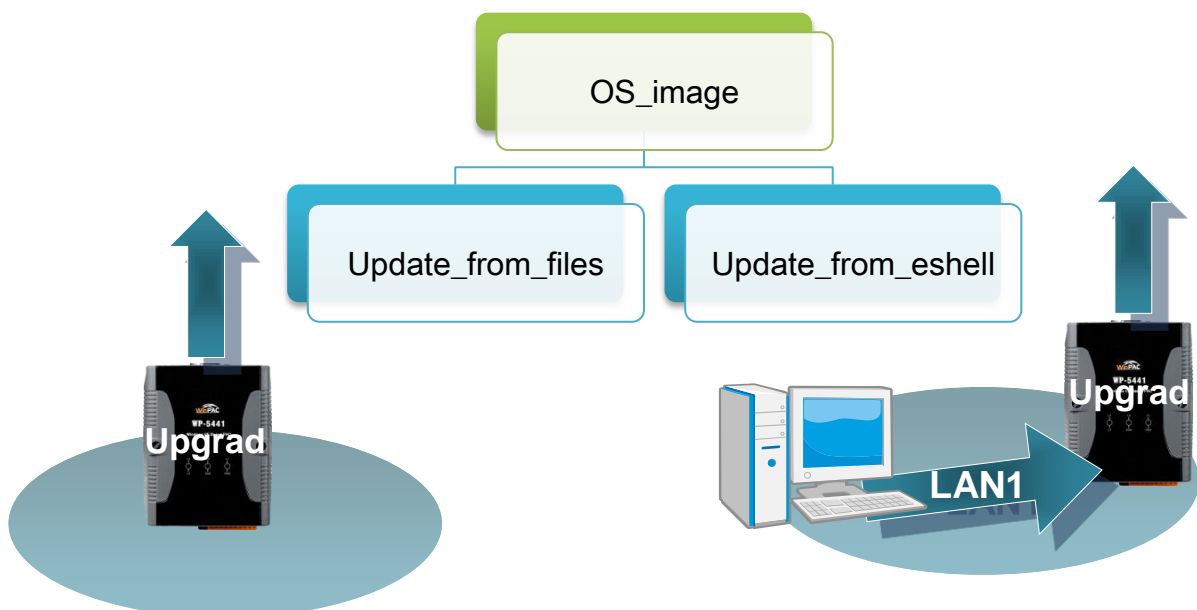


There are two ways to update the OS:

1. Update from file (Please refer to section 6.1.1)

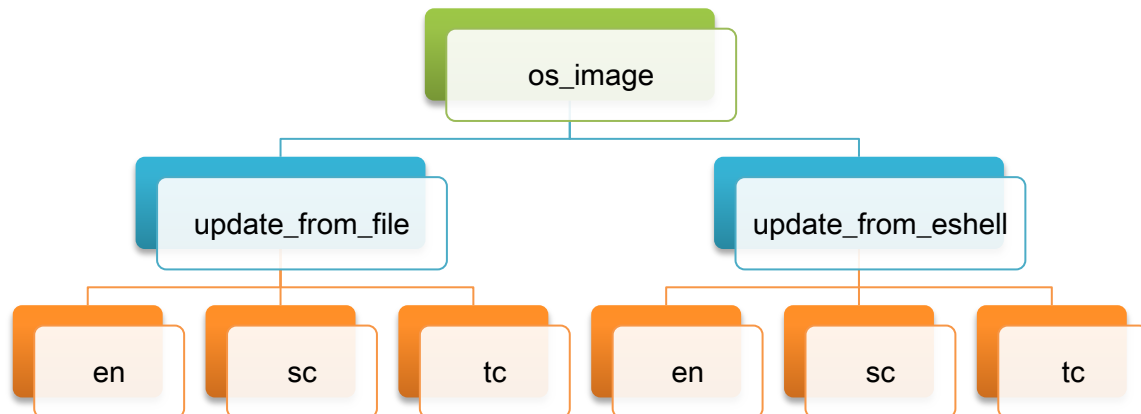
(We recommend that you use this one for more quicker and easier to update)

2. Update from Eshell (Please refer to section 6.1.2)



The WinPAC-5000 OS supports multi-language:

1. en - English
2. sc - Simplified Chinese
3. tc - Traditional Chinese



6.1.1. OS Updates Using Installation Package File

Installation package is easier to upgrade OS image, you just copy the package file (.exe) and the corresponding “Autolnit.bat” file to WinPAC-5000, and then double-click installation package file to run it.



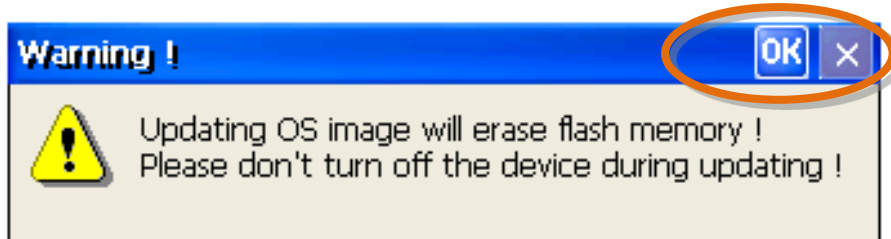
Step 1: Get the latest version of the installation package file and the corresponding “Autolnit.bat” file uploading to WinPAC-5000

- The latest version of the installation package file and the corresponding “Autolnit.bat” file can be obtained from:
CD:\Napdos\wp-5000_ce50\OS_Image\update_from_file\
http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/os_image/update_from_file/
- The corresponding “Autolnit.bat” file can be obtained from the same folder.

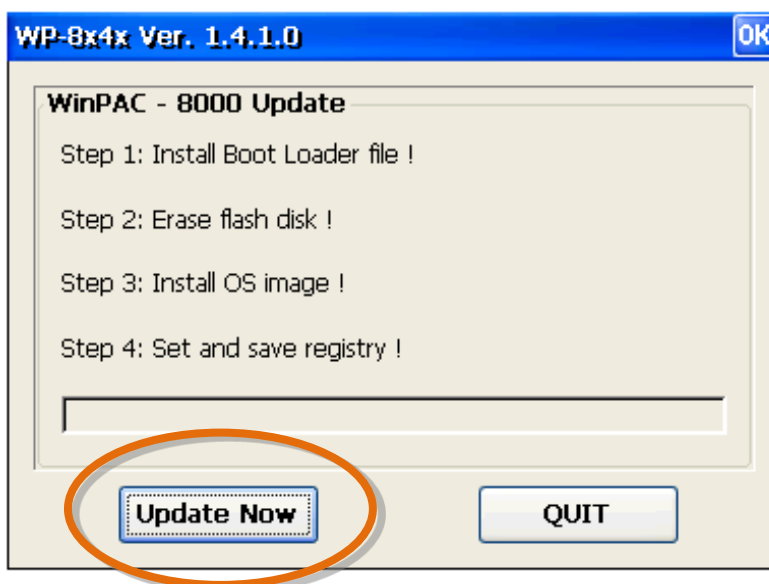
There are several ways to upload these files to WinPAC-5000:

- i. Upload files via Ethernet.
- ii. Upload files via a USB storage device, the removable Micro SD card or FTP server

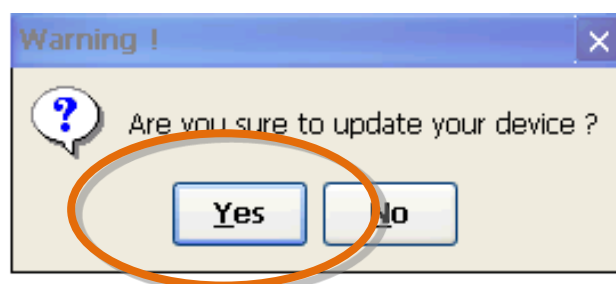
Step 2: Run the installation package file and then click OK to make sure you receive the important notice of this procedure will erase flash memory



Step 3: Click Update Now to start updating the WinPAC-5000



Step 4: Click Yes to make sure update the WinPAC-5000



This installation procedure will perform the following tasks:

- i. Install boot loader file

Important Warnings



Be careful, if the boot loader broken off in this step and cannot restart in safe mode, you have to send it back to us.

- ii. Erase flash disk
- iii. Install OS image
- iv. Set and save registry

Tips & Warnings



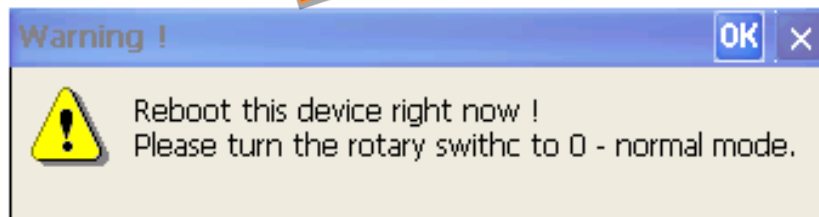
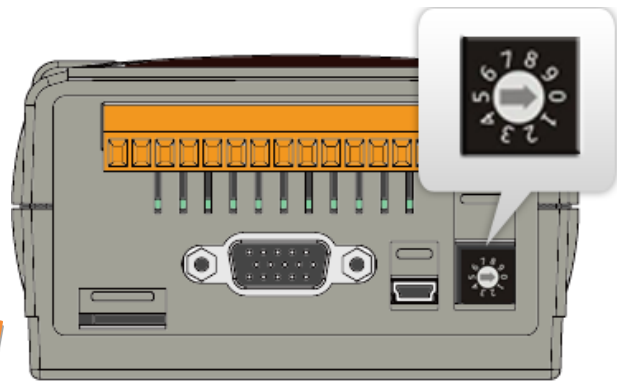
This procedure will reset the registry settings to their default settings, and all of your settings will be lost.

During this time, do not turn off the WinPAC-5000. If the update is cancelled before completion, the WinPAC-5000 may become damaged and may require servicing or exchange.

Besides, we recommend that you turn off all other applications before starting to upgrade the OS.

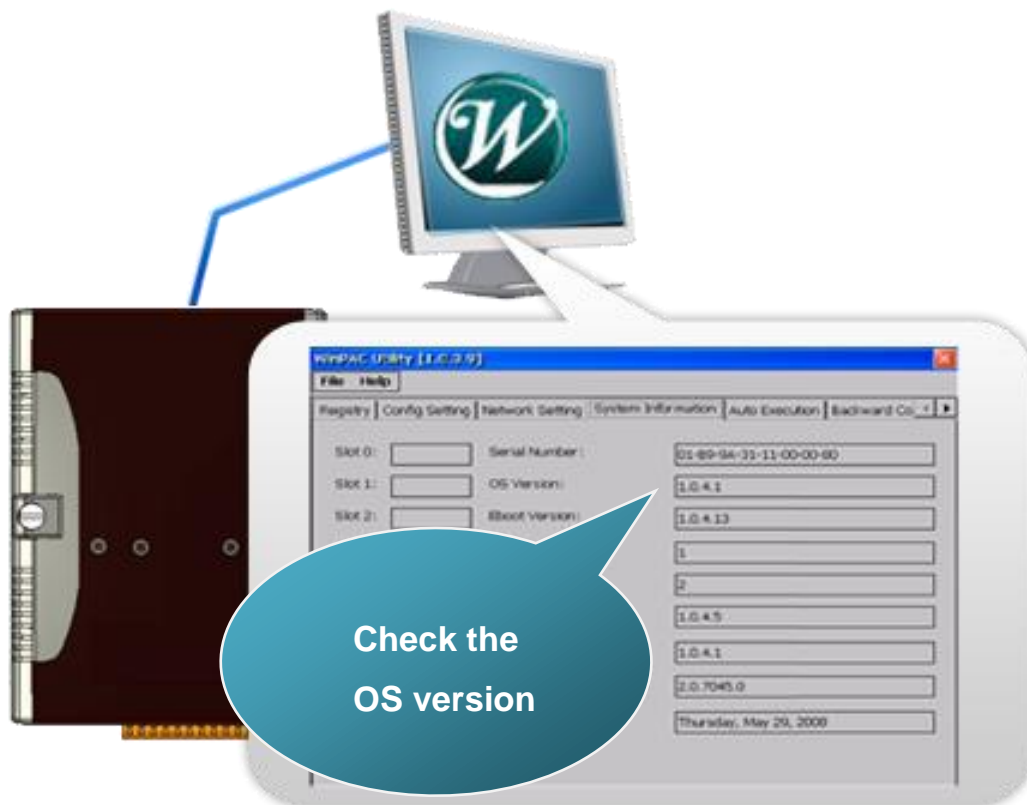
Step 5: Click OK

After completing the above-mentioned tasks, the “Warning !” dialog box will appear as follow, before clicking OK button, you must first turn the rotary switch to the 0 position



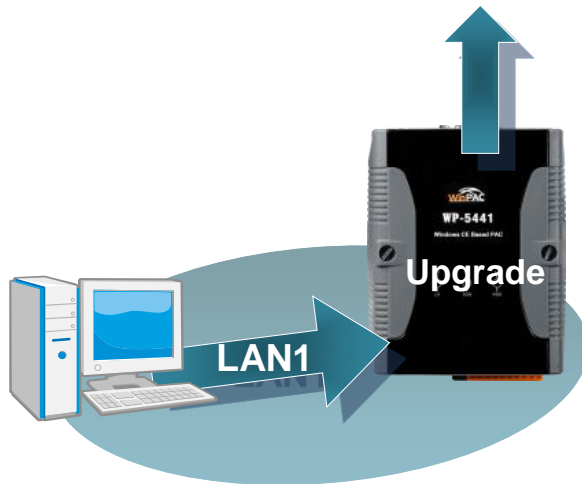
Step 6: Check the OS version of WinPAC-5000

Start the WinPAC Utility, and then select the “System Information” tab to check the current OS version.



6.1.2. OS Updates Using Eshell via Ethernet

By default, the OS updates via LAN1. Therefore, to update the OS image, make sure LAN1 is connected to the PC.



Step 1: Get the latest version of the WinPAC-5000 OS image

The latest version of the WinPAC OS image can be obtained from:

CD:\Napdos\wp-5000_ce50\OS_Image\update_from_eshell\

http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-5000_ce50/os_image/update_from_eshell/

Step 2: Run the Eshell



ESHELL

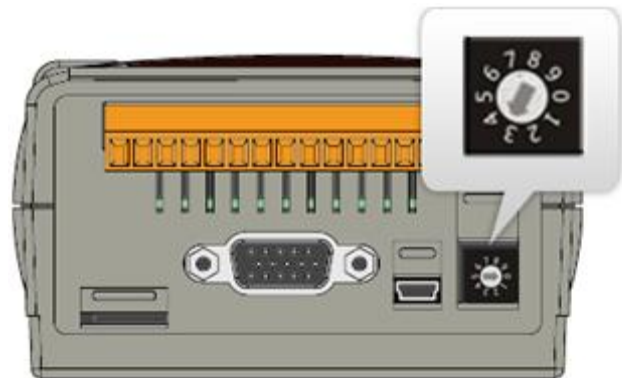
The Eshell can be obtained from:

CD:\Napdos\wp-5000_ce50\PC_Tools\Eshell\

ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-5000_ce50/pc_tools/eshell/

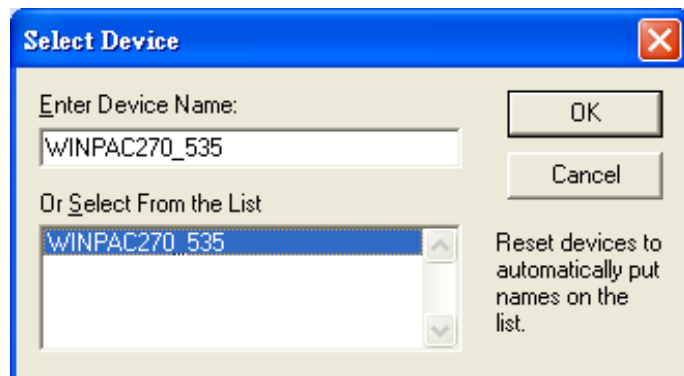
Step 3: Configure the boot mode in OS update mode

Turn the rotary switch to “3”, and then reboot the WinPAC.
The Select Device dialog box appears.

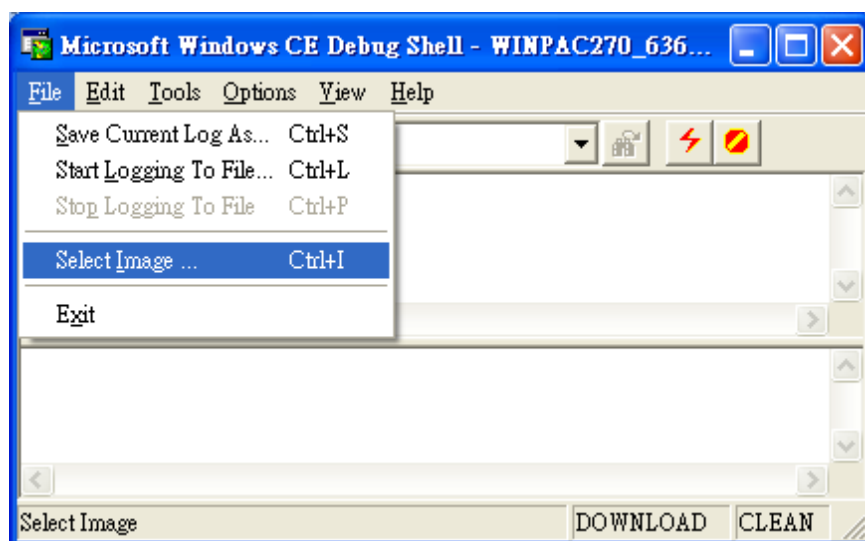


Step 4: Select the device which you want to update the OS image, and then click OK

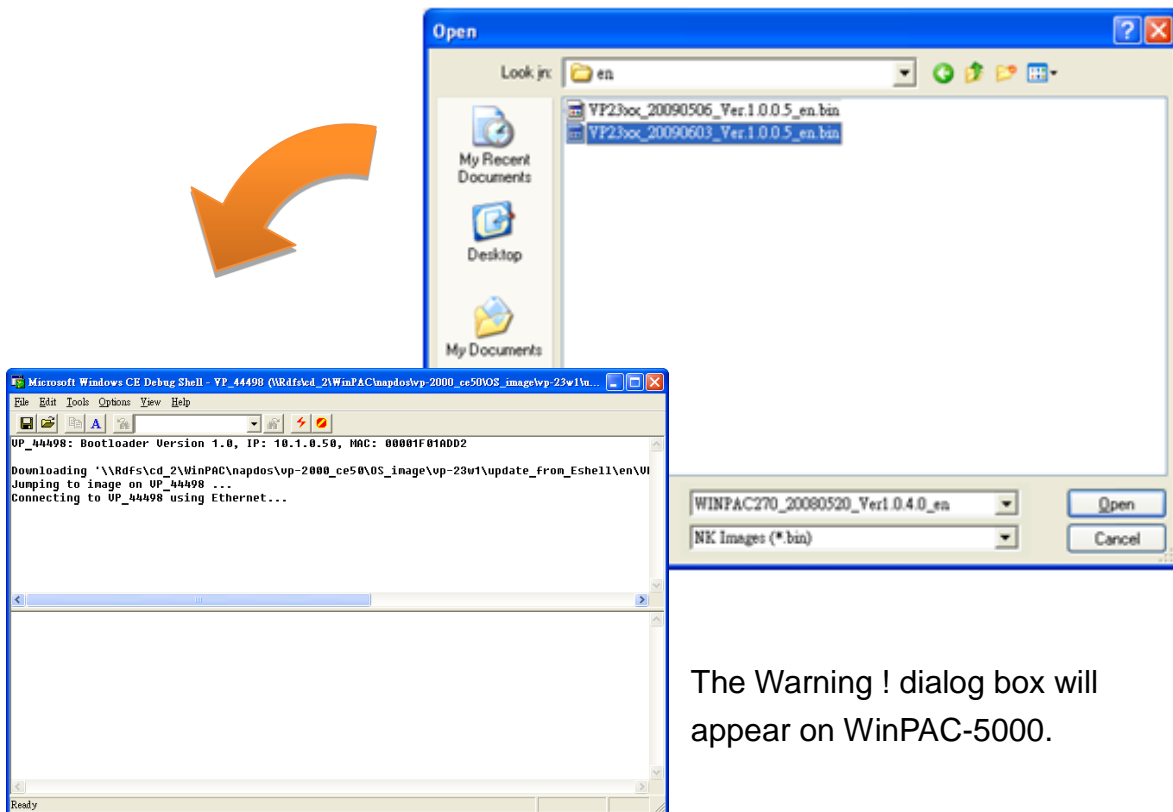
Select the device name which you want to update the OS image from the list.



Step 5: On the File menu, and then click Select Image...

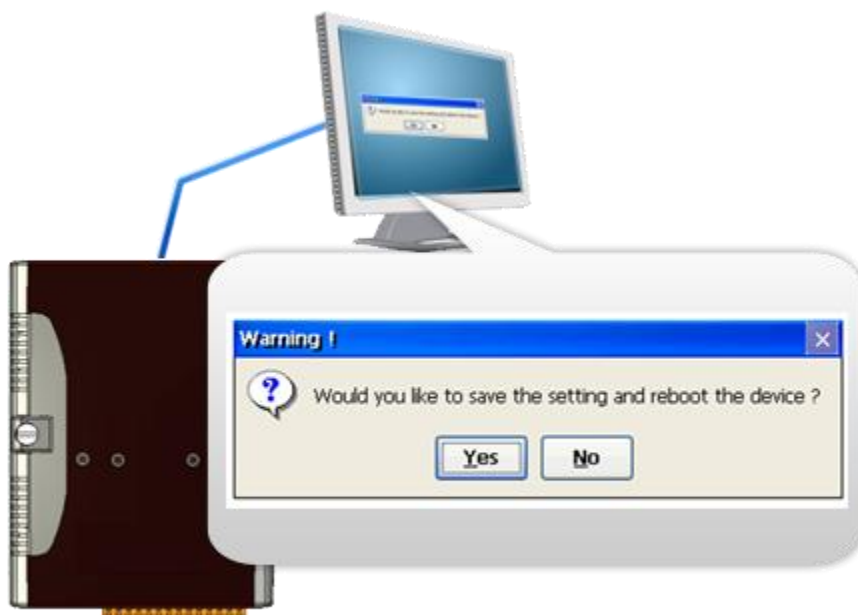


Step 6: Select the downloaded OS image file, and then click Open



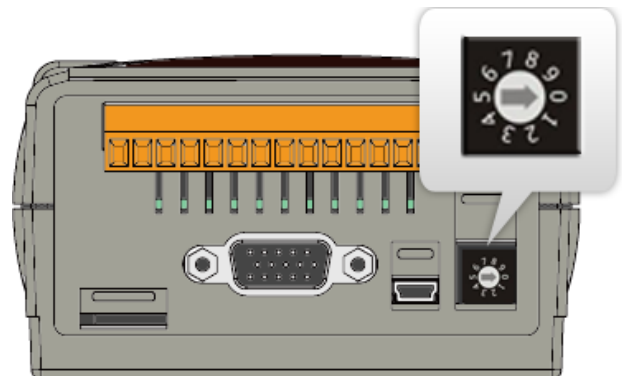
The Warning ! dialog box will appear on WinPAC-5000.

Step 6: Click No to finish the process



Step 7: Configure the boot mode in normal mode

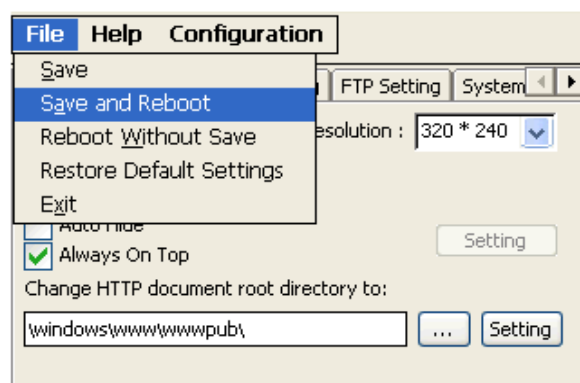
Turn the rotary switch to “0”, and then reboot the WinPAC.



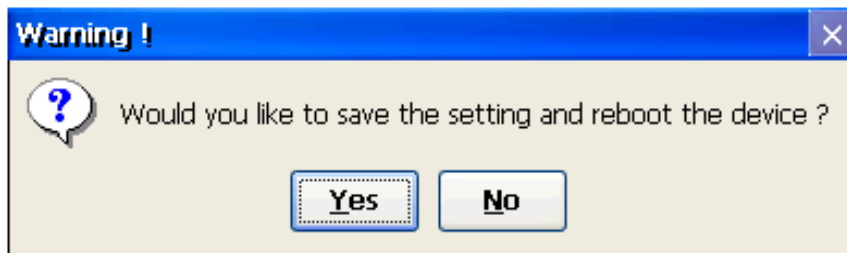
Step 8: Run the WinPAC Utility



Step 9: On the File menu, click Save and Reboot

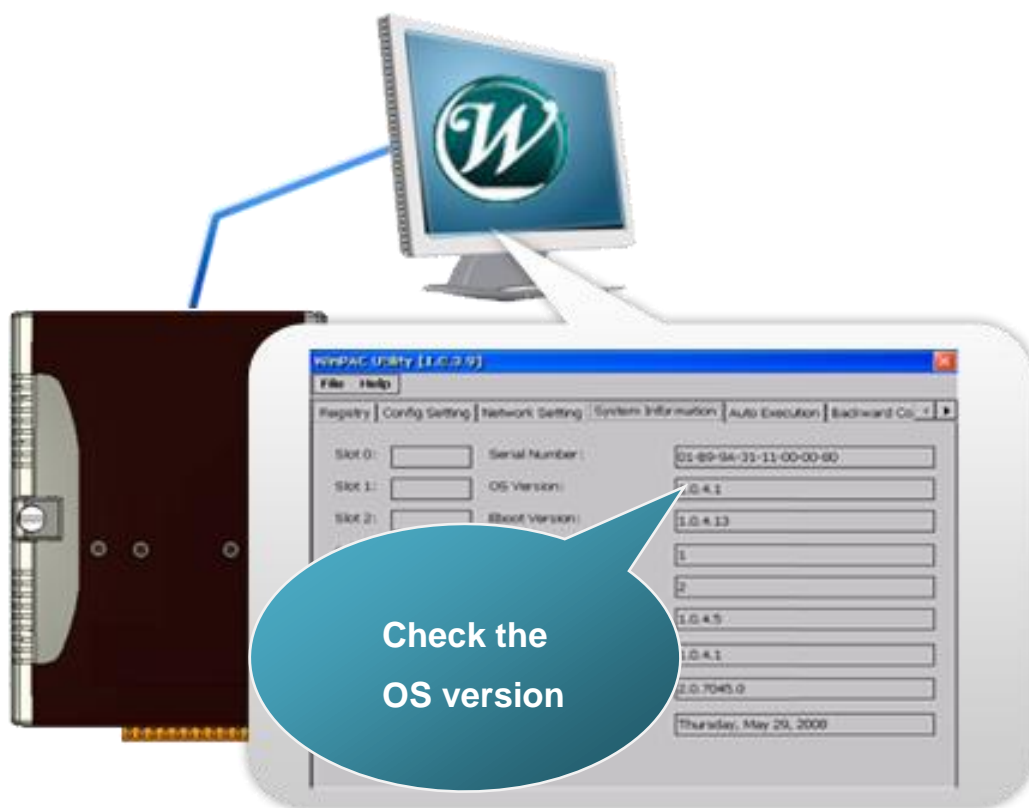


Step 11: Click Yes to reboot the WinPAC-5000



Step 10: Check the WinPAC OS version

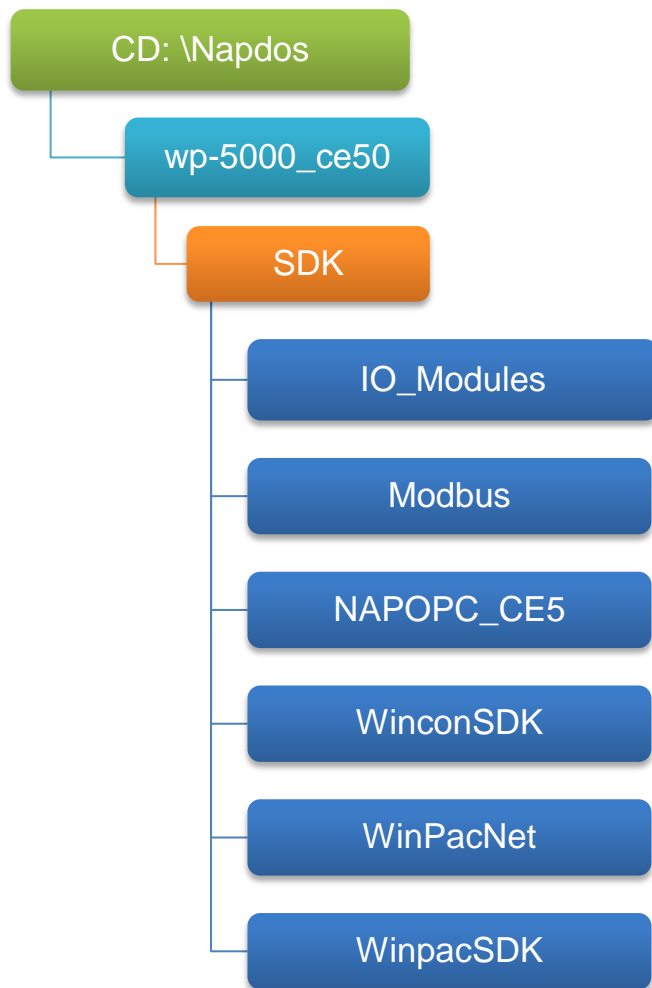
Start the WinPAC Utility, and then select the "System Information" tab to check the current OS version.



6.2. SDKs Updates

The updates files of SDKs are located on:

CD:\Napdos\wp-5000_ce50\SDK\



By eVC and donet development tools, the WinPAC SDK installation is divided into the following two parts:

- i. WinPAC SDK updates for dotnet (Please refer to section 6.2.1)
- ii. WinPAC SDK updates for eMbedded Visual C++ (Please refer to section 6.2.2)

6.2.1. WinPAC SDK updates for C# or VB.net

To determine the SDK version that is compatibly running on the WinPAC, you can read the “Release Note” which is located under each SDK folder, these files provides important updated information for what we fixed and added.

Step 1: Get the latest version of the C# or VB.net components

The latest version of the C# or VB.net components can be obtained from:

ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-5000_ce50/sdk/WinPACNet/

Step 2: Copy the latest version of DLL to Host PC and WinPAC

The DLL files on Host PC are located at anywhere only the solution can reference it.

The DLL files on WinPAC are located at the same directory as the .exe file.

6.2.2. WinPAC SDK updates for eVC++

To determine the SDK version that is compatibly running on the WinPAC, you can read the “Release Note” which is located under each SDK folder, these files provides important updated information for what we fixed and added.

Step 1: Get the latest version of the eVC++ components

The latest version of the eVC++ components can be obtained from:

ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-5000_ce50/sdk/WinPACSDK/

Step 2: Copy the latest version of header files and libraries to Host PC

The header files are located at:

C:\Program Files\Windows CE Tools\wce500\PAC270\Icpdas\Include\ARMV4I\

The libraries are located at:

C:\Program Files\Windows CE Tools\wce500\PAC270\Icpdas\Lib\ARMV4I\

Step 3: Copy the latest version of DLL files to WinPAC

The DLL files are located at:

\System_Disk\ICPDAS\System

Appendix A. Tips-How to

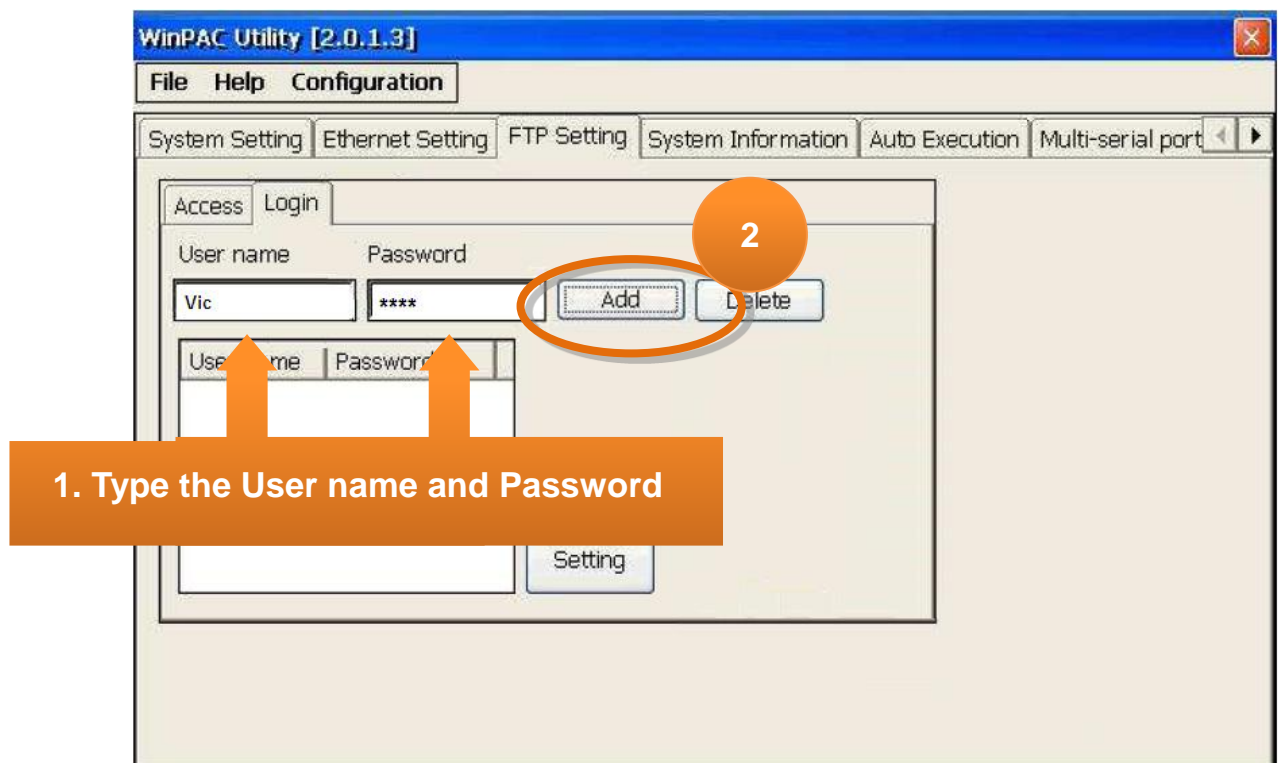
Here we will guide you through some very useful tips to customize your WinPAC-5000

A.1. How to add a User Account

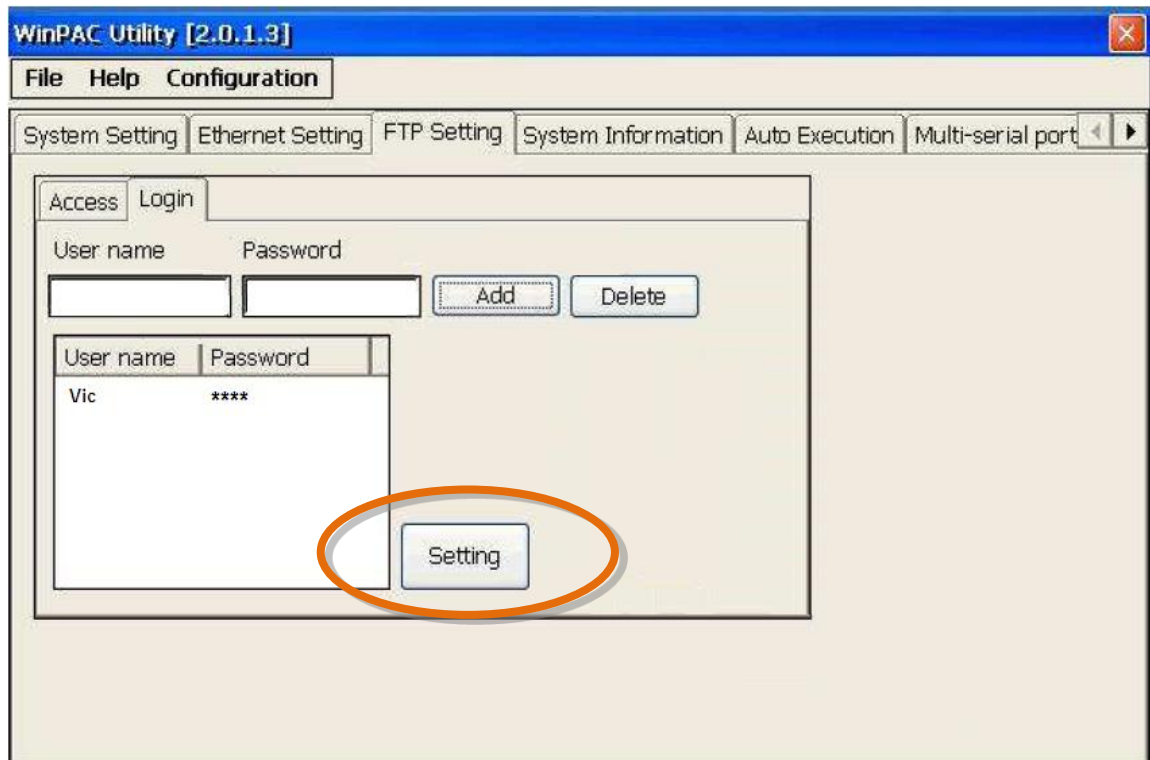
To establish a new telnet and FTP account, please perform the following steps:



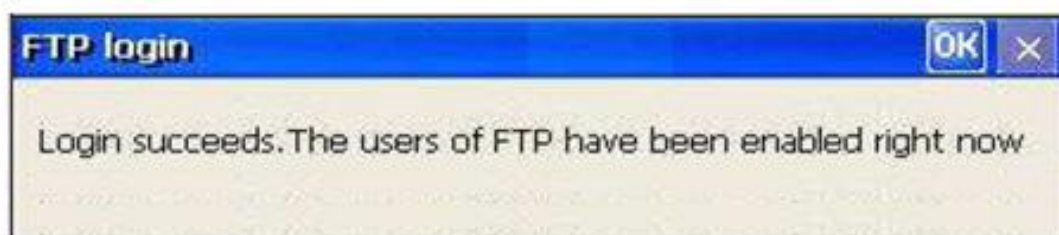
Step 2: On the Login tab of the FTP Setting tab, type the user name and password, and then press Add button



Step 3: The user has been added to the allowed under the remote login and included in the following list, and then press Setting button

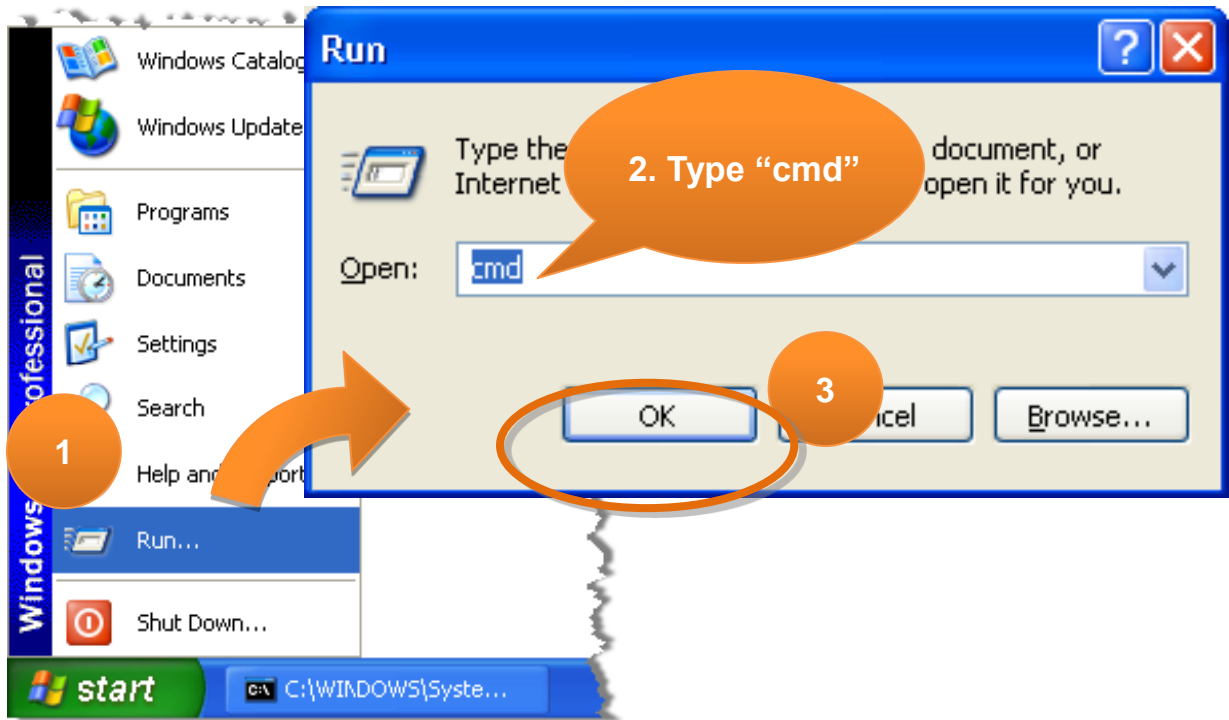


Step 4: Press OK to store the settings

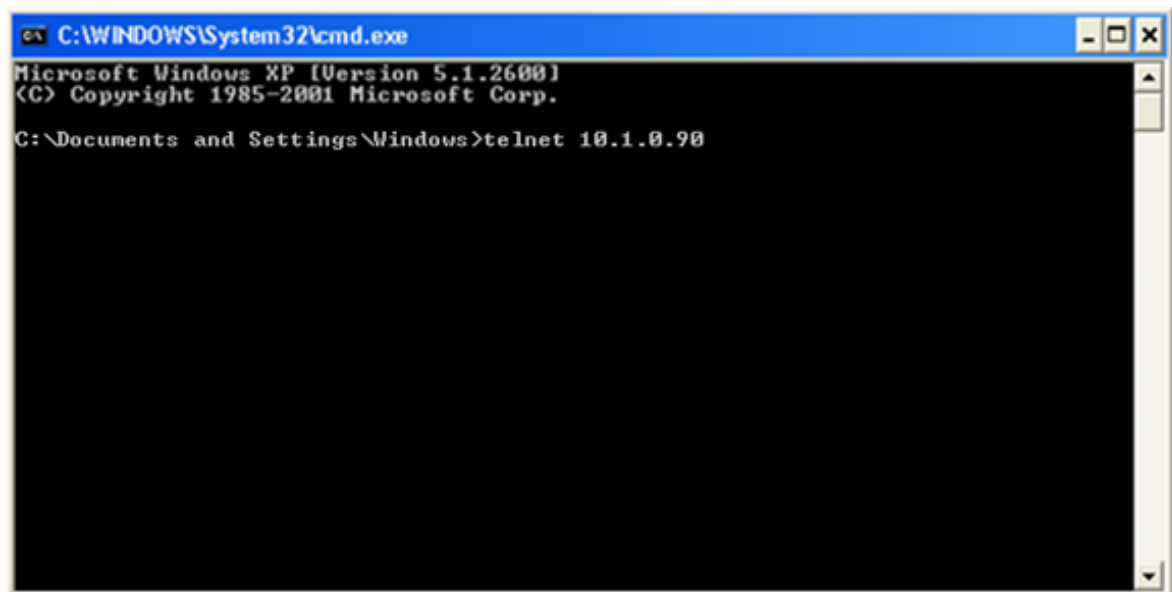


A.1.1. How to Use telnet to remote login the WinPAC from PC

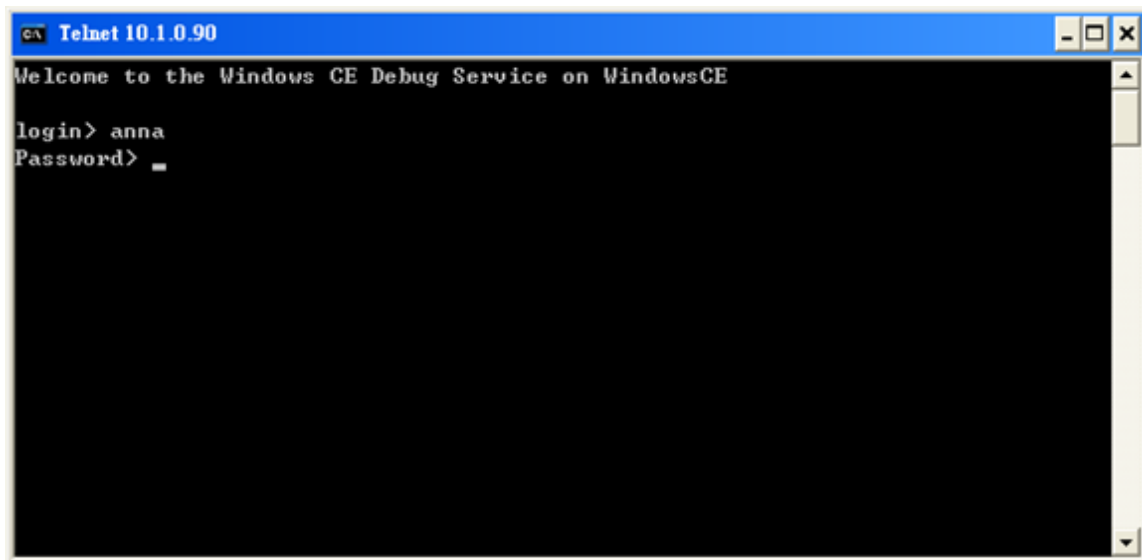
Step 1: On the PC, open a MS-DOS command prompt



Step 2: At the command prompt, type "telnet (IP address)"

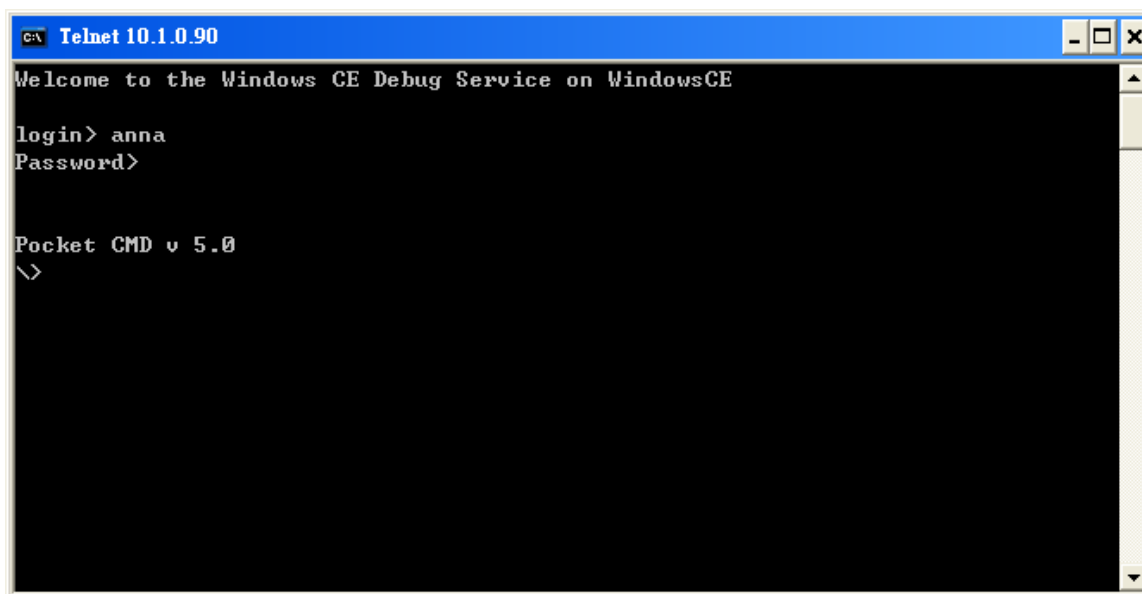


Step 3: The connection has been set up, and then type the name and password



```
CA Telnet 10.1.0.90
Welcome to the Windows CE Debug Service on WindowsCE
login> anna
Password> _
```

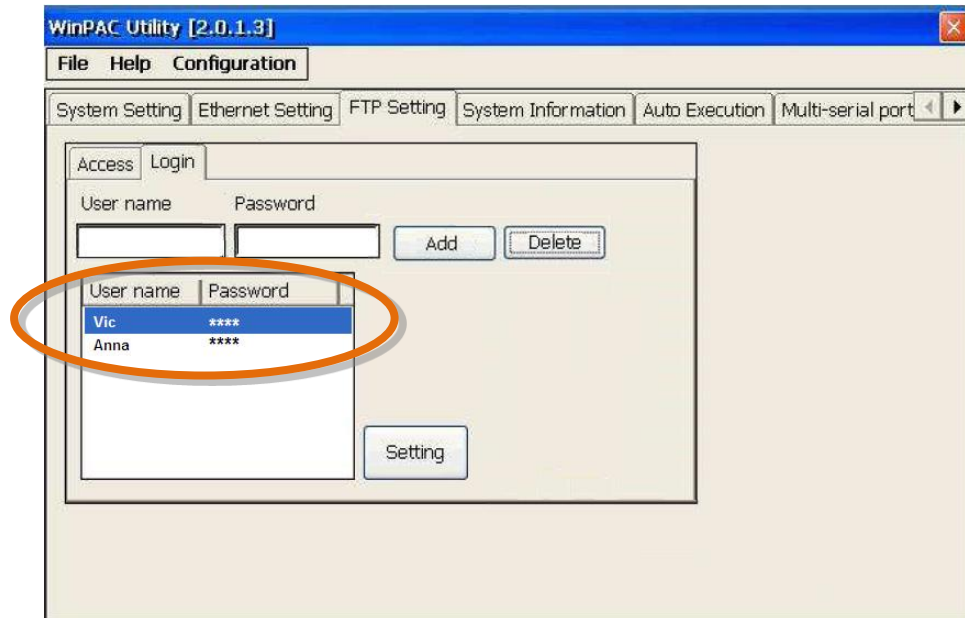
Step 4: The remote login has been completed



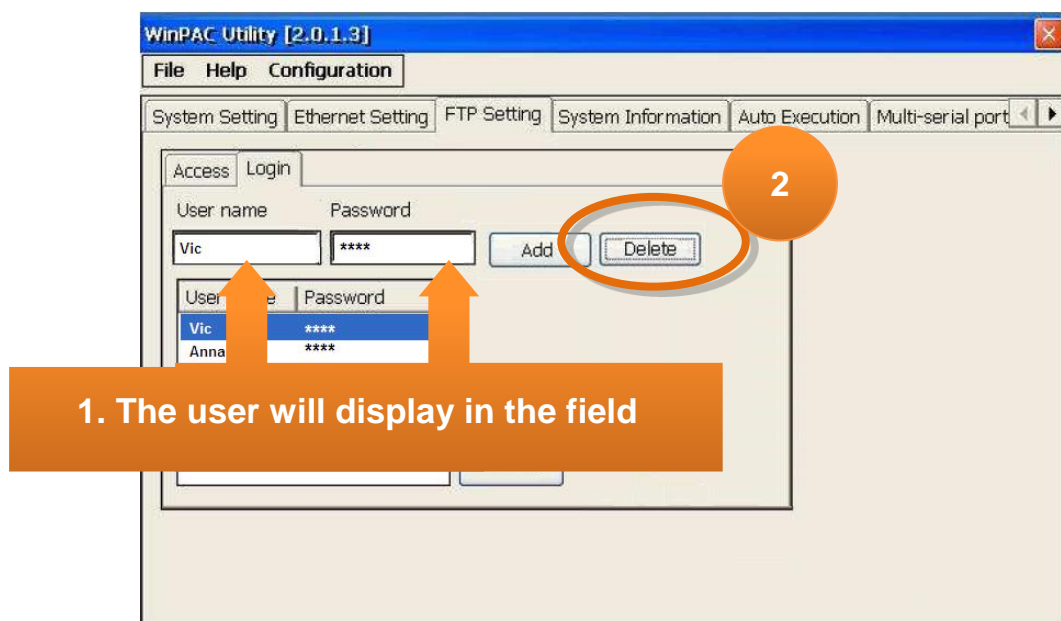
```
CA Telnet 10.1.0.90
Welcome to the Windows CE Debug Service on WindowsCE
login> anna
Password>
Pocket CMD v 5.0
\>
```

A.1.2. How to remove the user from the login list

Step 1: Click a user from the list which you want to remove



Step 2: The user will display in the field, and then press Delete to delete the user from the login list



A.2. How to online debug WinPAC

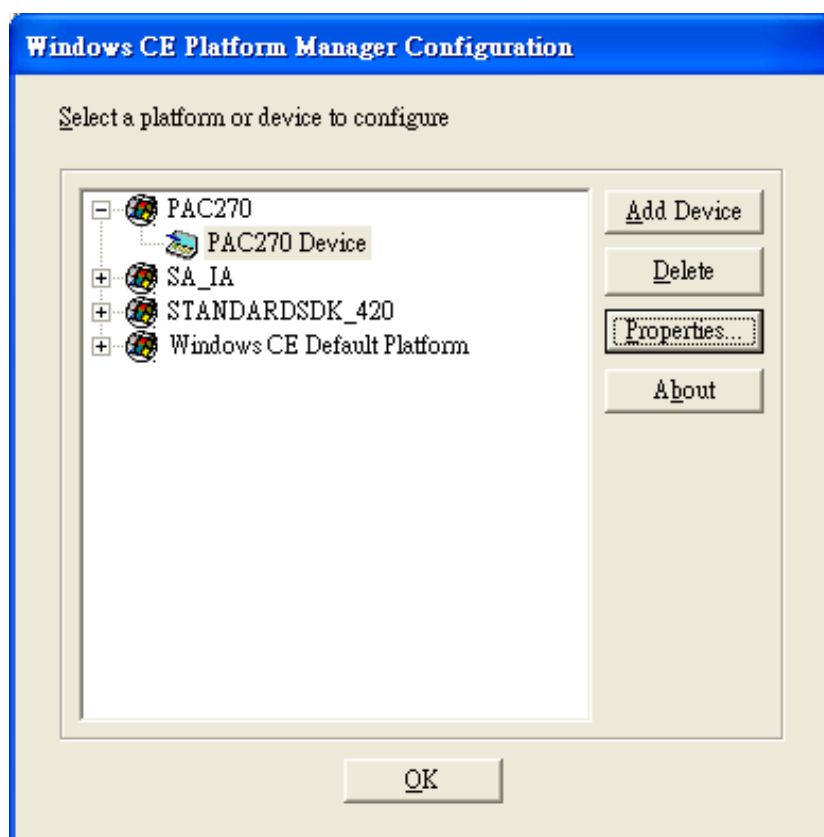
Debugging is a process that you use to find and resolve errors, or bugs, in a program.

A.2.1. Debug WinPAC programs in EVC++

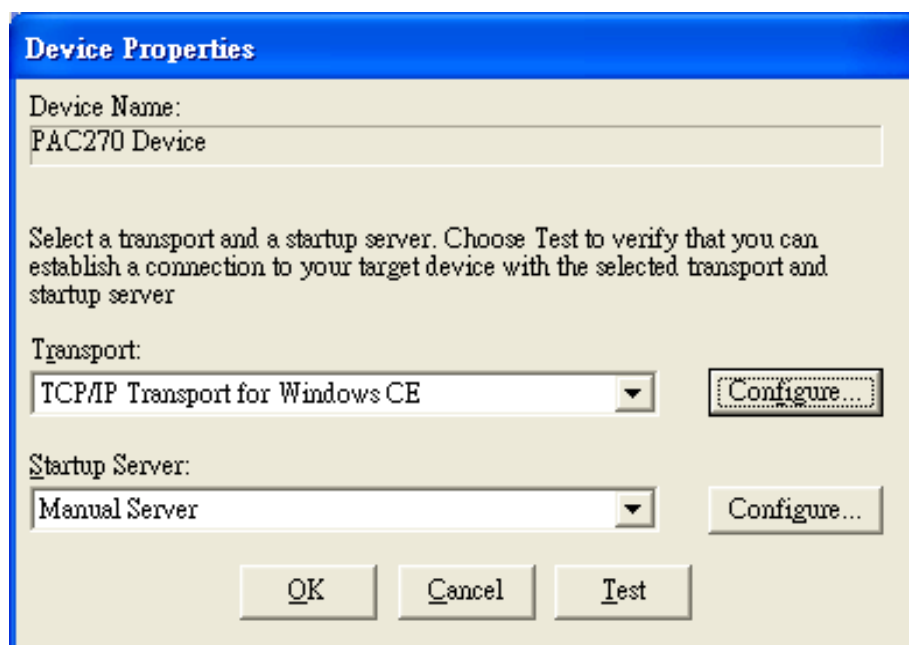
Step 1: On the Tools menu, click Configure Platform Manager...



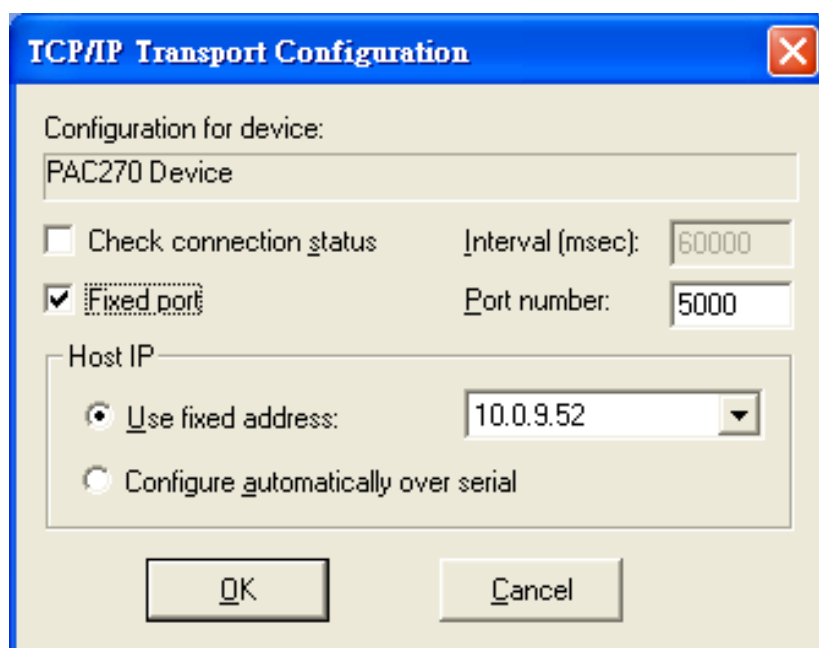
Step 2: On the Windows CE Platform Manager Configuration dialog, click Properties...



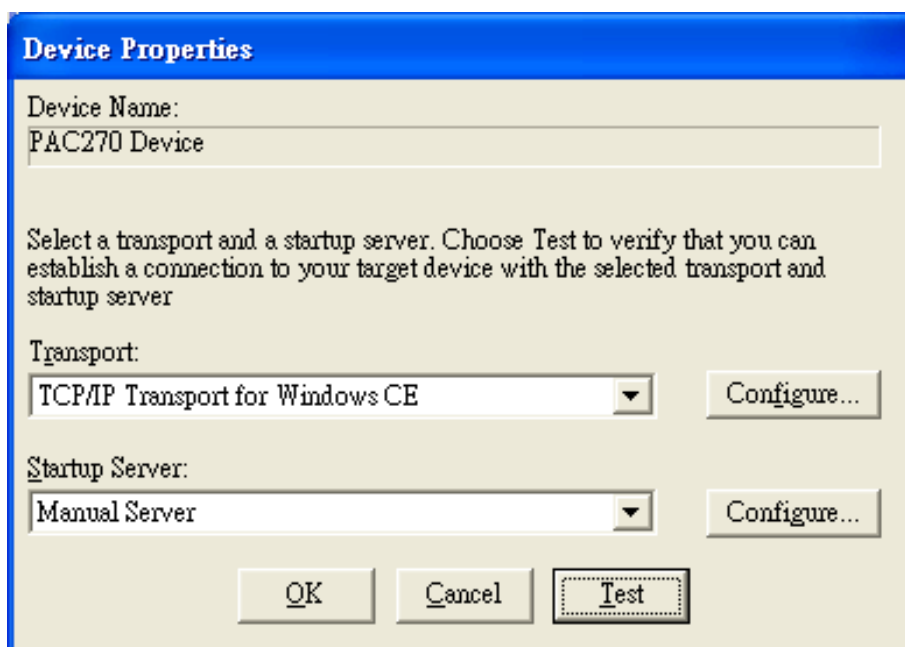
Step 3: On the Device Properties dialog, click Configure...



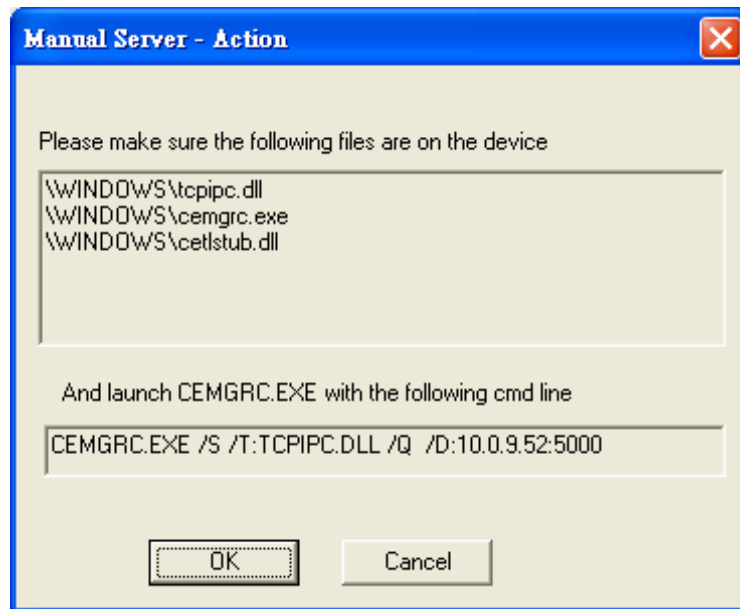
Step 4: On the TCP/IP Transport Configuration dialog, select Fixed port check box, and then click the OK



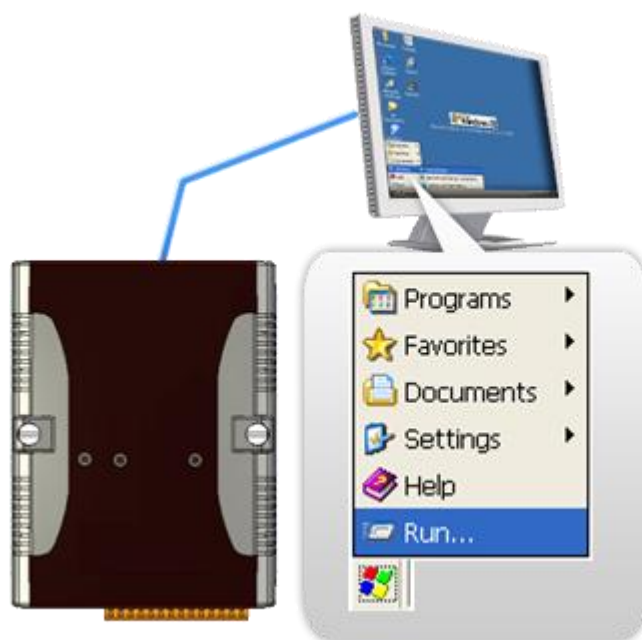
Step 5: On the Windows CE Platform Manager Configuration dialog, click Test



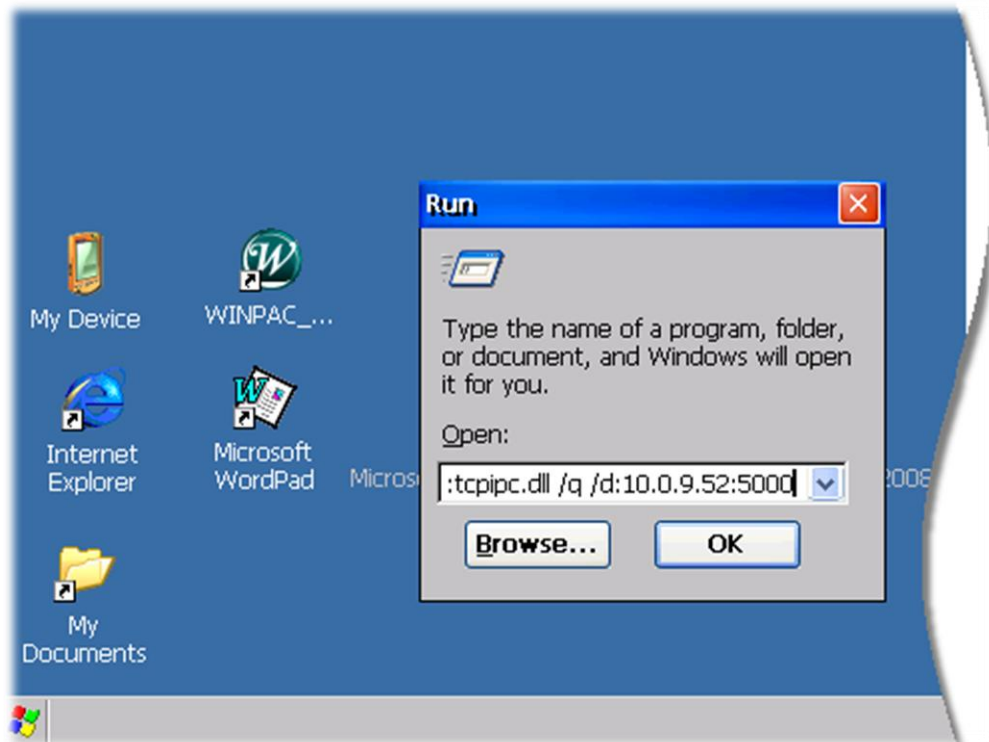
Step 6: The Manual Server - Action dialog will appear displaying a command line, before click OK to close dialog, turn to the WinPAC controller side to do the next two-steps



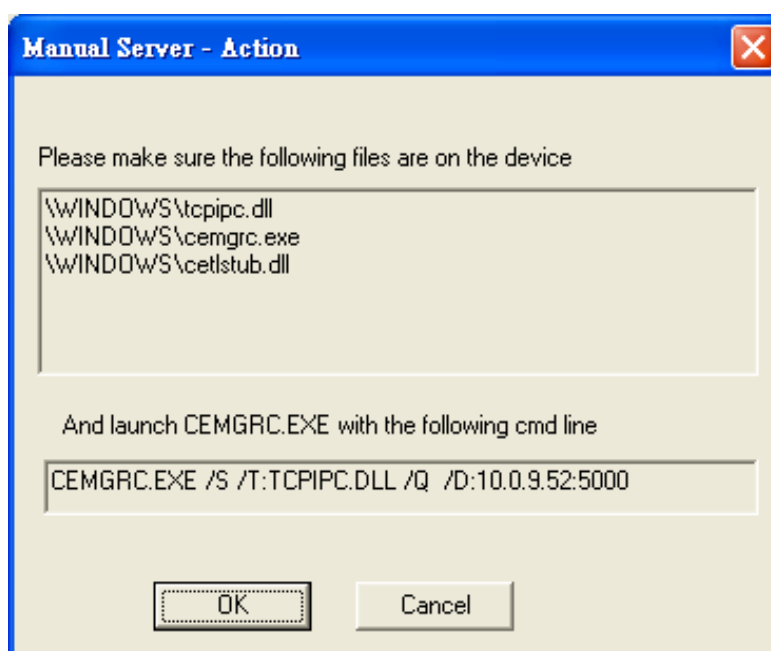
Step 7: On the WinPAC, select the  menu, and then click Run...



Step 8: On the Run dialog, type the command which displays in step 6 and then click OK



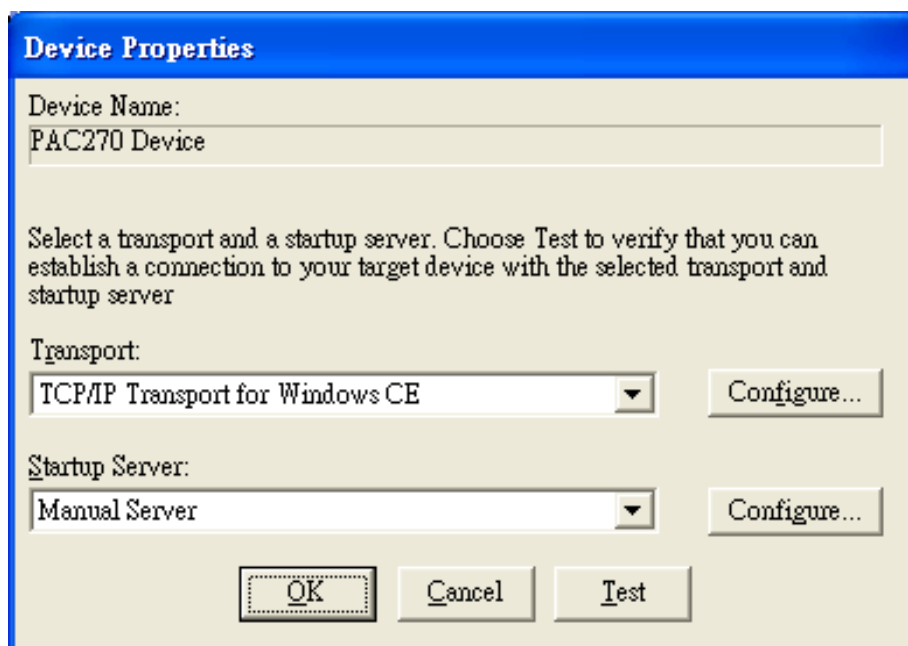
Step 9: Return to the Host PC side, and click OK on the Manual Server – Action dialog



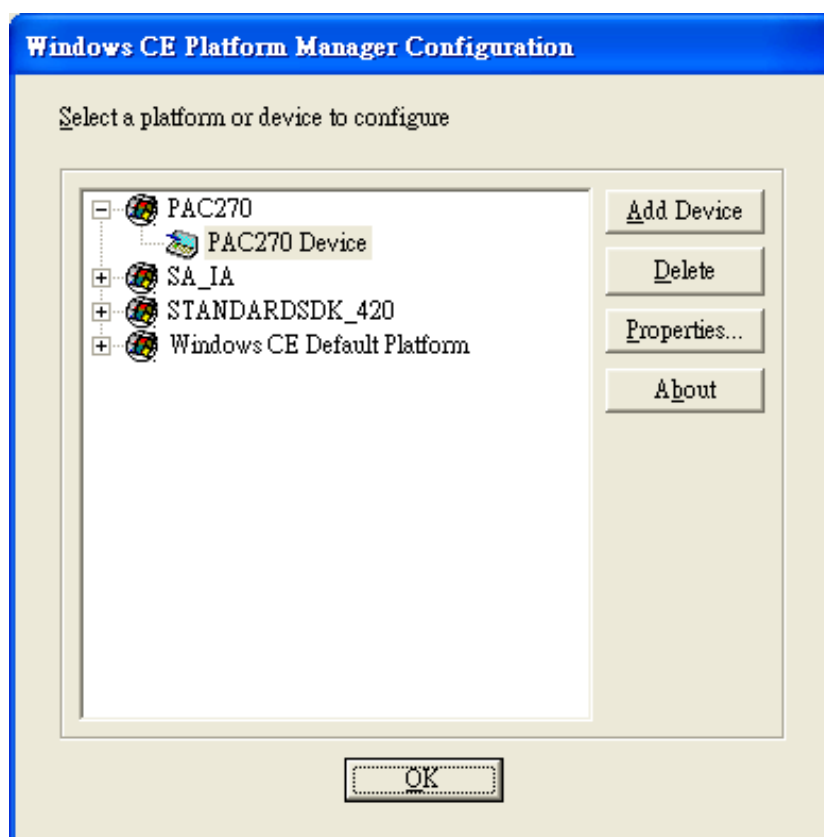
Step 10: On the Testing Device Connection dialog, click OK



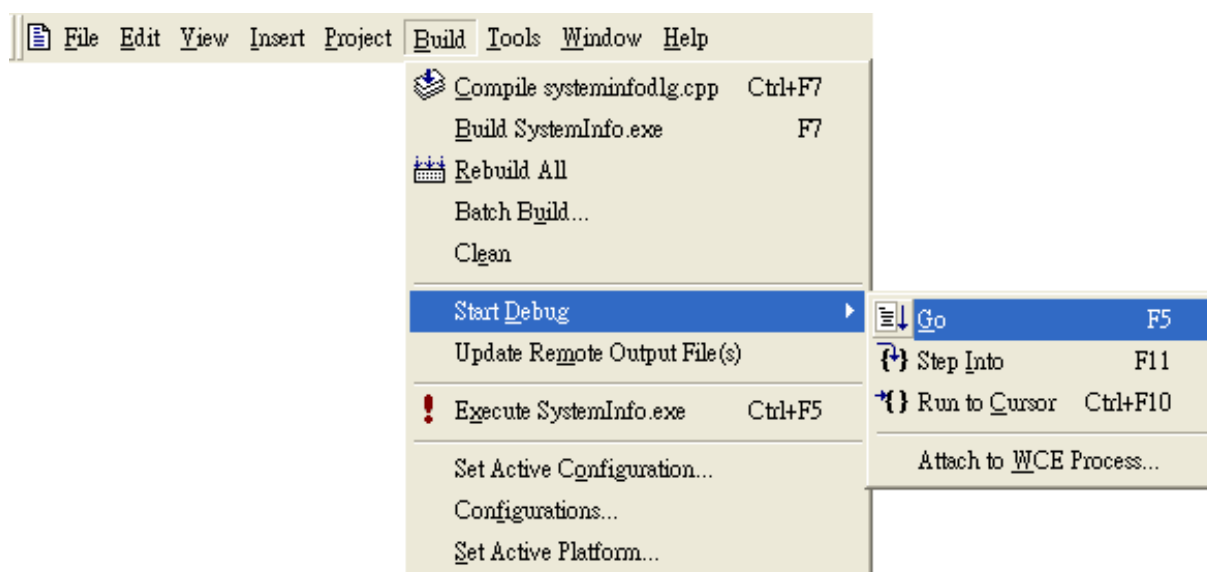
Step 11: On the Device Properties dialog, click OK



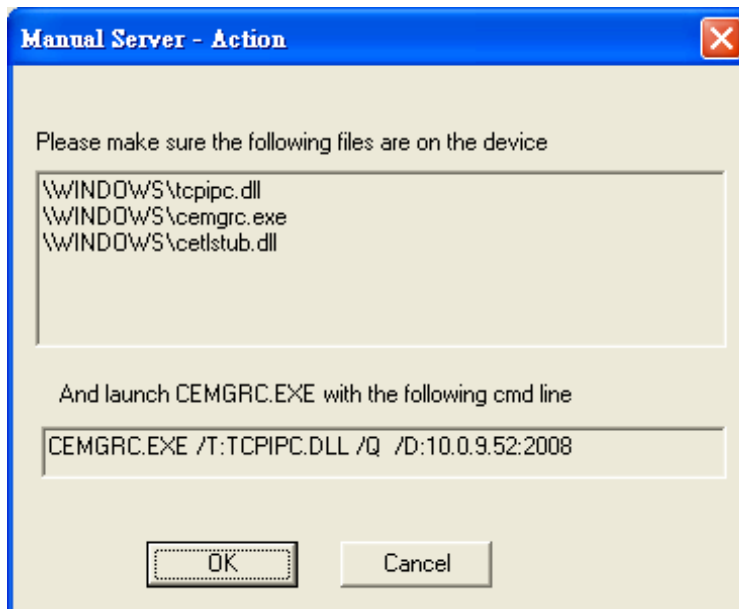
Step 12: On the Windows CE platform or device to configure dialog, click OK



Step 13: On the Build menu, point to Start Debug, and then click Go



Step 14: The Manual Server - Action dialog will appear displaying a command line, before click OK to close dialog, turn to the WinPAC controller side to do the next two-steps



Step 15: On the Microsoft eMbedded Visual C++ dialog, click OK

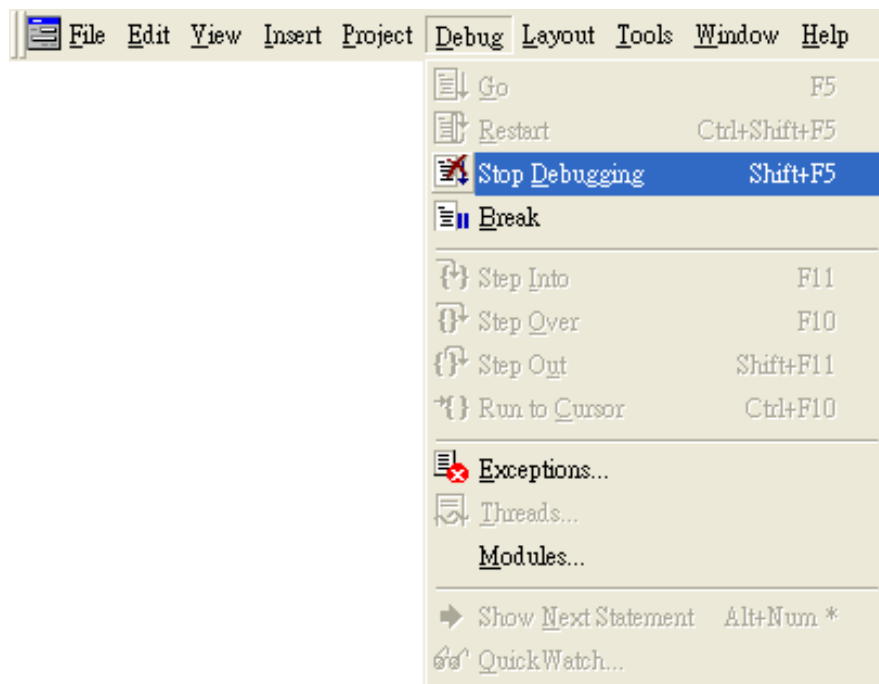


Step 16: Connection established. Then you can debug on line.

Tips & Warnings



If you want to quit the debugger and return to editing, you can click the “Stop Debugging” button from “Debug” menu



A.2.2. Debug WinPAC programs in Visual Studio 2005/2008

Debugging in Visual Studio 2005/2008 are provided by WinPAC OS image V 1.3.0.4 or later.

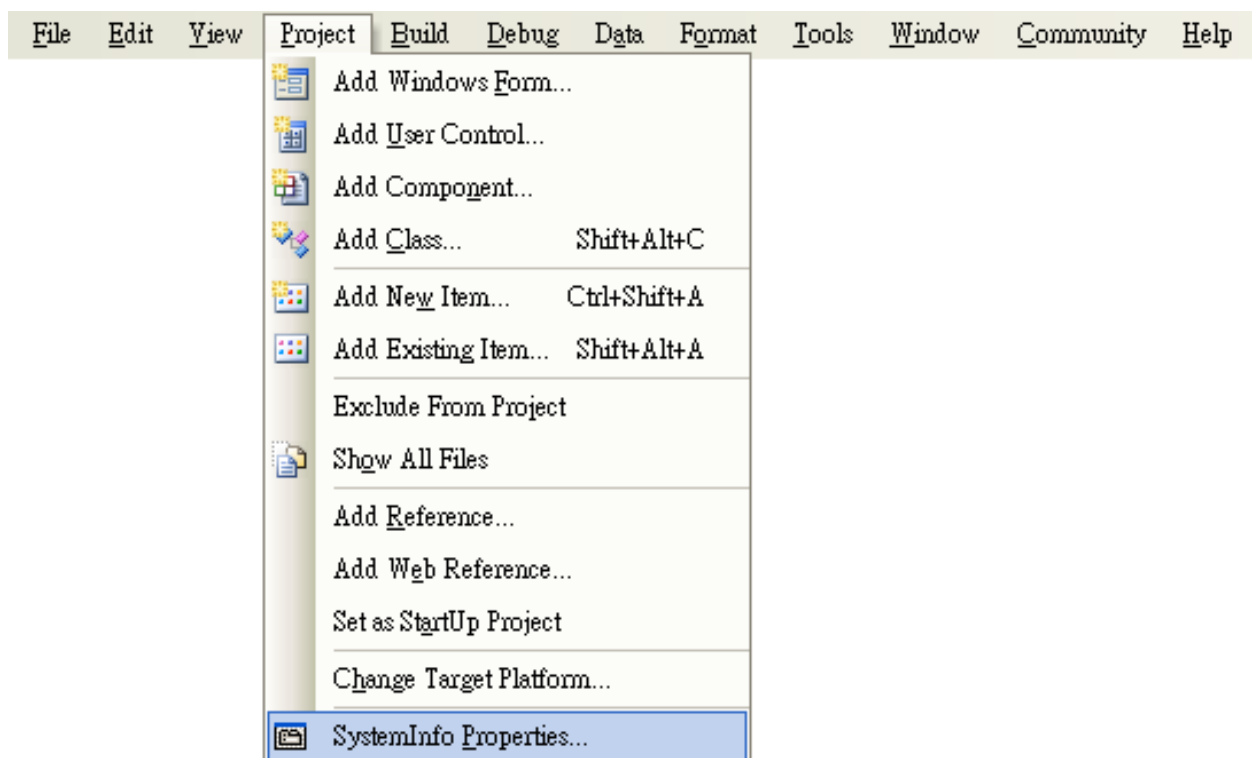
Step 1: Make sure the following file are listed with the matching version numbers

Path	File
C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Bin	<ol style="list-style-type: none"> 1. ActiveSyncBootstrap.dll 2. ConMan2.dll 3. ConManPS.dll 4. DesktopDMA.dll 5. eDbgTL.dll 6. TcpConnectionC.dll
C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Bin\1033	conmanui.dll
C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Target\wce400\armv4i	<ol style="list-style-type: none"> 1. DeviceDMA.dll 2. eDbgTL.dll 3. TcpConnectionA.dll 4. clientshutdown.exe 5. CMAccept.exe 6. ConmanClient2.exe

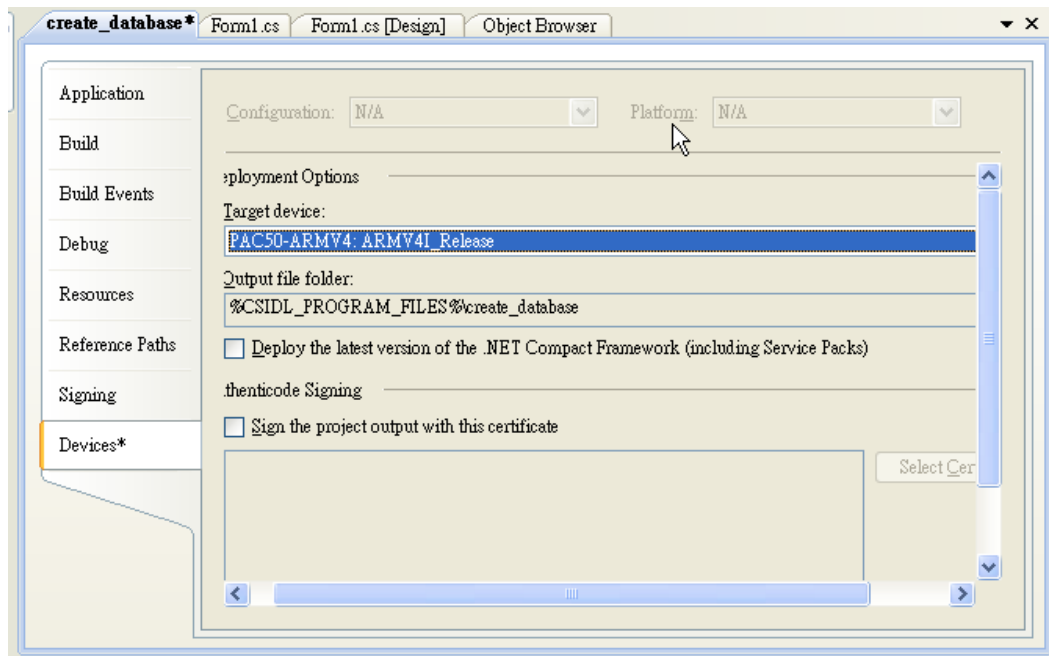
Step 2: If the version matches correctly and the entire file are there, copy the following files to WinPAC:\System_Disk\ICPDAS\System folder

- ✓ Clientsshutdown.exe
- ✓ ConmanClient2.exe
- ✓ CMaccept.exe
- ✓ eDbgTL.dll
- ✓ TcpConnectionA.dll

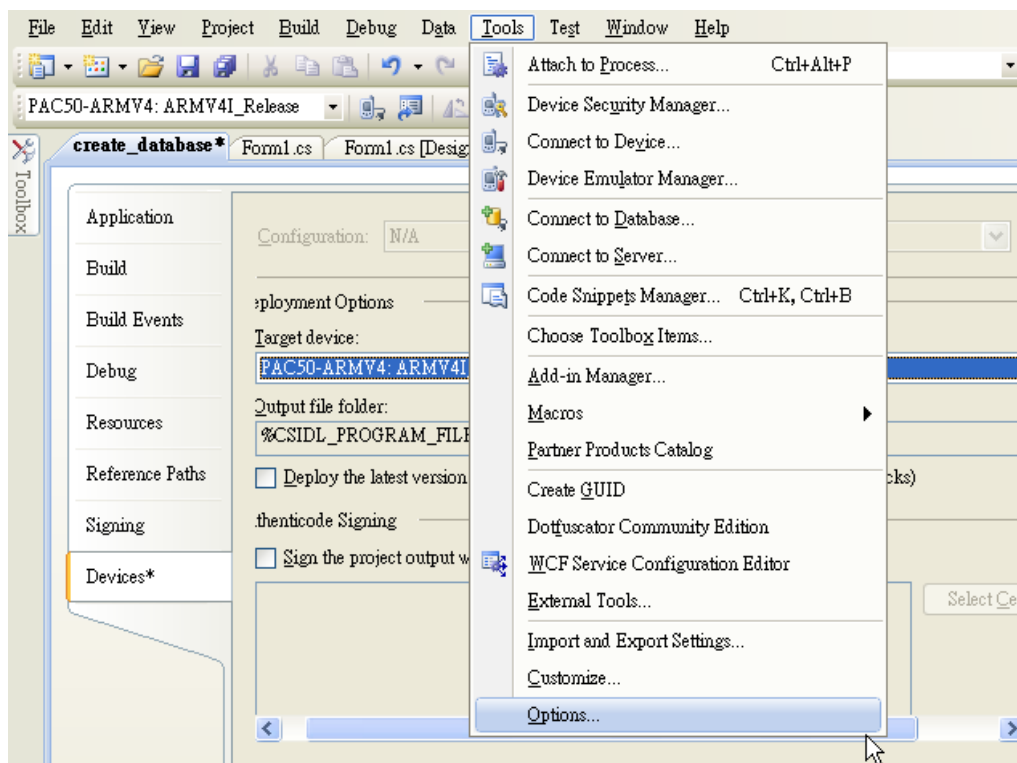
Step 3: On the Project menu, click [Project Name] Properties...”



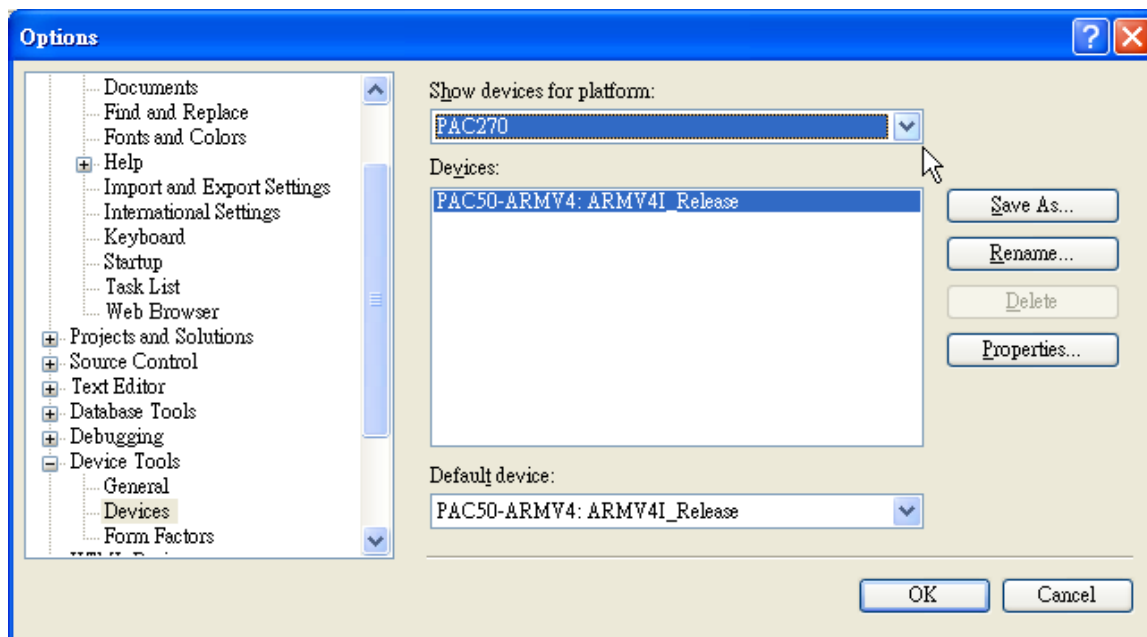
Step 4: On the SystemInfo* tab, unselect Deploy the latest version of the .NET compact Framework (including Service Packs) check box



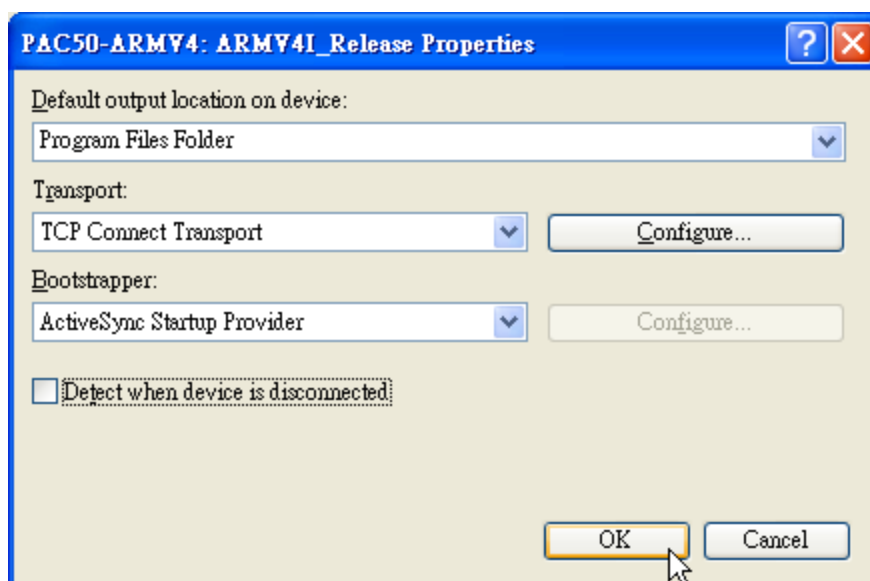
Step 5: On the Tools menu, click Options...



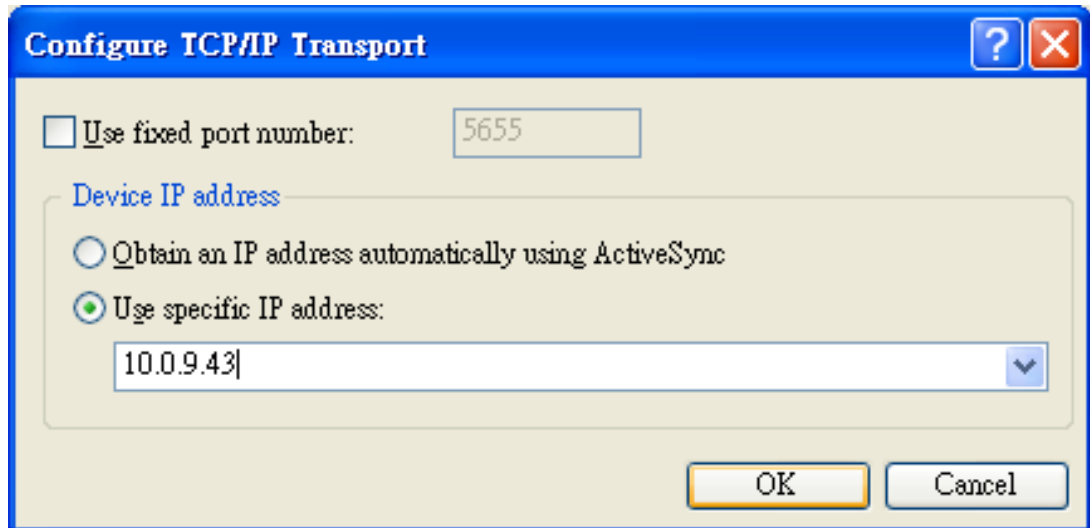
Step 6: On the Options dialog, select PAC 270 from the Show devices platform list, and then click Properties...



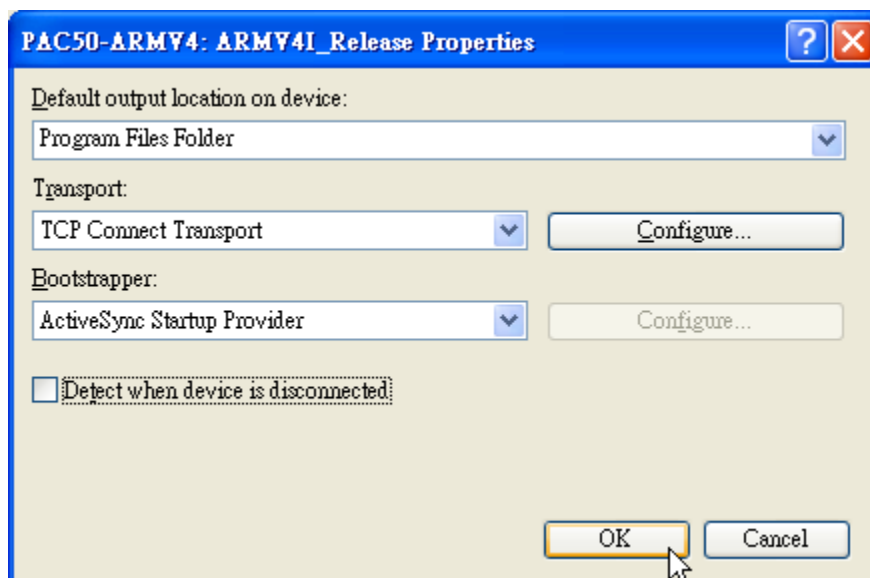
Step 7: On the PAC50- ARMV4:ARMV4I_Release Properties dialog, click Configure...



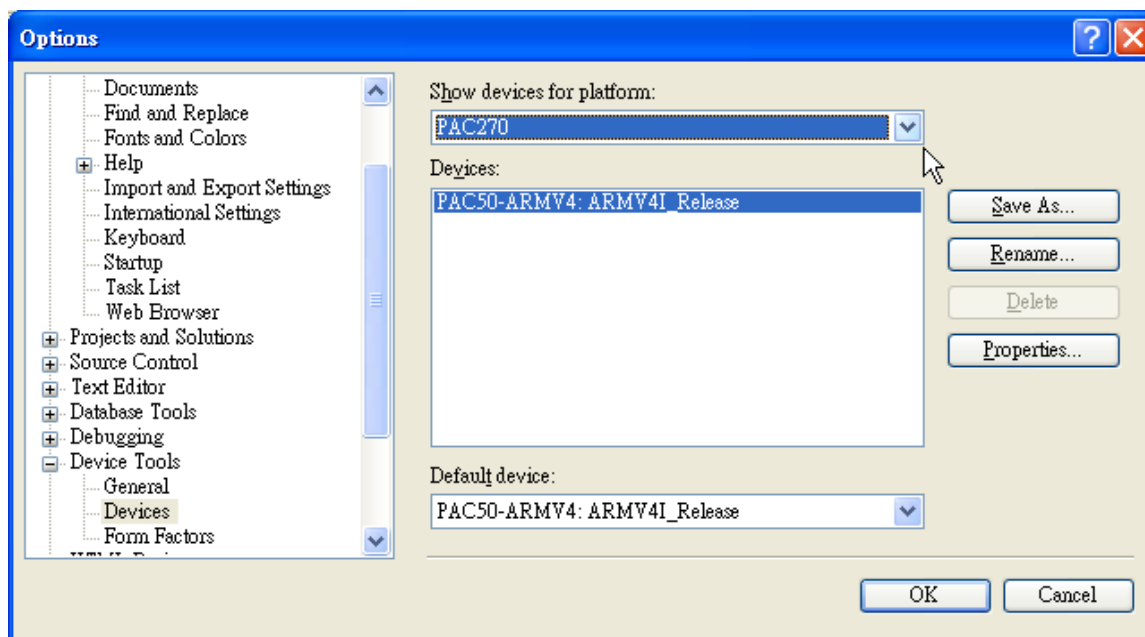
Step 8: On the Configure TCP/IP Transport dialog, select the Use specific IP address option and type the IP address of WinPAC, and then click OK



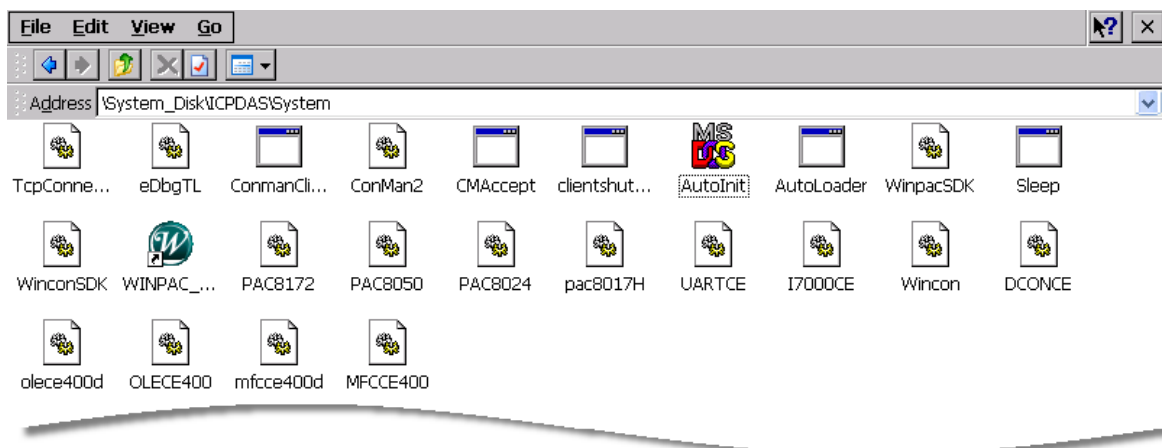
Step 9: On the PAC50- ARMV4:ARMV4I_Release Properties dialog, click OK



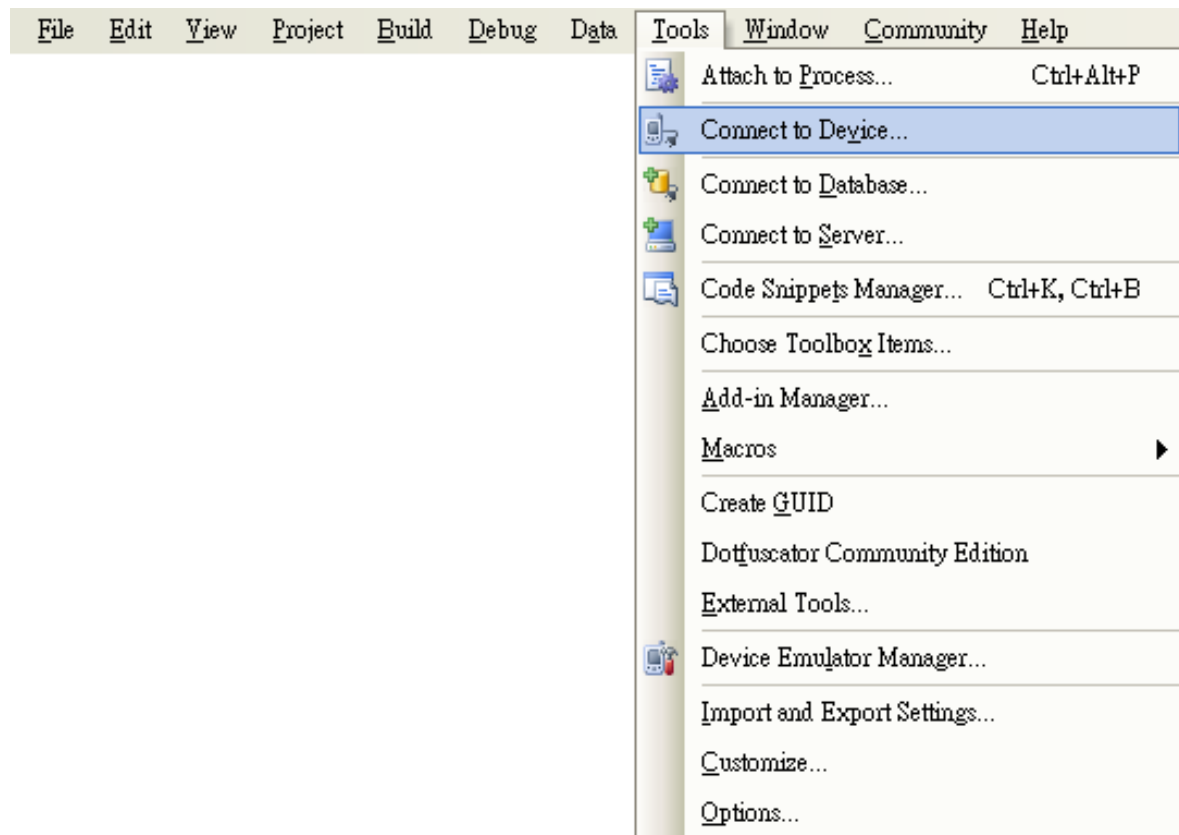
Step 10: On the Options dialog, click OK



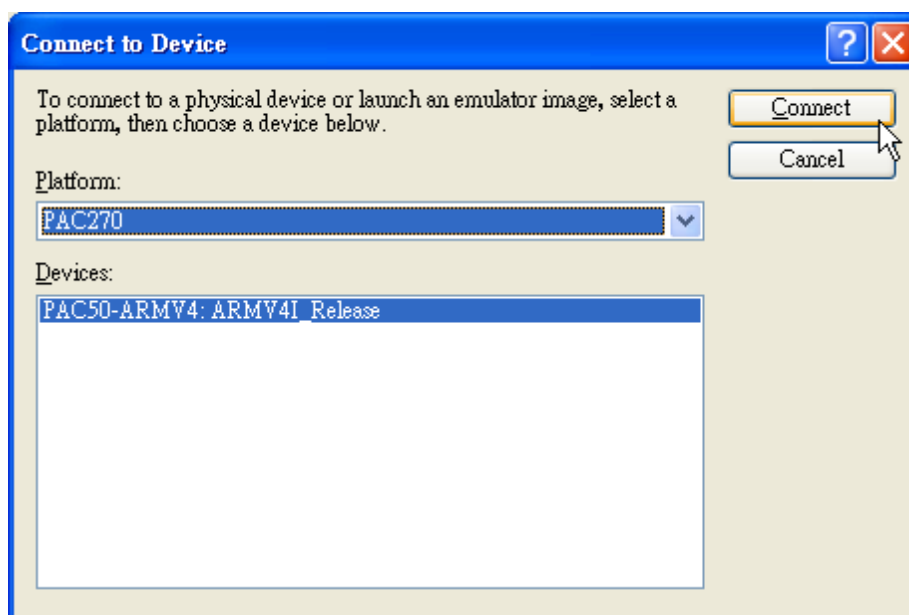
Step 11: On the WinPAC, run the CommanClient2 and the CMAccept.exe applications which is located at: \\System_Disk\ICPDAS\System



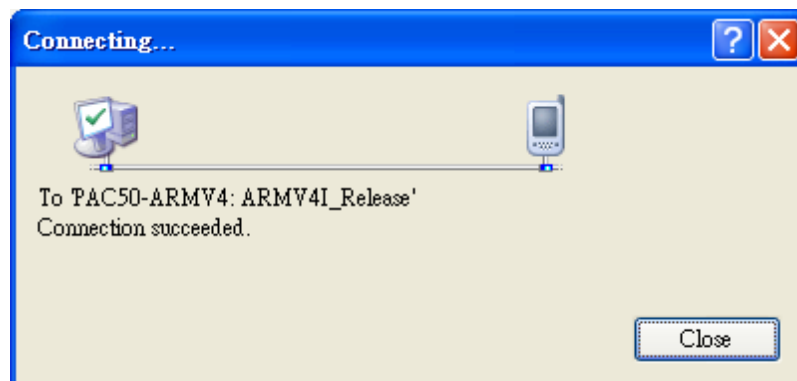
Step 12: On the Tools menu, click Connect to Device...



Step 13: On the Connect to Device dialog, select PAC 270 from Platform list and then click Connect



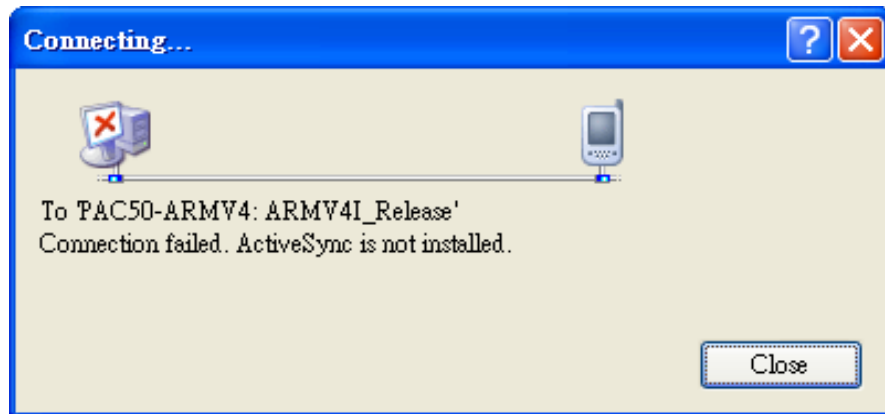
Step 14: On the Tools menu, click Connect to Device...



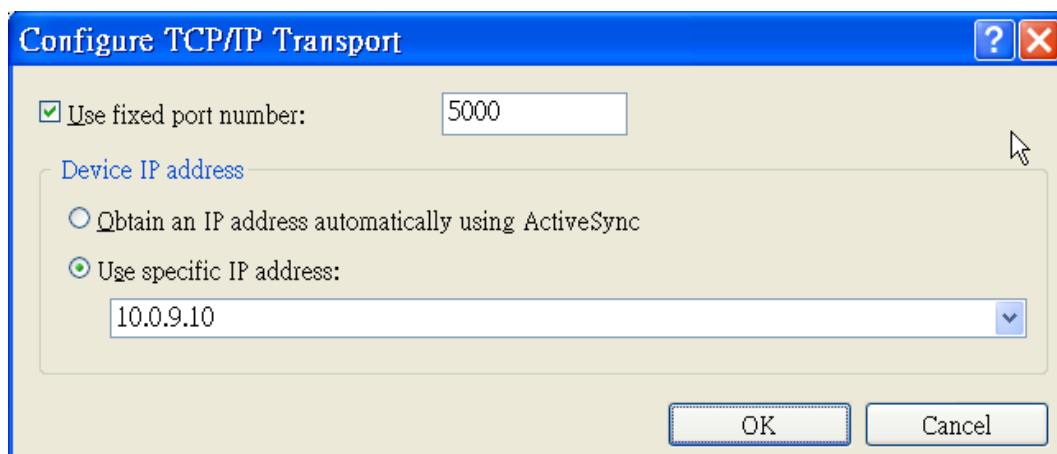
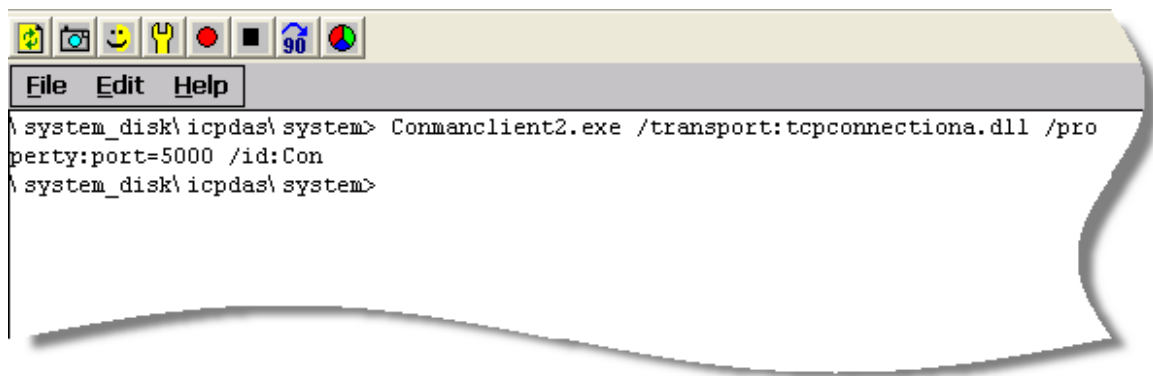
Step 15: Connection established. Then you can debug on line

FAQ:

If the connection fails shown as follow, return to step 11 to do the action below



Open the command prompt, run the
“CommanClient2.exe/transport:tcpconnectiona.dll/property:port=5000/i
d:Con” at: \System_Disk\ICPDAS\System, and then run the
“CMAccept.exe”



A.3. How to use the printer

WinPAC have ability to access the printer, you can connect to the printer via Ethernet network or USB.

Tips & Warnings

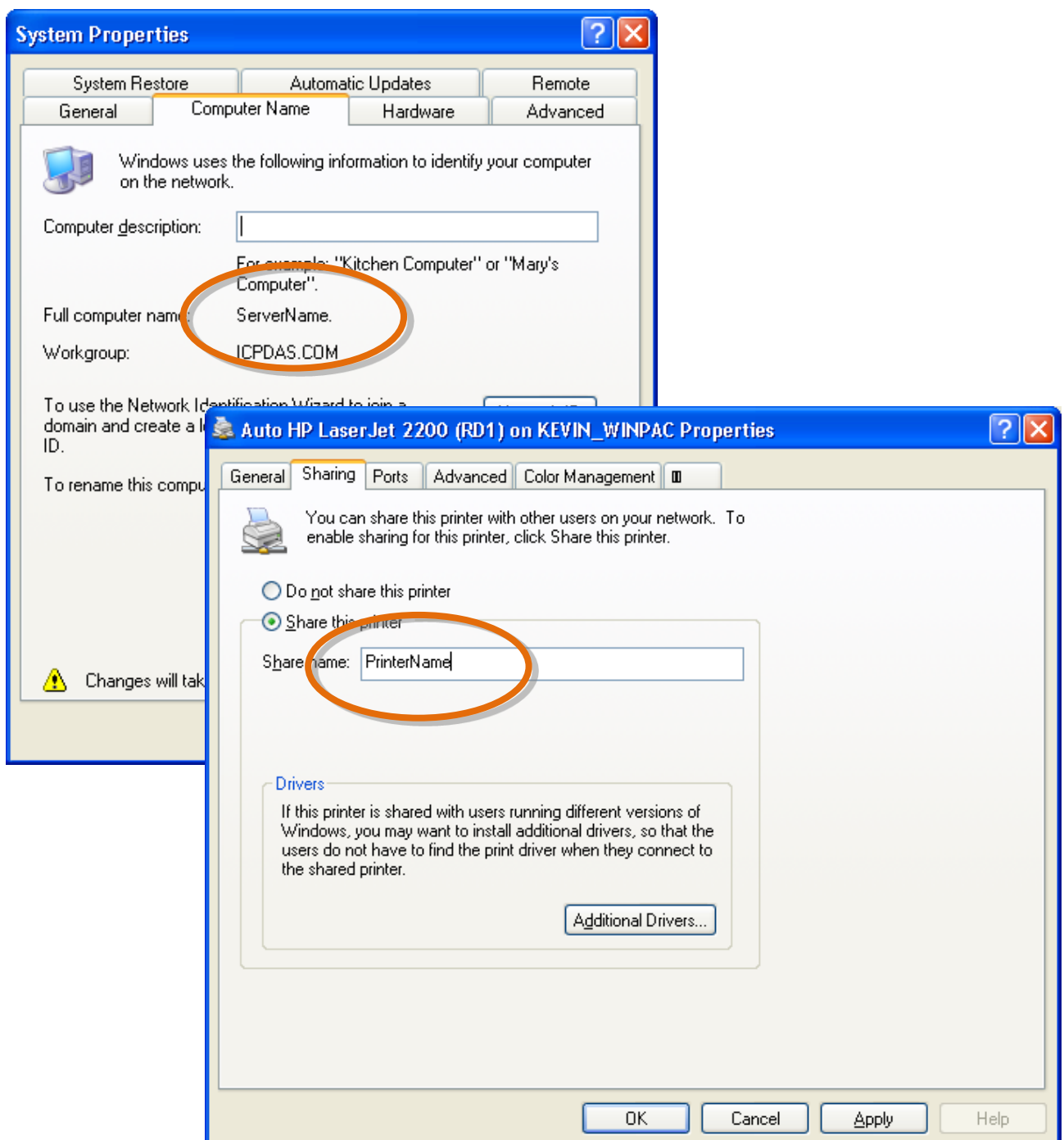


WinPAC only supports HP Laser Jet Printers which support PCL6 driver.

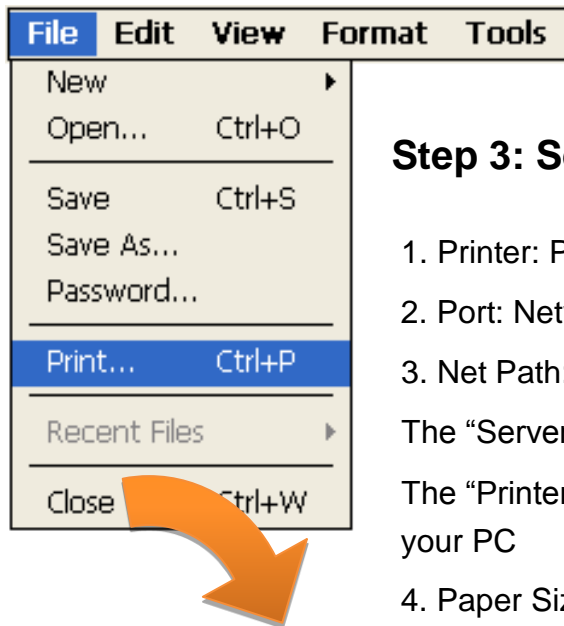
A.3.1. How to use network printer

To use a shared network printer, please perform the following steps:

Step 1: On the Host PC, check the name of the Host PC and the shared printer



Step 2: On the WinPAC, open a WordPad format file



Step 3: Set up the printer

1. Printer: PCL Laser
2. Port: Network
3. Net Path: [\\ServerName\PrinterName](#)

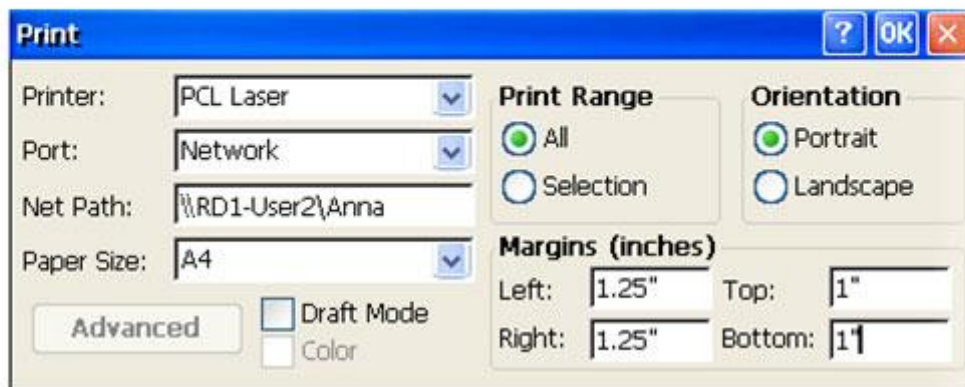
The "ServerName" is your PC's name or IP.

The "PrinterName" is your printer's shared name of your PC

4. Paper Size: Select the paper size



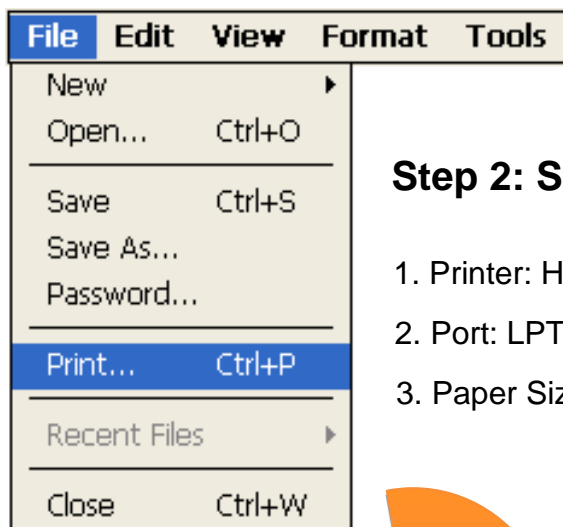
Test !!!



A.3.2. How to use printer via USB

To use a shared network printer via USB, please perform the following steps:

Step 1: On the WinPAC, open a WordPad format file

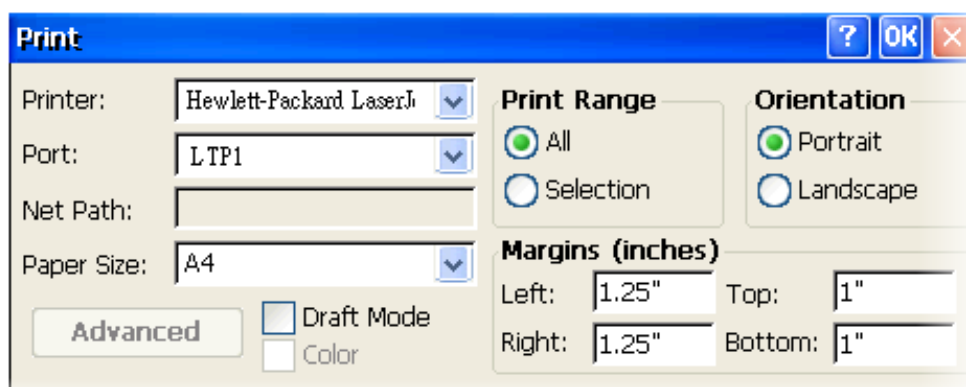


Step 2: Set up the printer

1. Printer: Hewlett-Packard LaserJet
2. Port: LPT1
3. Paper Size: Select the paper size



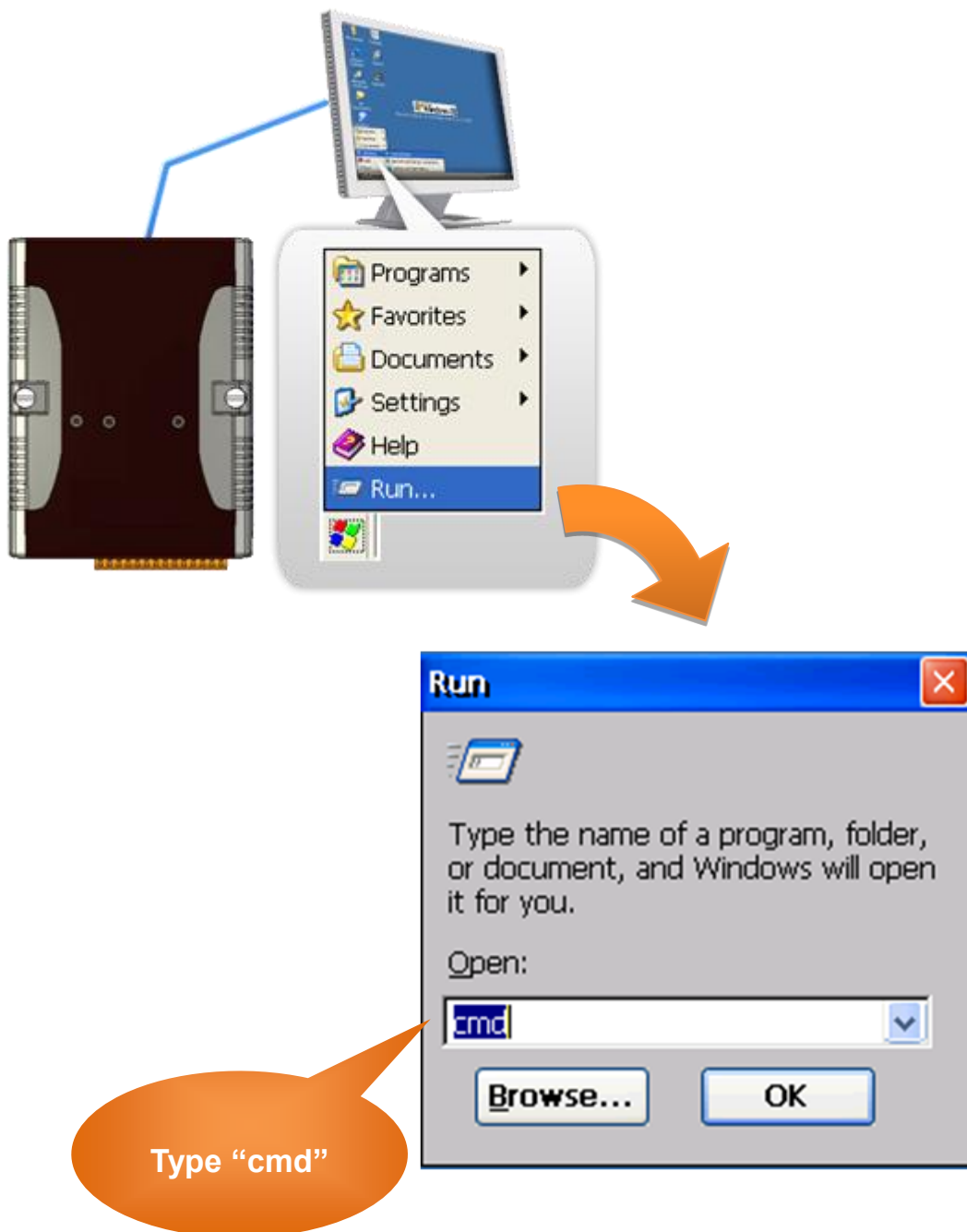
Test !!!



A.4. How to use services tool

The services tool can help you turn on, turn off and monitor the WinCE services.

Step 1: Open a MS-DOS command prompt



Step 2: List all services

[Syntax] services list

```
File Edit Help
Pocket CMD v 5.0
\> services list
NFYO: 0x00030110 NOTIFY.Dll Running
HTPO: 0x00031570 HTTPD.DLL Running
CRDO: 0x00032070 credsvc.dll Running
MMQ1: 0x00036790 MSMQD.Dll Off
OBX0: 0x00036b20 OBEXSrVr.dll Off
FTPO: 0x00037770 FTPD.Dll Running
TELO: 0x00037ac0 TELNETD.Dll Running
SMB0: 0x0003c3e0 smbserver.dll Running
NTPO: 0x0003fff0 timesvc.dll Running
\>
```

Step 3: Type the commands to configure service

[Syntax] services stop <services name>

For example, turn on the “FTP” service:

services stop FTP0:

```
File Edit Help
Pocket CMD v 5.0
\> services stop FTP0:
\> services list
NFYO: 0x00030110 NOTIFY.Dll Running
HTPO: 0x00031570 HTTPD.DLL Running
CRDO: 0x00032070 credsvc.dll Running
MMQ1: 0x00036790 MSMQD.Dll Off
OBX0: 0x00036b20 OBEXSrVr.dll Off
FTPO: 0x00037770 FTPD.Dll Off
TELO: 0x00037ac0 TELNETD.Dll Running
SMB0: 0x0003c3e0 smbserver.dll Running
NTPO: 0x0003fff0 timesvc.dll Running
\>
```

Tips & Warnings



For more information about using services tool, you just type
“services help”

```
File Edit Help
Pocket CMD v 5.0
\> services help
Commands:
    help - print this text
    list - lists loaded services
    load <service name> - activates a service that is inactive
    stop <service instance> stops/pauses a service (does not unload)
    start <service instance> - starts/resumes a service
    refresh <service instance> - causes service to refresh its config
    unload <service instance> - causes service to be unloaded and
    register <service name> - service will be automatically loaded at
reboot
    unregister <service name> - service will not be automatically
next reboot
    command <service name> [arg1 arg2 ...] - send service-specific
o service
    help <service name> - get information on what service-specific
are supported

    <service name> - service's name in the registry (i.e. HTTPD)
    <service instance> - particular instantiation (i.e. HTTPD:)

Flags:
    -f <file name>
    -s silent
    -d output to debugger

\> █
```

A.5. How to use ActiveSync through USB port

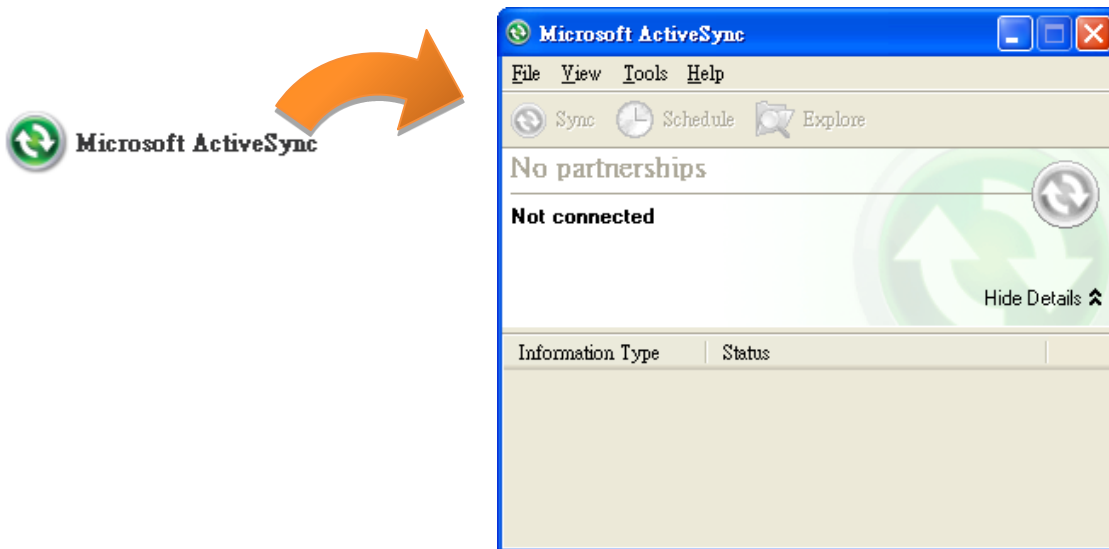
ActiveSync helps you to synchronize the files on your host PC with the WinPAC.

Step 1: On the PC, install the Microsoft ActiveSync software

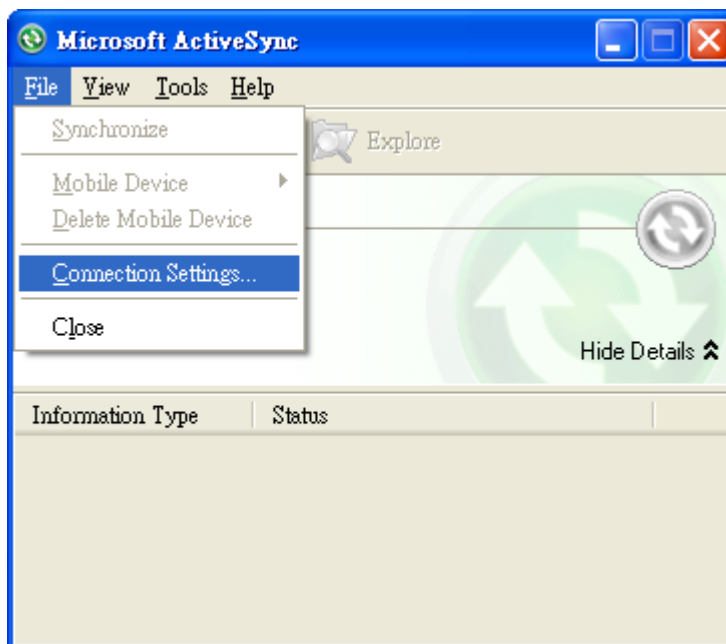
The Microsoft Active Sync software can be obtained from Microsoft website.

Step 2: Run the Microsoft ActiveSync

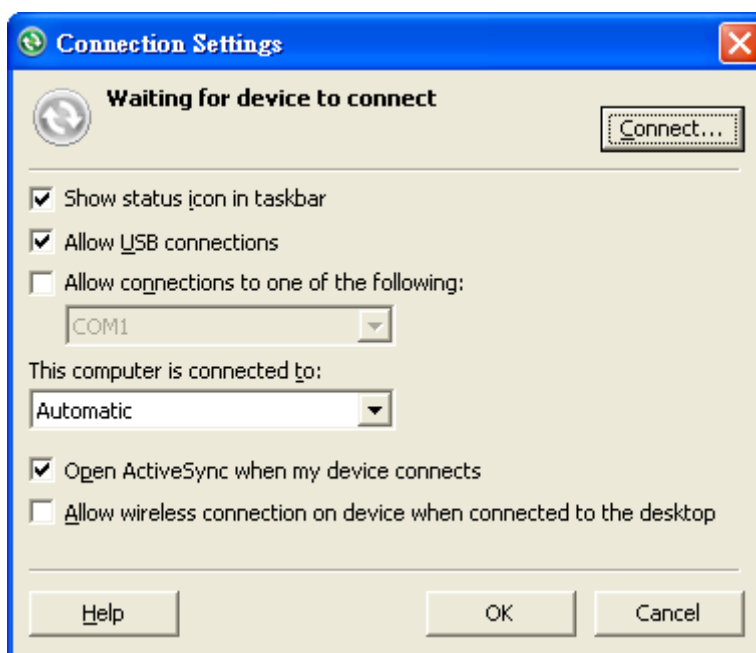
You can run Microsoft Active Sync from the Start menu



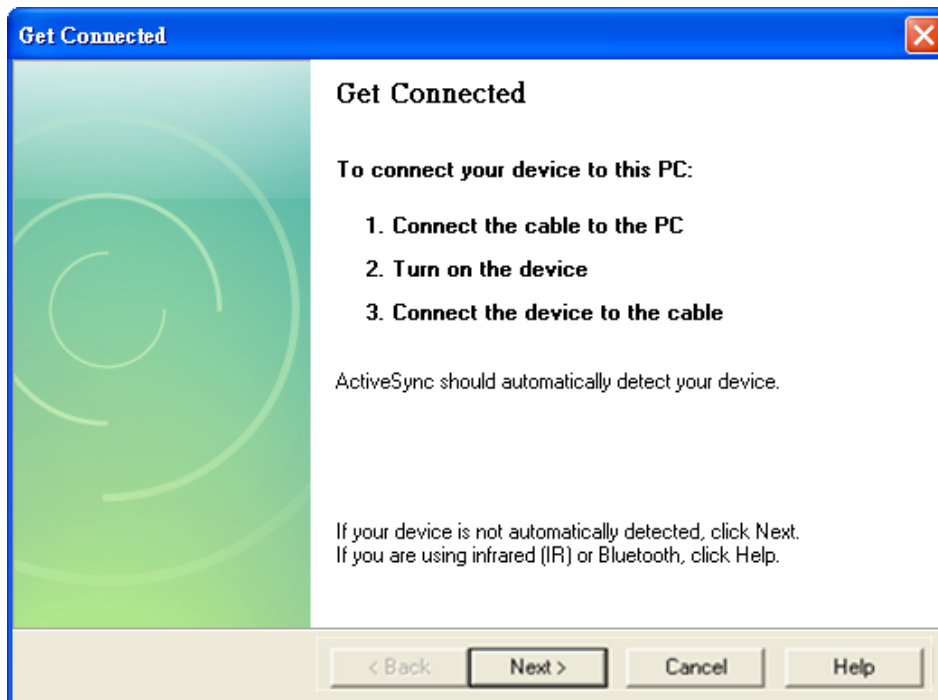
Step 3: On the File menu, click Connection Settings...



Step 4: Make sure the Allow USB connections are selected, and then click Connect...

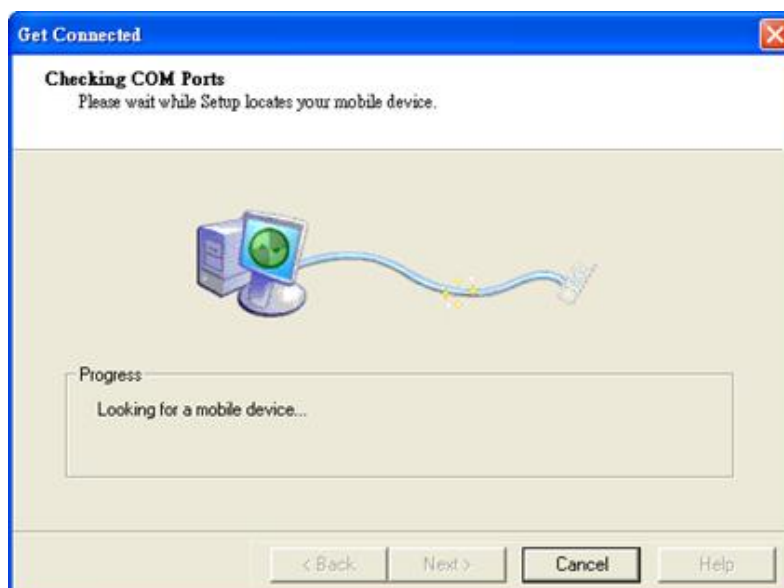


Step 5: Click Next to get connected



Step 6: Wait a while until the connection is established

After the connection is established, the color of the ActiveSync icon will change to green.



Disconnected – Black & Write



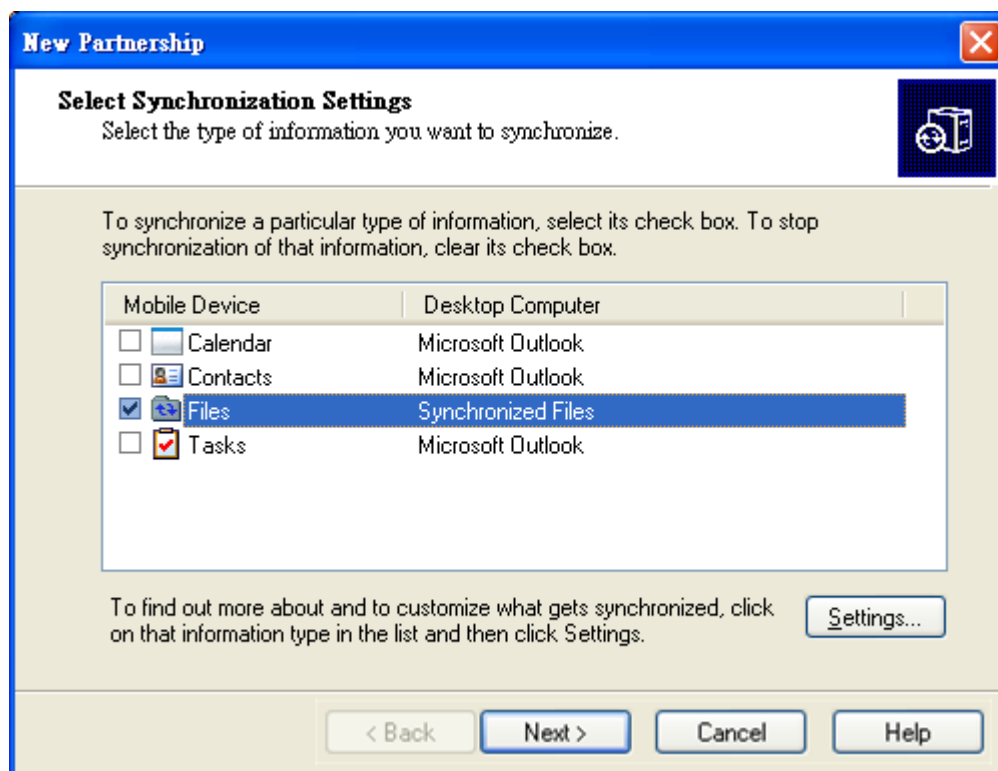
Connected - Green



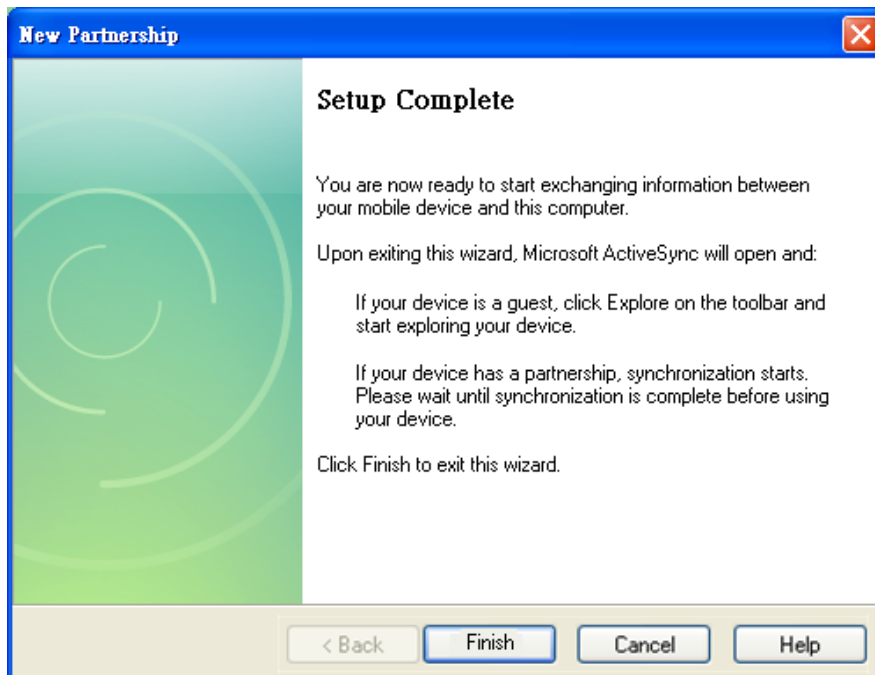
Step 7: Click Yes, and then click Next to set up a partnership



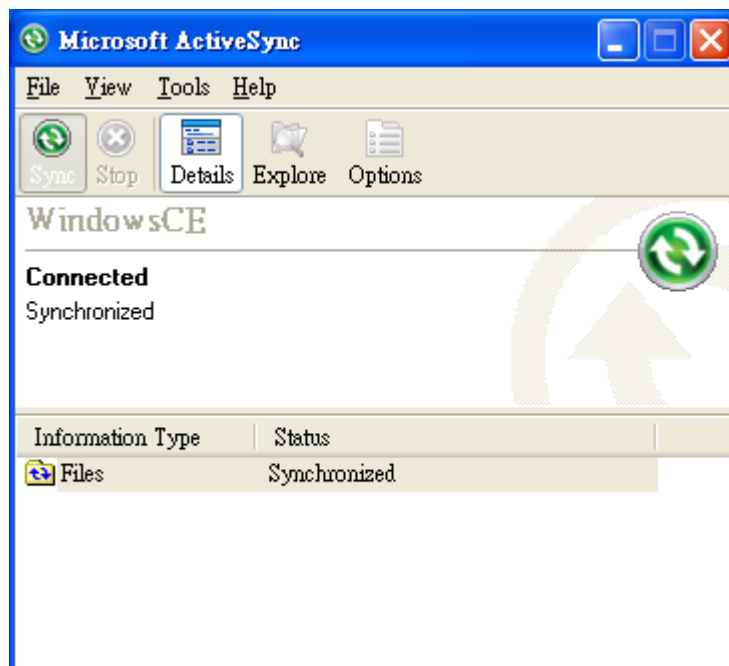
Step 8: Select the type of information you want to synchronize, and then click Settings...



Step 9: Click Finish to complete the setup

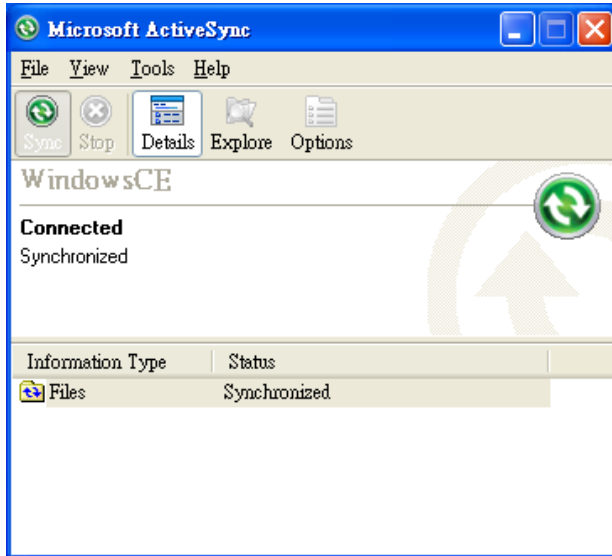


Step 10: Click Sync to synchronize the information

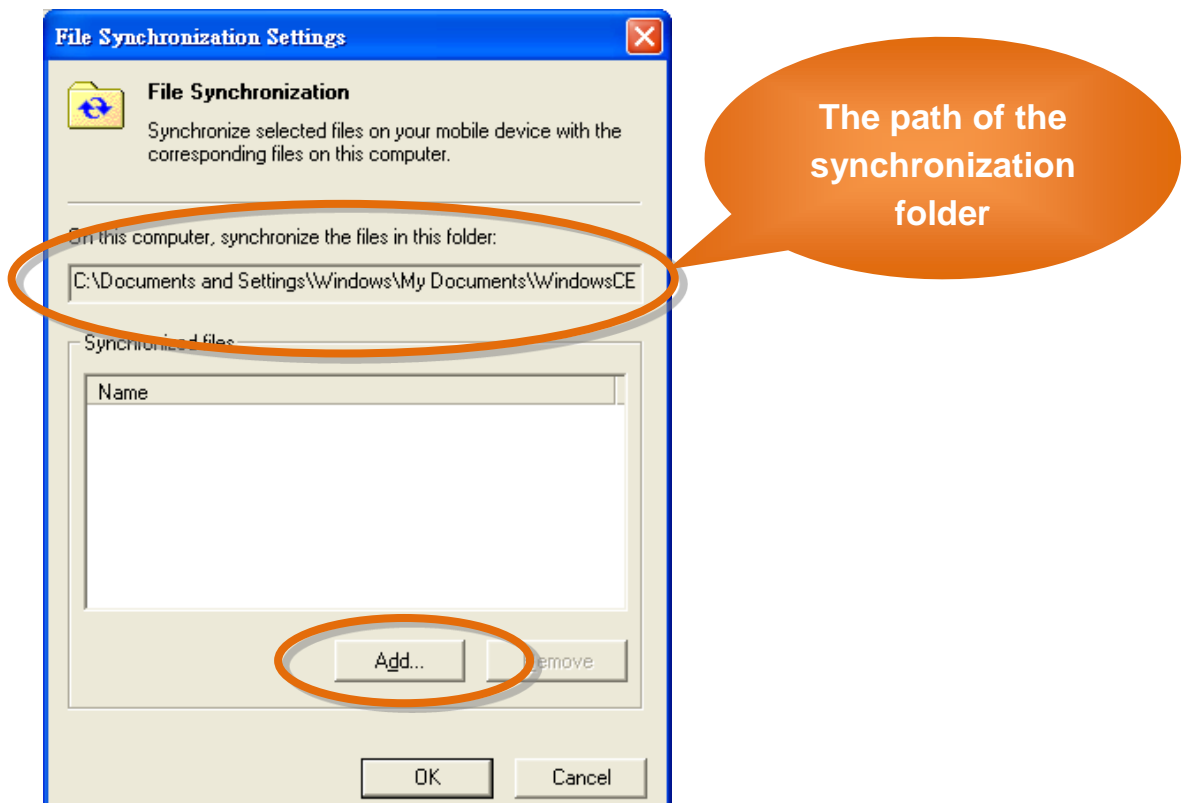


Example: Synchronize a file between the PC and WinPAC-5000

Step 1: Follow the above-mentioned procedures to synchronize a file folder, and then double-click the Files



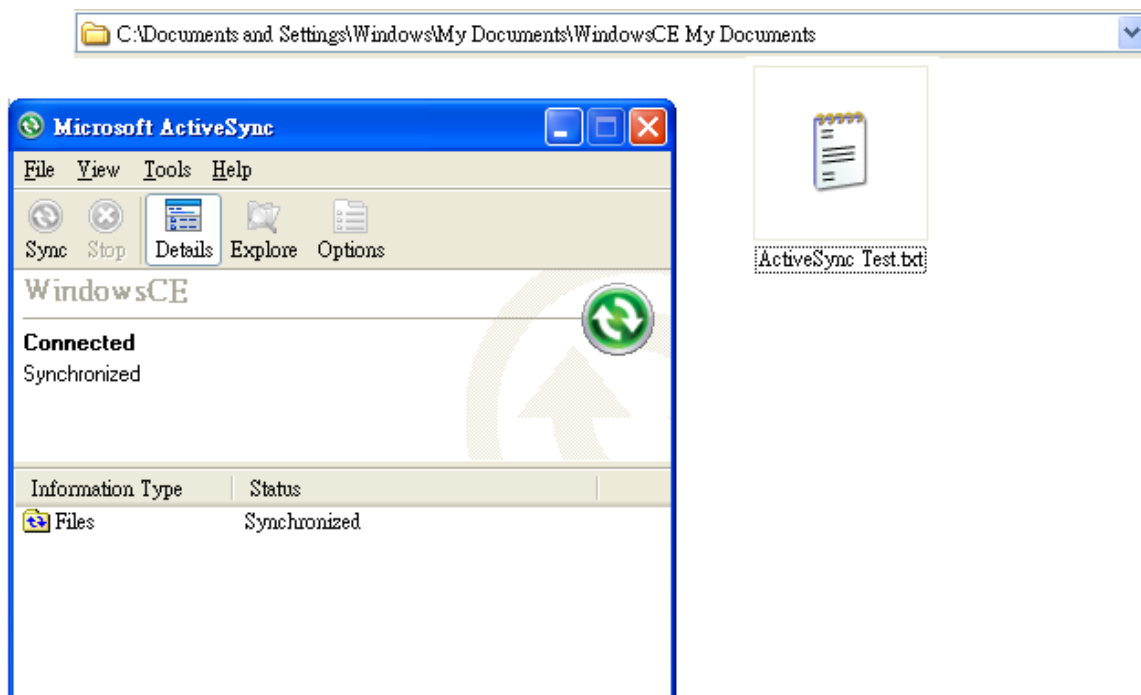
Step 2: Under the Synchronized files, click Add... to select the synchronized files or add the file to the synchronization folder, and then click OK



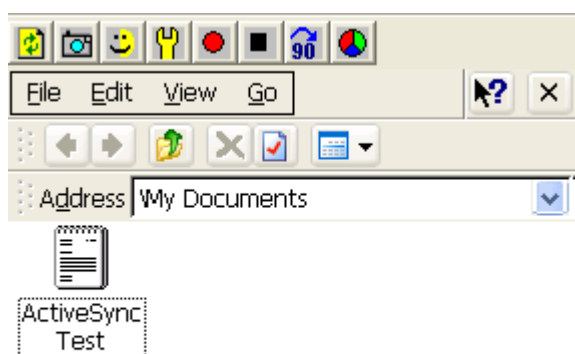
Step 3: Check the synchronization status

After clicking OK, the synchronization will be performed.

The synchronization folder on PC



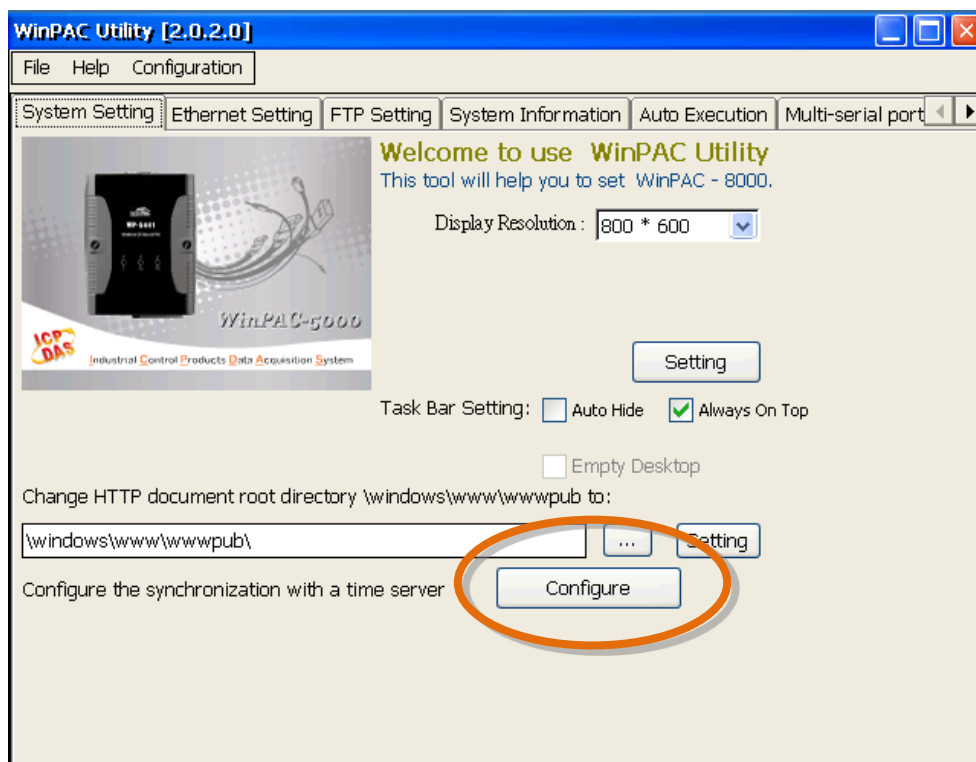
The synchronization folder on WinPAC-5000



A.6. How to automatically synchronize the WinPAC clock with an Internet Time Server

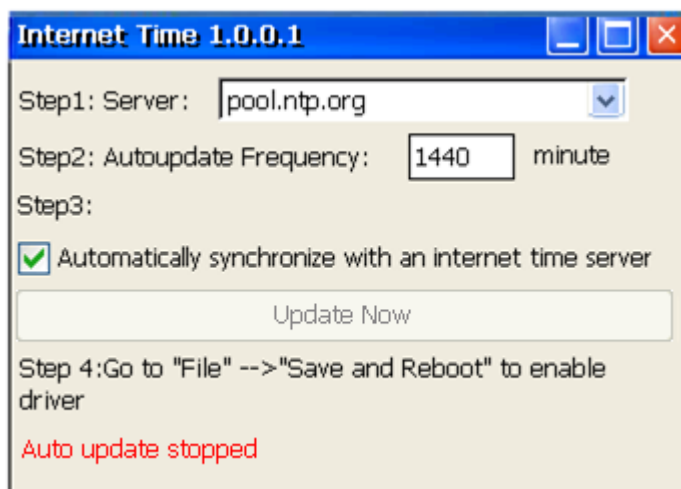


Step 2: On the System Setting tab, press Configure

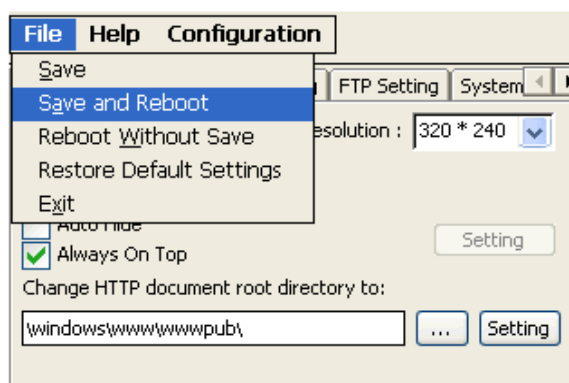


Step 3: Select the domain name in the Server drop down list, and then enter a value in the Autoupdate Frequency field

Step 4: Check the Automatically synchronize with an internet time server check box

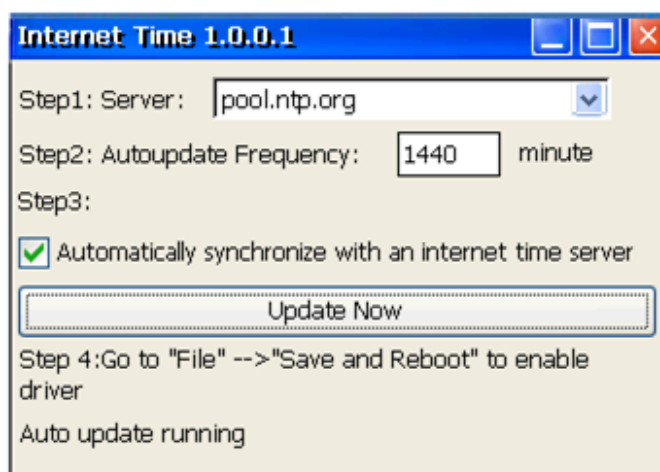


Step 5: On the File menu, click Save and Reboot



Step 6: The WinPAC will automatically synchronize with an internet time server regularly

Step 7: Press Update Now to synchronize WinPAC clock immediately.



Appendix B. XW-board Modules

The XW-board series are for uPAC-5000, LP-5000, and WP-5000 series. One PAC can only plug only one XW-board. The XW-board series have following common specification:

- DI channel is dry contact, sink type.
- DO channel is open collector, sink type.

DI, DO Expansion

Model	DI	DO	Isolation
XW107	8	8	-
XW107i			3750 Vrms
XW110	16	-	-

AI, AO, DI, DO Expansion

Model	AI (12-bit)		AO (12-bit)		DI	DO
	Ch	Range	Ch	Range		
XW304	6	+/- 5V	1	+/- 5V	4	4
XW310	4	+/- 10V	2	+/- 10V	3	3
XW310C	4	0~20 mA	2	0~20 mA	3	3

RS-232/422/485, DI, DO Boards

Model	Serial Port			DI	DO	Isolation
	Type	Ch	Wire			
XW506	RS-232	6	3-wire	-	-	-
XW507	RS-422/RS-485	1	4/2-wire	6	4	
XW509	RS-232	2	5-wire	6	4	
XW511i	RS-422/RS-485	3	4/2-wire	-	-	2500 Vrms

For more detailed information about these support modules, please refer to

http://www.icpdas.com/products/PAC/up-5000/XW-board_Selection_Guide.htm

Appendix C. Revision History

Revision	Date	Description
1.0.1	August 2010	Initial issue
1.0.2	December 2010	<ol style="list-style-type: none">1. Added information about using backup utility to back up the settings and files in section 2.5.2. Added information about a caution about using System_Disk in section 2.6.3. Added information on how to add a user account in section A.1.