WinPAC-8000 User Manual
(Standard series solution)

Version 2.0.3, July 2010

Service and usage information for

Model: WP-8131

Model: WP-8431

Model: WP-8831

Model: WP-8141

Model: WP-8441

Model: WP-8841

Written by Sean Hsu

Edited by Anna Huang

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1. Introduction

WinPAC-8000 is the second generation PAC of ICPDAS. It equips a PXA270 CPU (520 MHz) running a Windows CE.NET 5.0 operating system, various connections (VGA, USB, Ethernet, RS-232/485) and 1/4/8 slots for high performance parallel I/O modules (high profile I-8K series) and serial-type I/O modules (high profile I-87K I/O modules).

Its operating system, Windows CE 5.0, 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 in the WinPAC-8000 gives it the ability to run PC-based Control software such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, Soft PLC …etc.

Comparing with the first generation WinCon-8000, it not only improves the CPU performance (from 206 MHz to 520 MHz) and upgrading OS (from CE 4.1 to CE 5.0), but also adds many reliability features, such as dual LAN, redundant power input, dual battery backup SRAM, etc. It gives you all of the best features of both traditional PLCs and Windows capable PCs.

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1.1. Features

Windows CE .Net 5.0 Inside

Most of the popular features in MS software are included, such as

1. FTP Server
2. HTTP Server
3. ASP (Java script, VB script)
4. SQL Server Compact Edition 3.5
5. Compact .Net Framework 2.0

Remote Maintenance via FTP Server and VCEP Software

The FTP server is used for uploading applications or downloading data. And VCEP is designed for managing the WinPAC-8000. VCEP can synchronize every movement (screen, keyboard and mouse actions) between the PC and the WinPAC-8000 via the Ethernet. By using the FTP server and VCEP, you can update and manage the WinPAC-8000 remotely via the Ethernet.

Built-In OPC Server

NAPOPC_CE5 is an OPC server and SCADA software can easily integrate I/O modules through it. Furthermore, it also provides a library which users can use to develop their AP by eVC, C# or VB.Net.

NAPOPC_CE5 not only supports I/O modules in local slots, but also supports remote I/O modules with the following protocols via the RS-232/485 or Ethernet:

1. Modbus/RTU
2. Modbus/ASCII
3. Modbus/TCP
4. DCON

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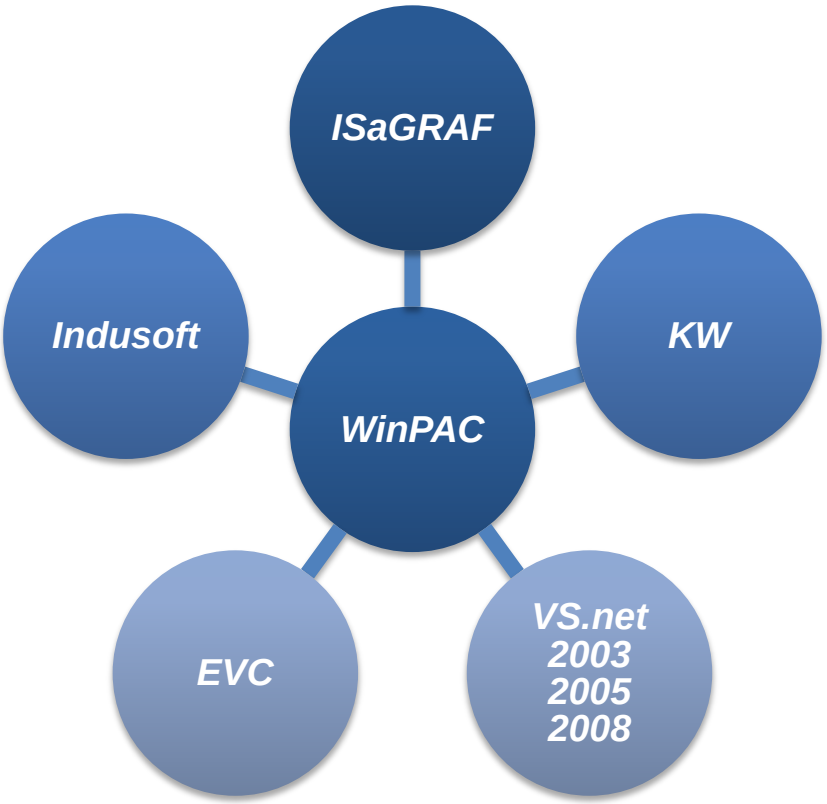
Rich Software Solutions



On the WinPAC-8000, ICP DAS provides the following software solutions to fit in different applications.

1. Visual Studio .Net 2003/2005/2008 and eVC solution:
   SDK as well as demo programs for C#, VB.Net and eVC are provided.
2. SoftPLC solution:
   A. ISaGRAF supports IEC61131-3 languages, Ladder Diagram (LD), Structured Text (ST), Function Block Diagram (FBD), Sequential Function Chart (SFC), Instruction List (IL), and Flow Chart (FC).
   B. KW-software supports IEC61131-3 languages and HMI features.
3. SCADA solution:
   Indusoft provides simple “drag and drop”, “point and click” developing environment for HMI and SCADA applications.

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Upgrading applications from WinCon to WinPAC just copy and play

Users can upgrade their controller from WinCon-8000 to WinPAC-8000, and meanwhile still keep most of their old applications (.exe file) running smoothly on WinPAC-8000 without any modification. The only thing that users have to do is just to copy the .exe file from WinCon-8000, paste it to WinPAC-8000, and then play it. How simple it is. And for exceptions that old applications (.exe file) are not able to follow the copy-and-paste rule, users can still finish the upgrading by recompiling the old applications.

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Hardware Features

Power CPU Module

The most important features of the CPU module are

1. PXA270 or compatible CPU (32-bit and 520MHz)
2. 128 MB SDRAM
3. 63 MB Built-In Flash Disk (WP-8x3x)
   31 MB Built-In Flash Disk (WP-8x4x)

Built-in VGA Port

A built-in VGA port can be directly connected to a regular LCD display. Users can operate the HMI or SCADA software (running on the WinPAC-8000) with display, keyboard and mouse just as how they usually did on regular PCs.

64-bit Hardware Serial Number

The 64-bit hardware serial number is unique and individual. Every serial number of WinPAC-8000 is different. Users can add a checking mechanism to their AP to prevent software from pirating.

I/O Module Hot Swap Ability

The WinPAC-8000 features hot swap which means that there is no need to power off the WinPAC-8000 for replacing modules. And the OS provides a function sending plug-in and removing messages to user's applications. Using this feature, users can design its own plug-and-play applications.

Rich I/O Expansion Ability (RS-232/485, Ethernet, FRnet, CAN)

Beside the local I/O slots, WinPAC-8000 also equips several RS-232/485 ports, two Ethernet ports to connect serial I/O and Ethernet I/O. And with FRnet and CAN communication module in local slot, FRnet I/O and CAN devices are easy to be integrated.

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Built-In Flash Disk (31/63 MB)

In normal situation, users can store their AP or data to the Micro SD card or USB Flash disk. But in some vibrational environment (for example, like driving ships), the two storage media would be bad connection. Then the built-in Flash disk will be the best storage media in such the vibrational environment.

Dual Watchdog Timer

A system could be hanged up when the OS or the AP fails. There are two watchdogs (OS watchdog and AP watchdog) designed to automatically reset the CPU when the situations happen. The design will increase the reliability of the system.

Dual Battery-Backup SRAM (512 KB)

To maintain important data while power off, non-volatile memory is the ideal design. The WinPAC-8000 equips a 512 KB SRAM with two Li-batteries to maintain data while power off.

The two Li-batteries can continually supply power to the 512 KB SRAM to retain the data for 5 years; and the dual-battery design can avoid data lost while replacing a new battery.

Dual Ethernet Ports

WinPAC-8000 provides two Ethernet ports. The two Ethernet ports can be used to implement redundant Ethernet communication and separate Ethernet communication (one for global Internet, one for private Ethernet).

Redundant Power Input

To prevent the WinPAC-8000 from failing by the power loss, the power module is designed with two input connectors. Once a power input fails, the power module switches to the other power input. And there is a relay output for informing the power failure.

Ventilated Housing Design Allows Operation Between -25 ~ +75 ˚C

Each WinPAC-8000 is housed in a plastic-based box with a column-like ventilator that can help to cool the working environment inside the box and allow the WinPAC-8000 operating between -25 ˚C and +75 ˚C

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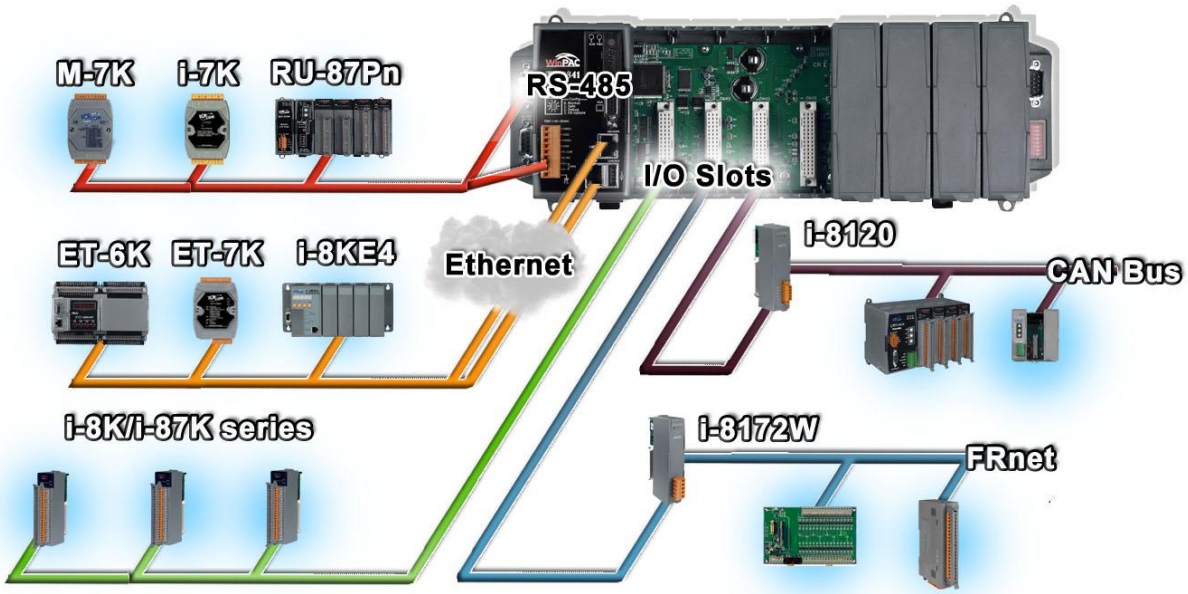
I/O expansion



WinPAC-8000 provides the following I/O expansion bus

Local I/O Slot

There are 1/4/8 slot options to expand local I/O. And the I/O modules can be parallel bus type (high profile I-8K series) and serial bus type (high profile I-87K series).

The difference between them is

Item	I-8K Series	I-87K Series
Microprocessor	No	Yes (8051)
Communication interface	Parallel bus	Serial bus
Communication speed	Fast	Slow
DI latched function	No	Yes
Counter input (for digital input module)	No	Yes (100 Hz)
Power on value	No	Yes
Safe value	No	Yes
Programmable slew-rate for AO module	No	Yes

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Ethernet

The available Ethernet I/O devices are ET-6000, ET-7000, I-8KE4/8 and I-8KE4/8-MTCP.

WinPAC-8000 can access them with Modbus/TCP or DCON protocol.

RS-485

WinPAC-8000 is equipped with two RS485 COM ports which enable the transmission rate up to a maximum of 115.2 Kbps. The medium for connection is a twisted-pair, multi-drop, 2-wire RS-485 network that can link i-7000, M-7000, RU-87Pn and high profile I-87K modules.

FRnet

FRnet is an innovative industrial field bus that has many special features, such as high-speed deterministic I/O control, real I/O synchronization capabilities, non-protocol communication, and easy programming. Plugging in an FRnet communication module (I-8172W), the WinPAC-8000 can link FRnet I/O modules to implement high-speed distributed I/O.

CAN Bus

The Controller Area Network (CAN) is a serial communication way, which efficiently supports distributed real-time control with a very high level of security. It provides the error-processing mechanisms and concepts of message priority. These features can improve the network reliability and transmission efficiency. Furthermore, CAN supplies the multi-master capabilities, and is especially suited for networking “intelligent” devices as well as sensors and actuators within a system or a sub-system. With I-8120, I-8123, I-8124, I-87120, I-87123, and I-87124, WinPAC-8000 is able to demonstrate every feature of CAN, CANopen, and DeviceNet.

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1.2. Specifications

System Software	
OS	WinCE.Net 5.0
.Net Compact Framework	2.0
Embedded Service	FTP server, Web server (supports VB script, JAVA script), Embedded SQL server
SDK Provided	Dll for eVC, Dll for Visual Studio.Net 2003/2005/2008

CPU Module	
CPU	PXA 270 or compatible (32-bit and 520 MHz)
SDRAM	128 MB
Dual Battery Backup SRAM	512 KB (for 5 years data retain)
Flash	WP-8x3x: 128 MB (64 MB for OS image, 63 MB for built-in Flash disk, 1 MB for registry) WP-8x4x: 96 MB (64 MB for OS image, 31 MB for built-in Flash disk, 1 MB for registry)
Expansion Flash Memory	Micro SD socket with one 1 GB Micro SD card (can support 16GB microSD card)
RTC (Real Time Clock)	Year-2000 compliance; seconds, minutes, hours, date of the month; month, year, valid up from 1980 to 2079
EEPROM	16 KB (0 ~ 8 KB for user, 9 ~ 14 KB for other programs, 15 ~ 16 KB for OS), Data Retention: 40 years; 1,000,000 erase/write cycles
64-bit Hardware Serial Number	Yes
Dual Watchdog Timer	Yes
Programmable LED Indicator	1

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Rotary Switch	Yes (0 ~ 9)
DIP Switch	Yes (8 bits); for WP-8431, WP-8441, WP-8831 and WP-8841 only

Power	
Input Range	+10 ~ +30 V_{DC}
Isolation	1 kV
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V_{DC}) for alarm
Capacity	WP-8131 and WP-8141: 1.0 A, 5 V supply to CPU and backplane, 0.6 A, 5 V supply to I/O expansion slots, total 30 W
	WP-8431 and WP-8441: 1.1 A, 5 V supply to CPU and backplane, 4.9 A, 5 V supply to I/O expansion slots, total 30 W
	WP-8831 and WP-8841: 1.2 A, 5V supply to CPU and backplane, 4.8 A, 5 V supply to I/O expansion slots, total 30 W
Consumption	WP-8131 and WP-8141: 7.3 W (0.3 A @ 24 V)
	WP-8431 and WP-8441: 9.1 W (0.38 A @ 24 V)
	WP-8831 and WP-8841: 9.6 W (0.4 A @ 24 V)

VGA & Communication Ports	
VGA	WP-8x3x: Yes, with one extra GPU (resolution: 1024 x 768, 800 x 600, 640 x 480) WP-8x4x: Yes (640 x 480, 800 x 600 resolution)
Ethernet Port	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, LED indicators)
USB 1.1 (host)	WP-8x3x: 2 WP-8x4x: 1

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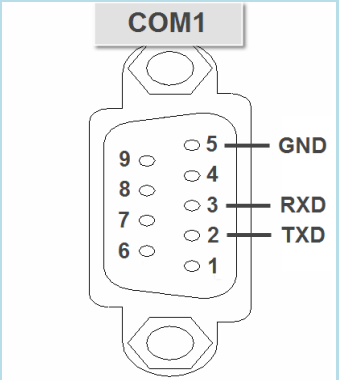
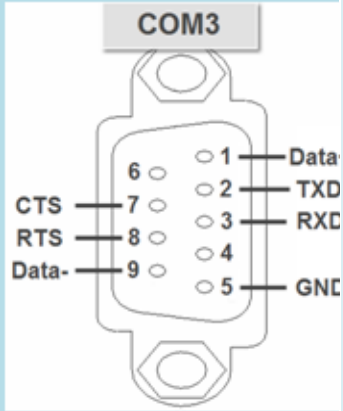
VGA & Communication Ports	
COM0	(Internal RS-485 interface communication with I-87K I/O modules in slots) Note: CPU internal UART Baud Rate – 115200 bps Data Bits – 8 Parity – None, Even, Odd Stop Bits – 1 FIFO – 1 byte
COM1 	(RS-232 used to update firmware) Note: CPU internal UART Baud Rate – 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits – 7, 8 Parity – None, Even, Odd Stop Bits – 1 FIFO – 1 byte
COM2	(RS-485) Note: 16C550 compatible Baud Rate – 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits – 5, 6, 7, 8 Parity – None, Even, Odd, Mark (Always 1), Space (Always 0) Stop Bits – 1, 2 FIFO – 16 bytes
COM3 	(RS-232/RS-485), for WP-8431, WP-8441, WP-8831 and WP-8841 only Note: 16C550 compatible Baud Rate – 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits – 5, 6, 7, 8 Parity – None, Even, Odd, Mark (Always 1), Space (Always 0)

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VGA & Communication Ports

Stop Bits – 1, 2

FIFO – 16 bytes

Tips & Warnings

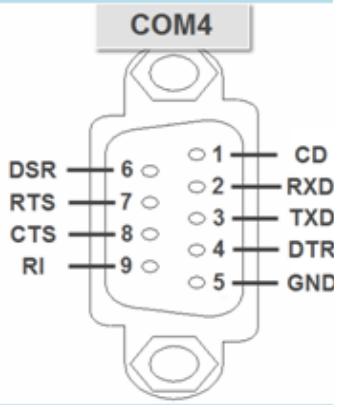
COM3 can be configured as either RS-232 or RS-485, that only can select one at a time and Its configuration depends on the pin connections as follows:

RS-232 (RXD, TXD, CTS, RTS and GND)

RS-485 (Data+ and Data-)

There is no software configuration or hardware jumper needed.

COM4



(RS-232), for WP-8431, WP-8441, WP-8831 and WP-8841 only, Note: 16C550 compatible

Baud Rate – 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

Data Bits – 5, 6, 7, 8

Parity – None, Even, Odd, Mark (Always 1), Space (Always 0)

Stop Bits – 1, 2

FIFO – 16 bytes

I/O Expansion Slots

Slot Number	(supports high profile I-8K and I-87K modules) WP-8131 and WP-8141: 1 Slot WP-8431/WP-8441: 4 Slots WP8831/WP-8841: 8 Slots
Hot Plug (will be available)	(supports high profile I-87K modules only) I/O Module Hot Swap Ability

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Dimensions	
WP-8131/WP-8141	95 x 132 x 111 mm
WP-8431/WP-8441	230 x 132 x 111 mm
WP-8831/WP-8841	354 x 132 x 111 mm

Operating Environment	
Operating Temperature	–25°C ~ +75°C
Storage Temperature	–30°C ~ +80°C
Humidity	10 ~ 90%, Non-condensing

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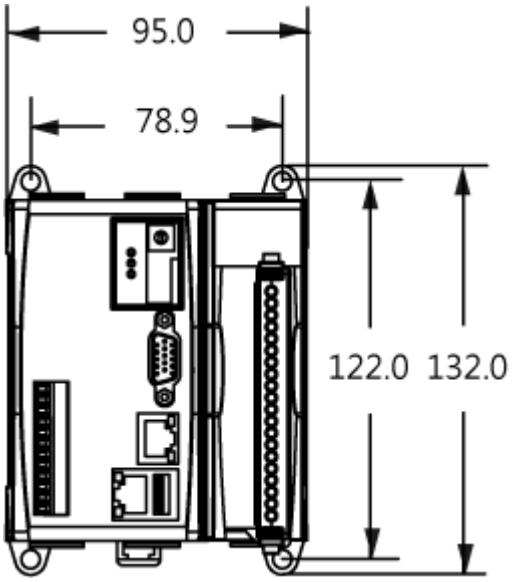
1.3. Dimensions

There are several series of WinPAC modules whose overviews depended on the quantity of the slot.

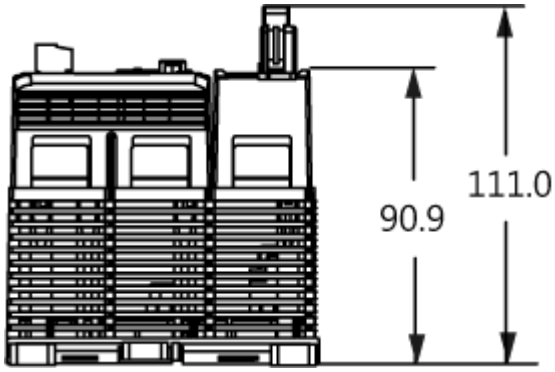
All dimensions in millimeter.

1 Slot

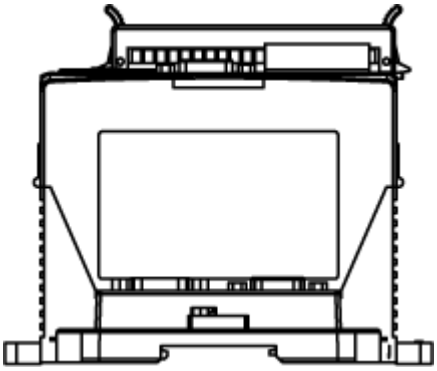
Top View



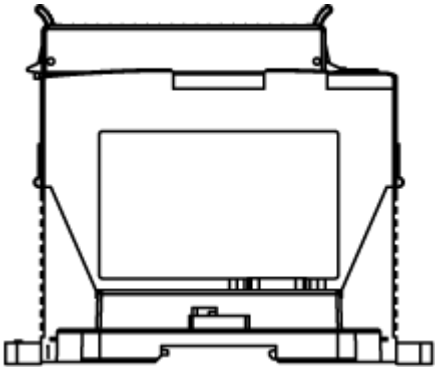
Front View



Right Side View



Left Side View



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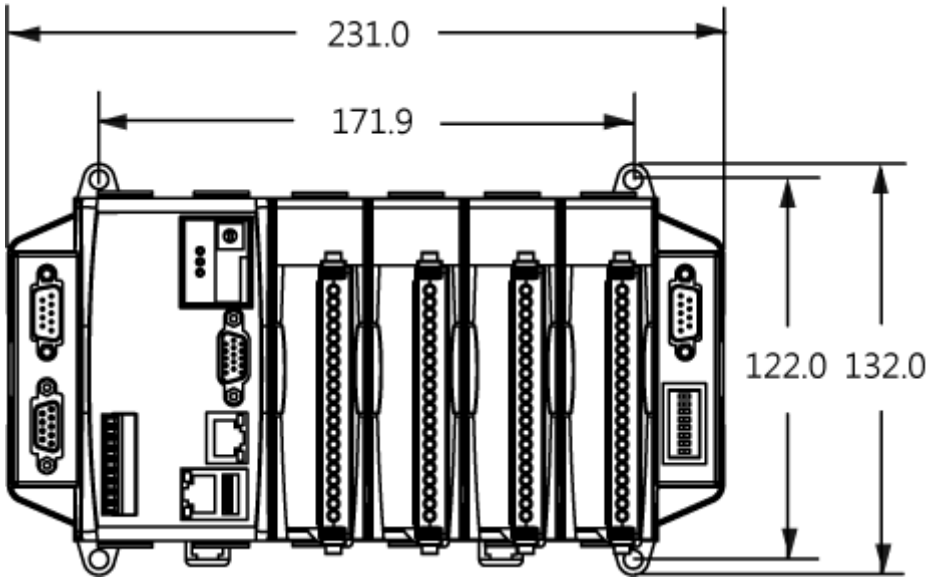
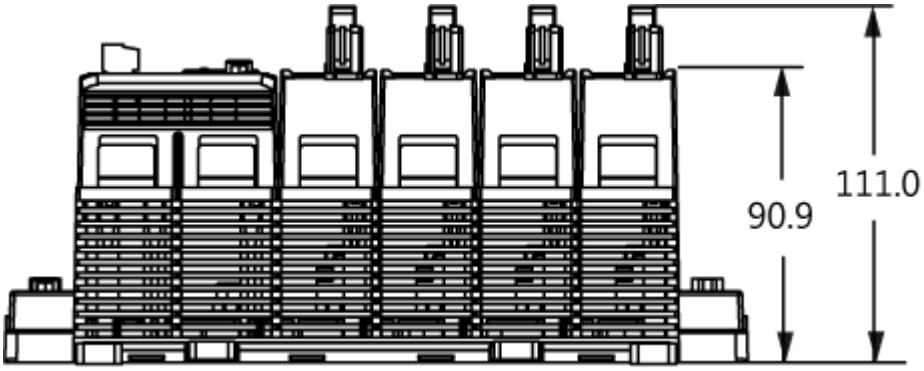
4 Slots

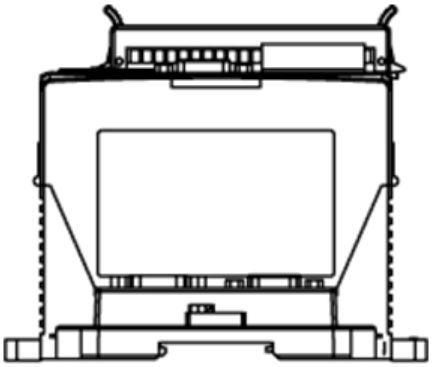
Top View



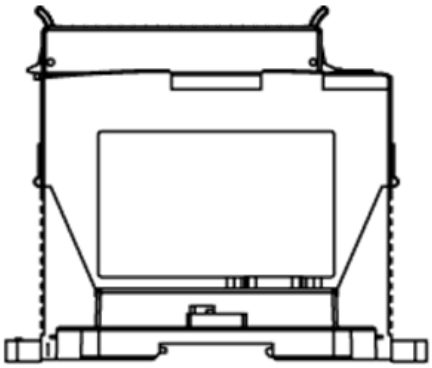
Front View



Right Side View



Left Side View



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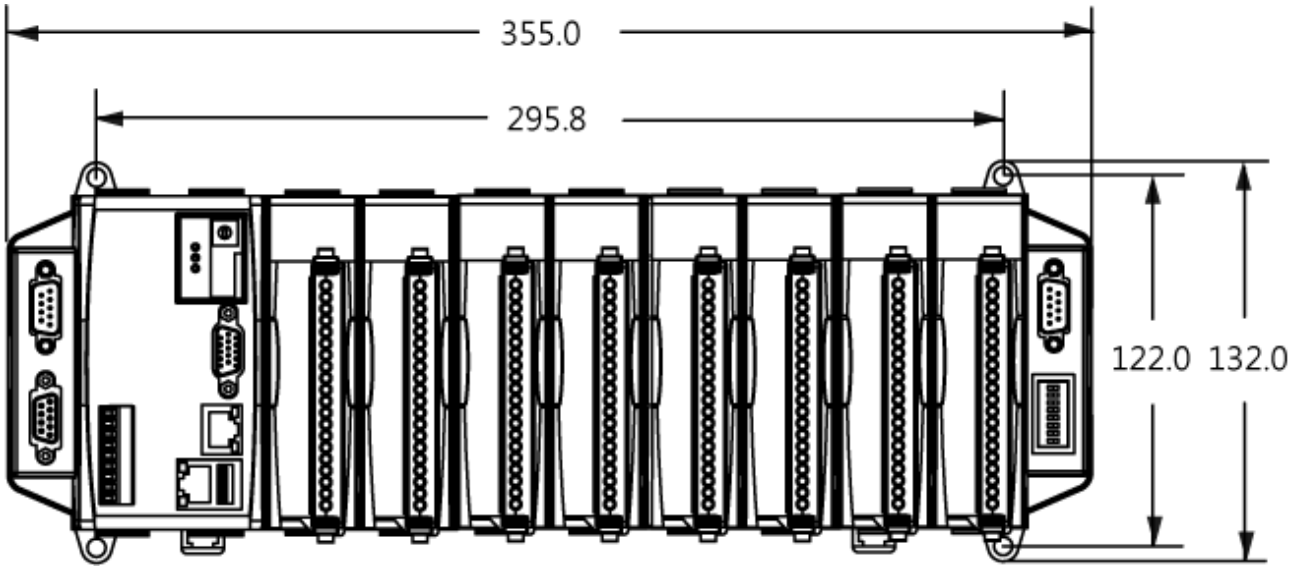
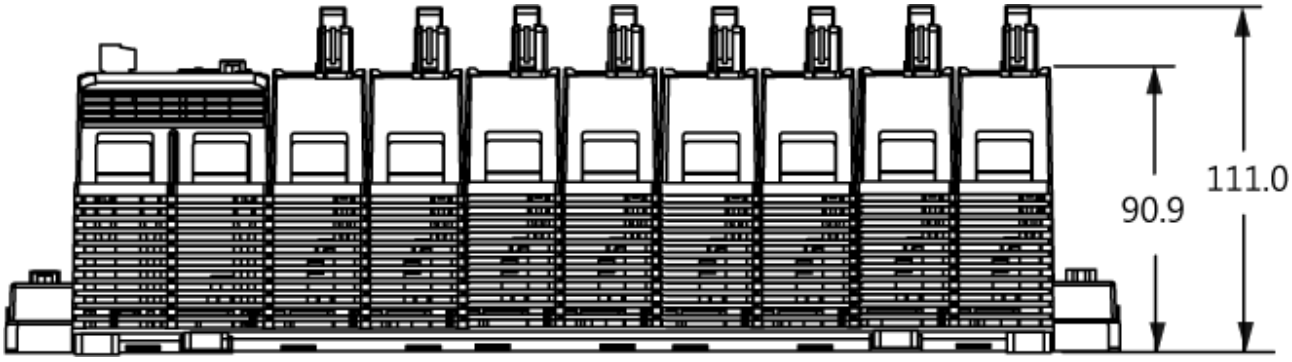
8 Slots

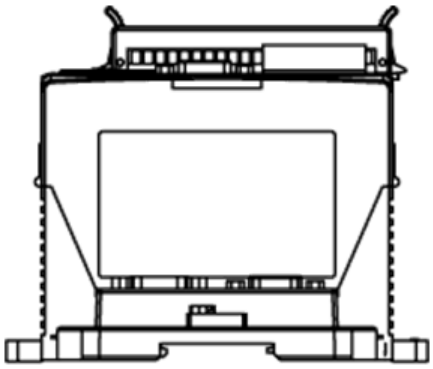
Top View



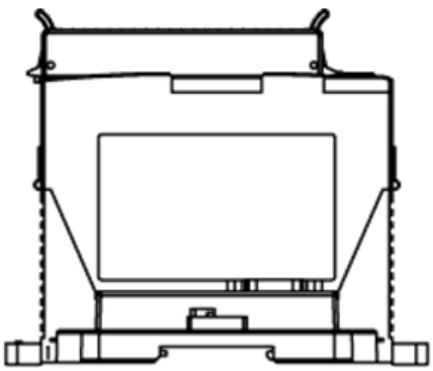
Front View



Right Side View



Left Side View



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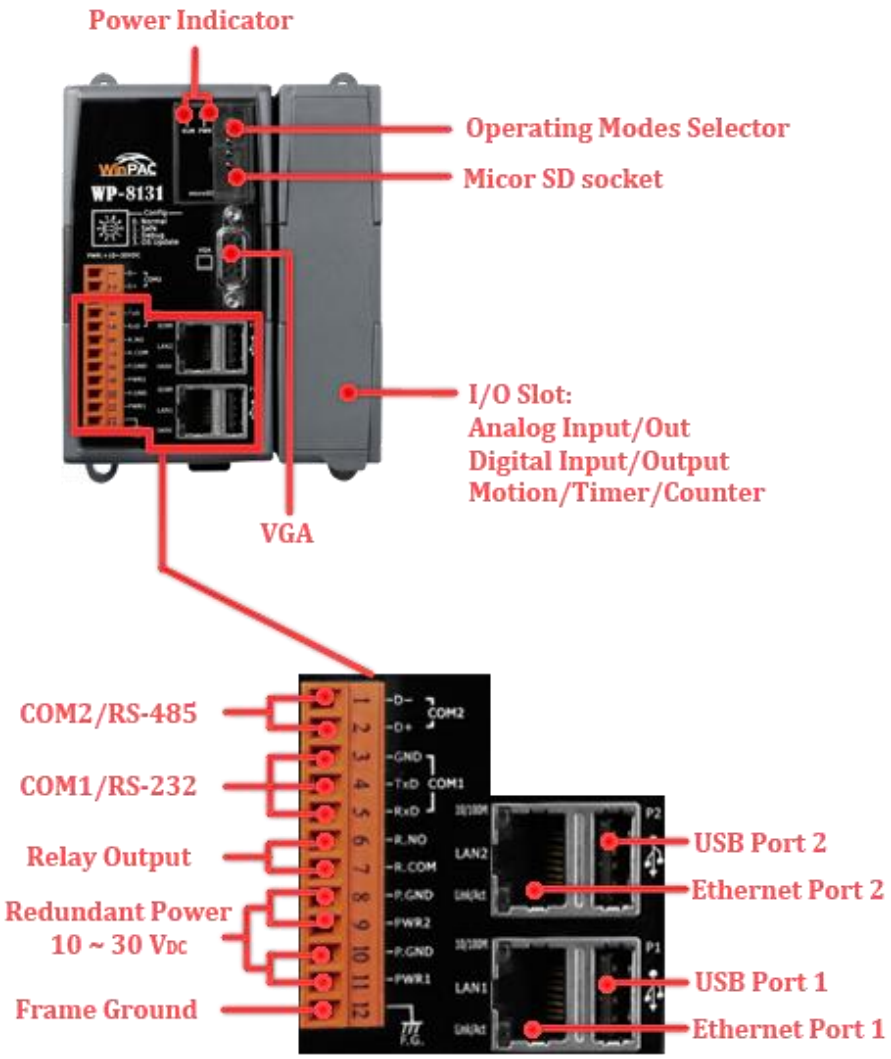
1.4. Overview

WP-8131



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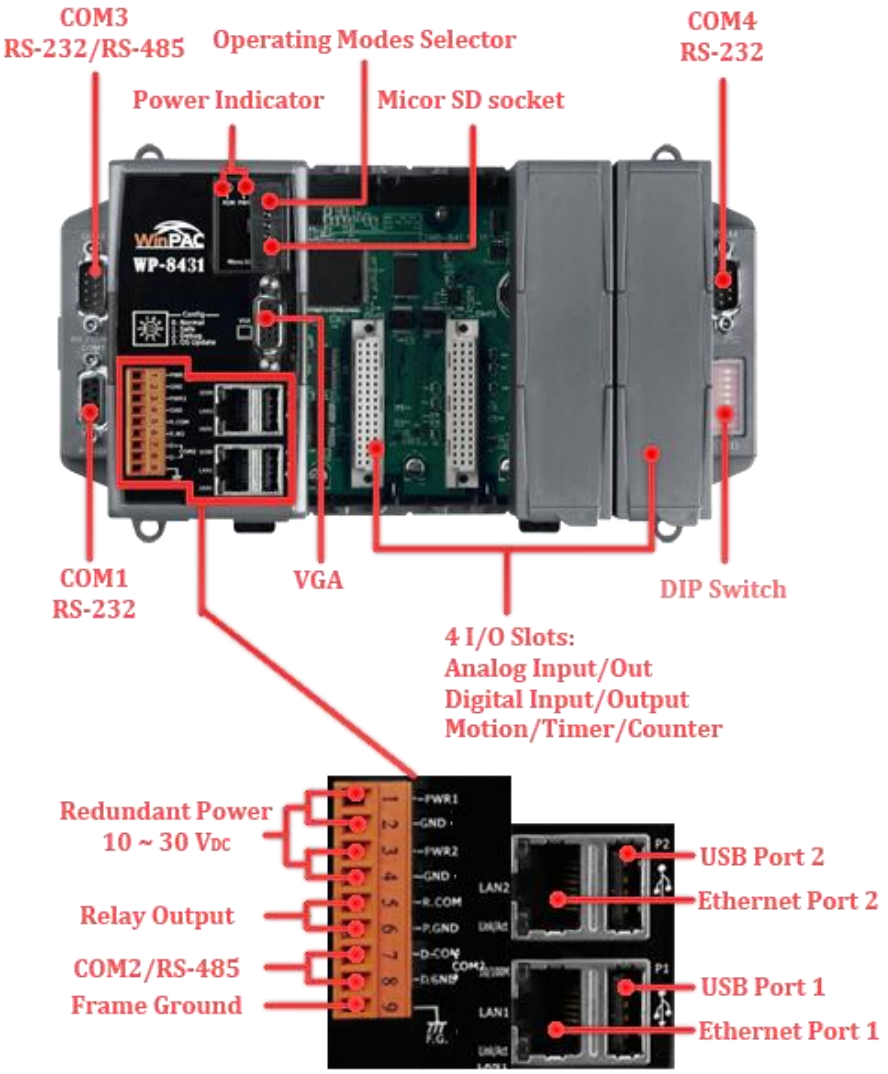

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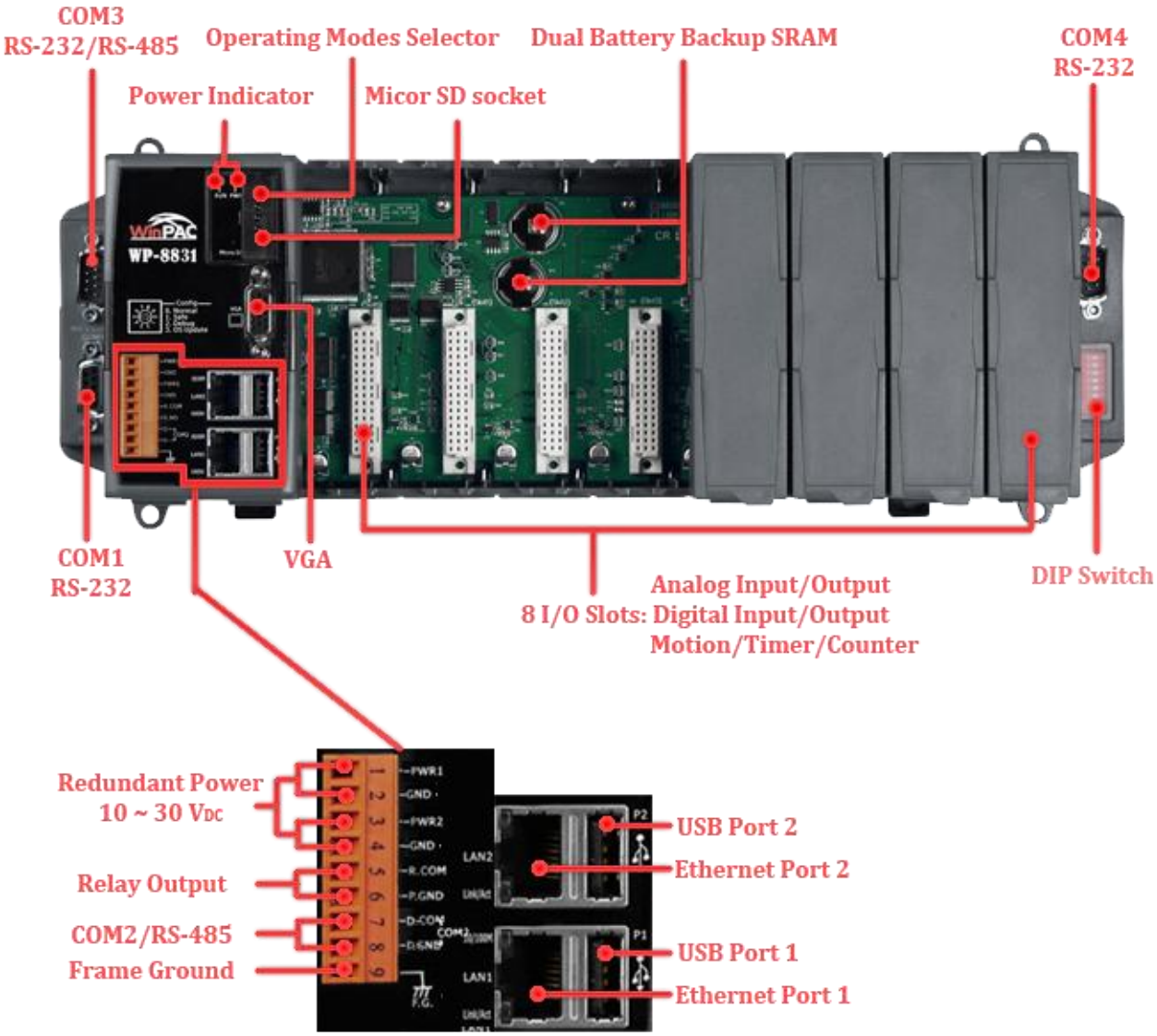

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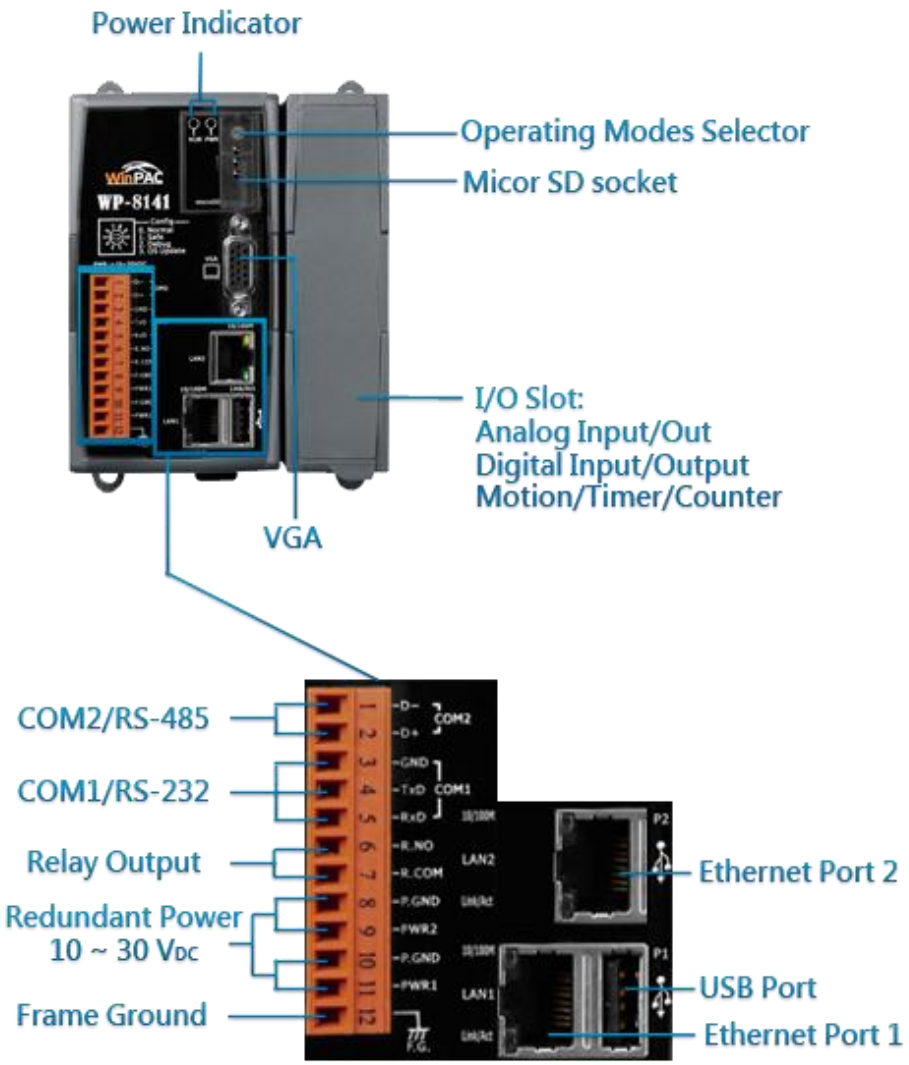

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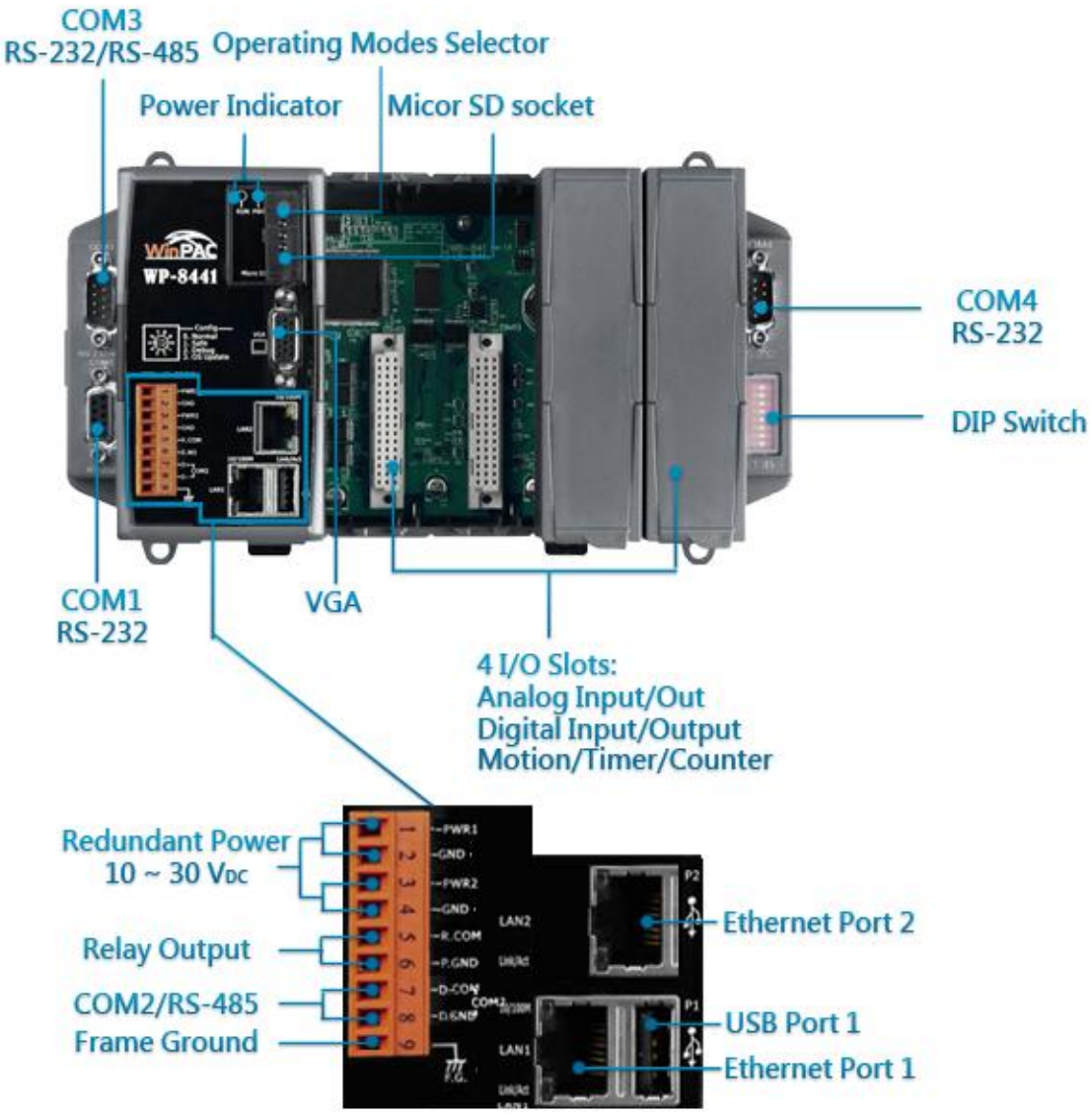

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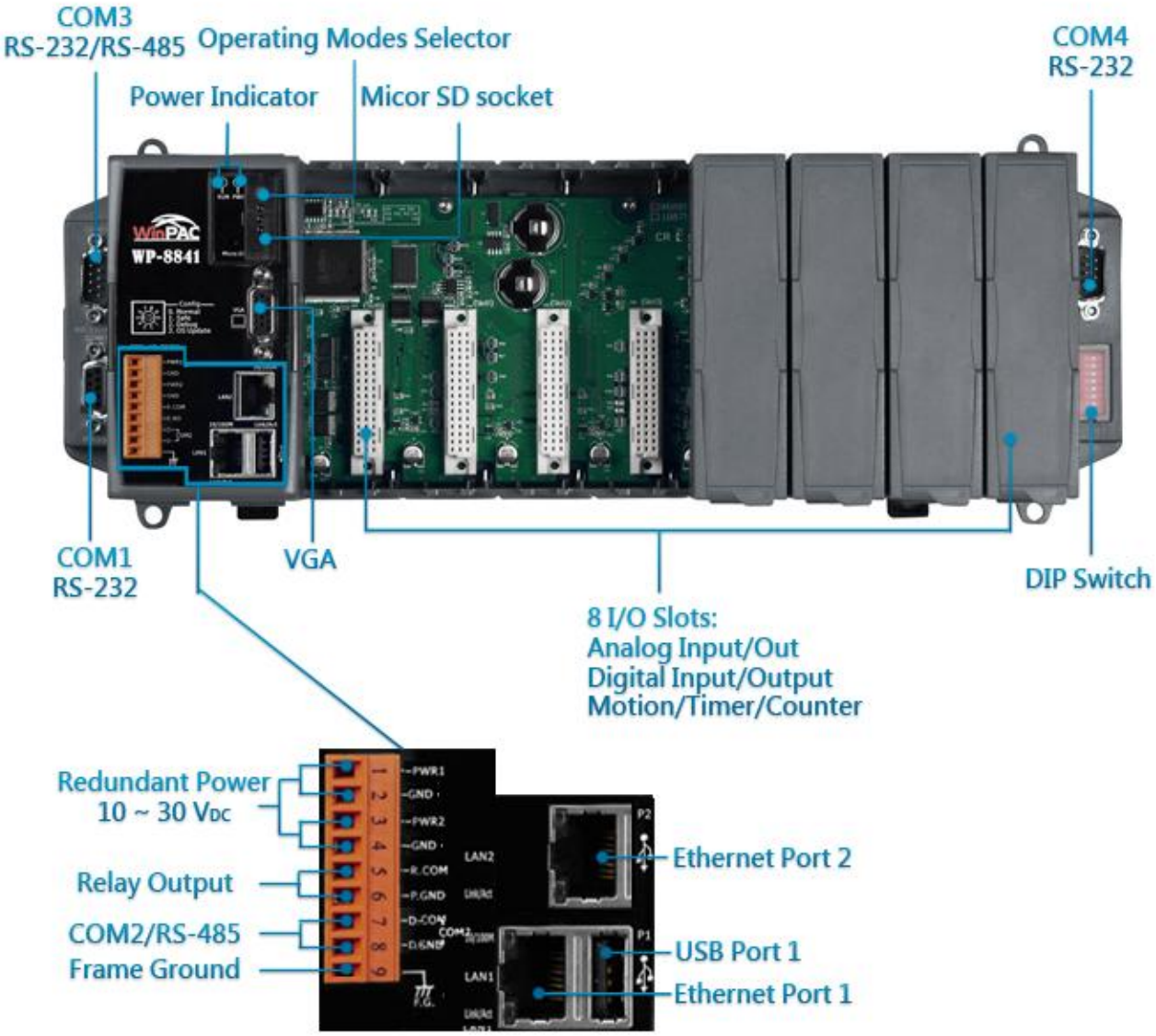

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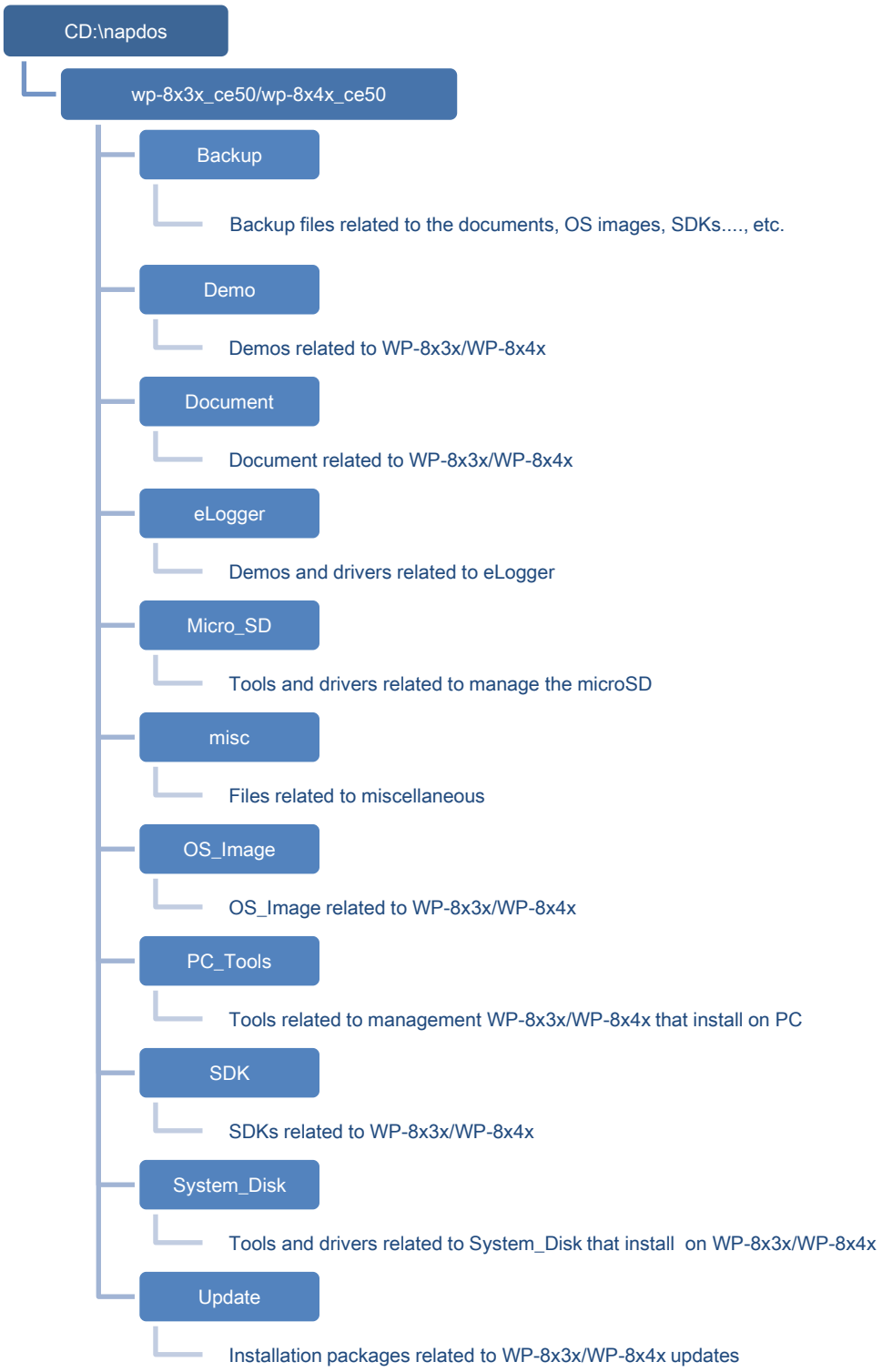
1.5. Companion CD

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



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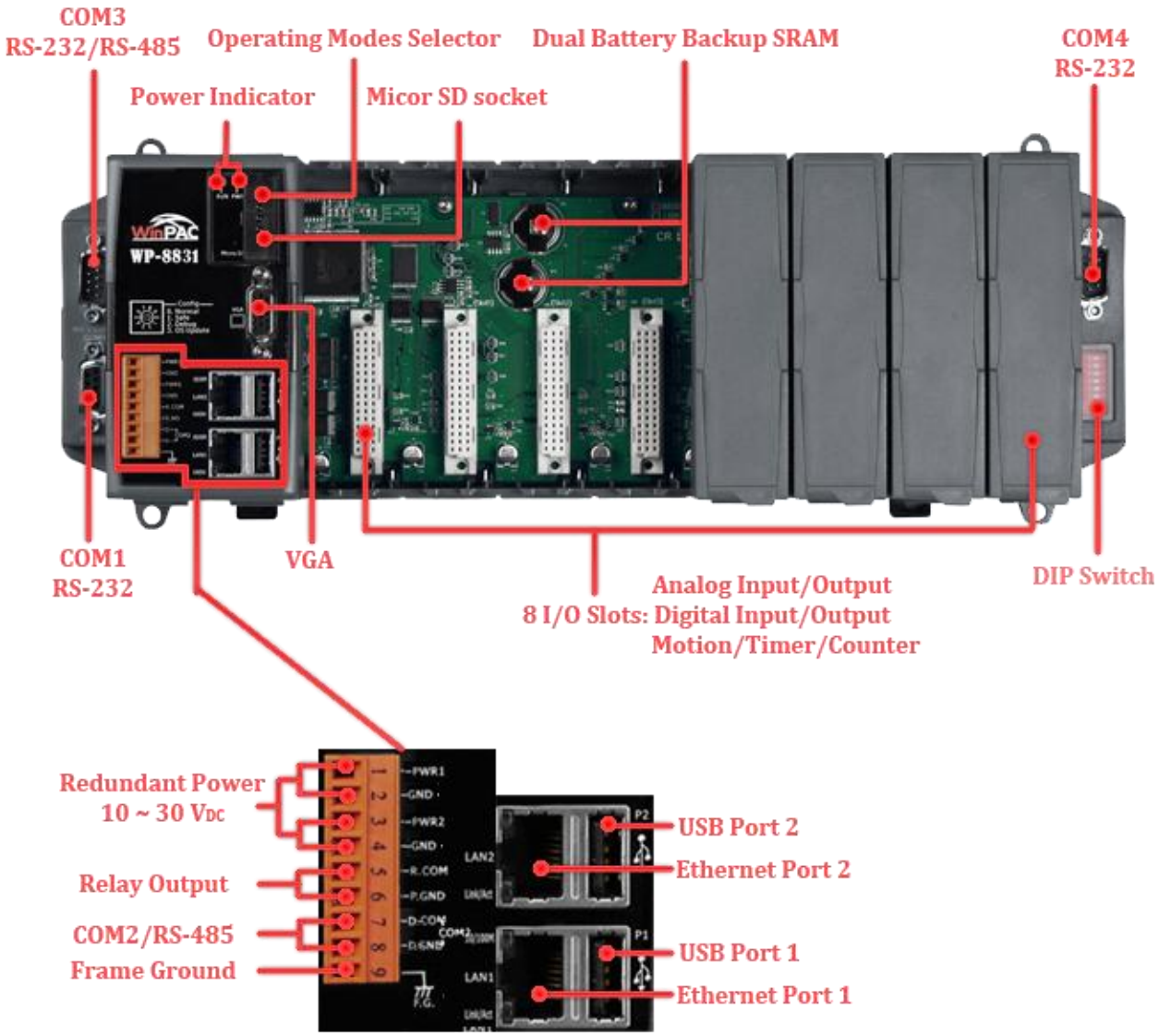
1.6. Comparison of WinPAC and WinCon

WP-8x3x/WP-8x4x

WP-8x3x/WP-8x4x is the second generation of PAC. It is equipped with various connections (VGA, USB, Ethernet, RS-232/485) and 1/4/8 slots for high performance parallel I/O modules (high profile I-8K series) and serial-type I/O modules (high profile I-87K I/O modules). Comparing to the first generation WinCon PAC, it not only improves the CPU performance (from 206 MHz to 520 MHz), but also add many reliability features.



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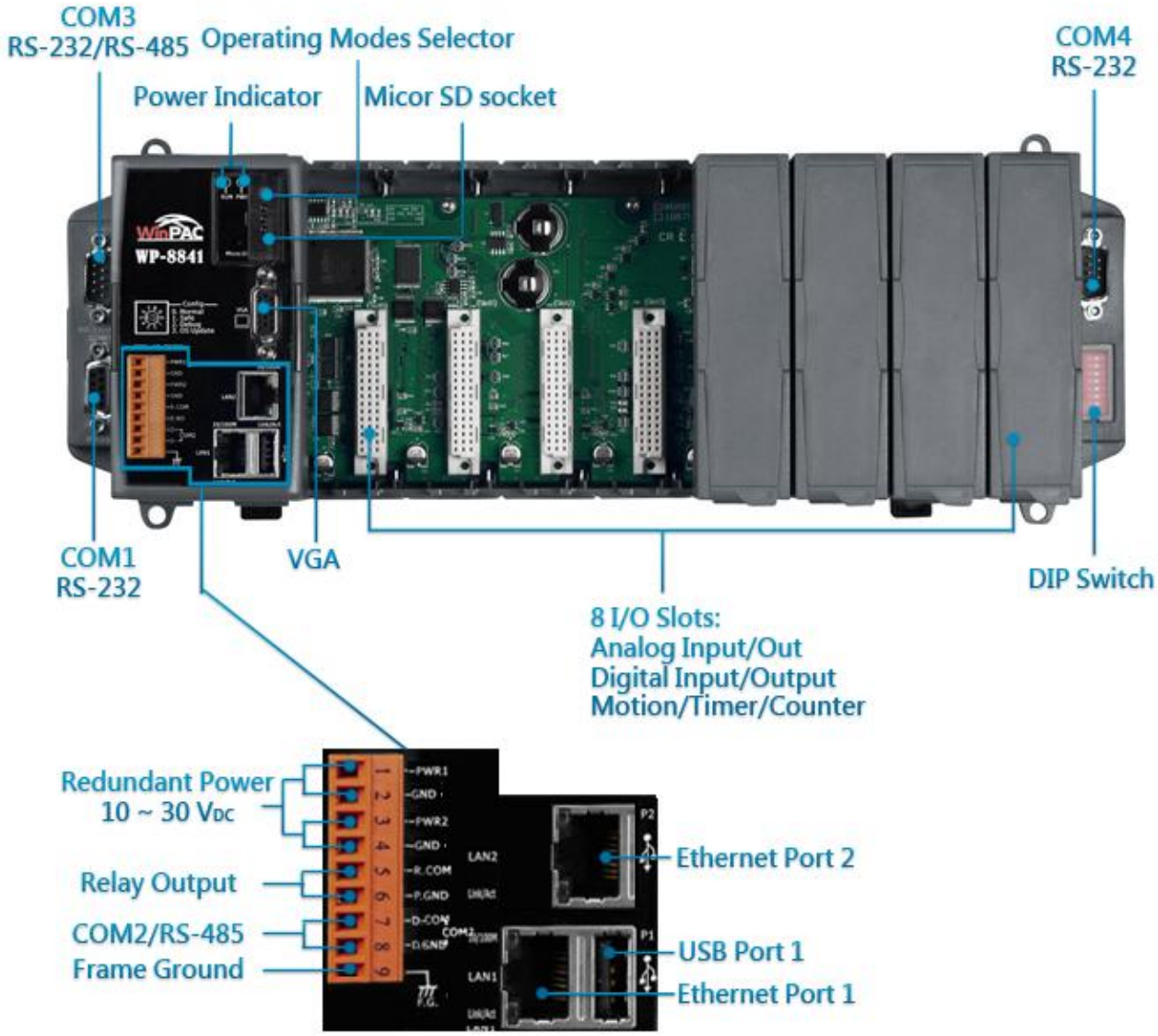

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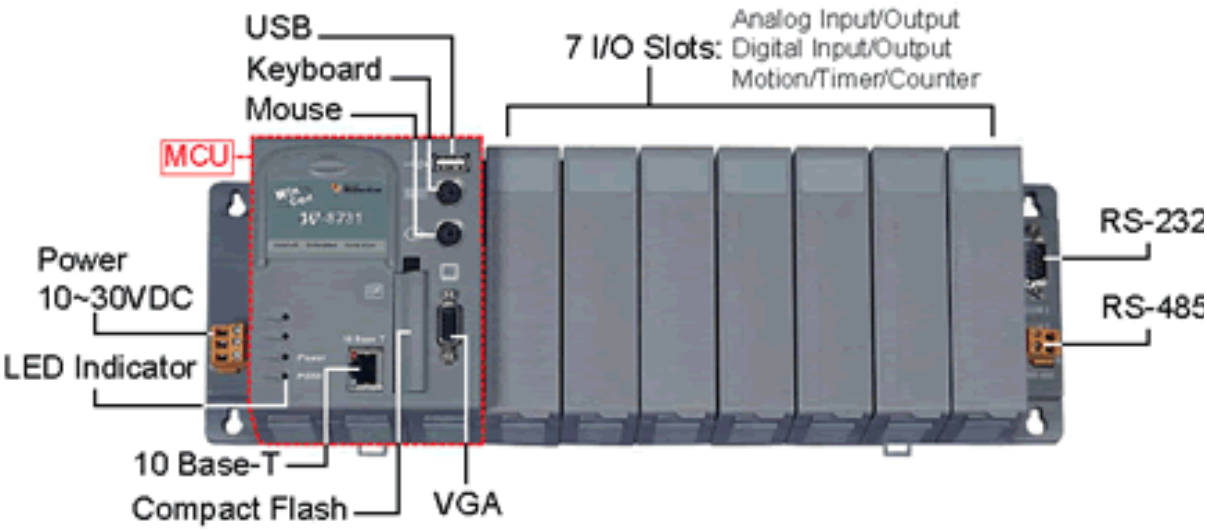
W-8x3x (Phased Out Since 2008)

W-8x3x is a PAC equipped with PC interface and 3/7 slots for I/O modules. Its PC-like interface includes: PS/2(keyboard and mouse), VGA port , USB port and RS-232/RS-485 communication ports. The powerful backplane(3/7 slots) can adopts versatile ICPDAS's high performance parallel (I-8K I/O modules) and serial-type I/O modules(I-87K I/O modules)



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W-8x4x

WinCon-8x4x series embedded controllers are derived from existing WinCon-8x3x series. This evolution includes dual USB host ports to support more connectivity to USB I/O devices, dual Ethernet 10/100M ports to provide higher network performance, network security, and redundancy capability, and a rotate switch to configure your system and applications.

	WP-8x3x	WP-8x4x	W-8x3x	W-8x4x
OS	Windows CE 5.0	Windows CE 5.0	Windows CE 4.1	Windows CE 4.1
CPU	520 MHz	520 MHz	206 MHz	206 MHz
SDRAM	128 MB	128 MB	64 MB	64 MB
Dual Battery Backup SRAM	512 KB	512 KB	-	-
Flash	128 MB (64 MB for OS image, 63 MB for built-in Flash disk, 1 MB for registry)	96 MB (64 MB for OS image, 31 MB for built-in Flash disk, 1 MB for registry)	32 MB (for OS image only)	32 MB (for OS image only)

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	WP-8x3x	WP-8x4x	W-8x3x	W-8x4x
EEPROM	16 KB	16 KB	16 KB	16 KB
Expansion Memory Slot	Micro SD slot (Default=1GB)	Micro SD slot (Default=1GB)	Compact Flash type II (Default=1GB)	Compact Flash type II (Default=1GB)
Interface	USB1.1 x 2 VGA port x 1 (1024 x 768, 640 x 480, 800 x 600)	USB1.1 x 1 VGA port x 1 (640 x 480, 800 x 600)	USB1.1 x 1 PS/2 port x 2 (Keyboard and Mouse), VGA port x 1 (320 x 240 ~ 1024 x 768)	USB1.1 x 2 VGA port x 1 (320 x 240 ~ 1024 x 768)
Ethernet Port	RJ45 x 2, 10/100 BaseTX	RJ45 x 2, 10/100 BaseTX	RJ45 x1, 10BaseT	RJ45 x 2, 10/100 BaseTX
COM0	For I-87K module in I/O slot	For I-87K module in I/O slot	-	-
COM1	RS-232	RS-232	For I-87K module in I/O slot	For I-87K module in I/O slot
COM2	RS-485	RS-485	RS-232	RS-232
COM3	RS-232/485	RS-232/485	RS-485	RS-485
COM4	RS-232	RS-232	-	-
I/O Expansion Slots	1/4/8	1/4/8	0/3/7	0/3/7
64-bit Hardware Serial Number	Yes	Yes	Yes	Yes
Push button	-	-	Yes (for Reset)	Yes (For Reset)
Programmable LED	1	1	-	-
Dual Watchdog Timer	Yes	Yes	Yes	Yes
Real Time Clock	Yes	Yes	Yes	Yes

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	WP-8x3x	WP-8x4x	W-8x3x	W-8x4x
DIP Switch (8 bit)	Yes	Yes	-	-
Rotary Switch	Yes (0~9)	Yes (0~9)	-	Yes (0~F)

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2. Getting Started

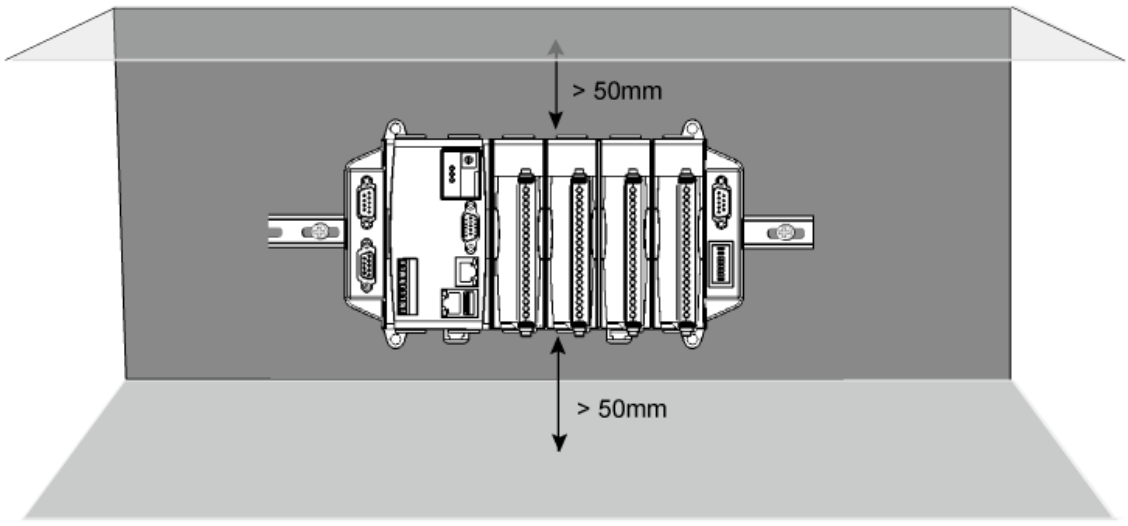
This chapter describes installation, basic configuration and fundamental operating principle needed to install and set up the WinPAC.

2.1. Mounting the Hardware

Step 1: Mounting the WinPAC

The WinPAC installation must provide proper ventilation, spacing, and grounding to ensure the equipment will operate as specified.

A minimum clearance of 50mm between the WinPAC and the top and bottom side of the enclosure panels must be provided.



There is a minimum of 50mm clearance between the top and bottom edges of the WinPAC and the enclosure panels.

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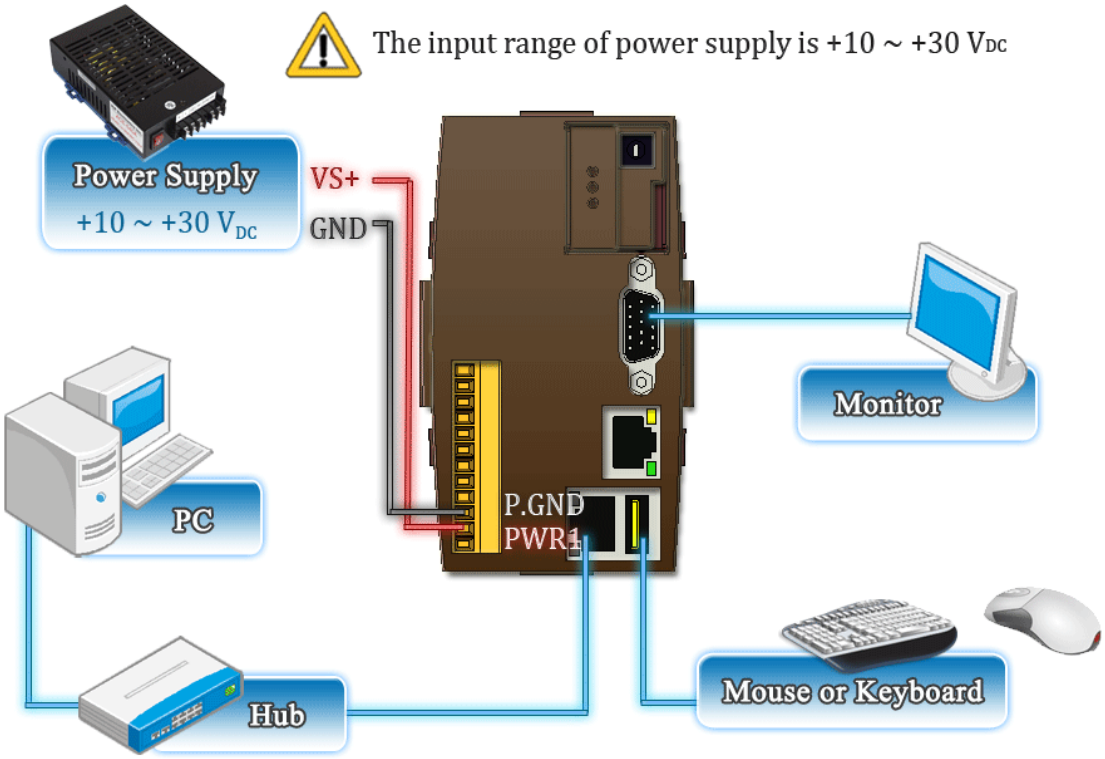
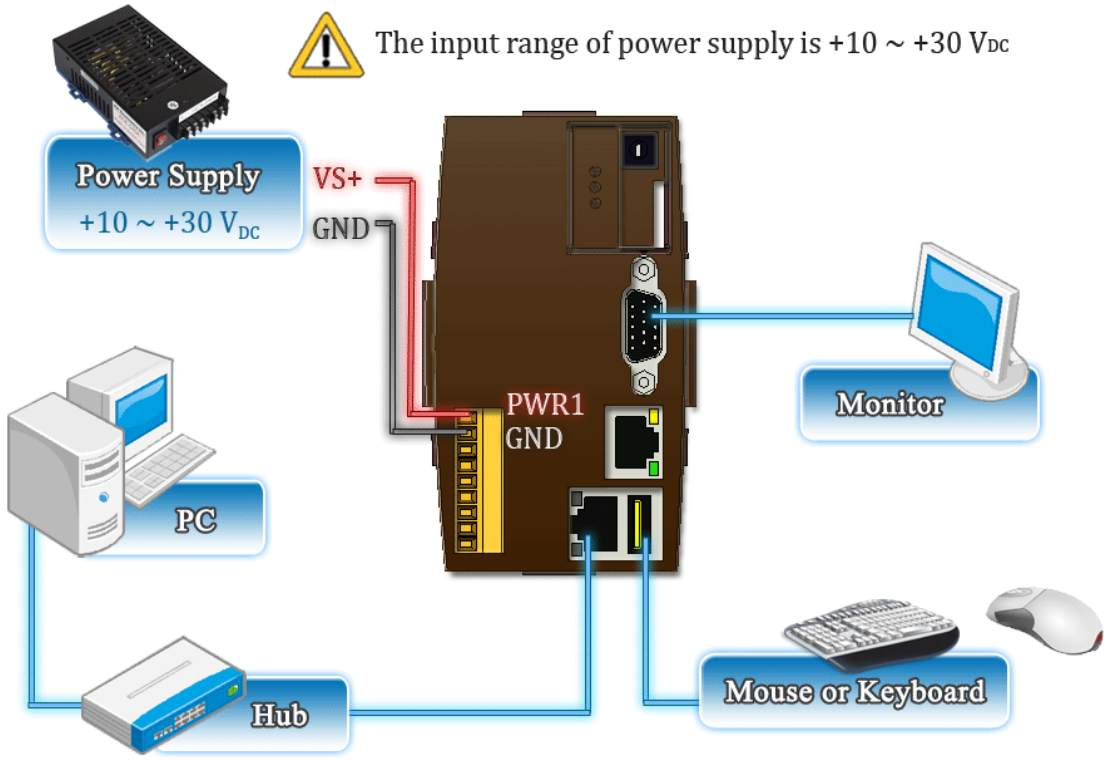
Step 2: Connecting power and I/O device

The diagram below shows the connections of the 1 slot of the WinPAC.



The diagram below shows the connections of 4/8 slots module of the WinPAC.



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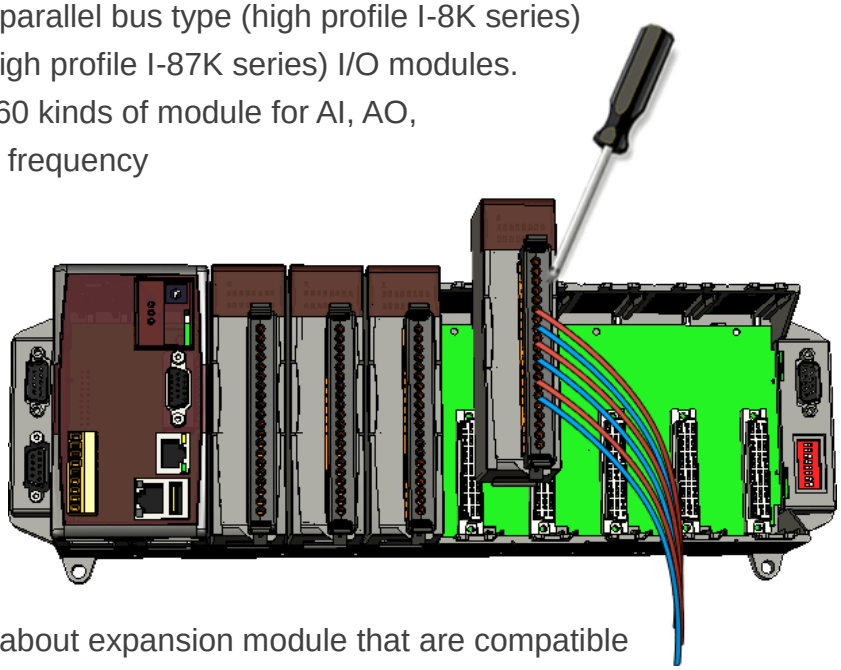
2.2. Inserting I/O Modules

The I/O slots support parallel bus type (high profile I-8K series) and serial bus type (high profile I-87K series) I/O modules. There are more than 60 kinds of module for AI, AO, DI, AO, counter input, frequency input, PWM output, motion control, memory, communication, etc.



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

http://www.icpdas.com/products/PAC/winpac/io_support_list.htm

Tips & Warnings

It is recommended that the power to the WINPAC-8000 is switched off when wring the I/O module which are plugging in the WINPAC-8000 slots.

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Step 1: Read the relevant documentation

The documentation for I-8K series modules is located at:

CD:\ Napdos\io_module
http://www.icpdas.com/products/PAC/winpac/io_support_list.htm

The documentation for I-87K series modules is located at:

CD:\ Napdos\io_module
http://www.icpdas.com/products/PAC/winpac/io_support_list.htm

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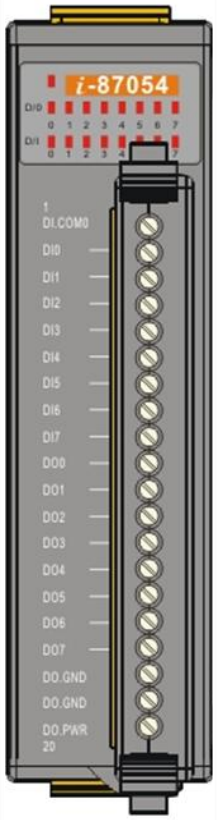
Step 2: Wiring Connections

All documents include the I/O module specifications, pin assignments and wiring connections.

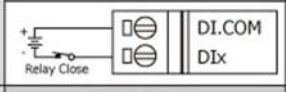
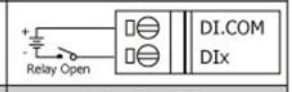
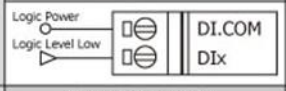
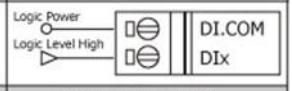
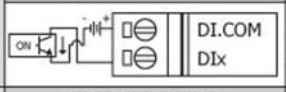
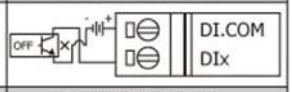
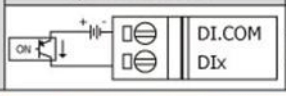
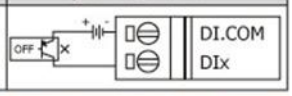
For example, Pin Assignments and Wiring connections for the I-87054W module are as follows:

Pin Assignments



Terminal No.	Pin Assignment Name
01	DI.COM0
02	DI0
03	DI1
04	DI2
05	DI3
06	DI4
07	DI5
08	DI6
09	DI7
10	DO0
11	DO1
12	DO2
13	DO3
14	DO4
15	DO5
16	DO6
17	DO7
18	DO.GND
19	DO.GND
20	DO.PWR

Wire Connection

Input Type	ON State LED ON Readback as 1	OFF State LED OFF Readback as 0
Relay Contact	Relay ON	Relay Off
		
TTL/CMOS Logic	Voltage < 1V	Voltage > 3.5V
		
NPN Output	Open Collector On	Open Collector Off
		
PNP Output	Open Collector On	Open Collector Off
		

Output Type	ON State LED ON Readback as 1	OFF State LED OFF Readback as 0
Drive Relay	Relay ON	Relay Off
Resistance Load		

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2.3. Configuring the Boot Mode

The WinPAC has five operating modes that can be determined through a rotary switch.

The table below lists the operation mode selection.

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)

Normal mode (Default)

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.

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

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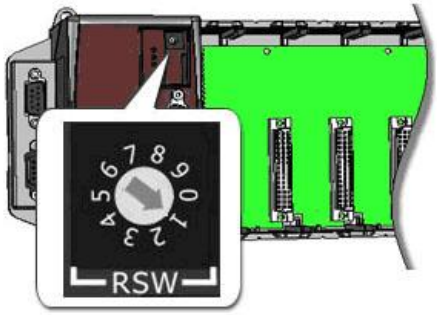
Tips & Warnings

In normal mode, if the new settings are not saved when you change and save the settings using the WinPAC Utility, to solve this problem, perform the following steps:

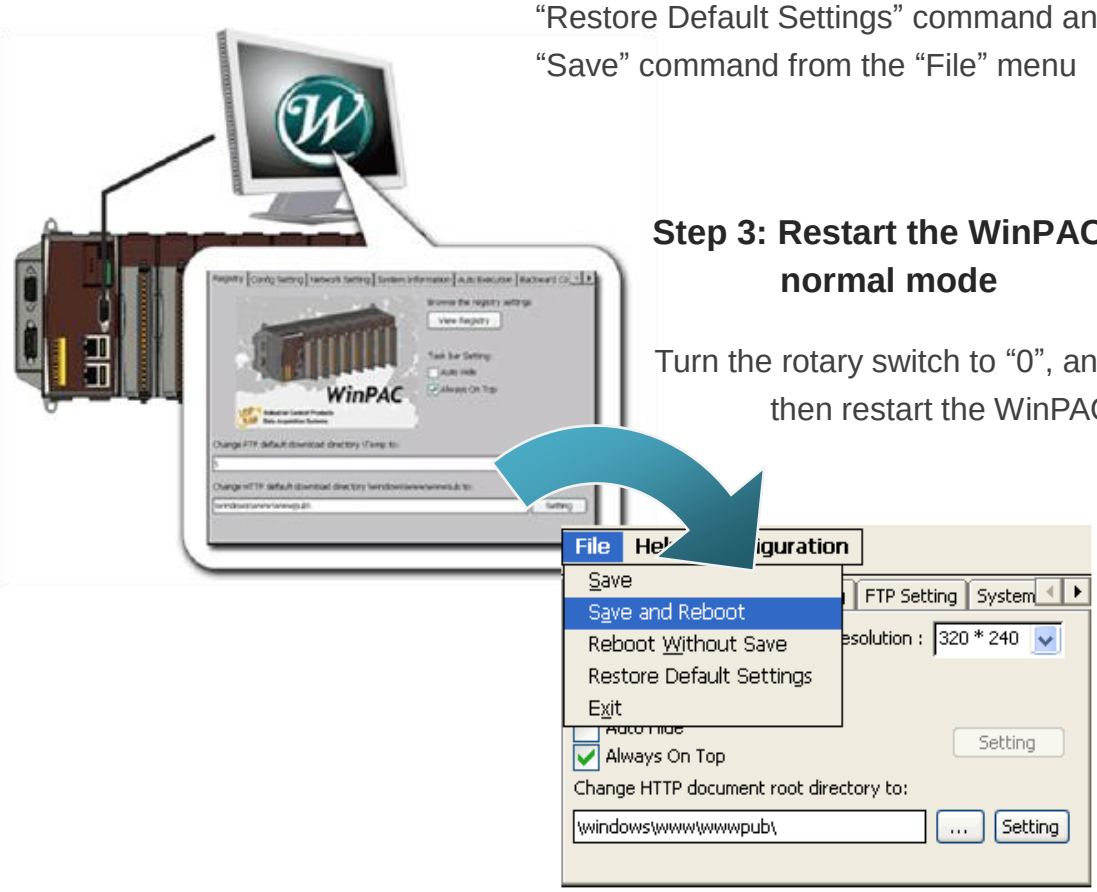
Step 1: Restart the WinPAC in safe mode

Turn the rotary switch to “1”, and then restart the WinPAC.



Step 2: Start the WinPAC Utility to restore the default settings

Start the WinPAC Utility, and then click the “Restore Default Settings” command and “Save” command from the “File” menu



Step 3: Restart the WinPAC in normal mode

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

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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. To update the WinPAC OS image, please refer to “6.1. OS updates”

DCON_CE mode

This mode is the same as Normal mode. Besides, DCON_CE.exe will be run automatically after booting

Tips & Warnings

DCON_CE.exe must be placed on the \System_Disk\Tools\DCON_CE, or else DCON_CE.exe cannot be run automatically after booting.

VCEP mode

This mode is the same as Normal mode. Besides, VCEP.exe will be run automatically after booting.

Tips & Warnings

VCEP.exe must be placed on the \System_Disk\Tools\VCEP or else VCEP.exe cannot be run automatically after booting.

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User mode

Rotary switch position 7, 8, 9 are reserved for user's applications.
When WinPAC is boot with one of these rotary switch positions, it is boot at normal mode. User's application can check the rotary switch position to run at different mode.

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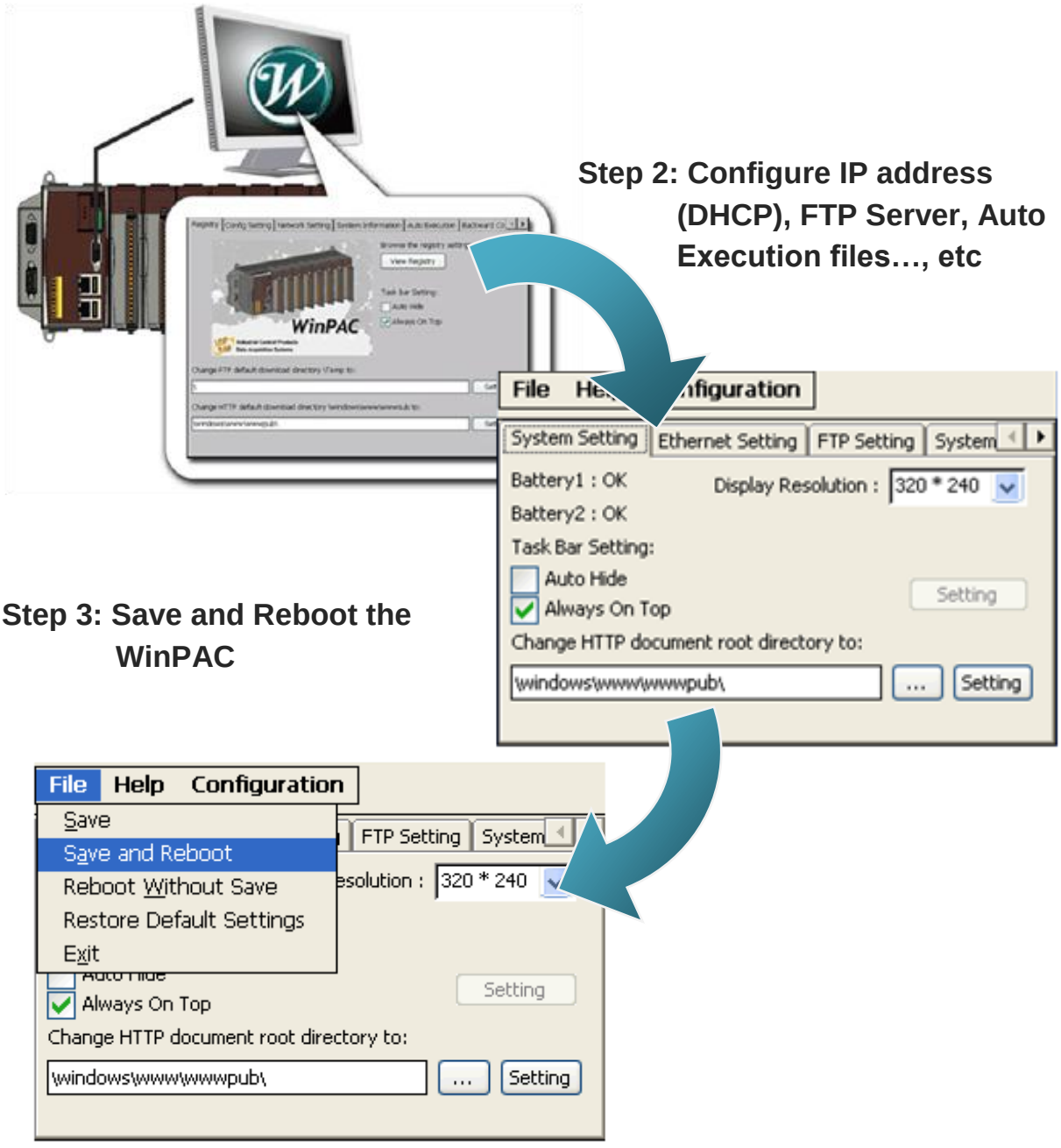
2.4. Using WinPAC Utility to manage the WinPAC

The WinPAC Utility is a toolkit used to quickly control and configure the WinPAC.

For more detailed information on WinPAC Utility applications, please refer to "3.5. WinPAC Utility"

Step 1: Run the WinPAC Utility located on desktop



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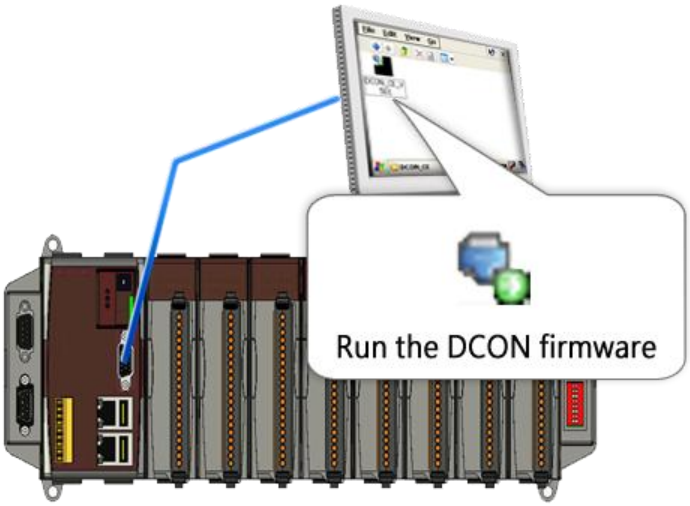
2.5. Using DCON Utility to Configure I/O Modules

DCON Utility is a tool kit used to quickly control and manage I-87K series expansion I/O modules.

Step 1: Run the DCON firmware on the WinPAC

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



Step 2: Run the DCON Utility on the host PC

The DCON Utility can be obtained from:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\PC_Tools\DCON_Utility\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/pc_tools/dcon_utility/
- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\PC_Tools\DCON_Utility\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/pc_tools/dcon_utility/

Step 3: Click the WIN CE button

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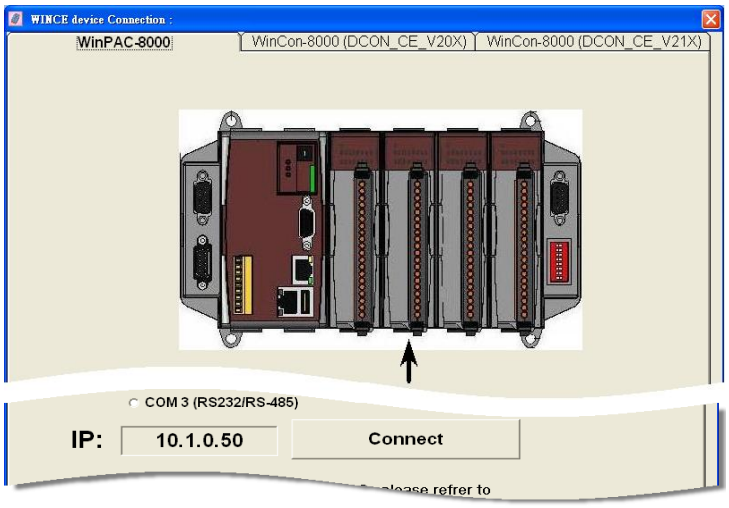
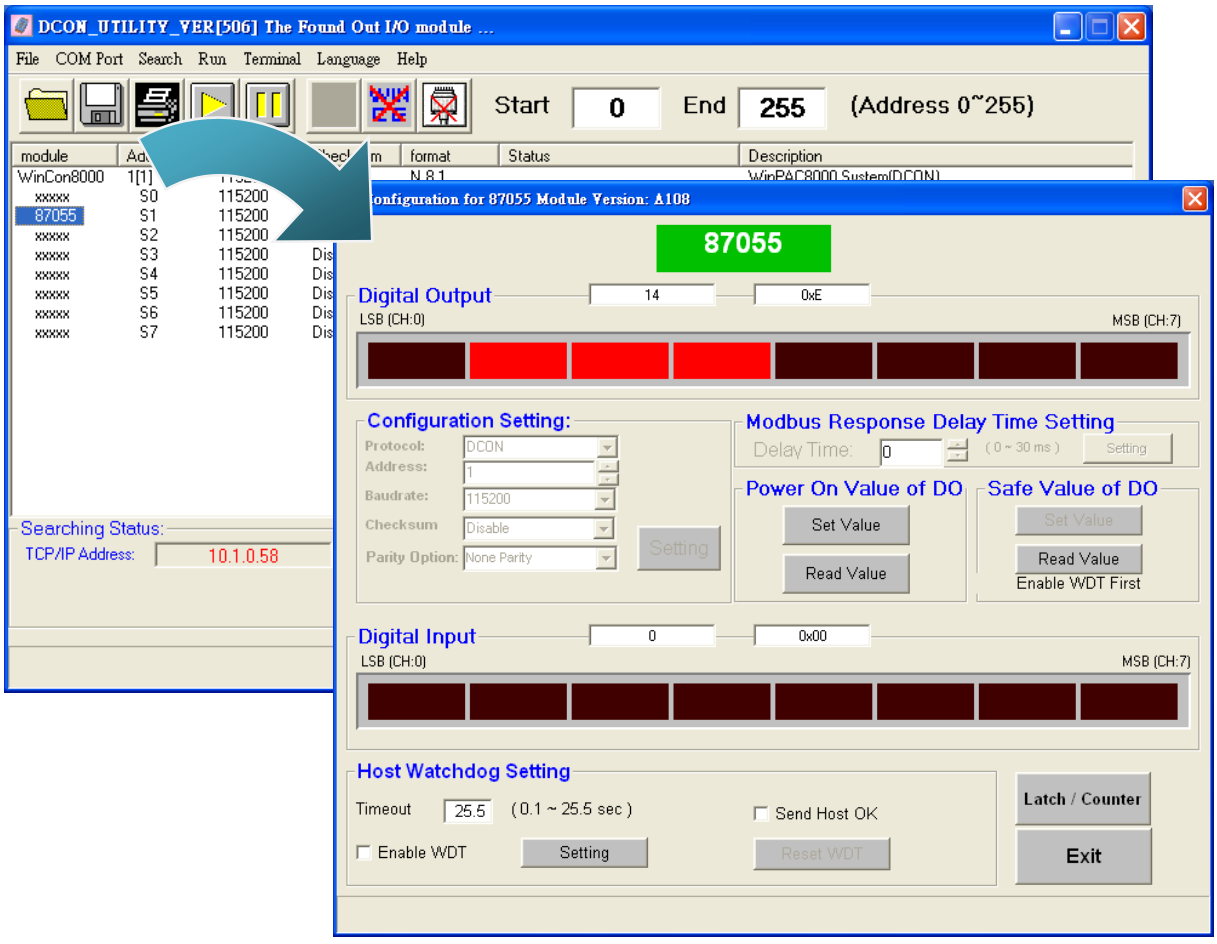
Step 4: Enter the IP address of the WinPAC to search the I-87K series expansion I/O modules



Step 5: Select the module name that you want to configure



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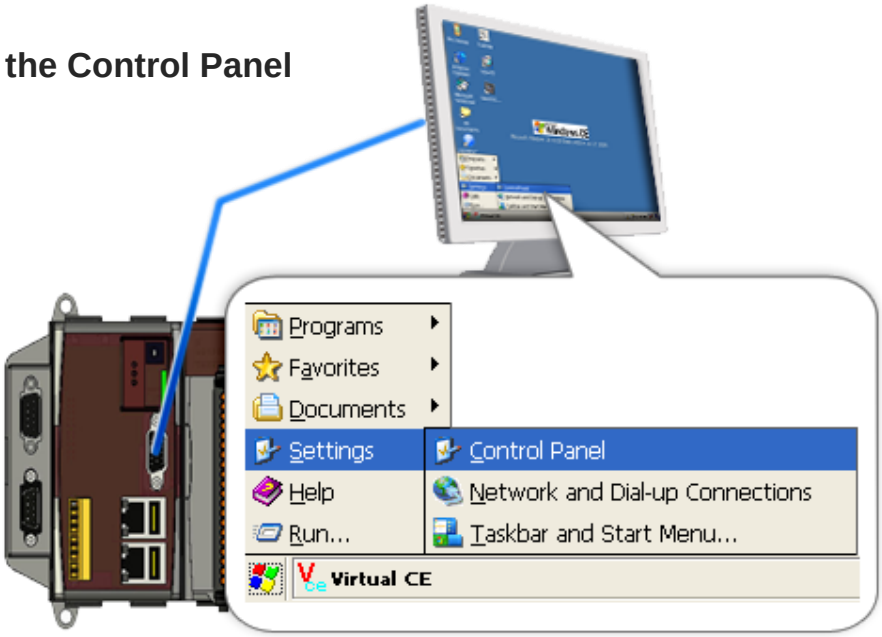
2.6. Changing the User Interface Language

The WinPAC 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



Step 2: Run the Regional Settings

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

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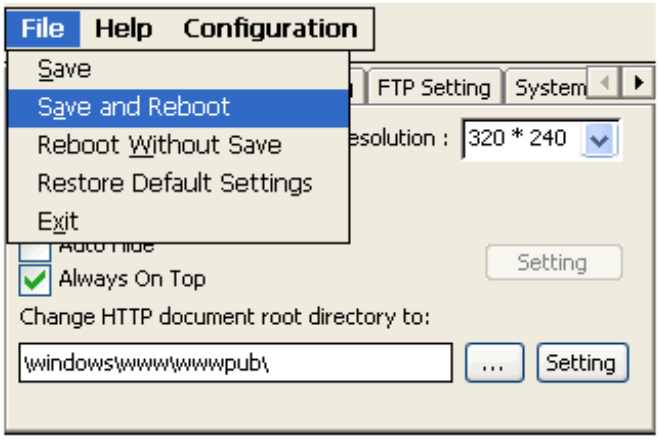
Step 4: Run the WinPAC Utility located on desktop

Step 5: Save and Reboot



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2.7. Installing the Touch Panel Driver

The WinPAC provides the Touch Panel driver for PenMount, Egalax, and ELO touch panels, and which can be obtained from WinPAC:
\System_Disk\External_device_driver\

The table below provides a list of supported models and respective device driver names.

Supported Model	Driver Name
ADP-1080T-U	penmount_usb_touch_vyyyymmdd.cab
ADP-1080T-R	penmount_serial_touch_vyyyymmdd.cab
GA-700YY-USB	egalax_usb_touch_vyyyymmdd.cab
GA-700YY-UOM	egalax_serial_touch_vyyyymmdd.cab
ELO USB touch panel	elo_usb_touch_vyyyymmdd.cab
ELO RS-232 touch panel	elo_serial_touch_vyyyymmdd.cab

For more information on how to make setting of touch panel driver, please refer to:
http://www.icpdas.com/products/PAC/winpac/download/winpac_8000/download_os_images.htm

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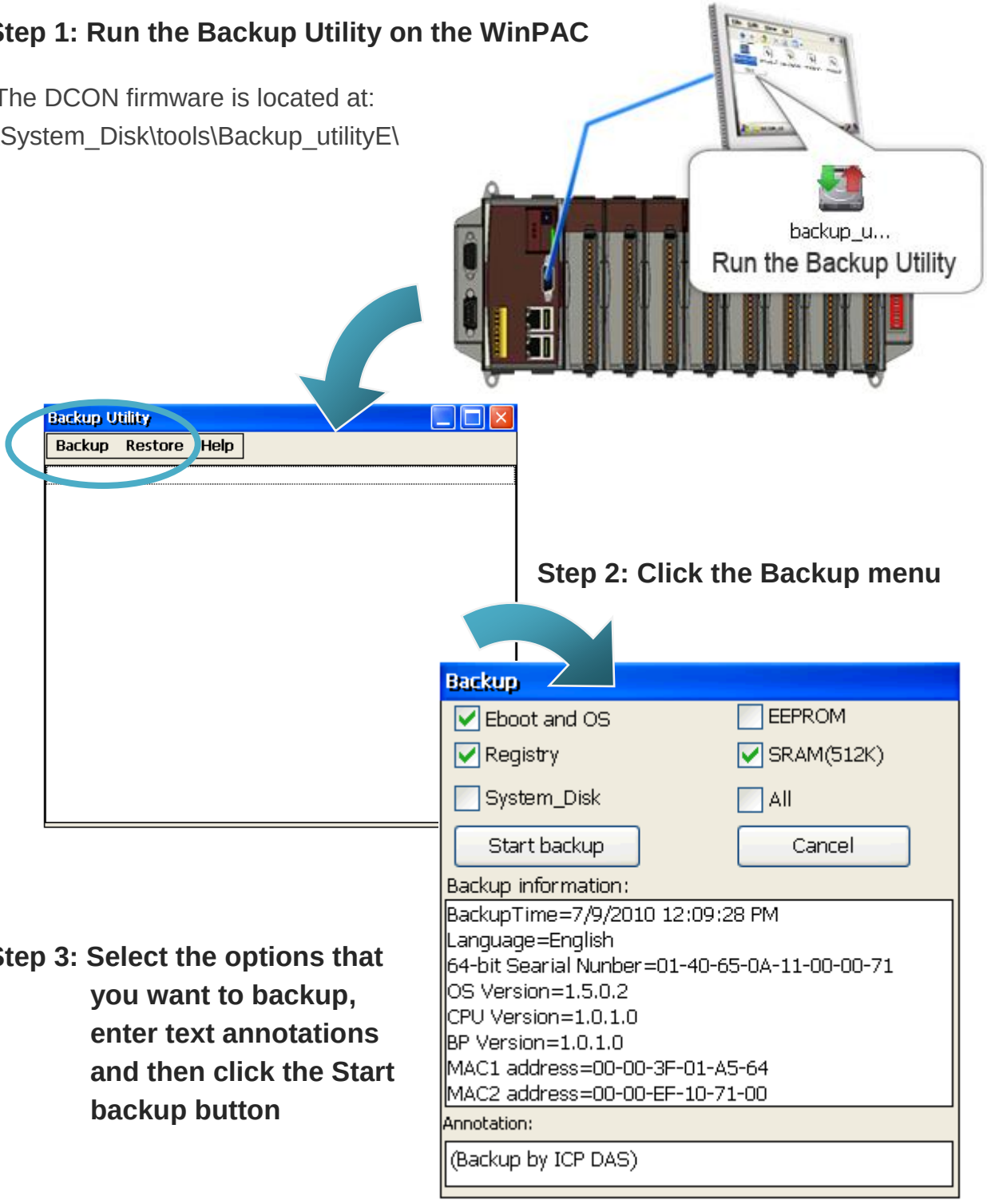
2.8. Using Backup Utility to back up the settings and files

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

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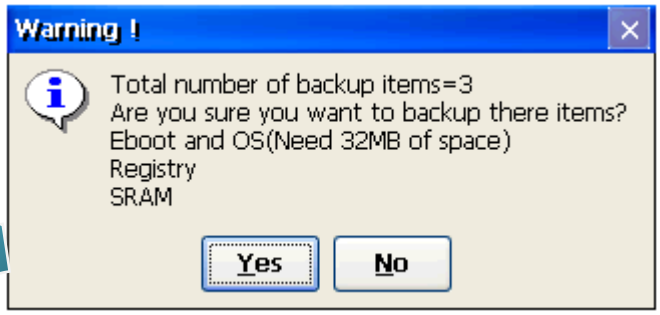
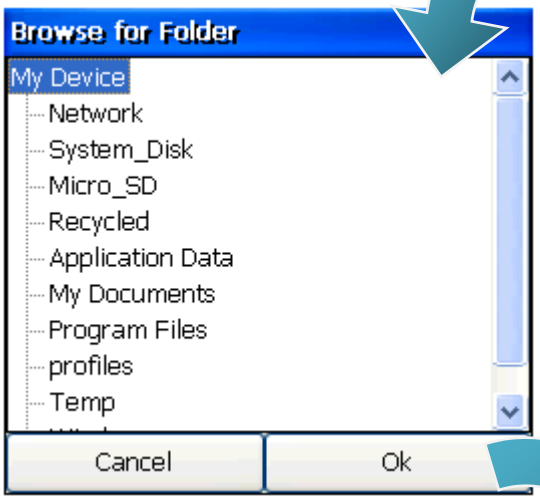
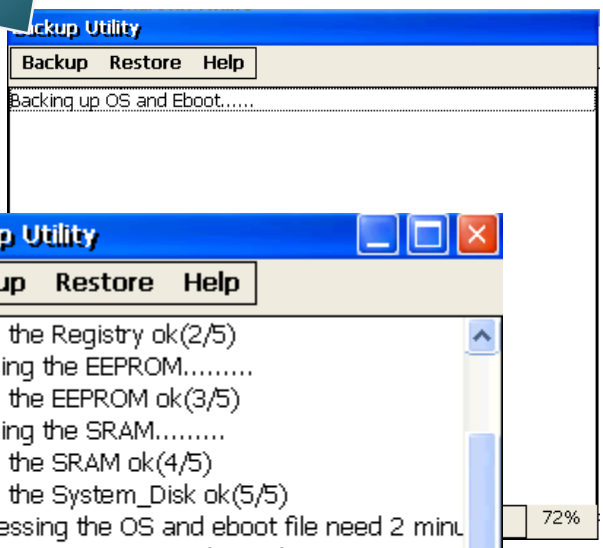
Step 4: Confirm the backup options and then click Yes button





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



Step 6: Wait for process to finish

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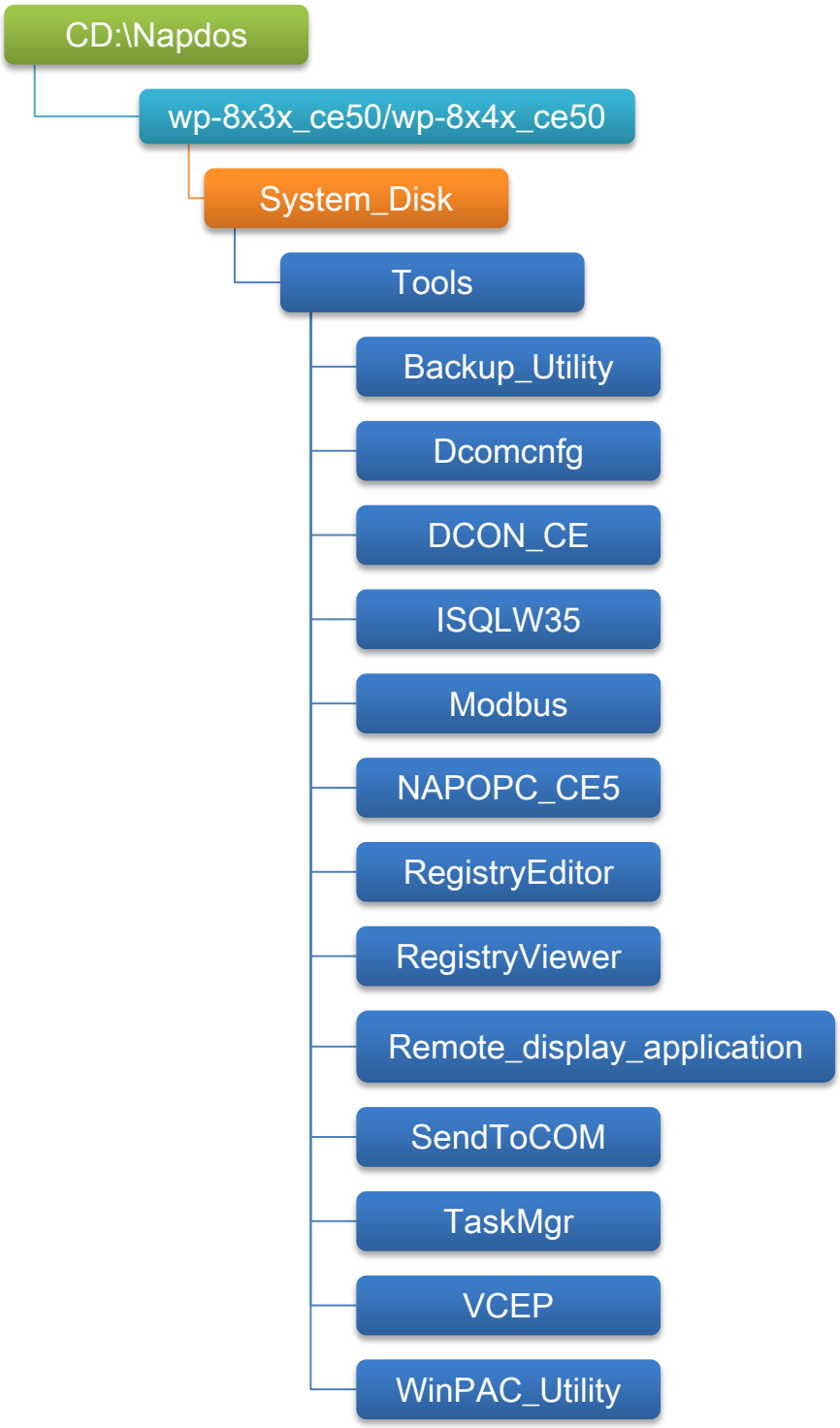
3. Tools and Tasks

This chapter briefly describes the functions of the WinPAC software toolkits.

Following tools has been installed on the WinPAC.



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• 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.

For more information about the Backup Utility, please refer to “3.6.Bacup Utility”.

•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.

For more information about the NAPOPC_CE5, please refer to “3.2. NAPOPC_CE5”.

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• RegistryEditor

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

• RegistryViewer

The Registry Viewer allows user to view 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.

For more information about the VCEP, please refer to “3.4. VCEP (Virtual CE Pro)”.

• 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.

For more information about the WinPAC Utility, please refer to “3.5. WinPAC Utility”.

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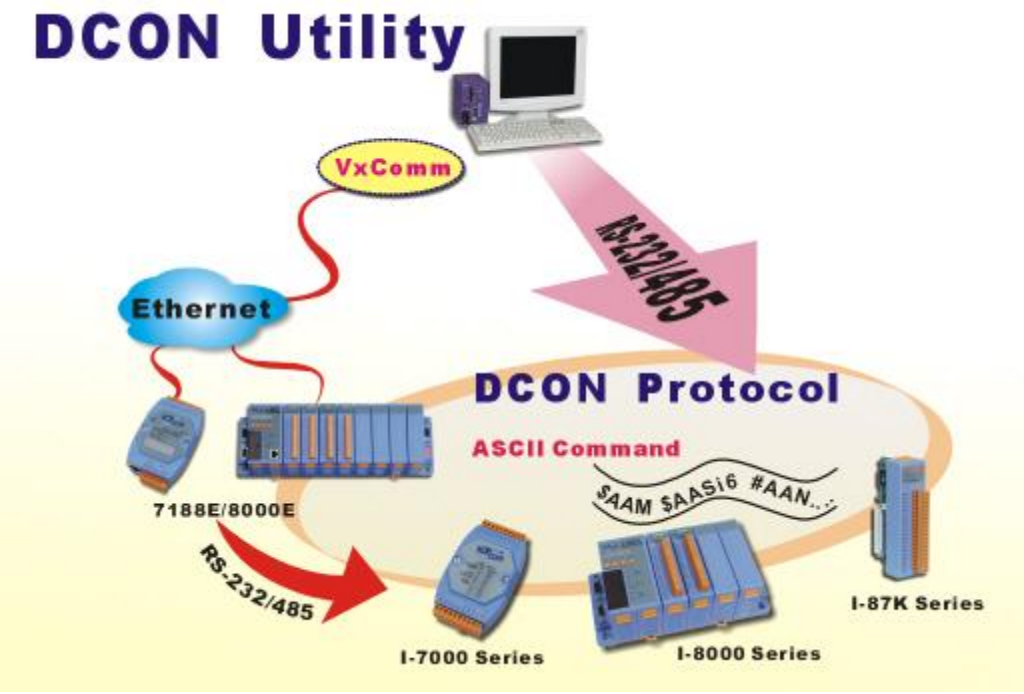
3.1. DCON Utility



The DCON Utility is a toolkit that help user search the network, easily to Configure the I/O modules and test the I/O status via the serial port (RS-232/485) or Ethernet port (using virtual com port). It supports not only the DCON Protocol I/O modules but also the M Series I/O Modules (Modbus RTU M-7K, M-87K and will support Modbus ASCII M-87K) now.

For more detailed information on WinPAC Utility applications, please refer to "2.5. Using DCON Utility to configure the I/O modules"

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3.2. 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”

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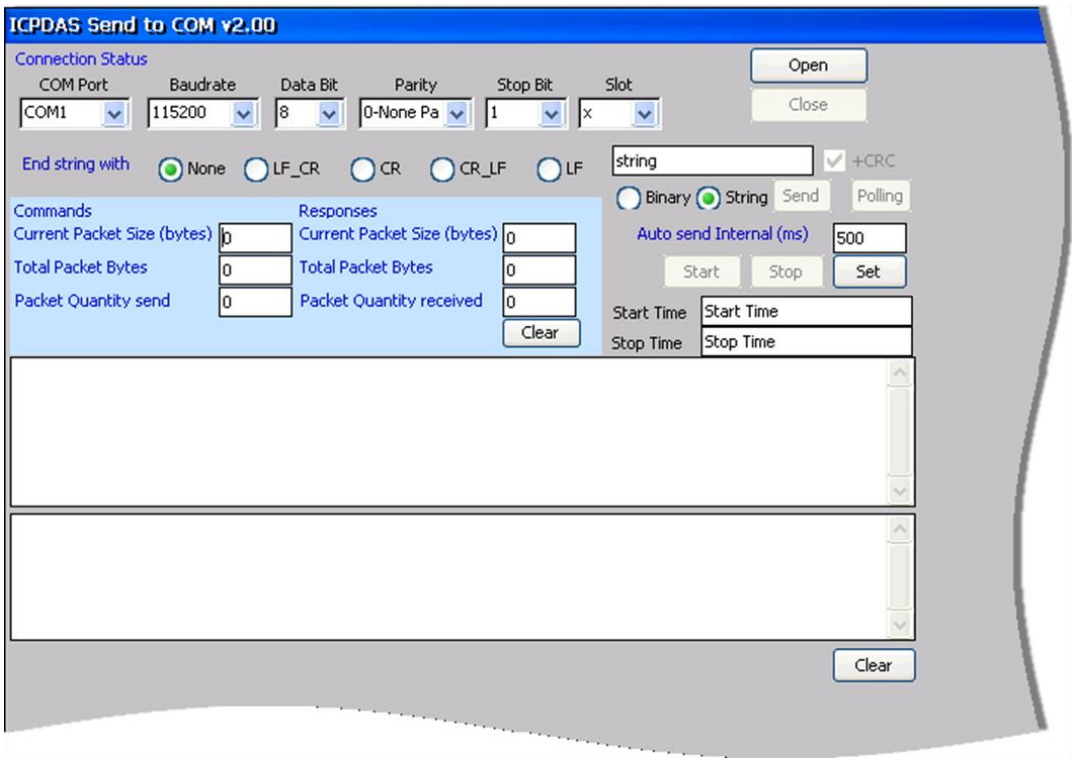
3.3. SendToCOM

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



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3.4. 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

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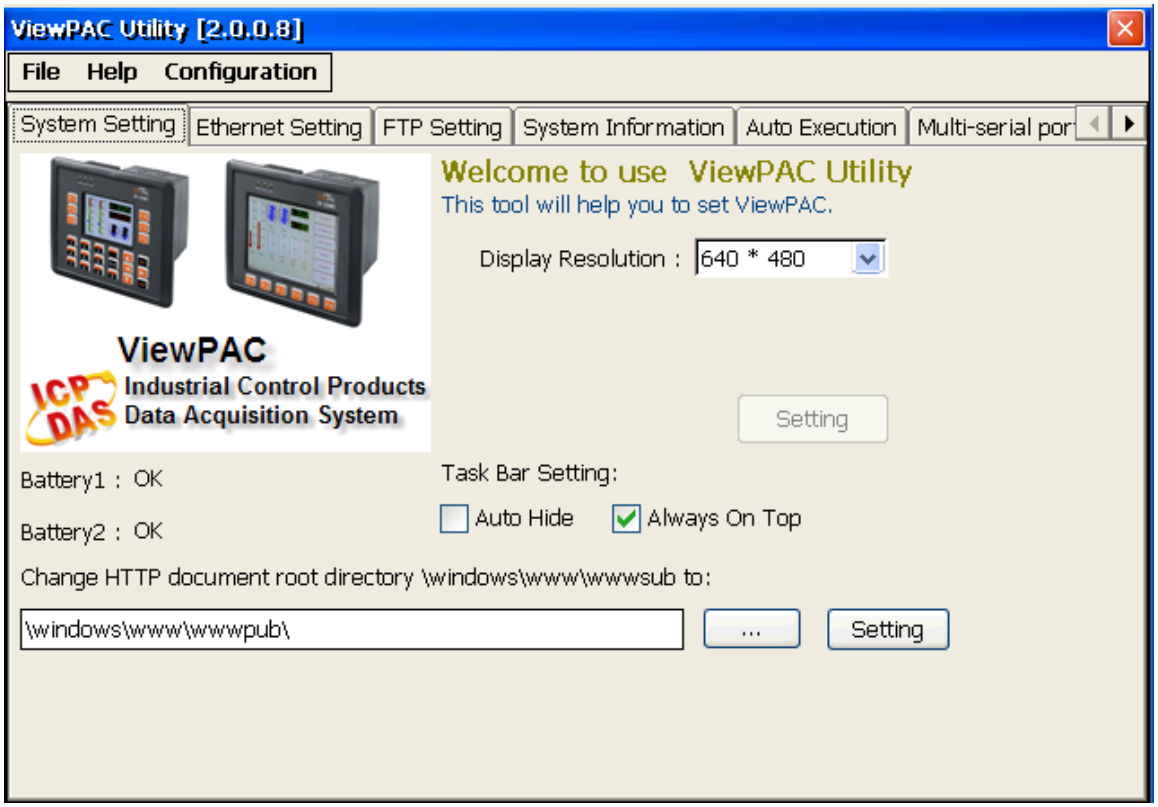
3.5. WinPAC Utility

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



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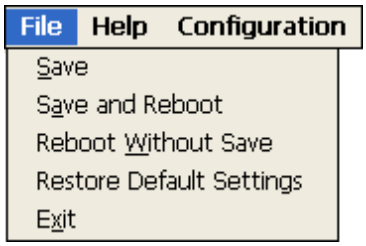
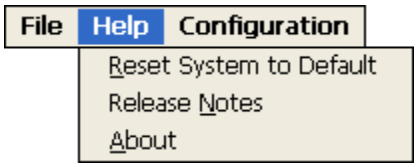
3.5.1. Menu Bar

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

✓ **File Menu**



✓ **Help Menu**



✓ **Configuration Menu**

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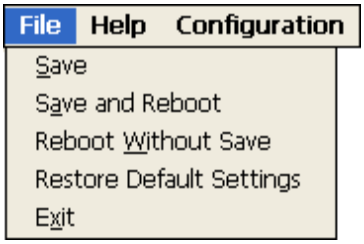
File Menu



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.

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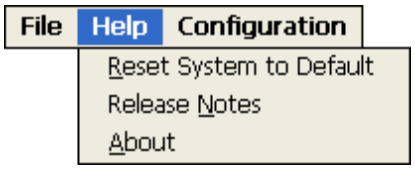
Help Menu



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.

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Configuration Menu

The menu commands	Use to
Import Registry Key	Backs up a sub-key of registry by using a registration entry (.reg) file. How to use: Step 1: Select the “Import Registry Key”, then the “Open” dialog box will appear Step 2: On the “Open” dialog box, select a specific .reg file to import Warning: 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	Makes a back up of a registry sub-key How to use: Step 1: Select the “Export Registry Key”, then the “Export Registry” box will appear Step 2: Select a specific root key Step 3: Input a specific path of sub-key Step 4: Push the “OK” button, then the “Save As” dialog box will appear prompting you to select a location where you want to save this exported file Warning: The export operation will export all the sub-keys of the specific key which you input.
Store All Registry Setting	Stores all registry setting to flash from .das file which is saved by “Dump All Registry Setting”. How to use:

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The menu commands	Use to
	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 Warning: 1. The .das file which should be saved by “Dump All Registry Setting”. 2. It will save automatically after store .das file.
Dump All Registry Settings	Dump all registries setting to .das file. 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.

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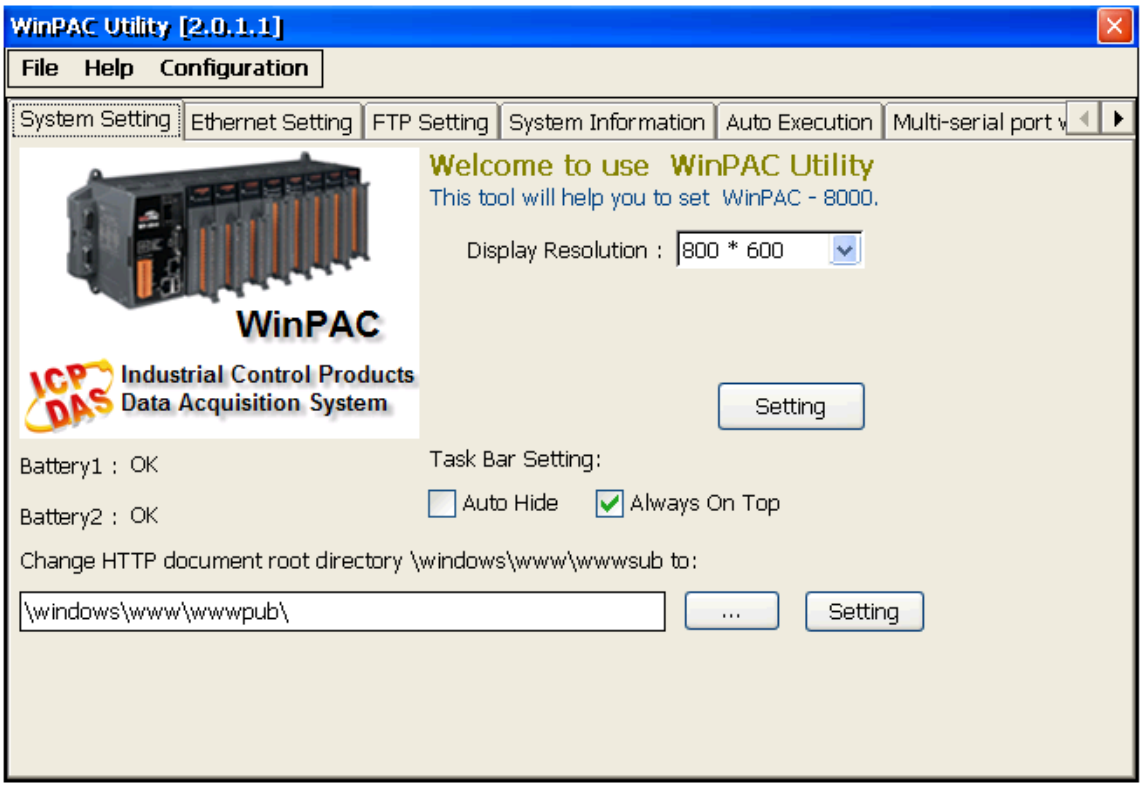
3.5.2. Property Tabs

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**
- ✓ **Backplane Compatibility**

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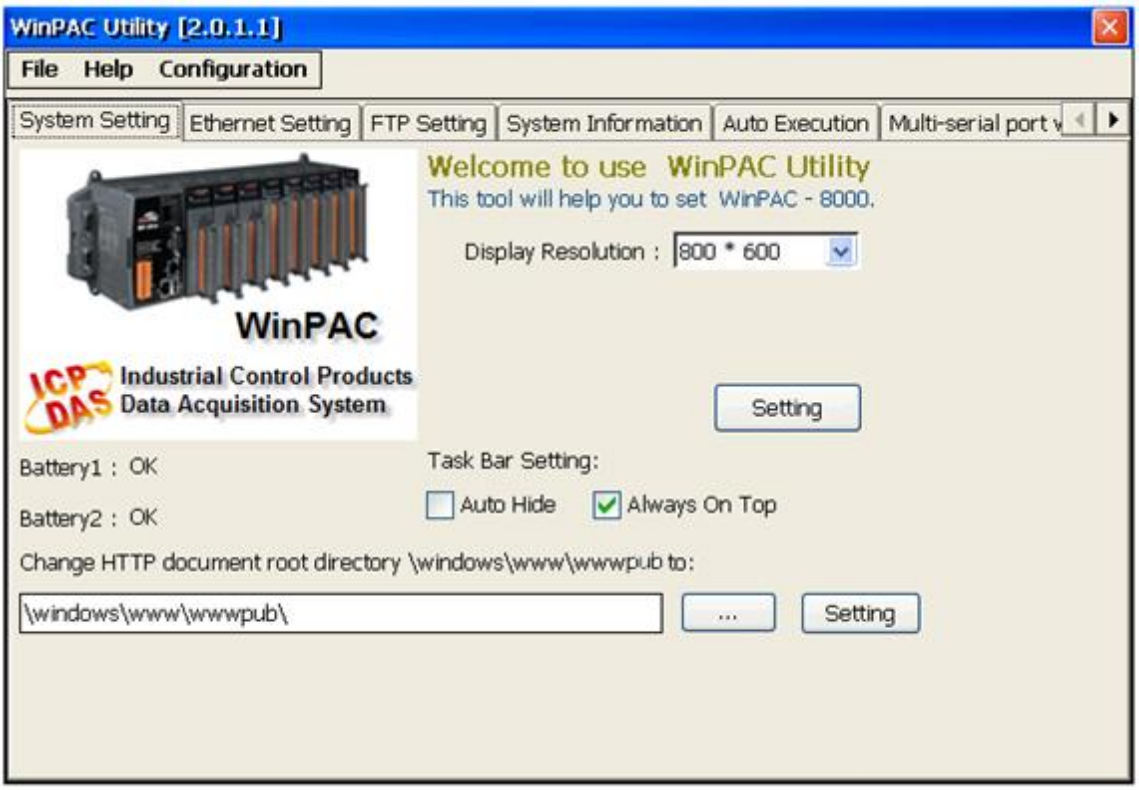
System Setting Tab

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.

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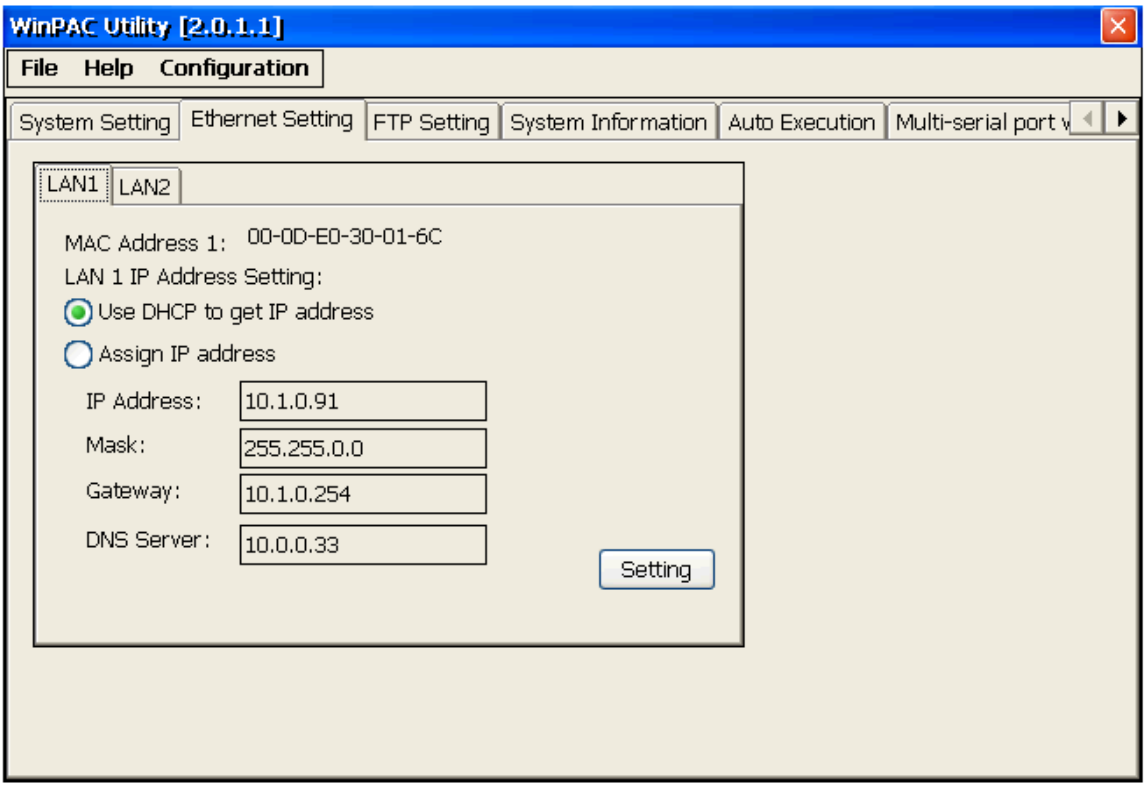
Ethernet Setting Tab

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	Obtaining an IP address automatically from DHCP: Select the Use DHCP to get IP address option. Manually assign an IP address: Select the Assign IP address option.
Monitor the MAC address	See the MAC Address 1 and MAC Address 2 fields that display the physical address of LAN1 and LAN2.

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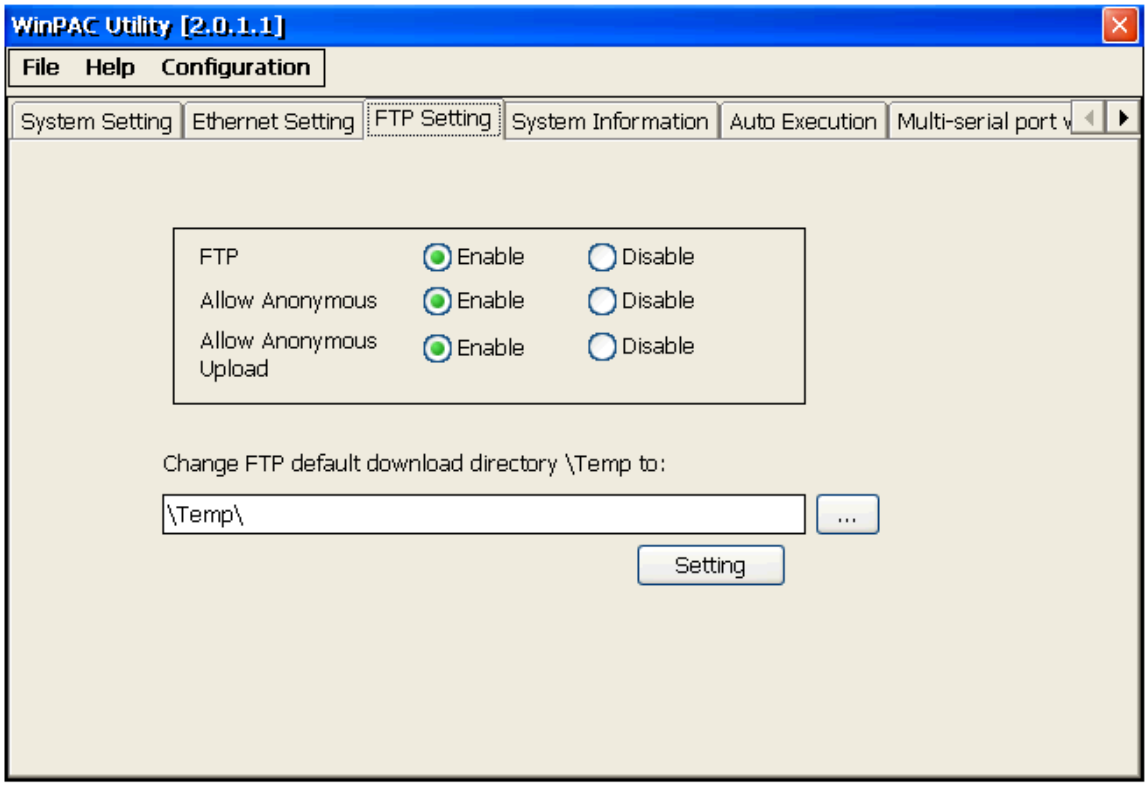
FTP Setting Tab

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	Enable: Select the Enable check box in the FTP field. Disable: Select the Disable check box in the FTP field.
Enable or disable anonymous FTP access	Enable: Select the Enable check box in the Allow Anonymous field. Disable: Select the Disable check box in the Allow Anonymous field.
Enable or disable anonymous FTP upload	Enable: Select the Enable check box in the Allow Anonymous Upload field. Disable: Select the Disable check box in the Allow Anonymous Upload field.

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The tab use to	How to use
Change the FTP directory path	Enter a new path in the Change FTP default download directory field, and then press the Setting button.

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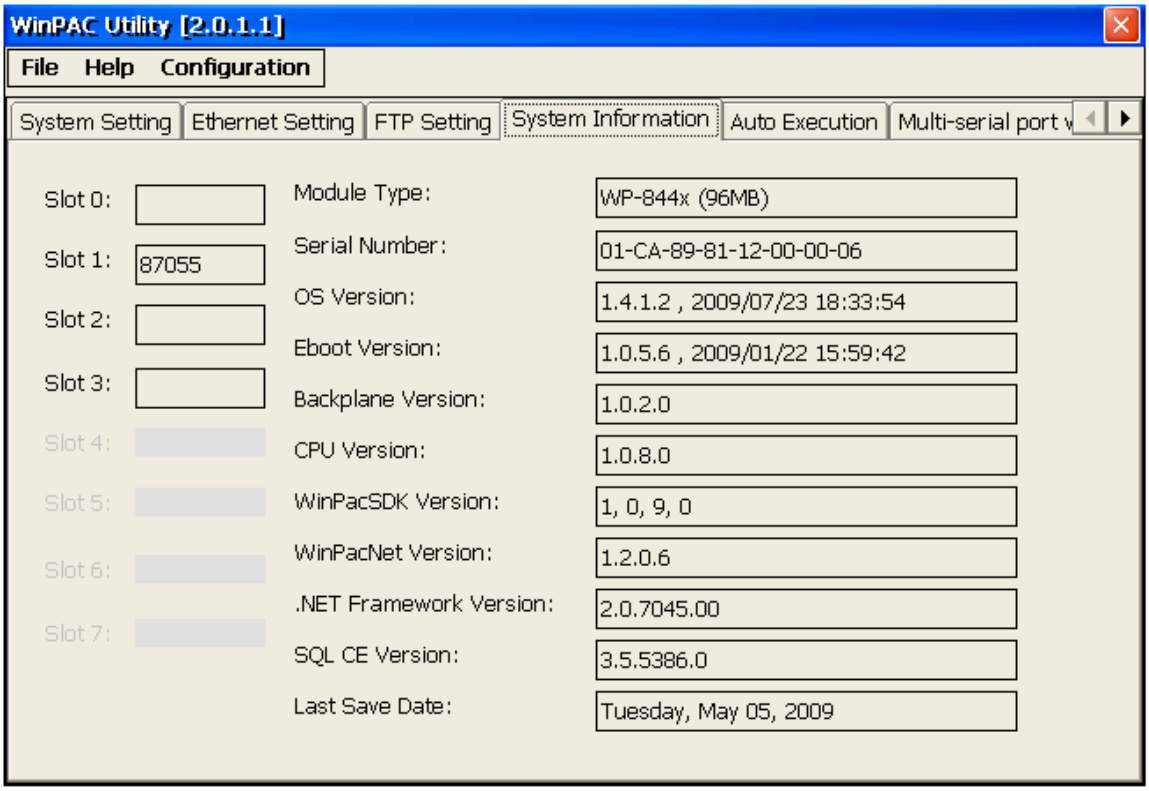
System Information Tab

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.



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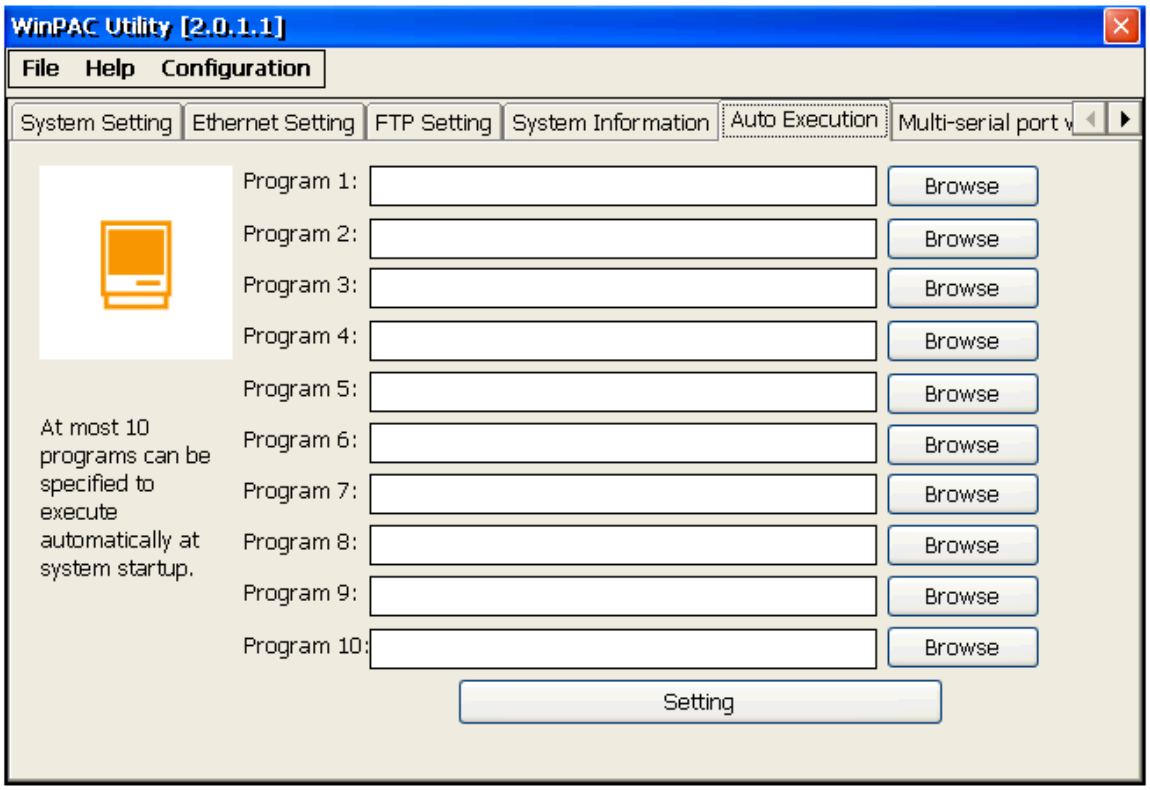
Auto Execution Tab

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

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.

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Multi-Serial Port Wizard Tab

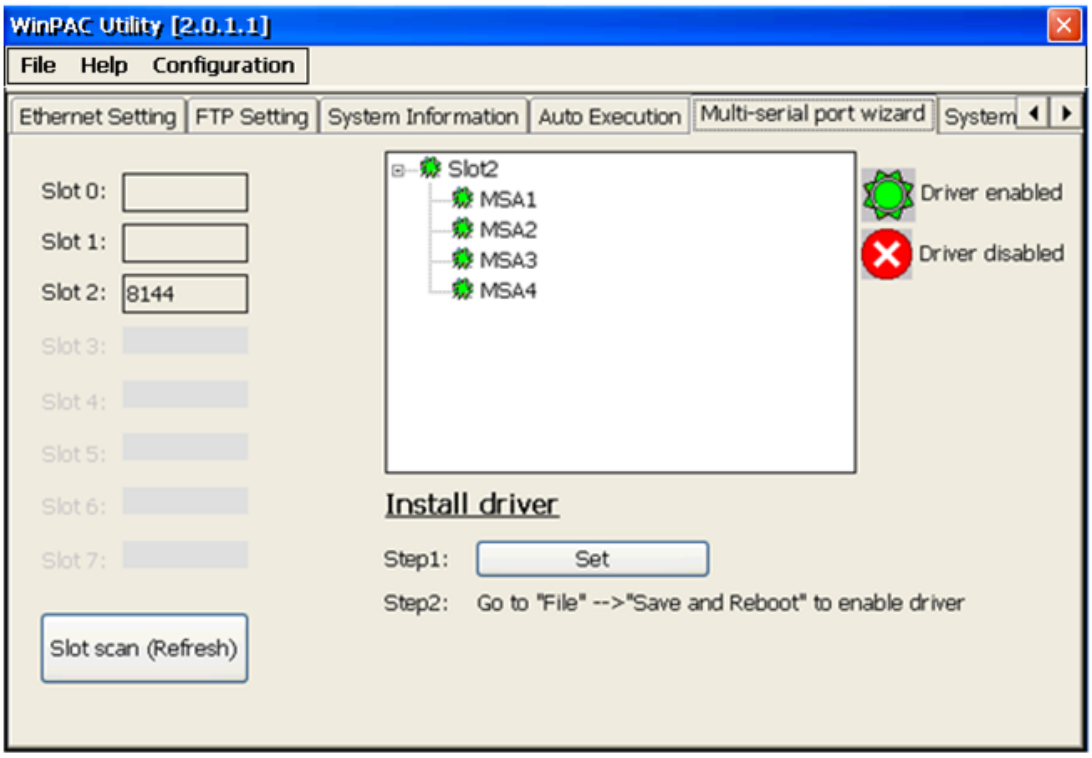
The Multi-serial port provides functions for installation of the RS-232/RS-422/RS-485 communication module driver.

The table below shows the expansion RS-232/RS-422/RS-485 communication modules that are compatible with the WinPAC.

Item	RS-232	RS-422/RS-485	Isolation	Connector
I-8112iW	2	-	2500 Vrms	DB-9 x 2
I-8114W	4	-	-	DB-37 x 1
I-8114iW	4	-	2500 Vrms	DB-37 x 1
I-8142iW	-	2	2500 Vrms	Terminator block x 1
I-8144iW	-	4	2500 Vrms	Terminator block x 1

The WinPAC can be expanded to support up to 16 COM ports.

For more detailed information about these support modules, please refer to http://www.icpdas.com/products/Remote_IO/i-8ke/selection_rs232_i8k.htm



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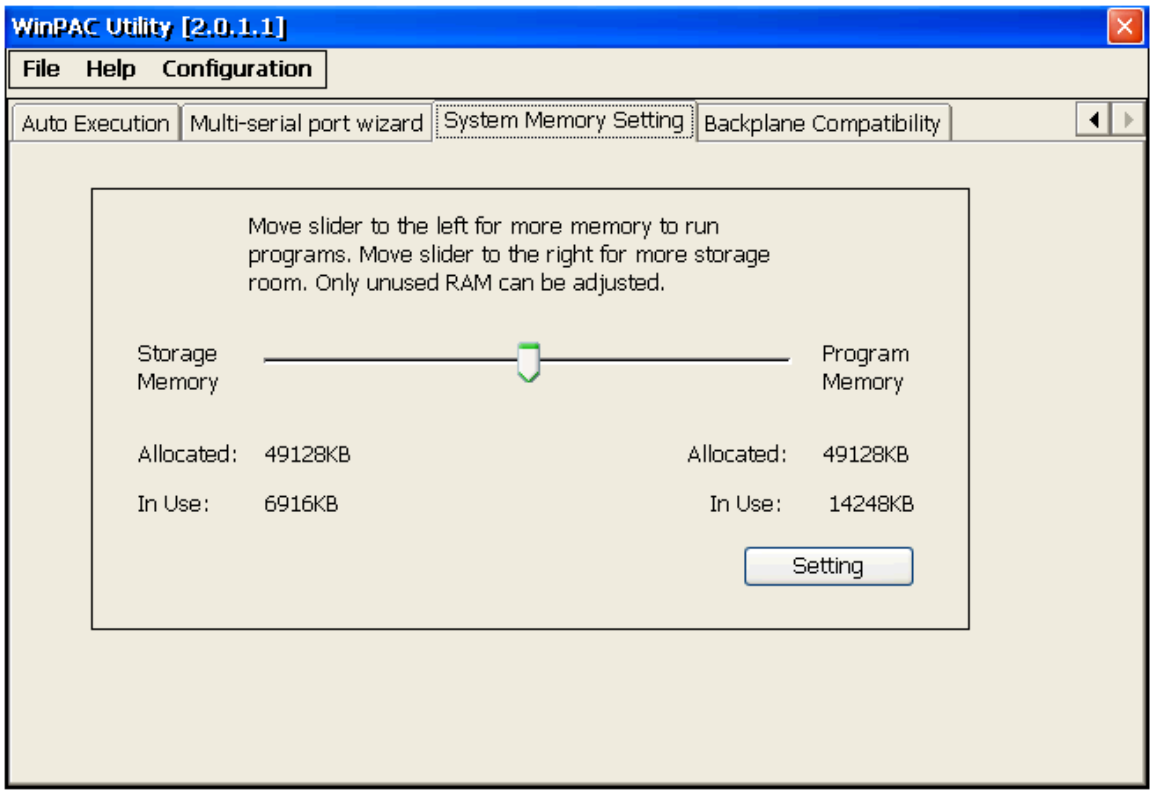
System Memory Setting Tab

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

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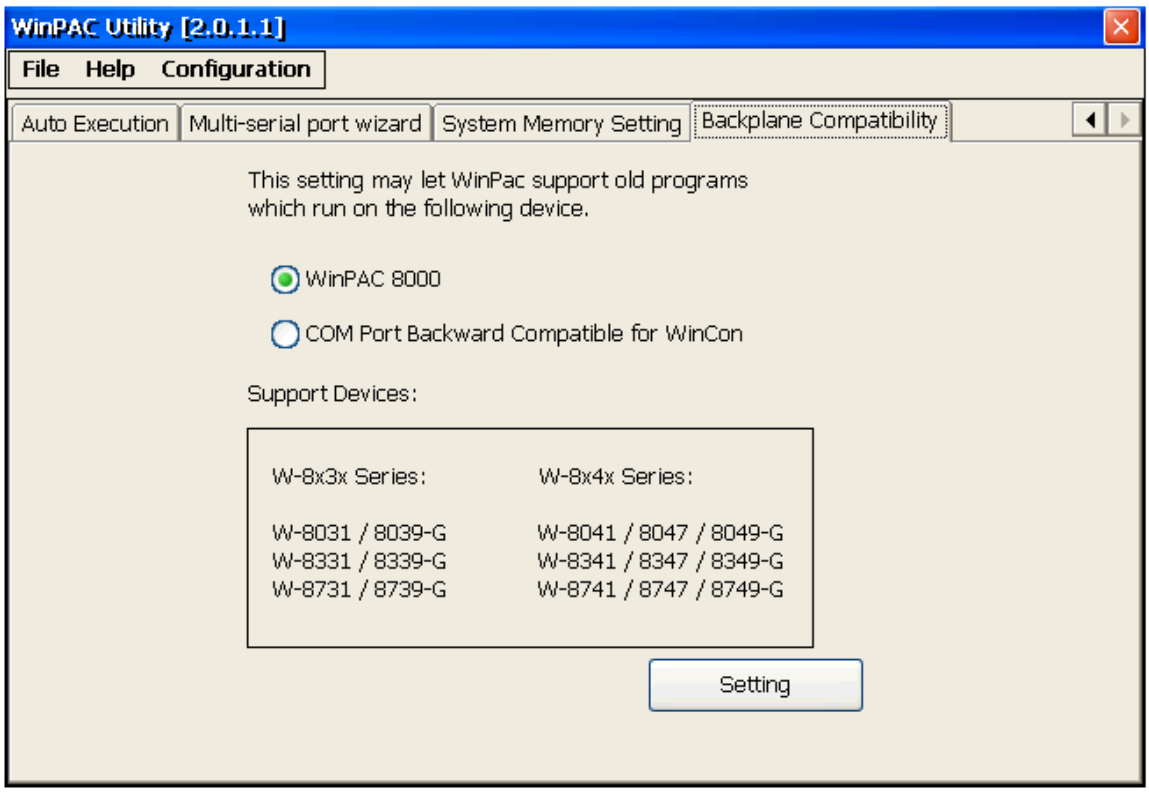
Backplane Compatibility Tab

The Backplane Compatibility tab provides functions to keep old programs running on WinPAC without any modification. the unused RAM.



The tab use to	How to use
Configure programs running at WinCON-8000	Select the “COM Port Backward Compatible for WinCon” and then press Setting button

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4. Your First WinPAC Program

This chapter describes the components of the WinPAC SDK, and provides step by step tutorial for developer that will teach you how to create your first WinPAC program.

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

4.1. Preparing the Development Tools

There are several programming tools available for application developers targeting Windows CE-based WinPAC. One of the following tools must be installed on the Host PC.

- ✓ Microsoft eMbedded Visual C++
- ✓ Visual Basic.net
- ✓ Visual C#

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4.2. Installing WinPAC SDKs

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

Below is a step by step procedure for installing the WinPAC SDKs.

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

Step 2: Execute the "PAC270_SDK_YYYYMMDD.msi" which is located in

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\SDK\
- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\SDK\

Step 3: Follow the prompts until the installation is complete

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4.3. Understanding the WinPAC SDK

The WinPAC SDK includes several application programming interfaces (APIs) that allows you perform various supporting tasks when developing WinPAC.

➢ Requirements

The WinPAC SDK only supports NET Framework 2.0 or above.

➢ Installation Path

After installing the WinPAC SDKs, a number of functions can be installed on the Host PC, and this installation puts the header files, libraries into the following public places so they are easily changed by update the WinPAC SDKs.

Header files:

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

Libraries:

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

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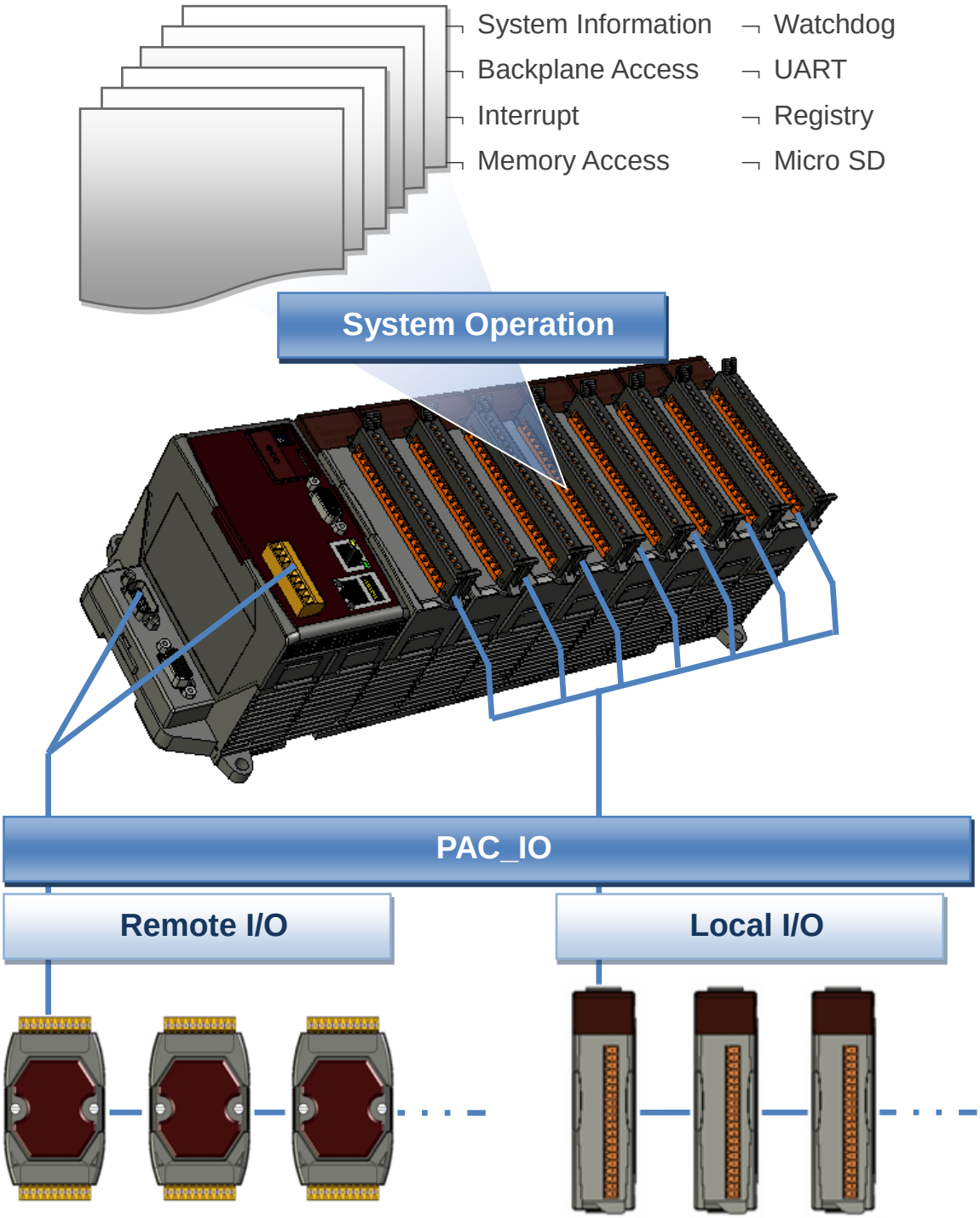
4.3.1. WinPAC SDK Overview



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- **SystemInformation Functions**

Provides reference information for the system status.

- **Backplane Access API**

Provides reference information for the backplane access APIs, including backplane information.

- **Interrupt API**

Provides reference information for the Interrupt APIs

- **Memory Access API**

Provides reference information for the memory R/W APIs, including EEPROM and SRAM.

- **Watchdog Functions**

Provides reference information for the watchdog APIs, including hardware watchdog and OS watchdog.

- **Uart API**

Provides reference information for the Uart APIs.

- **Registry API**

Provides reference information for the registry.

- **MicroSD Management API**

Provides reference information for the MicroSD Manager.

- **PAC_IO API**

Provides reference information for IO APIs, including local and remote.
In additions, no matter 8K or 87K modules use the same API.

- **Error Handling API**

Provides reference information for error handling.

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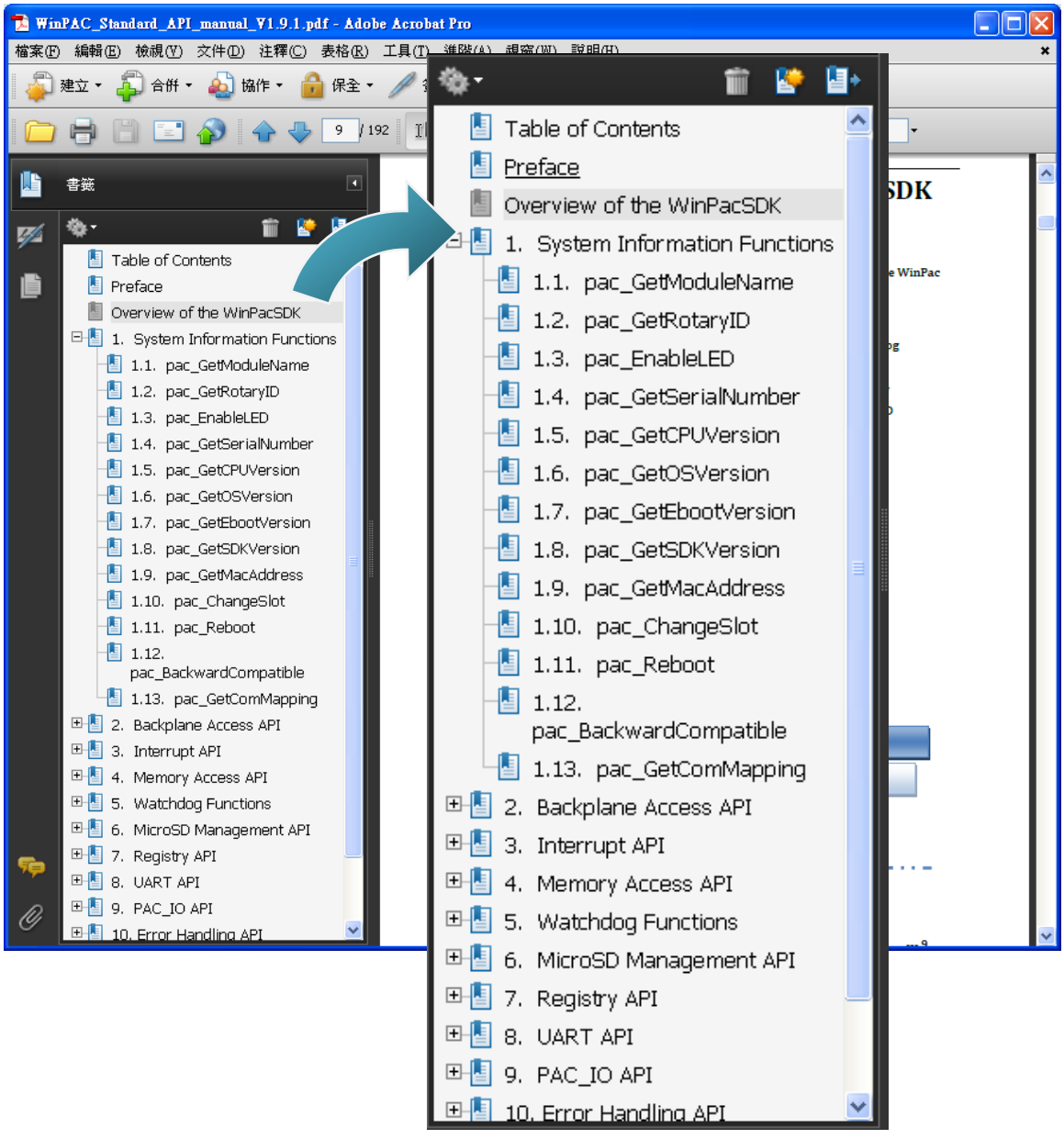
4.3.2. WinPAC SDK Reference

For full usage information regarding the description, prototype and the arguments of the functions, please refer to the “WinPAC Standard API Manual” located at:

➤ For WP-8x3x series
CD:\Napdos\wp-8x3x_ce50\Document\SDK_Document\
ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/document/sdk_document/

➤ For WP-8x4x series
CD:\Napdos\wp-8x4x_ce50\Document\SDK_Document\
ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/document/sdk_document/



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4.4. Your First Program in C#

Here we will explain how to create a C# program running on WinPAC. We assume that you use Visual Studio 2005.

Depending on the version of

To create a demo program with C# development tool includes the following main steps:

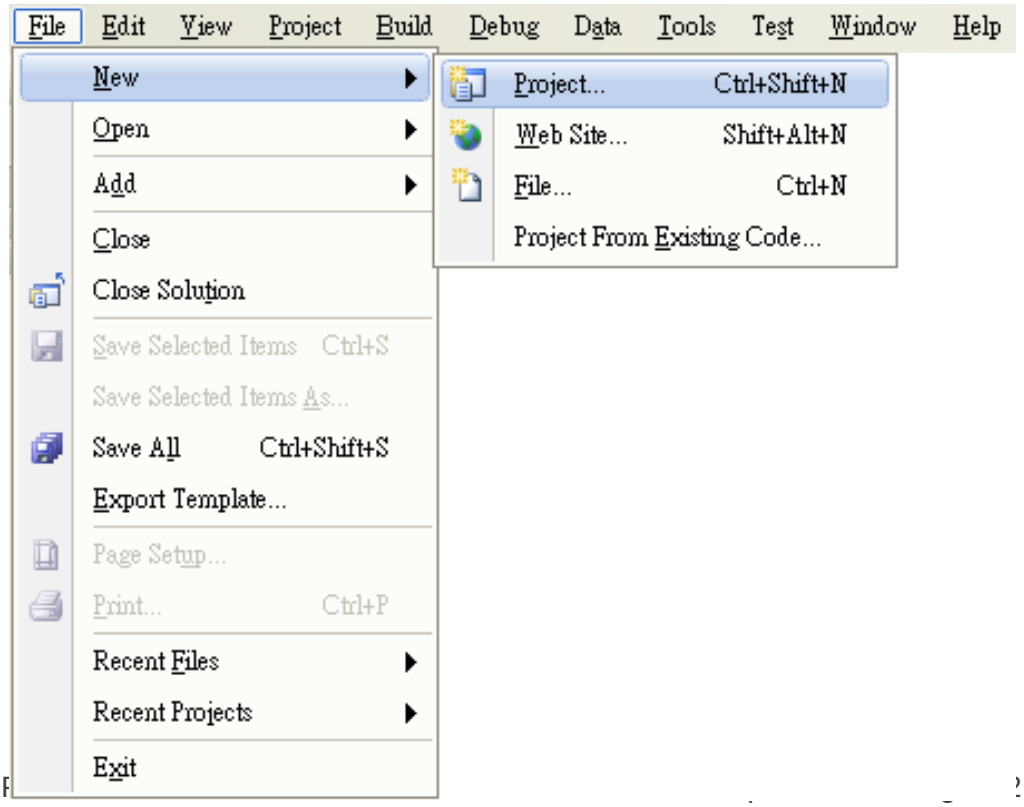
1. Create a new project
2. Add project reference for an application
3. Design and Build an application program
4. Execute the application on the WinPAC

All main steps will be described in the following subsection.

4.4.1. Create a new project

Step 1: Start the Visual Studio 2005

Step 2: On the “File” menu, select the “New” command, and then click the “Project” command



WinP

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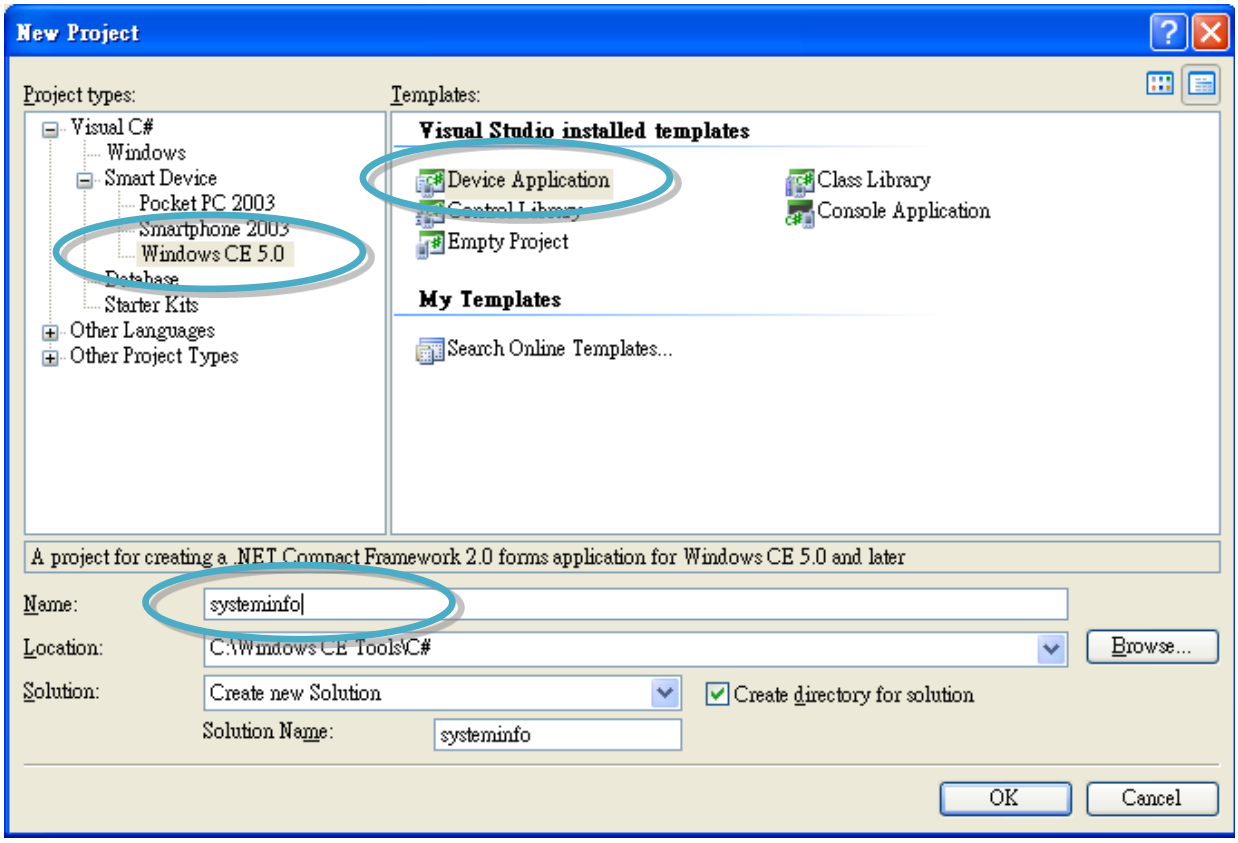
Step 3: In the “New Project” dialog box do the following in this order



Step 4: Click OK to start creating a “systeminfo” project

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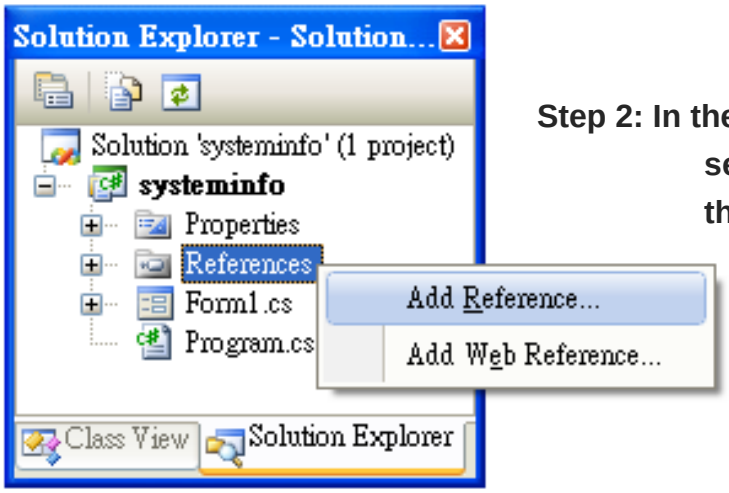
4.4.2. Add project reference for an application

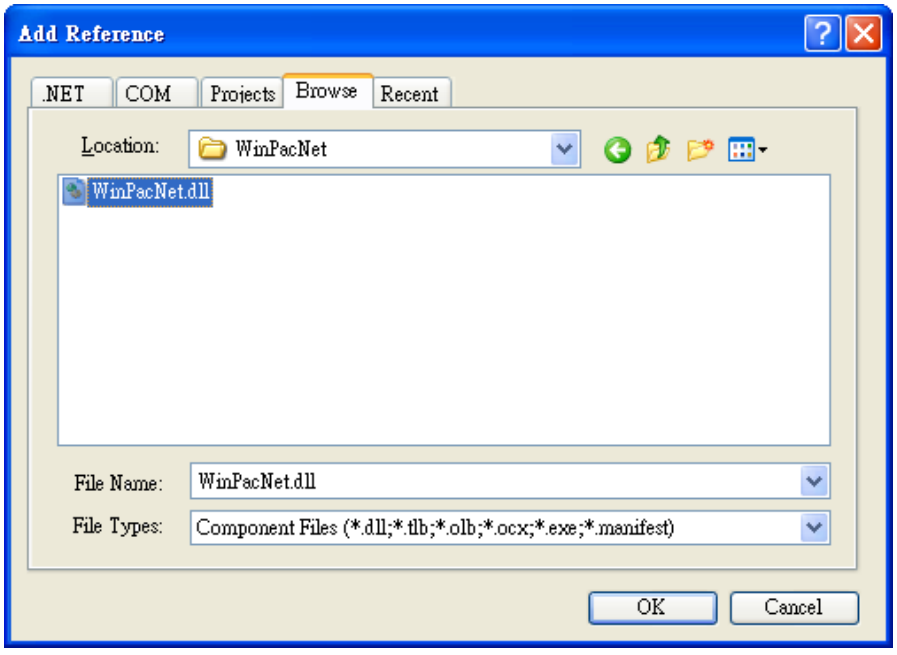
Step 1: On the “Solution Explorer” window, right-click the “Reference” and then click the “Add Reference…” command



Step 2: In the “Add Reference” dialog box, select the “Browse” tab, and then specify the directory of the “Winpacnet.dll” file in the “File name” field

The “winpacnet.dll” file can be obtained from:

- For WP-8x3x series:
  CD:\Napdos\wp-8x3x_ce50\SDK\WinPacNet\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/sdk/winpacnet/
- For WP-8x3x series:
  CD:\Napdos\wp-8x4x_ce50\SDK\WinPacNet\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/sdk/winpacnet/



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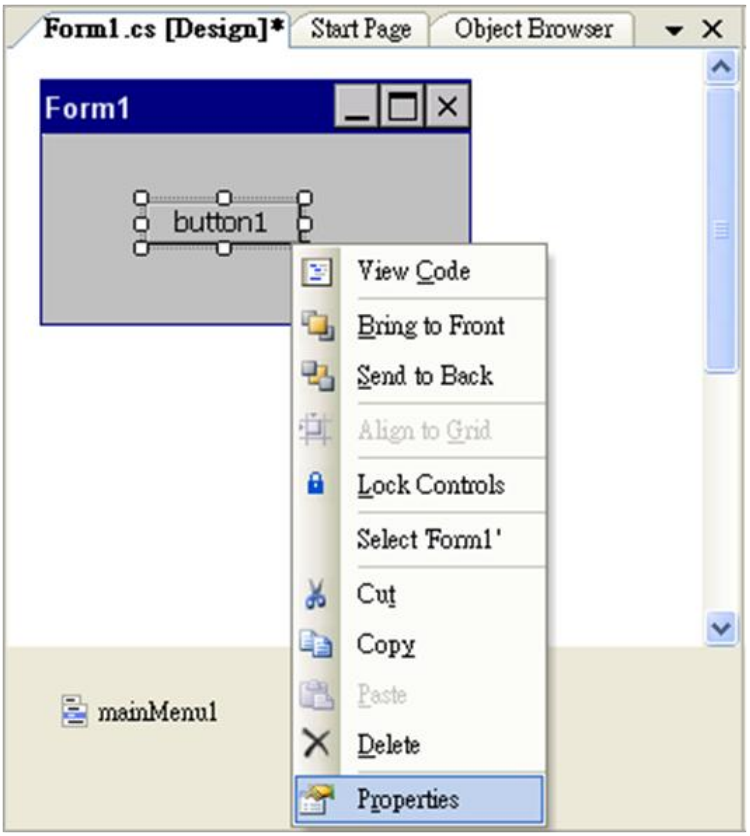
4.4.3. Design and Build an application program

Step 1: **Add a “button” object in the “From1” dialog box**

Step 2: Right-click the “button” object and click the “Properties” command



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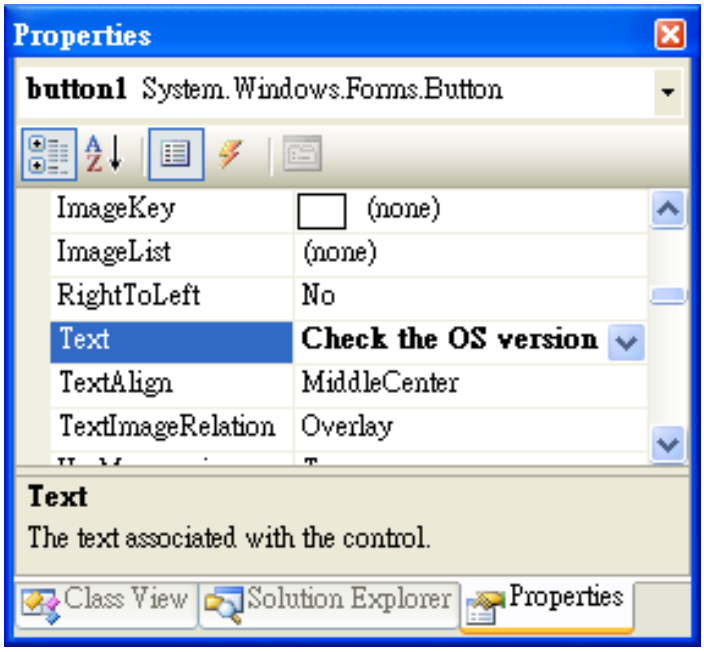
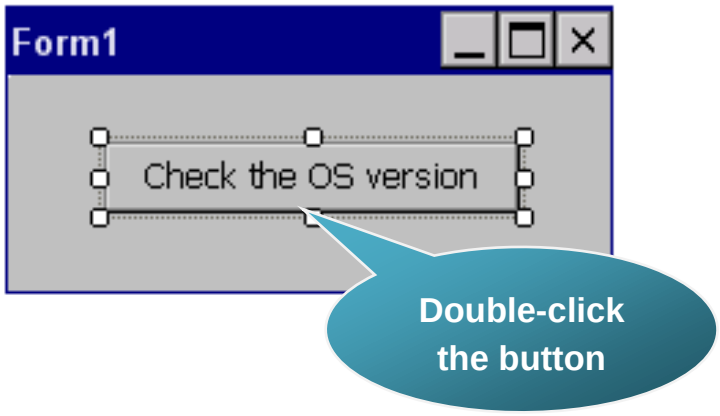
Step 3: On the “Properties” window, type “Check the OS version” in the “Text” edit box



Step 4: In the “Form1” dialog box, double-click the button” object to open the editor window



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Step 5: Insert the “using WinPACNet;” into the header area after “using System.Windows.Forms;”

```
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

Step 6: Insert the following code in the Editor Window

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());
        }
    }
}
```


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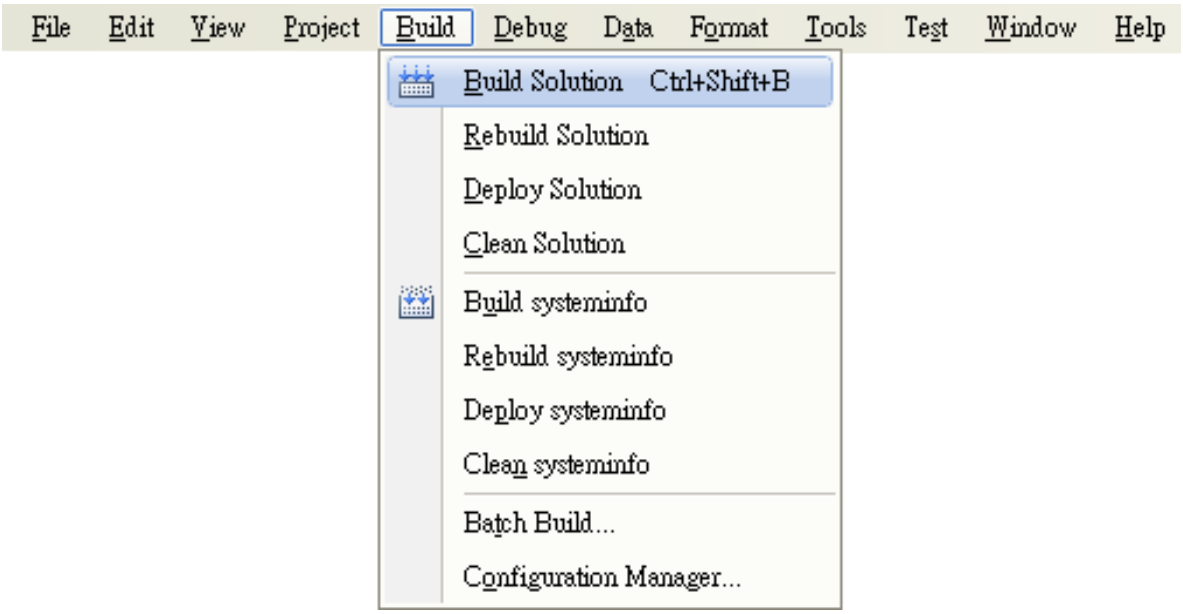
4.4.4. Execute the application on the WinPAC

Step 1: On the “Build” menu, click the “Build Solution” command



Step 2: Open the web browser and type the IP address to connect the FTP server of WinPAC

Step 3: Upload the “systeminfo.exe” application and the corresponding “Winpacnet.dll” file to the WinPAC via the WinPAC FTP server

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Tips & Warnings

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

Step 4: On the WinPAC, execute the uploaded file

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4.5. Your First Program in VB.net

To create a demo program with C# development tool includes the following main steps:

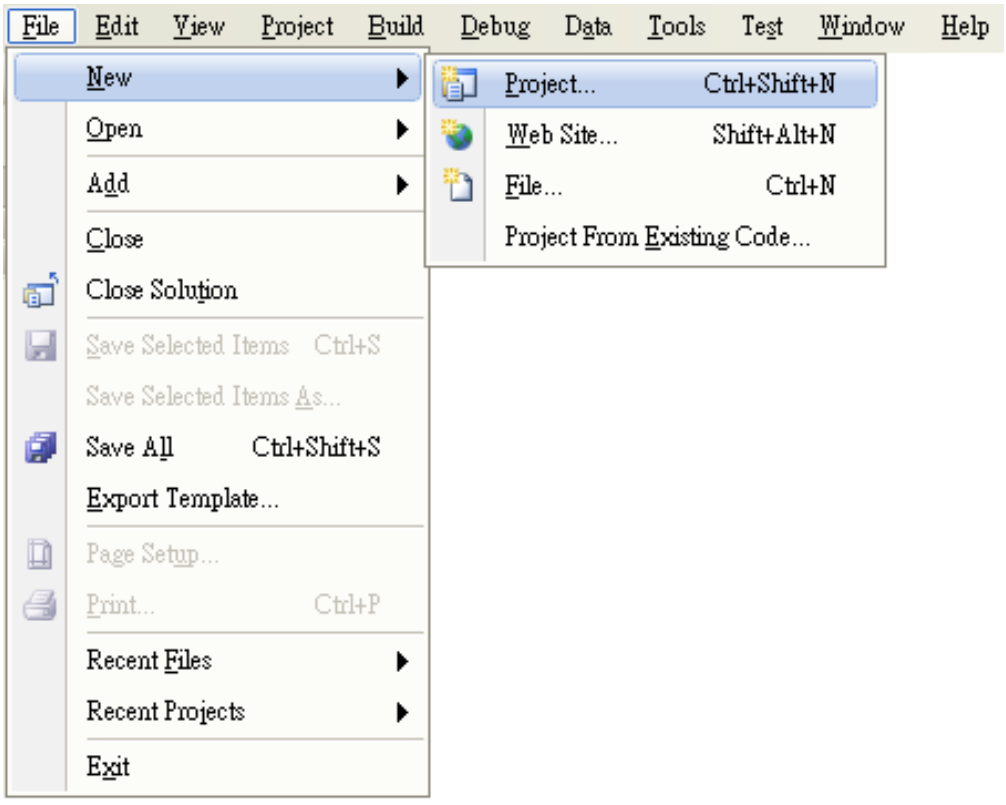
1. Create a new project
2. Add project reference for an application
3. Design and Build an application program
4. Execute the application on the WinPAC

All main steps will be described in the following subsection.

4.5.1. Create a new project

Step 1: Start the Visual Studio 2005

Step 2: On the “File” menu, select the “New” command, and then click the “Project” command



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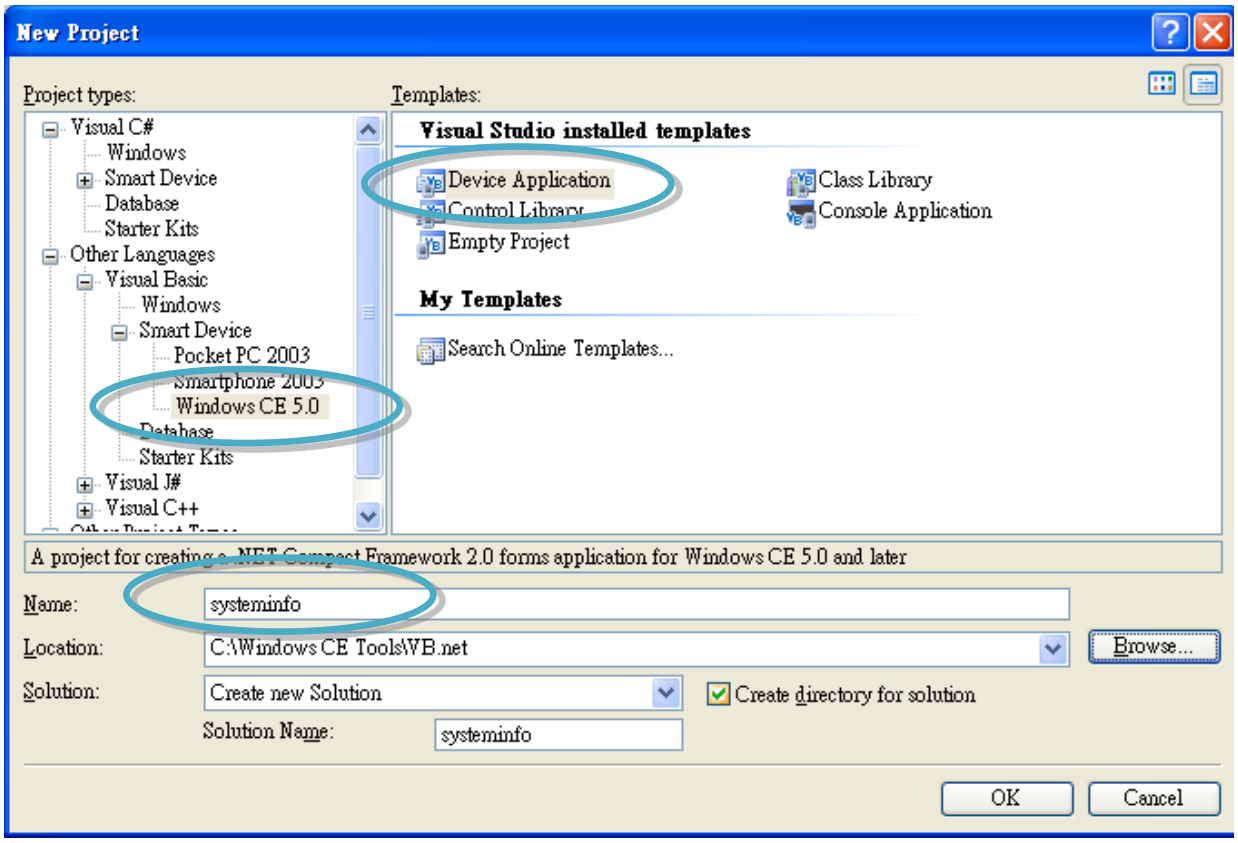
Step 3: In the “New Project” dialog box do the following in this order



Step 4: Click OK to start creating a “systeminfo” project

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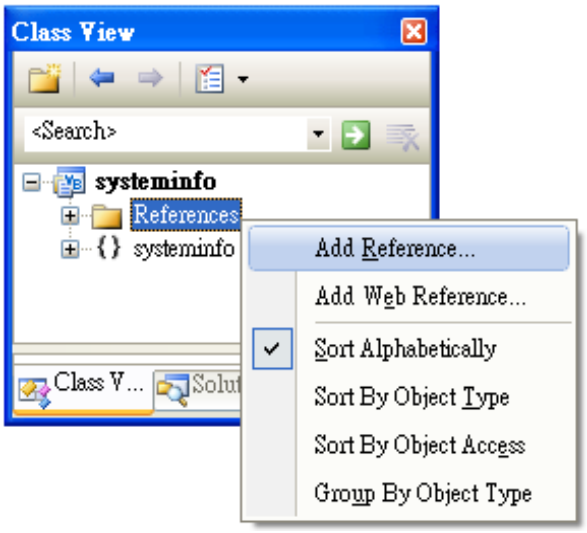
4.5.2. Add project reference for an application

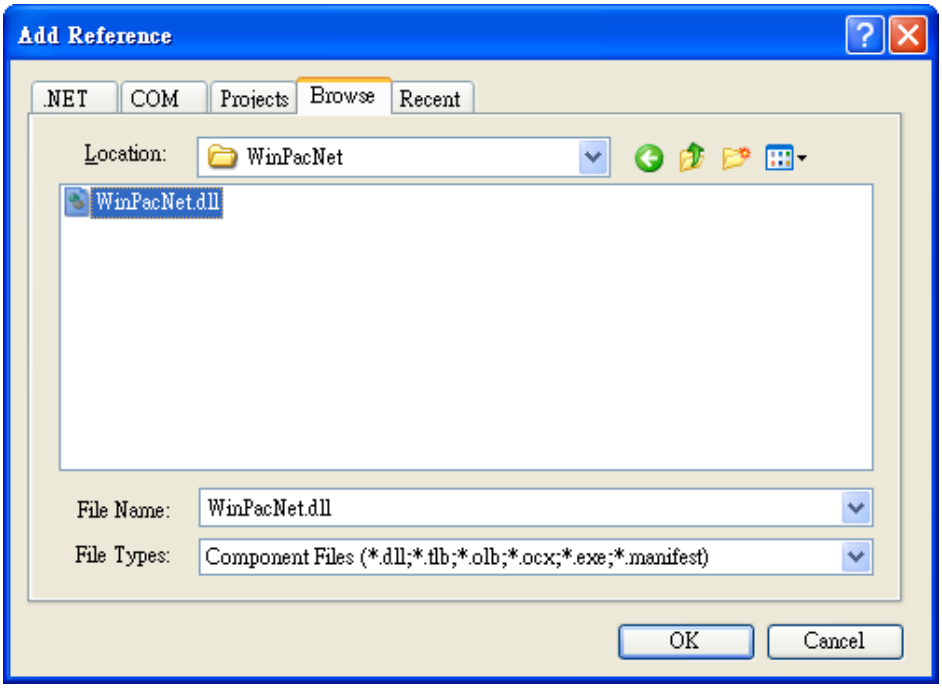
Step 1: On the “Class View” window, right-click the “Reference” and then click the “Add Reference…” command



Step 2: In the “Add Reference” dialog box, select the “Browse” tab, and then specify the directory of the “Winpacnet.dll” file in the “File name” field

The “winpacnet.dll” file can be obtained from:

- For WP-8x3x series:
  CD:\Napdos\wp-8x3x_ce50\SDK\WinPacNet\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/sdk/winpacnet/
- For WP-8x3x series:
  CD:\Napdos\wp-8x4x_ce50\SDK\WinPacNet\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/sdk/winpacnet/



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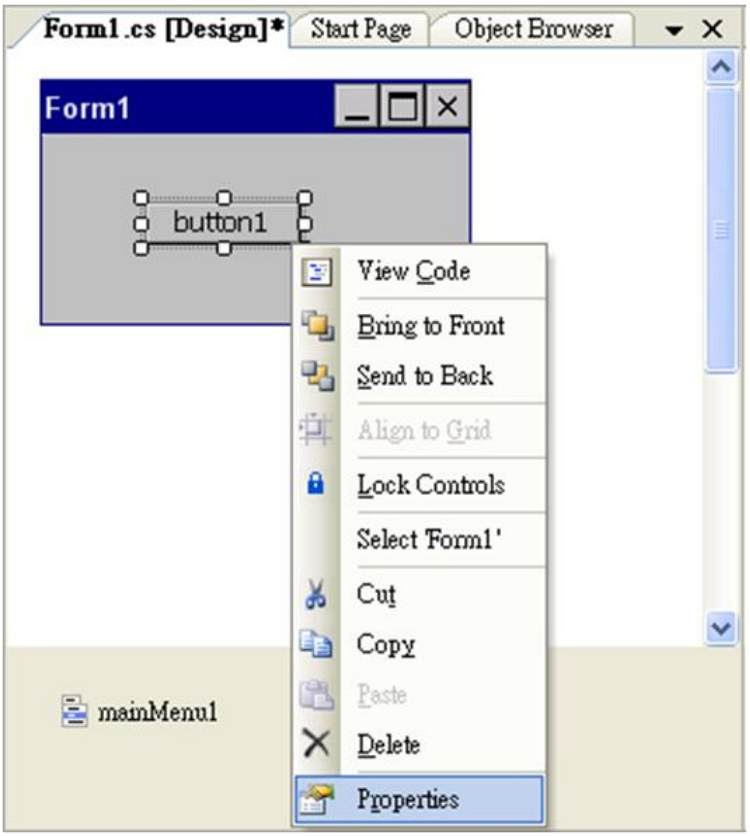
4.5.3. Design and Build an application program

Step 1: **Add a "button" object in the "From1" dialog box**

Step 2: Right-click the "button" object and click the "Properties" command



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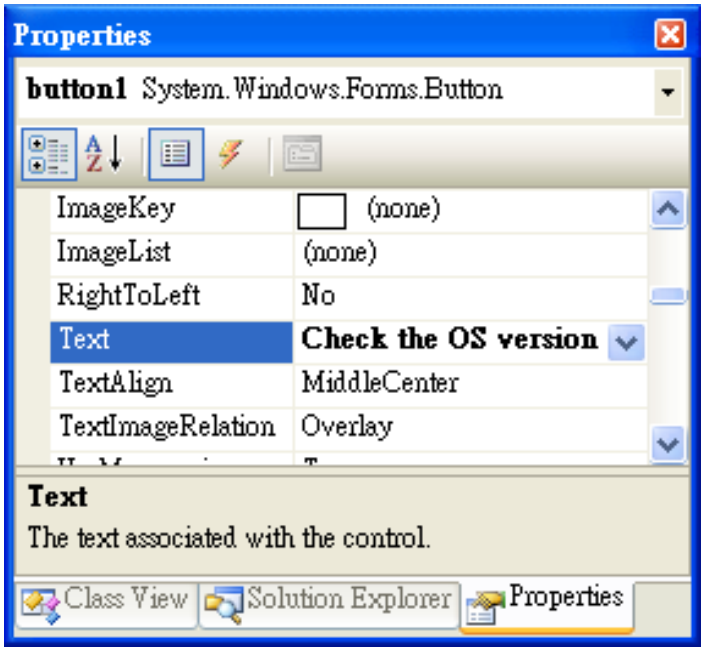
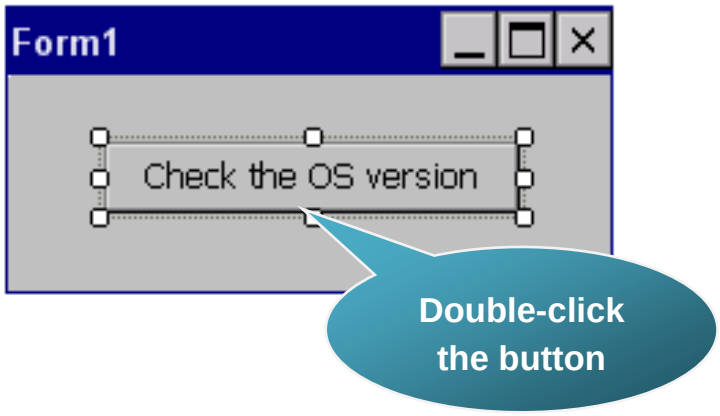
Step 3: On the “Properties” window, type “Check the OS version” in the “Text” edit box



Step 4: In the “Form1” dialog box, double-click the button” object to open the editor window



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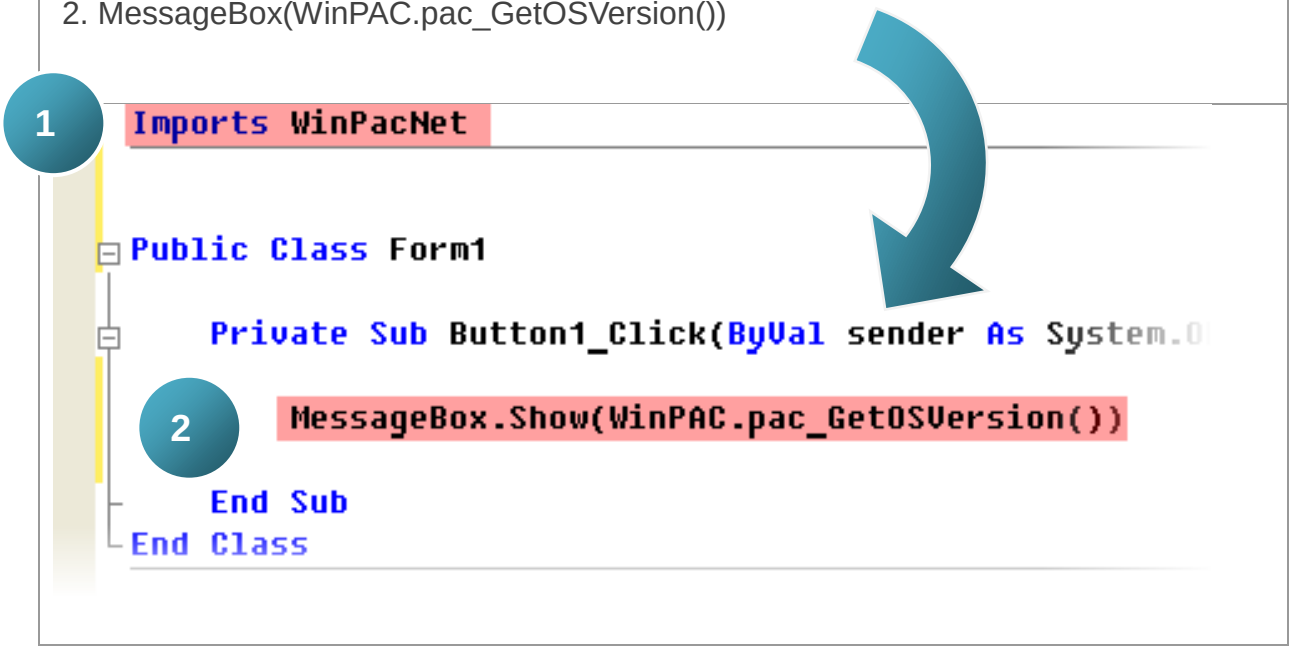
Step 5: Insert the following code in the Editor Window

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



Tips & Warnings

The “WinPacNet” of “Imports WinPacNet” is case- sensitive

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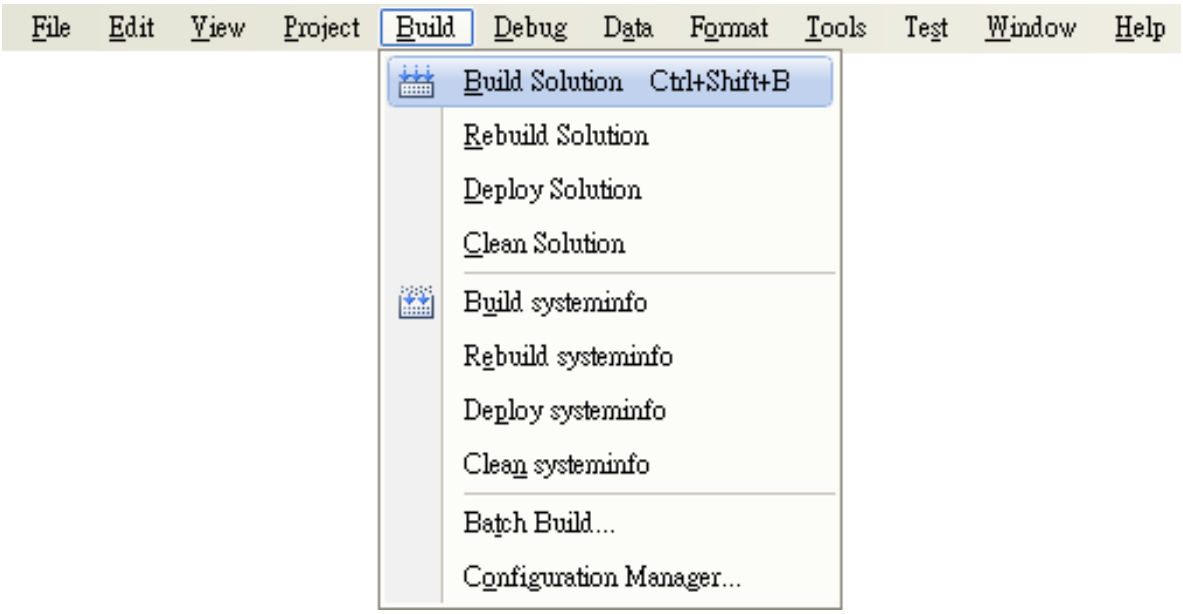
4.5.4. Execute the application on the WinPAC

Step 1: On the “Build” menu, click the “Build Solution” command-



Step 2: Open the web browser and type the IP address to connect the FTP server of WinPAC

Step 3: Upload the “systeminfo.exe” application and the corresponding “Winpacnet.dll” file to the WinPAC via the WinPAC FTP server

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Tips & Warnings

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

Step 4: On the WinPAC, execute the uploaded file

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4.6. Your First Program in eMbedded Visual C++

To create a demo program with eMbedded Visual C++ development tool includes the following main steps:

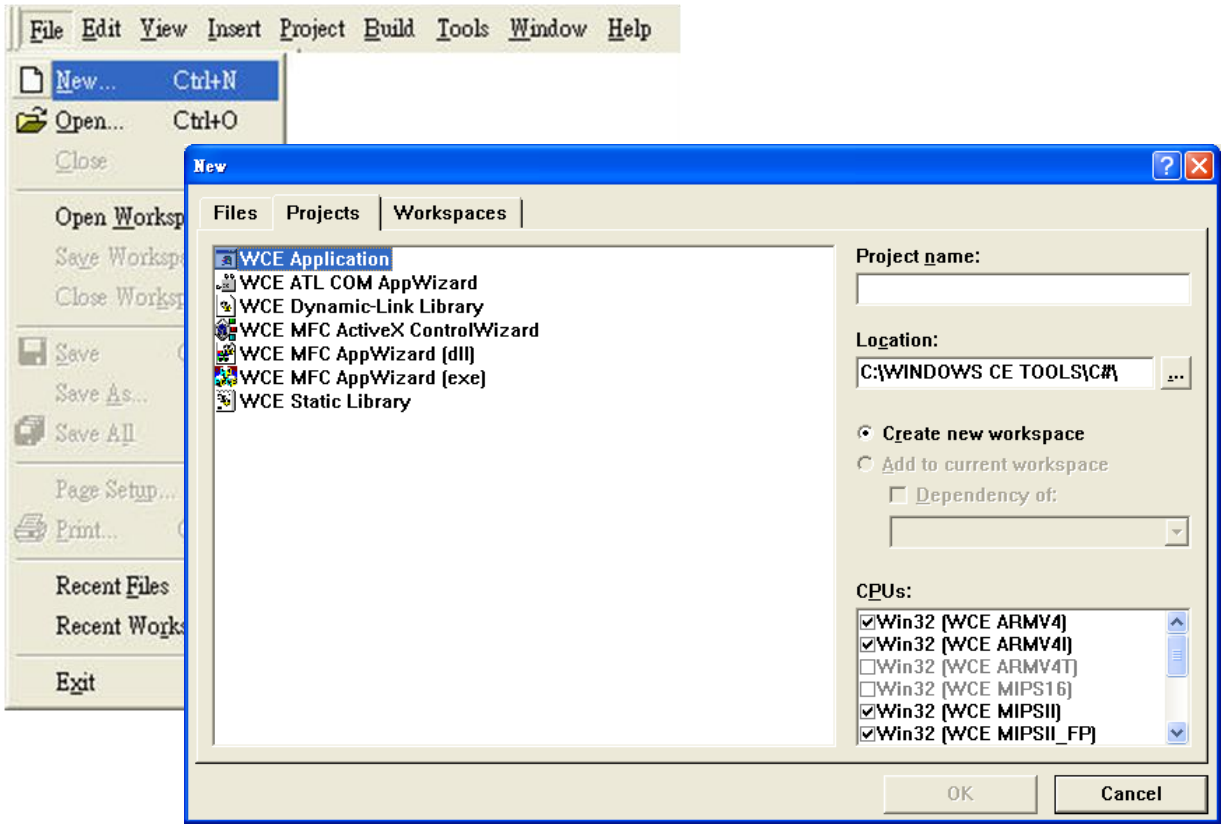
1. Create a new Forms-Based project
2. Configure compiler options
3. Design and Build an application program
4. Execute the application on the WinPAC

All main steps will be described in the following subsection.

4.6.1. Create a new Forms-Based project

Step 1: Start the Microsoft Embedded Visual C++

Step 2: From the “File” menu, click the “New” command



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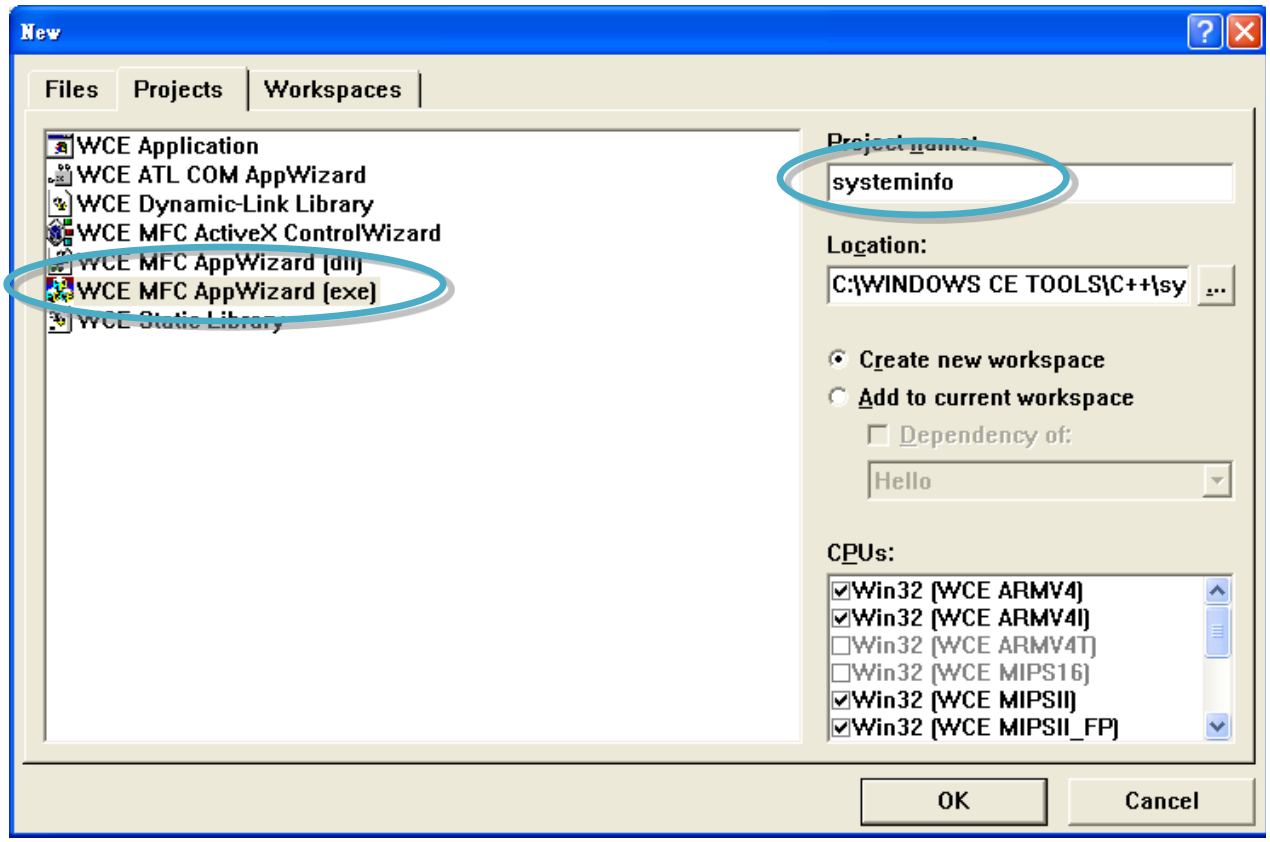
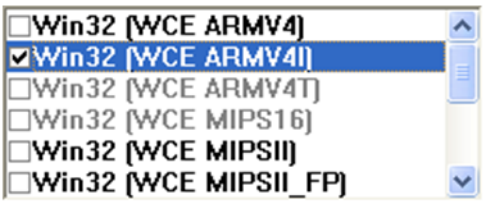
Step 3: In the “New” dialog, select the “Projects” tab and do the following in this order



Tips & Warnings

The selected CPU type must have “Win32 [WCE ARMV4I]”



Step 4: Click the “OK” button to start the wizard

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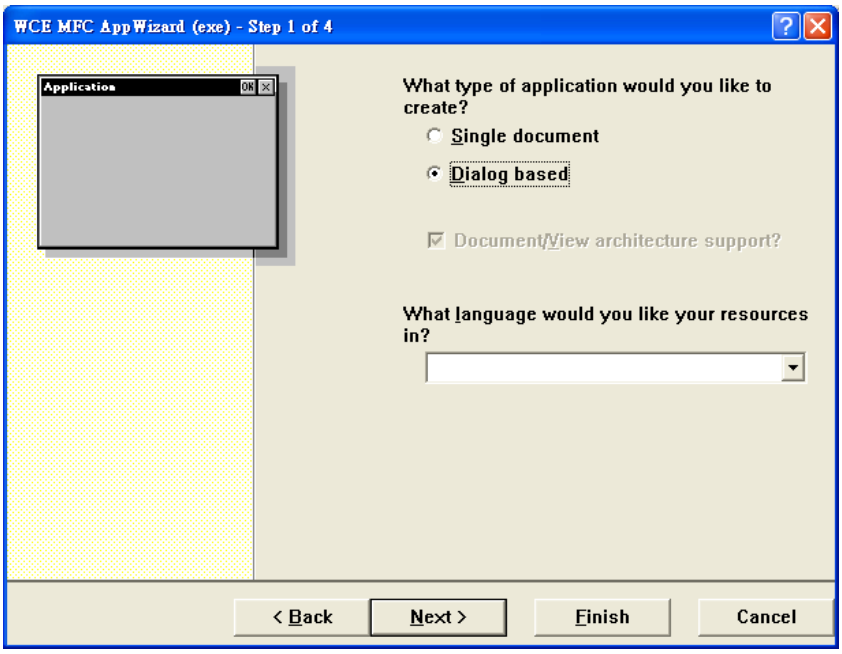
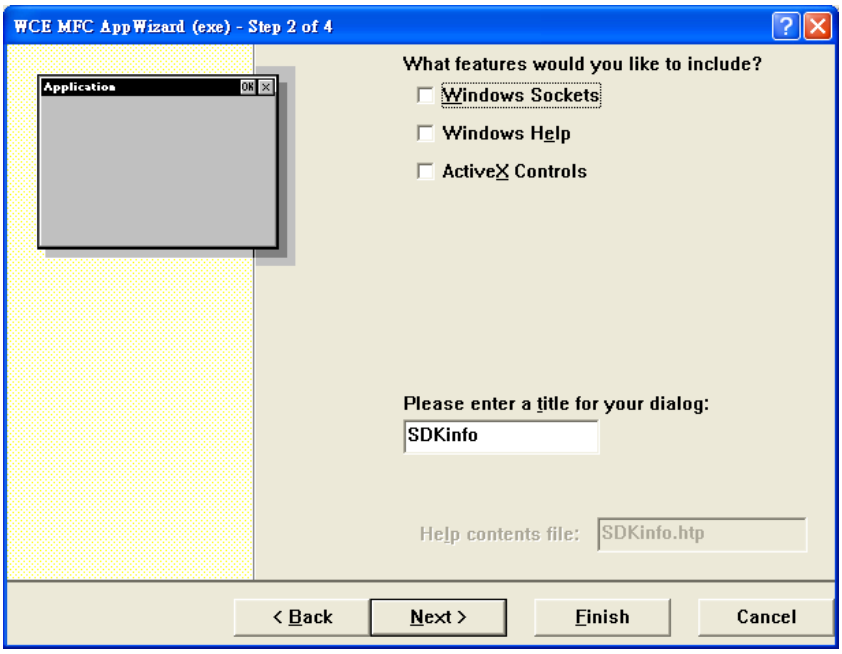
Step 5: On the first page of the wizard, select “Dialog based” option and then click the “Next” button to the next step



Step 6: On the next page of the wizard, leave all the options as they are, and then click the “Next” button to the next step



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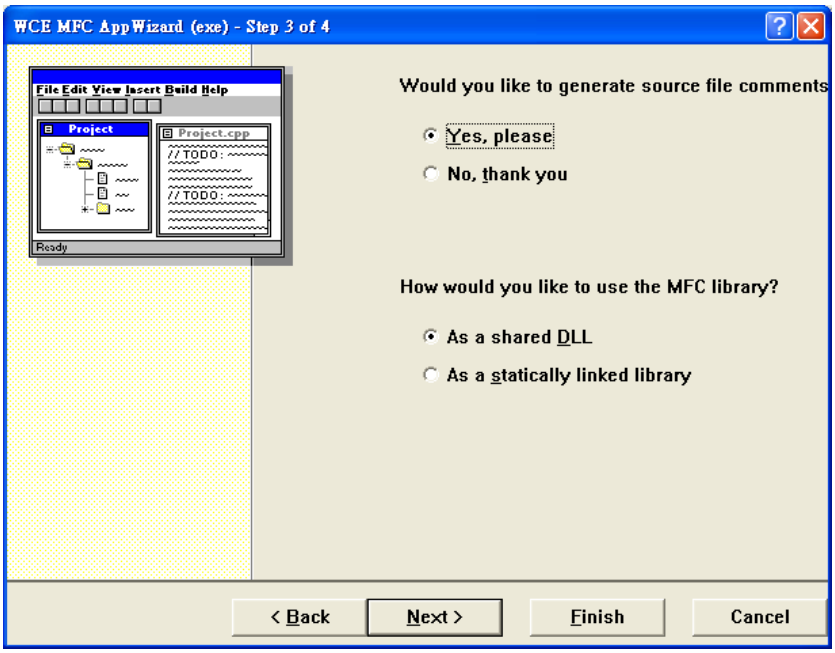
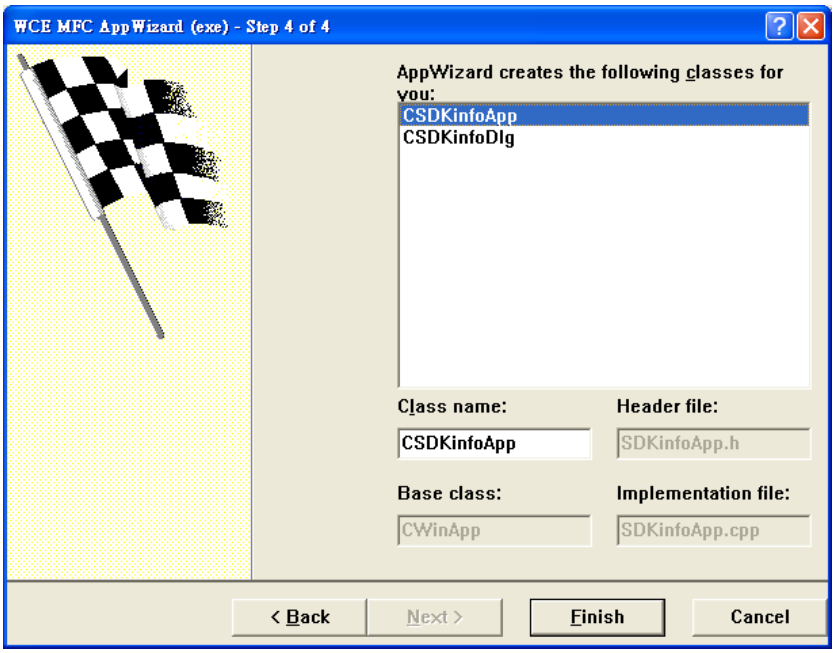
Step 7: On the next page of the wizard, leave all the options as they are, and then click the “Next” button to the next step



Step 8: On the next page of the wizard, leave all the options as they are, and then click the “Finish” button to complete the wizard



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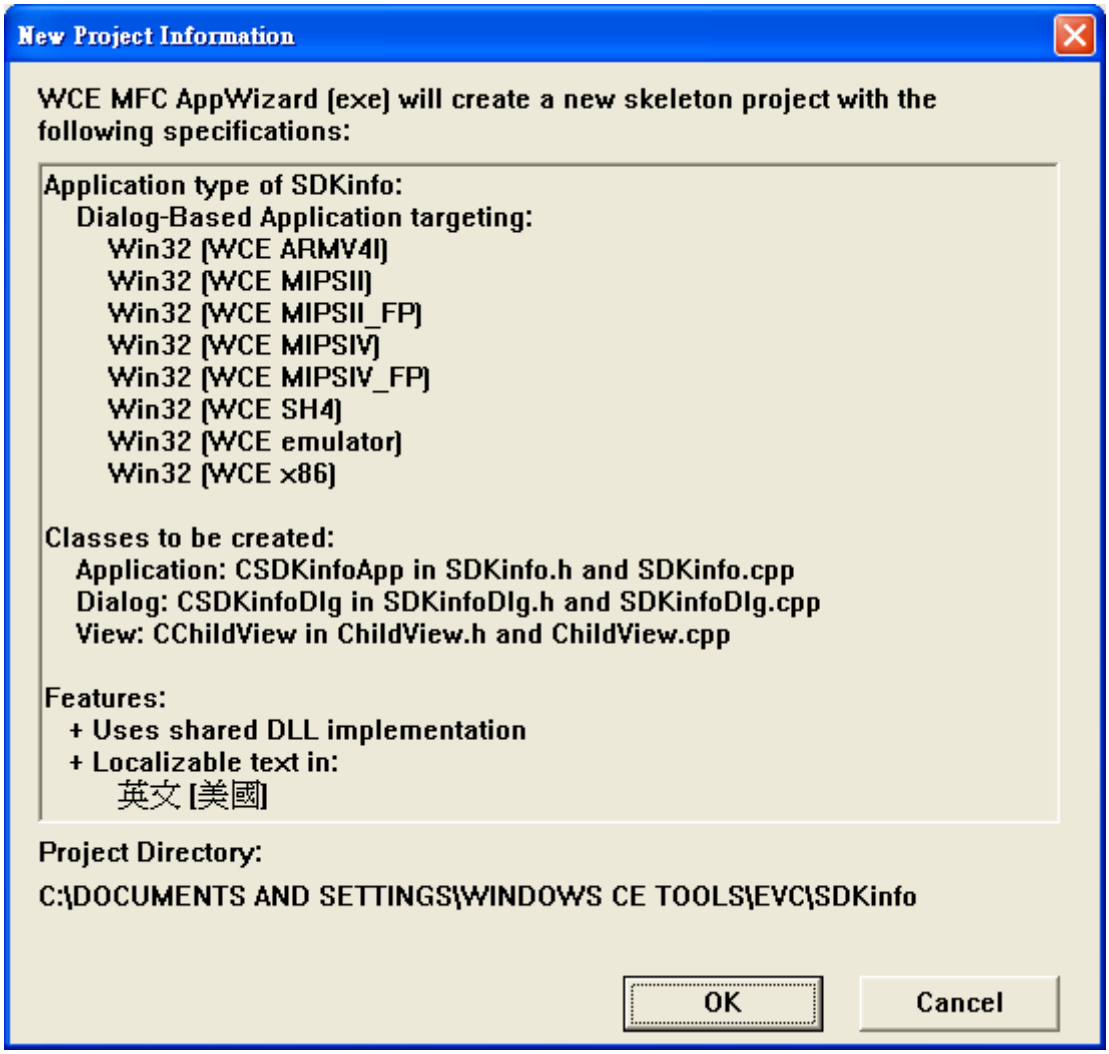
Step 9: The final summary appears, click the “OK” button to exit the wizard



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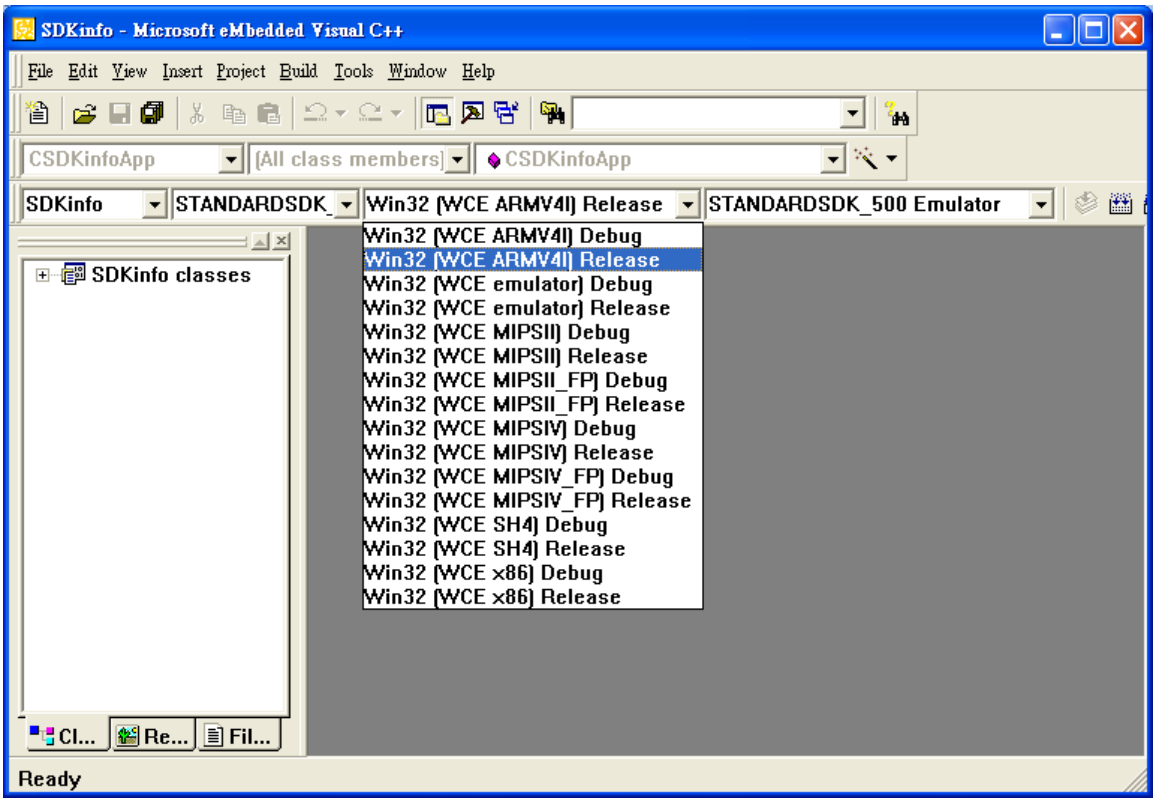
4.6.2. Configure compiler options

On the WCE configuration toolbar, select the “Win32 [WCE ARMV4] Release”



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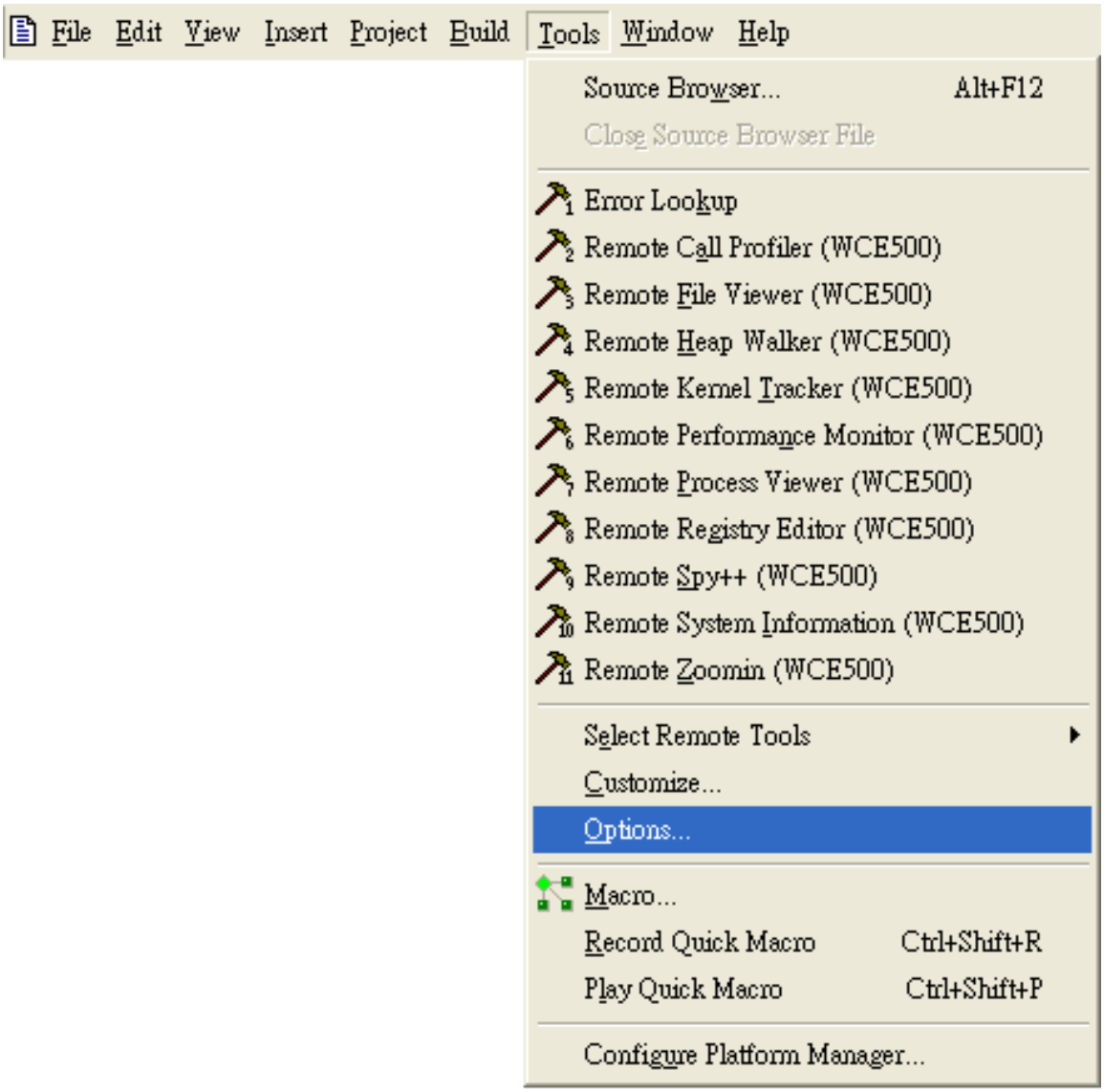
4.6.3. Specify the path for project reference

Step 1: Click the “Options…” command from the “Tools” menu



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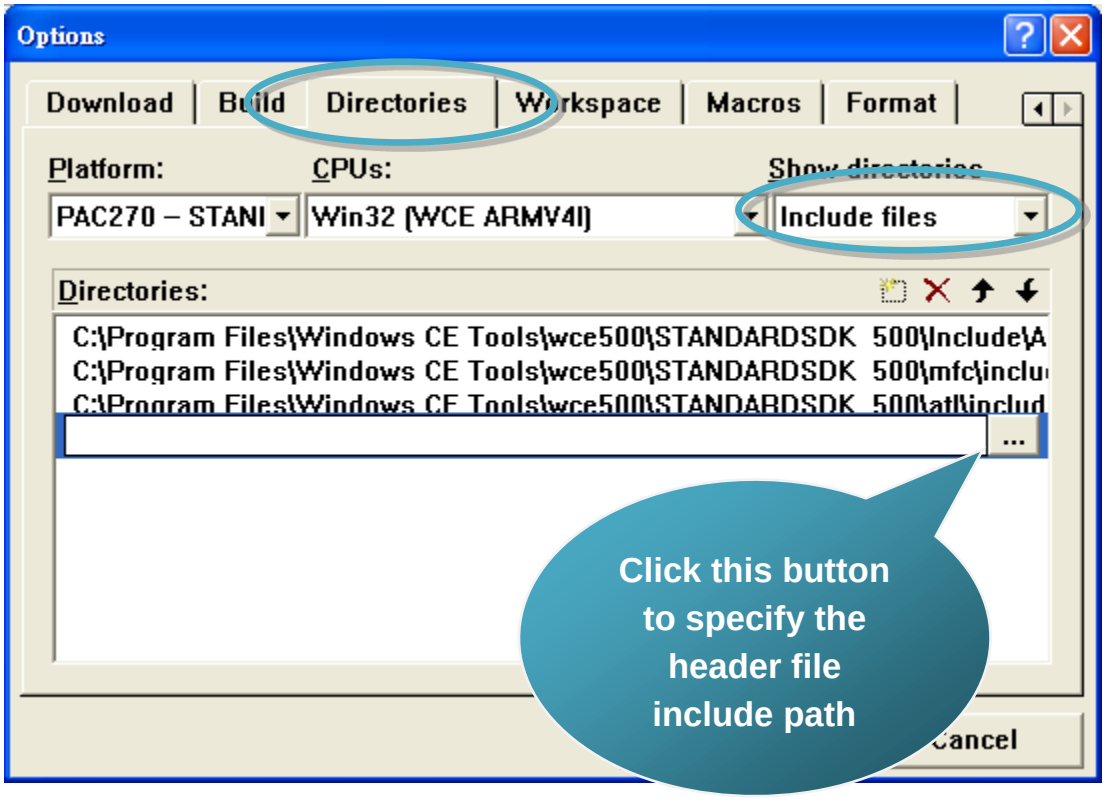
Step 2: In the “Option” dialog, select the “Directories” tab and do the following in this order to specify the header file include path

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

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



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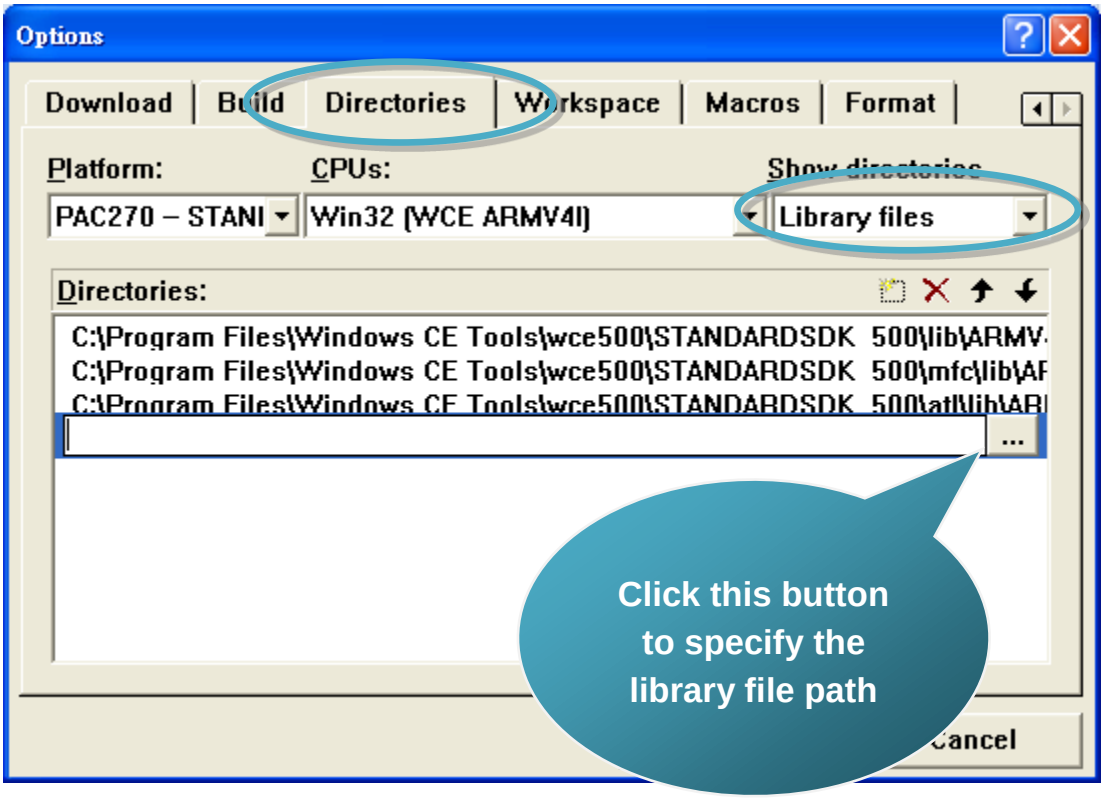
Step 3: In the “Option” dialog, select the “Directories” tab and do the following in this order to specify the library file path

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

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



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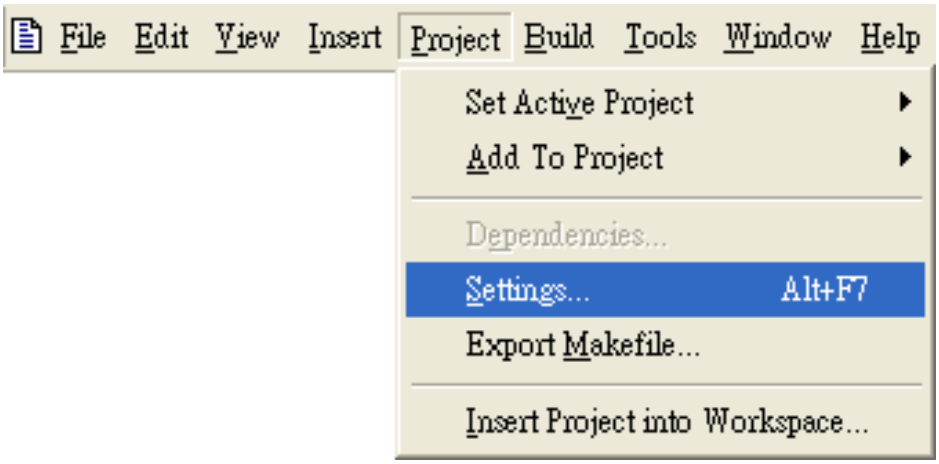
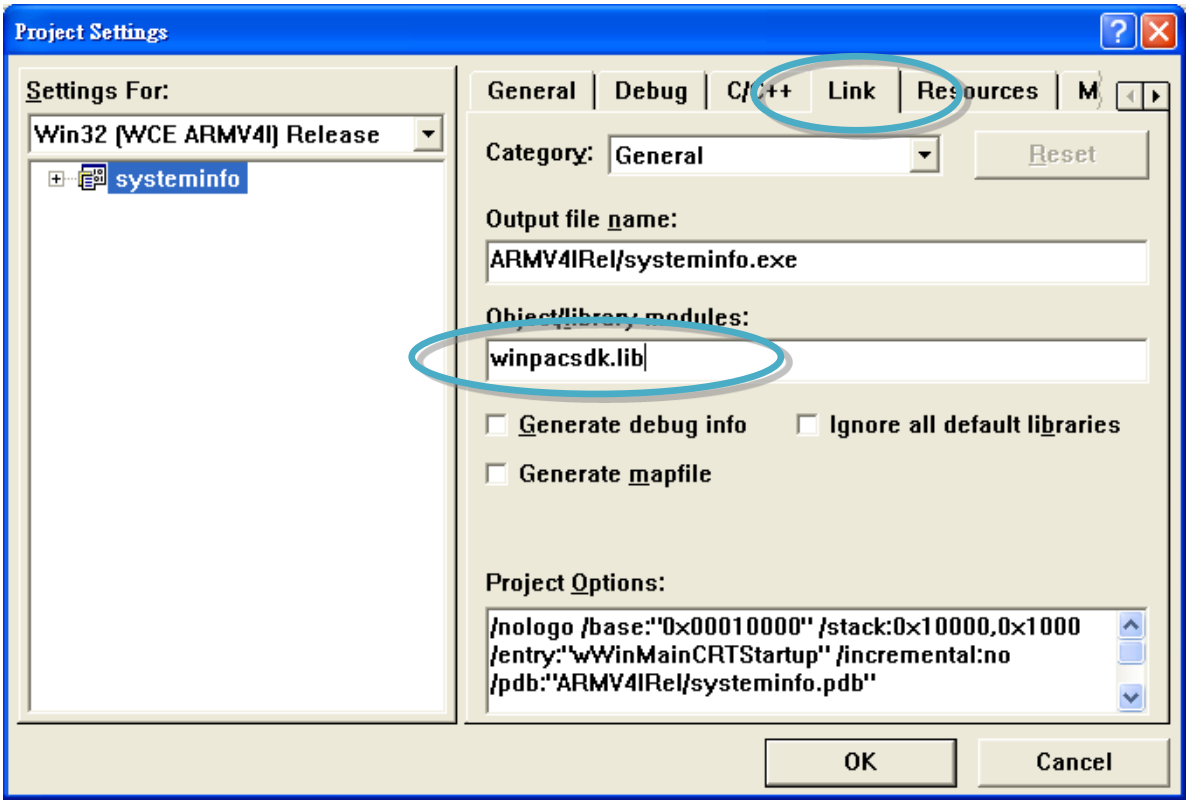
Step 4: Click the “Settings…” command from the “Project” menu



Step 5: In the “Project Settings” dialog box do the following in this order



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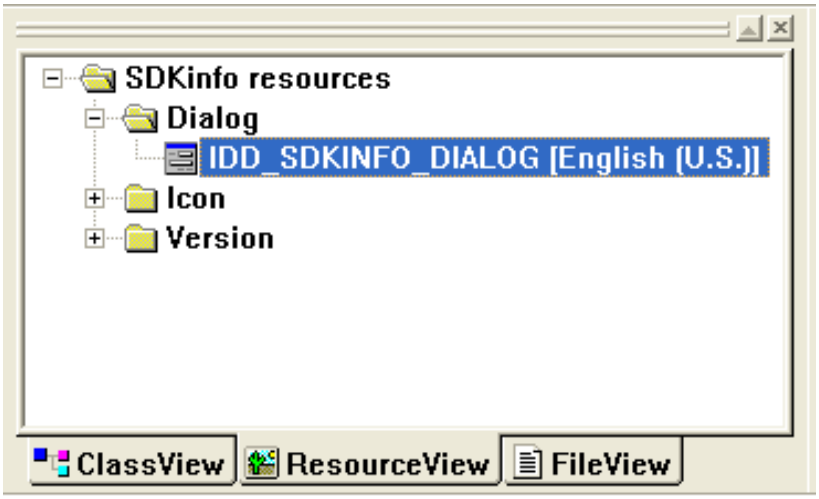
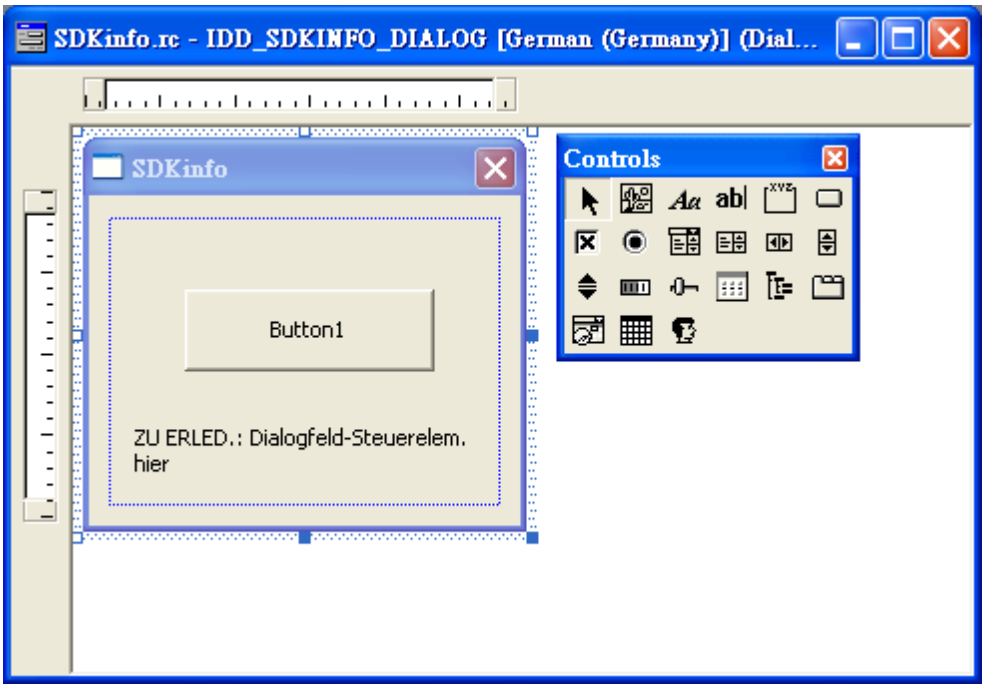
4.6.4. Design and Build an application program

Step 1: On the "Workspace" window, select the "ResourceView" tab and expand the "dialog" folder, and then double-click the "IDD_DEMO_DIALOG" to open the dialog box



Step 2: Add the "button" object in the "systeminfo" dialog box



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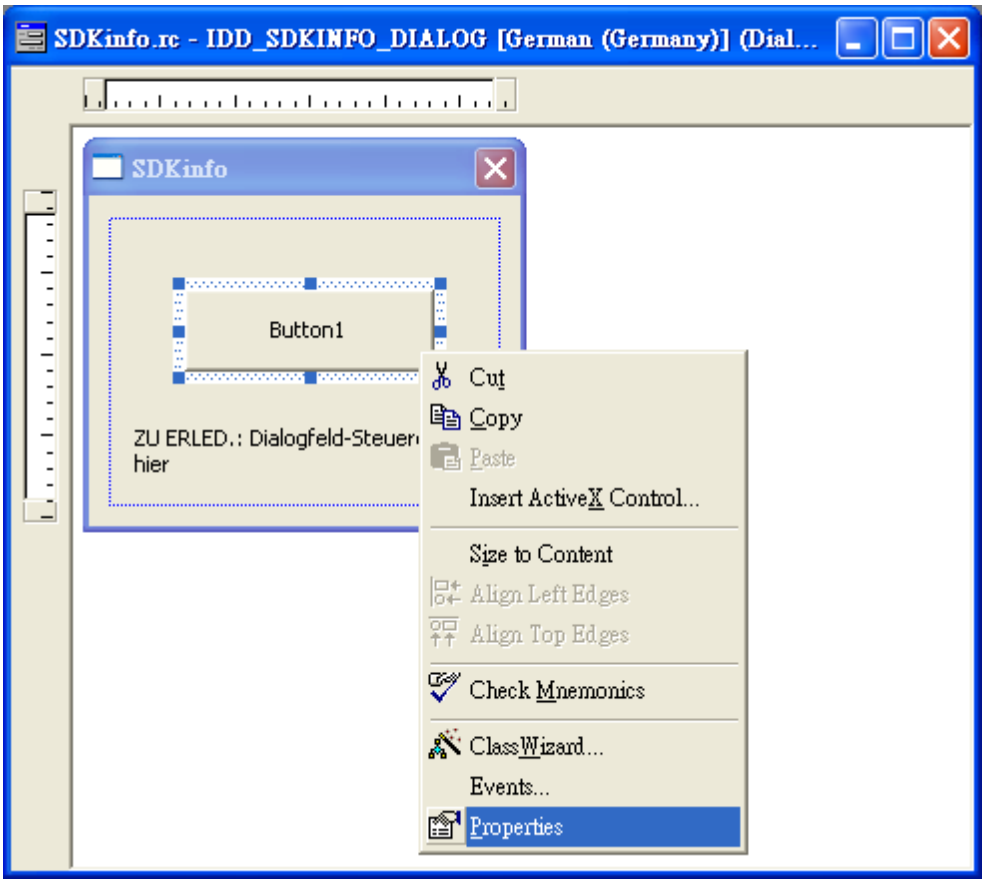
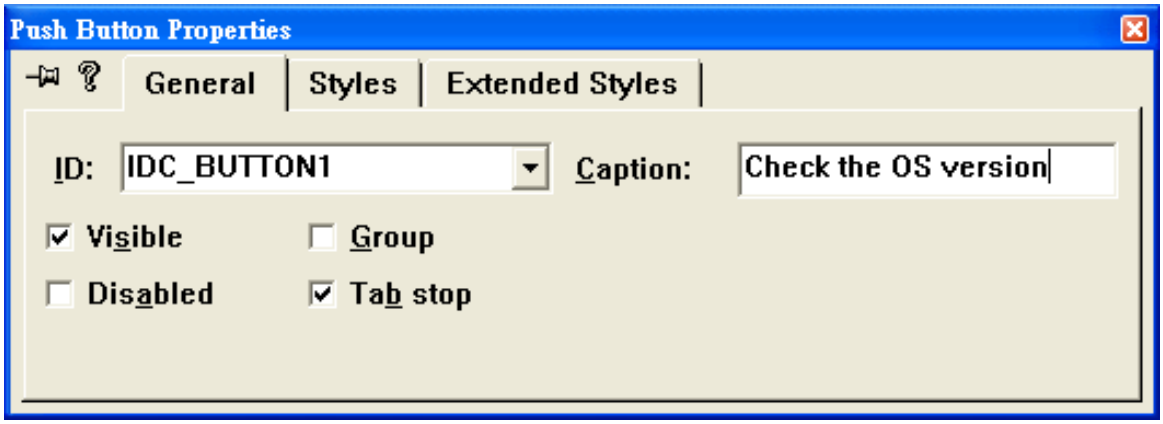
Step 3: In the “systeminfo” dialog box, right-click the button object and then click the “Properties” command



Step 4: Type the “Check the OS version” in the “Caption” edit box and then click **the “close” button**



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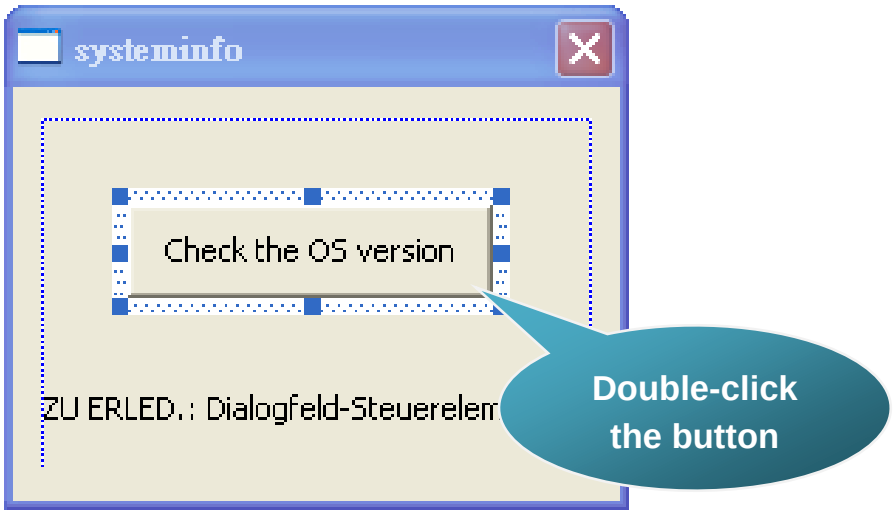
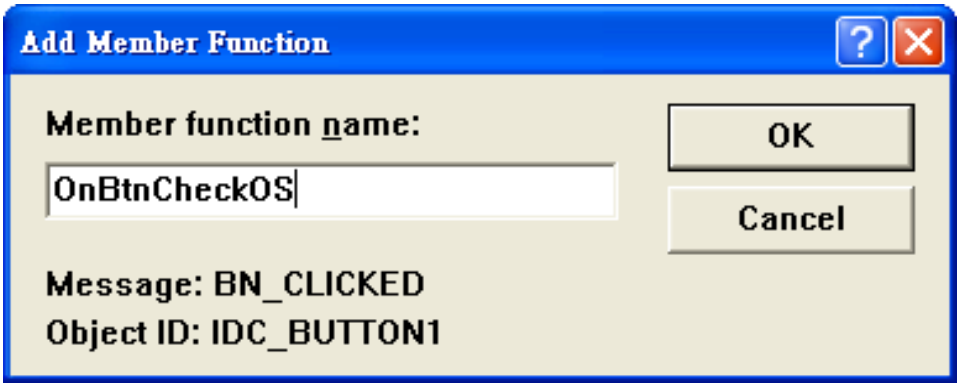
Step 5: In the “systeminfo” dialog box, double-Click the button object



Step 6: Type the “OnBtnCheckOS” in the “Member function name” edit box and then click the “OK” button



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Step 7: Insert the following code into the Editor Window

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

```
    return TRUE;  // return TRUE  unless you
}



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 8: Insert the "#include "winpacsdk.h"" into the header area

```
#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

/////////////////////////////////////////////////////////////////////////////
// CSysteminfoDlg dialog
```


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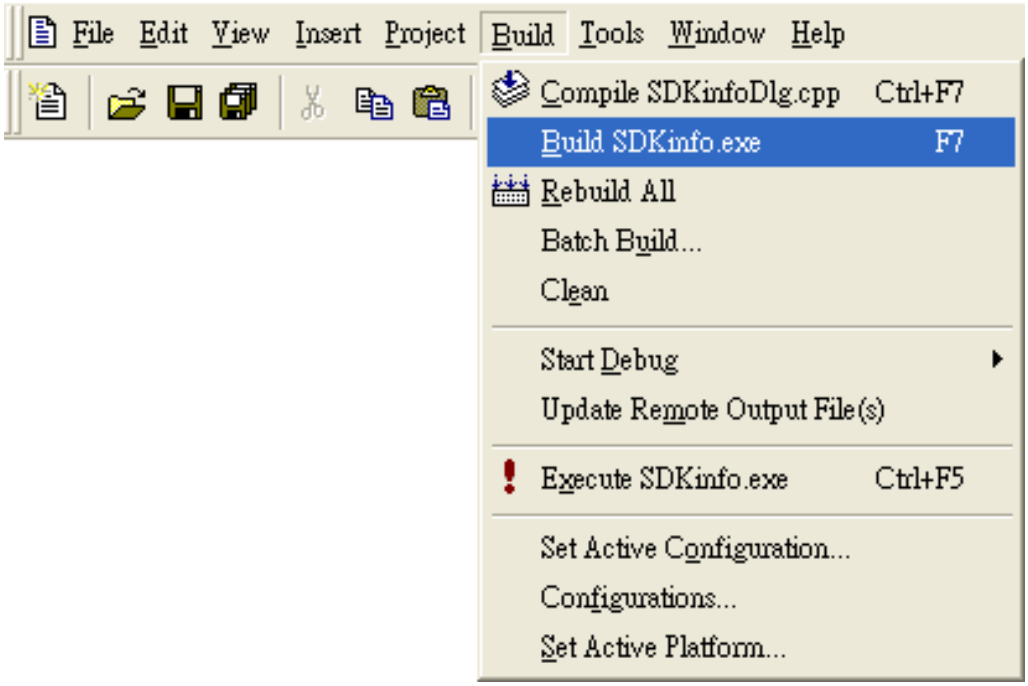
4.6.5. Execute the application program on WinPAC

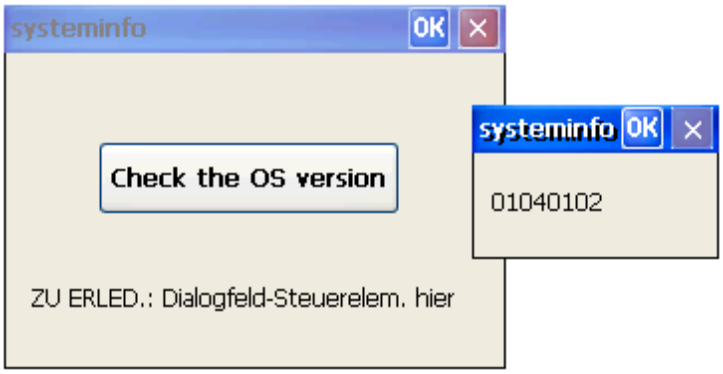
Step 1: On the “Build” menu, click the “Build systeminfo.exe” command



Step 2: Open the web browser and type the IP address to connect the FTP server of WinPAC

Step 3: Upload the “systeminfo.exe” application to the WinPAC via the WinPAC FTP server

Step 4: On the WinPAC, execute the uploaded file



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5. APIs and Demo References

This chapter introduces demo programs that have been designed for the WinPAC. You can examine the demo source code, which includes numerous comments, to familiarize yourself with the WinPAC API. This will allow developing your own applications quickly by modifying these demo programs. The following details the contents of the WinPAC demo programs.

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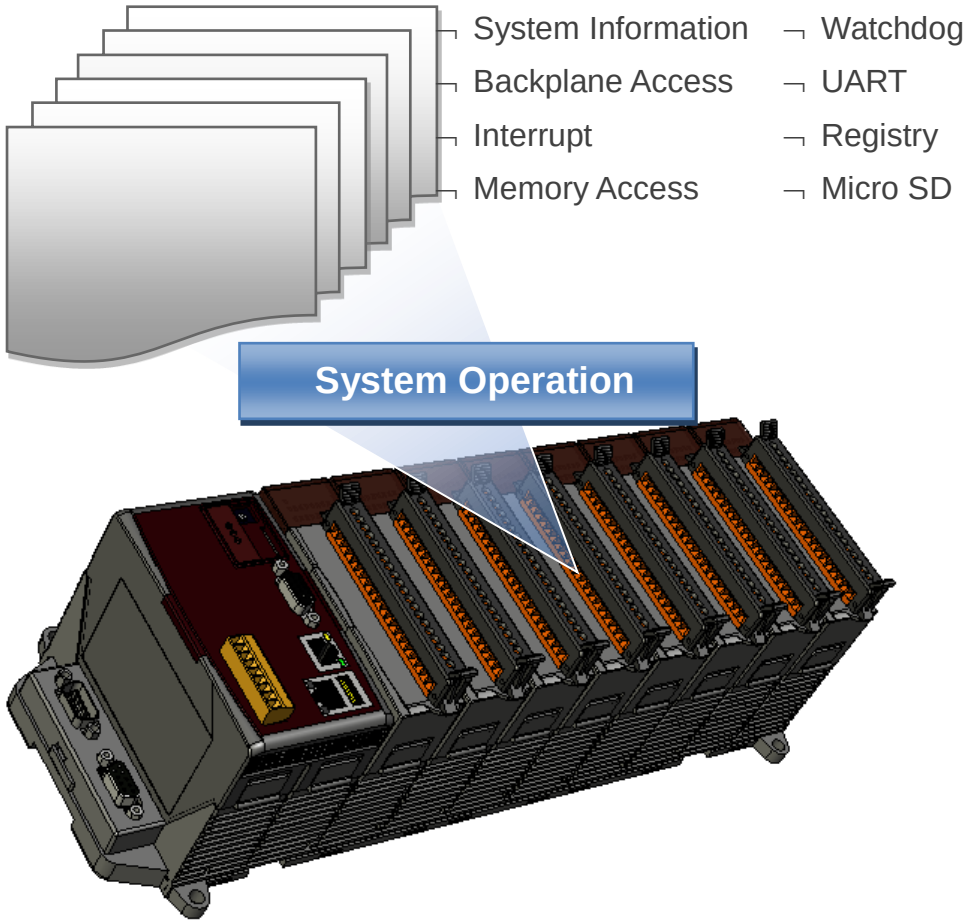
5.1. Demo programs with C#

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 demos that have been designed to demonstrate the standard operation features of the WinPAC.



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WinPAC Standard API:

Folder	Demo	Explanation
system	systeminfo	Retrieves information about the OS version, CPU version, SDK version, etc.
backplane	backplaneinfo	Retrieves information about the DIP switch, backplane ID and slot count.
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:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\DotNET\C#.NET\Standard\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/dotnet/c%23.net/standard/

- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\DotNET\C#.NET\Standard\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/dotnet/c%23.net/standard/

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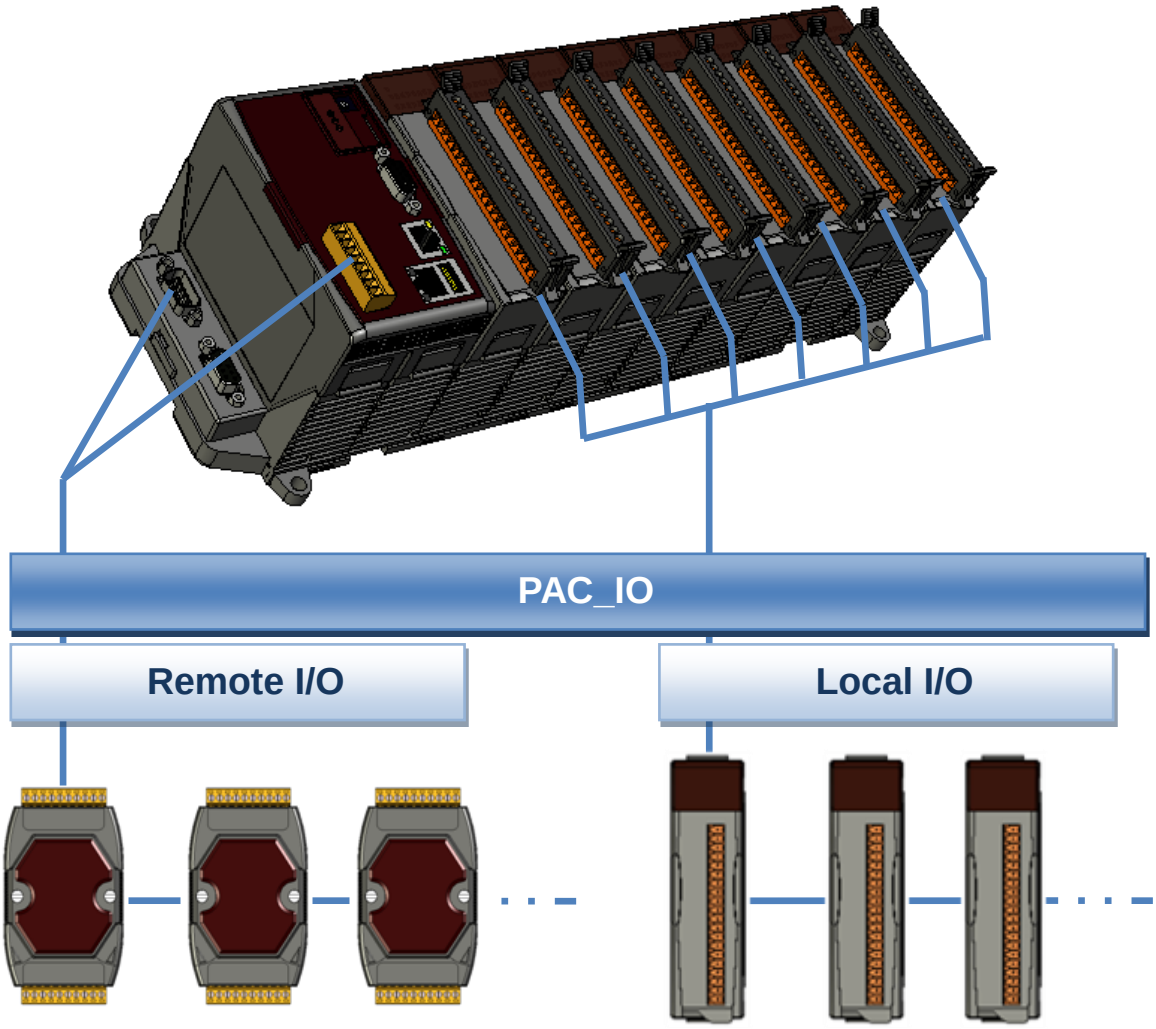
5.1.2. C# Demo programs for PAC IO API

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



PAC IO API:

Folder	Demo	Explanation
Local	find_io	Shows how to retrieve the module names and types which plugged in the WinPAC.
	8k_di	Shows how to read the DI values of DI module. This demo program is used by 8K series DI modules.
	8k_do	Shows how to write the DO values to DO module. This demo program is used by 8K series DO modules.

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Folder	Demo	Explanation
Remote	8k_dio	Shows how to read the DI and the DO values of the DIO module. This demo program is used by 8K series DIO modules.
	87k_basic	Shows how to send/receive a command/response application. This demo program is used by 87K series modules.
	87K_demo	Shows how use uart API and the IO modules located as slots. This demo program is used by 87K series modules.
	87k_ai	Shows how to read the AI values of AI module. This demo program is used by 87K series AI modules.
	87k_ao	Shows how to write the AO values to AO module. This demo program is used by 87K series AO modules.
	87k_di	Shows how to read the DI values of DI module. This demo program is used by 87K series DI modules.
	87k_do	Shows how to write the DO values to DO module. This demo program is used by 87K series DO modules.
	87k_dio	Shows how to read the DI and the DO values of the DIO module. This demo program is used by 87K series DIO modules.
	7k87k_basic	Shows how to send/receive a command/response application. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_ai	Shows how to read the AI values of AI module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_ao	Shows how to write the AO values to AO module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_di	Shows how to read the DI values of DI module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.

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Folder	Demo	Explanation
	7k87k_do	Shows how to write the DO values to DO module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_dio	Shows how to read the DI and the DO values of the DIO module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.

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

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\DotNET\C#.NET\PAC_IO\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/dotnet/c%23.net/pac_io/

- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\DotNET\C#.NET\PAC_IO\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/dotnet/c%23.net/pac_io/

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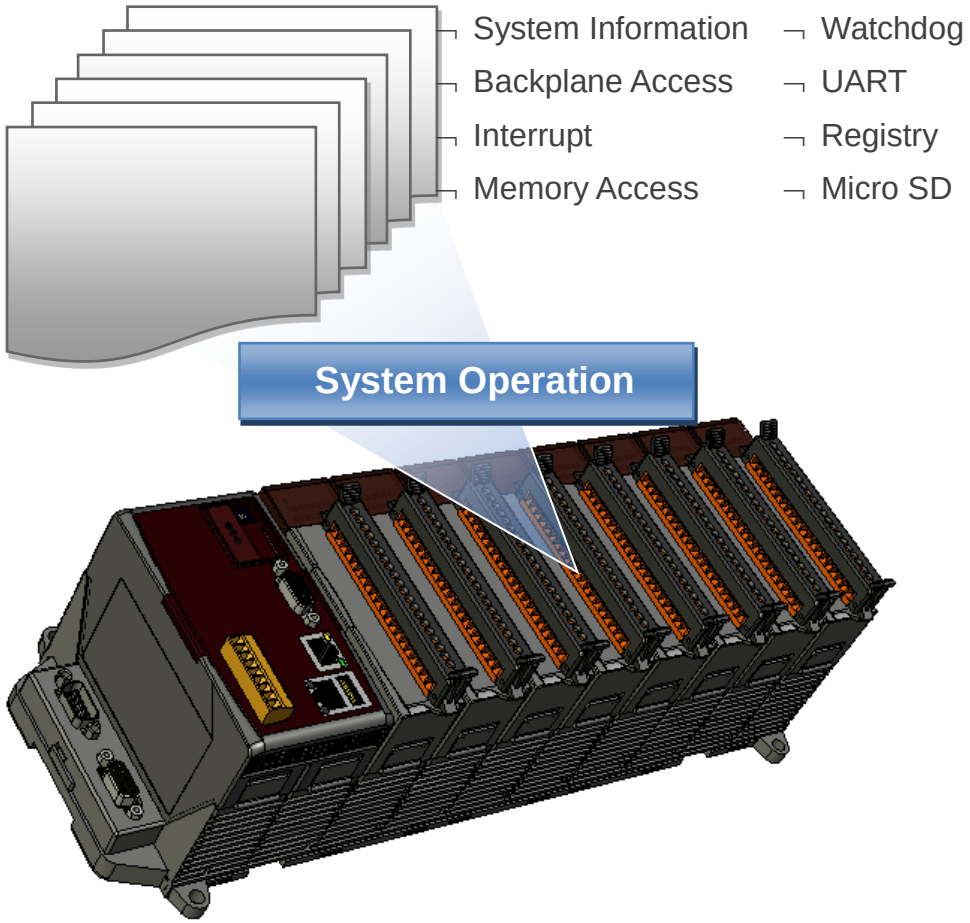
5.2. Demo Programs with eMbedded Visual C++

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 demos that have been designed to demonstrate the standard operation features of the WinPAC.



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WinPAC Standard API:

Folder	Demo	Explanation
system	Systeminfo	Retrieves information about the OS version, CPU version, SDK version, etc.
backplane	Backplaneinfo	Retrieves information about the DIP switch, backplane ID and slot count.
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 eVC application, these demo programs can be obtained from:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\eVCT\Standard\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/evc/standard/

- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\eVC\Standard\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/evc/standard/

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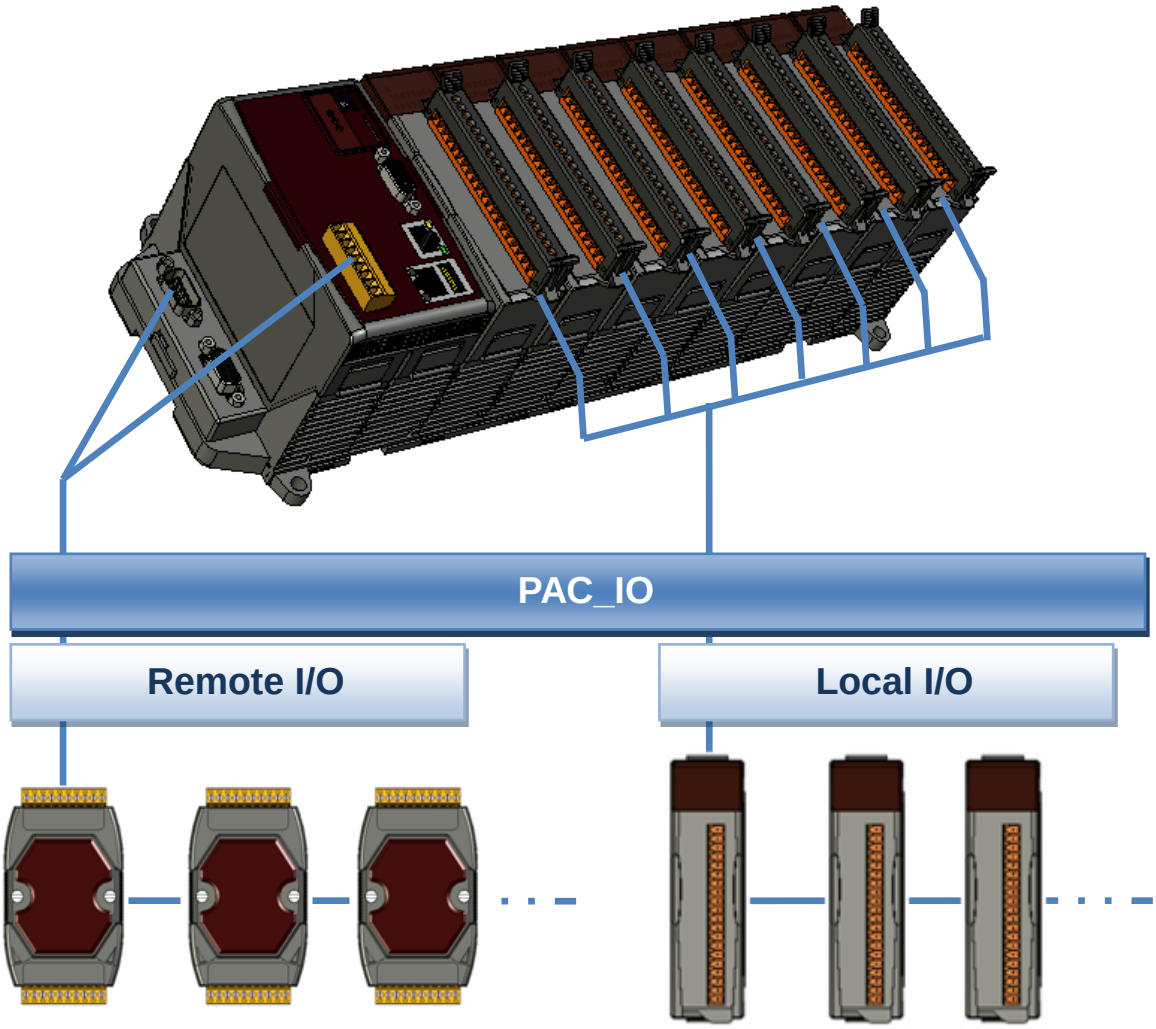
5.2.2. eVC Demo programs for PAC IO API

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



PAC IO API:

Folder	Demo	Explanation
Local	find_io	Shows how to retrieve the module names and types which plugged in the WinPAC.
	8k_di	Shows how to read the DI values of DI module. This demo program is used by 8K series DI modules.
	8k_do	Shows how to write the DO values to DO module. This demo program is used by 8K series DO modules.

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Folder	Demo	Explanation
Remote	8k_dio	Shows how to read the DI and the DO values of the DIO module. This demo program is used by 8K series DIO modules.
	87k_basic	Shows how to send/receive a command/response application. This demo program is used by 87K series modules.
	87K_demo	Shows how use uart API and the IO modules located as slots. This demo program is used by 87K series modules.
	87k_ai	Shows how to read the AI values of AI module. This demo program is used by 87K series AI modules.
	87k_ao	Shows how to write the AO values to AO module. This demo program is used by 87K series AO modules.
	87k_di	Shows how to read the DI values of DI module. This demo program is used by 87K series DI modules.
	87k_do	Shows how to write the DO values to DO module. This demo program is used by 87K series DO modules.
	87k_dio	Shows how to read the DI and the DO values of the DIO module. This demo program is used by 87K series DIO modules.
	7k87k_basic	Shows how to send/receive a command/response application. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_ai	Shows how to read the AI values of AI module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_ao	Shows how to write the AO values to AO module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_di	Shows how to read the DI values of DI module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.

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Folder	Demo	Explanation
	7k87k_do	Shows how to write the DO values to DO module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.
	7k87k_dio	Shows how to read the DI and the DO values of the DIO module. This demo program is used by 7K or 87K series AI modules which connected through a COM port.

For eVC application, these demo programs can be obtained from:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\eVC\PAC_IO\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/evc/pac_io/

- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\eVC\PAC_IO\
  ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/evc/pac_io/

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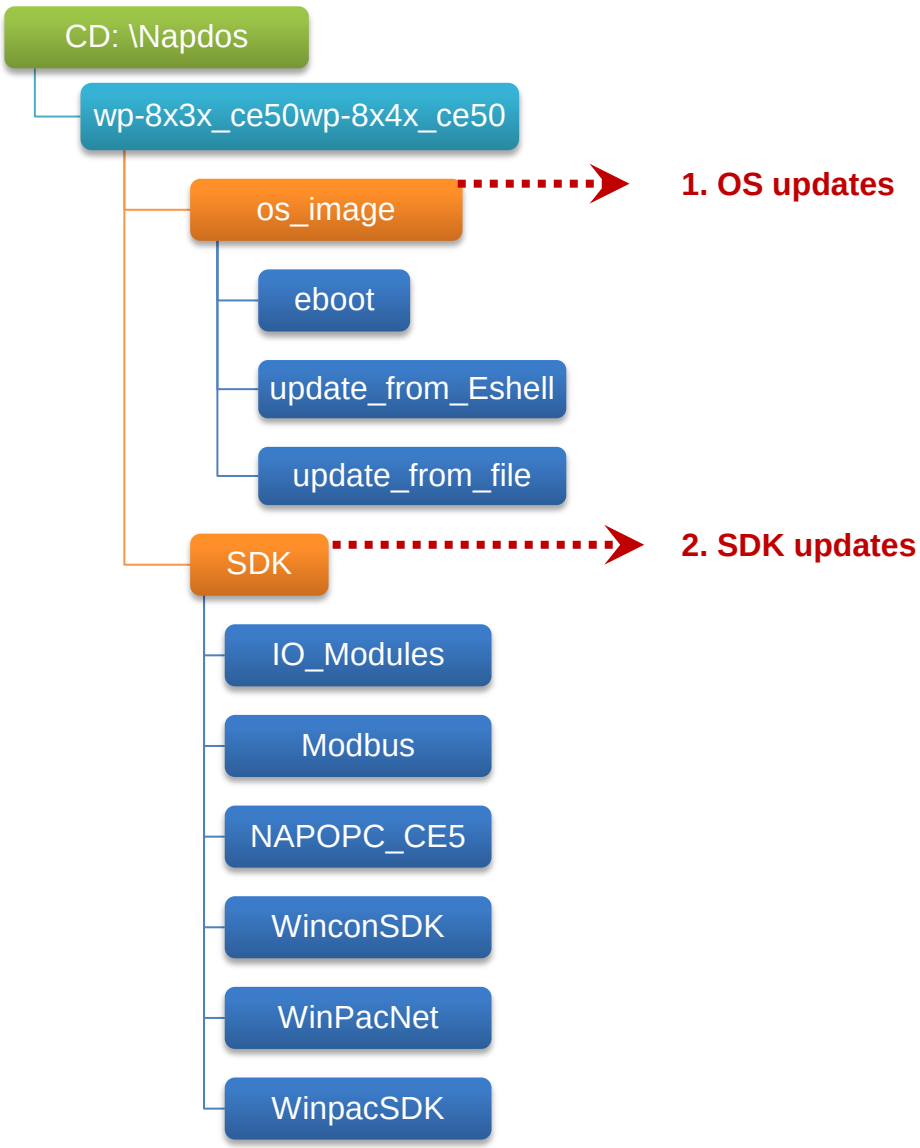
6. WinPAC Updates

This chapter provides instructions on how to upgrade WinPAC OS and SDK.

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

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



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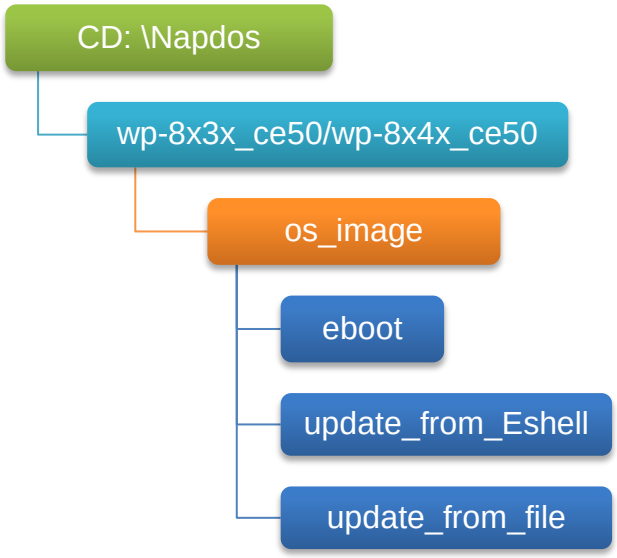
6.1. OS updates

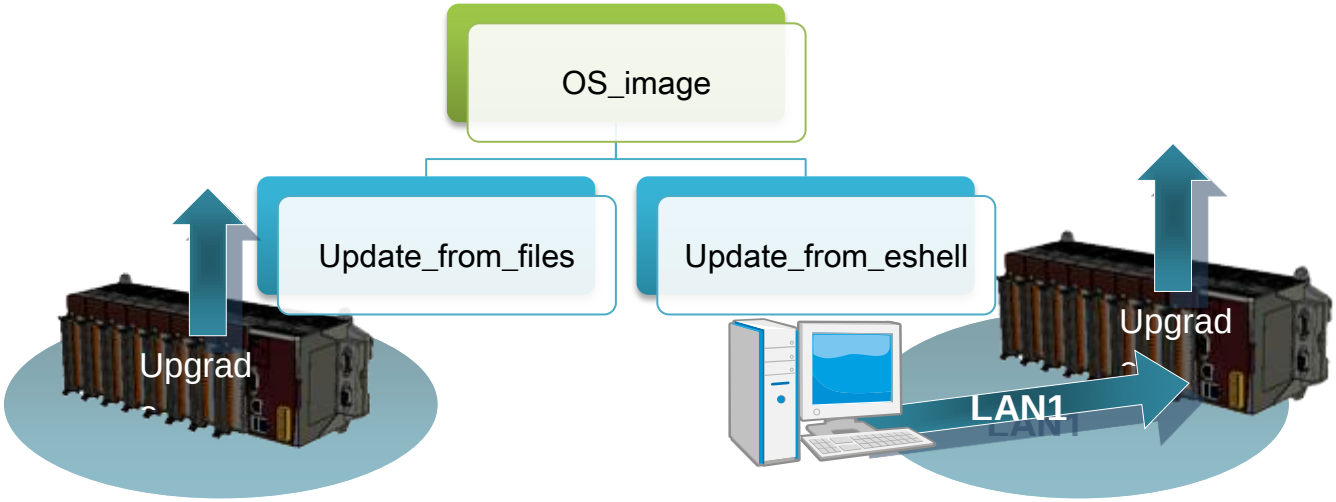
The updates files of OS image are located on:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\OS_Image\
- For WP-8x4x series
  CD:\Napdos\wp-8x4x_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)



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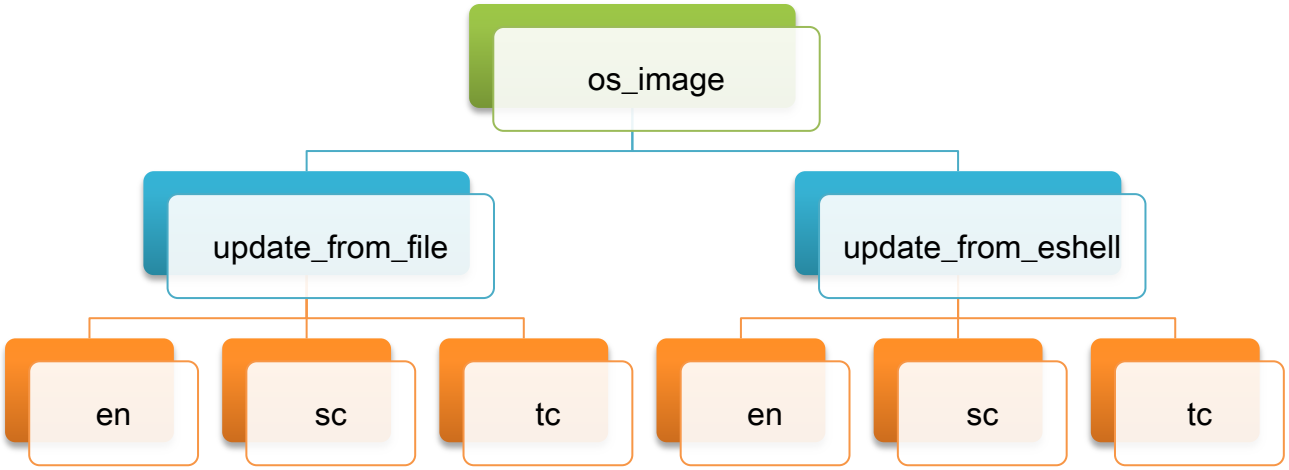
The WinPAC OS supports multi-language:

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



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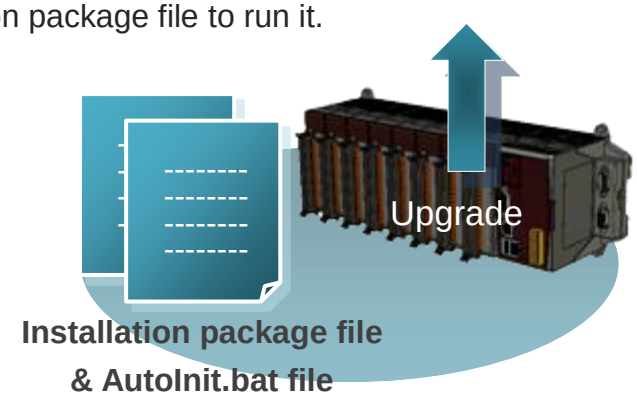
6.1.1. WinPAC OS updates using installation package file on WinPAC

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



Below is a step by step procedure for updating the WinPAC OS.

Step 1: Get the latest version of the installation package file and the corresponding “AutoInit.bat” file downloading to WinPAC

The latest version of the installation package file and the corresponding “AutoInit.bat” file can be obtained from:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\OS_Image\update_from_file\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/os_image/update_from_file/
- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\OS_Image\update_from_file\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/os_image/update_from_file/

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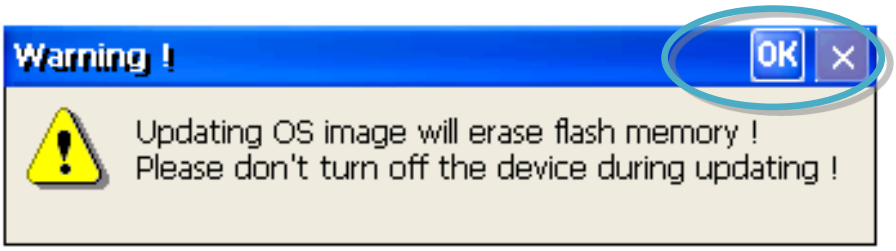
The corresponding “AutoInit.bat” file can be obtained from the same folder.

There are several ways to download the installation package file and the corresponding file to WinPAC:

i. On the WinPAC, you can download these files via Ethernet connection.
ii. On the PC, you can download these 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 ease flash memory



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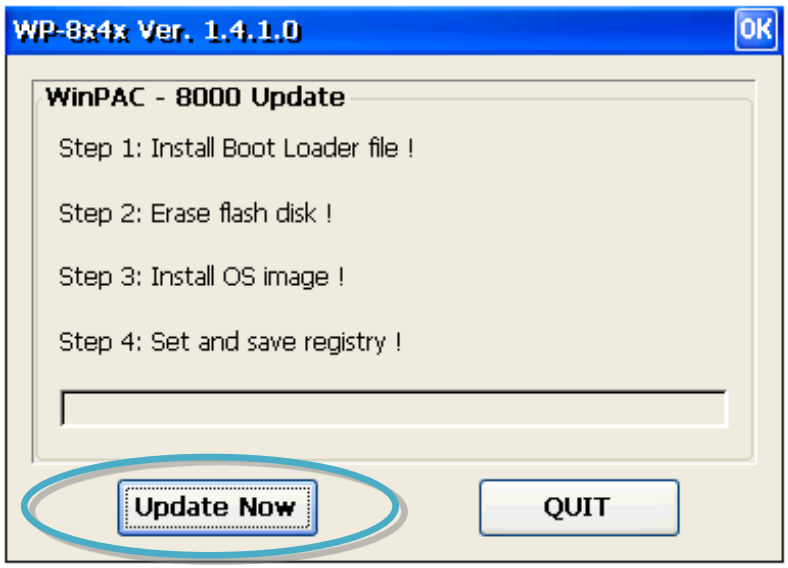
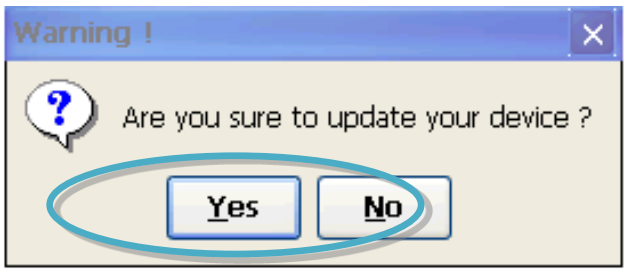
Step 3: Click “Update Now” to start the process



Step 4: Click “Yes” to make sure you ready to start the process



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

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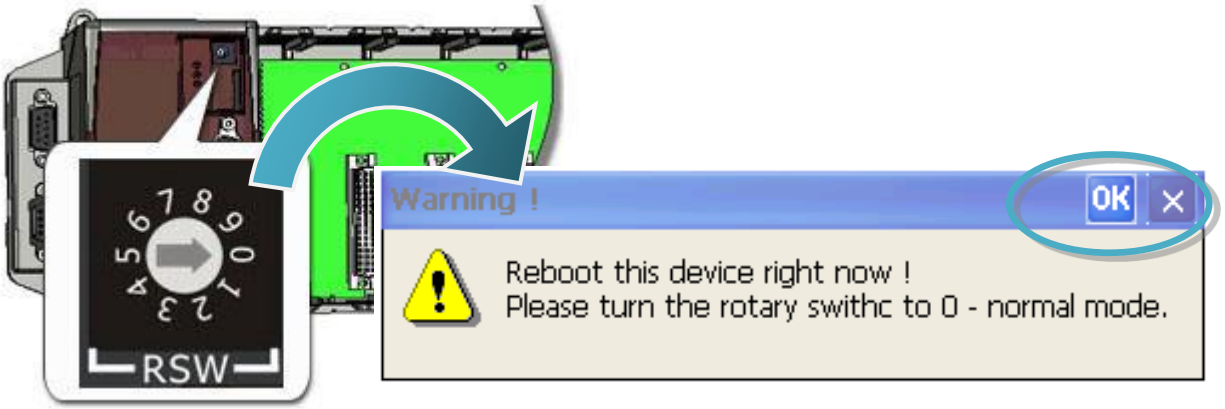
Tips & Warnings

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. If the update is cancelled before completion, the WinPAC 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: After completing the above-mentioned tasks, the "Warning !" dialog box will appear as follow, before clicking the "OK" button, you must first turn the rotary switch to the "0" position



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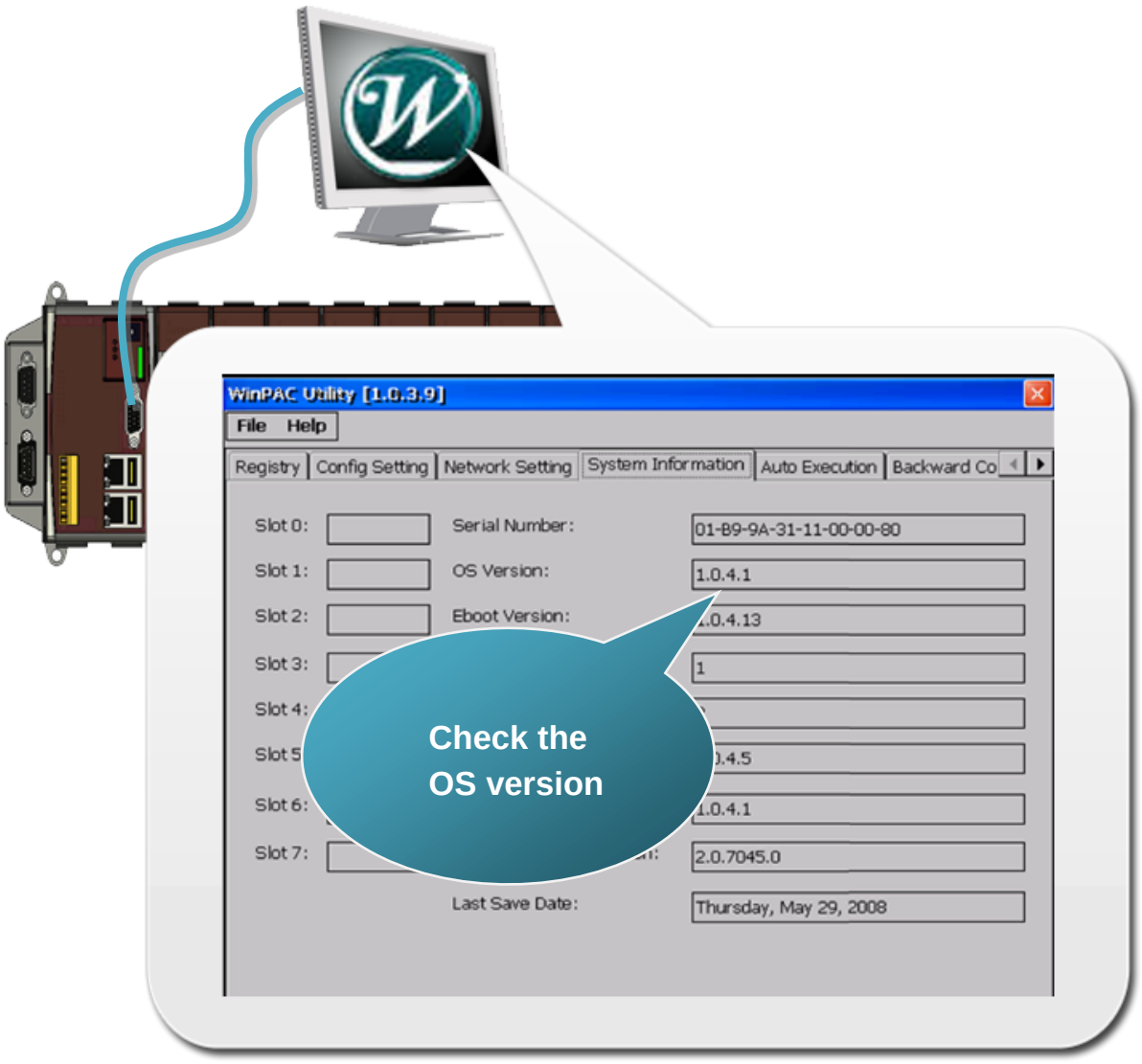
Step 6: Check the WinPAC OS version

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



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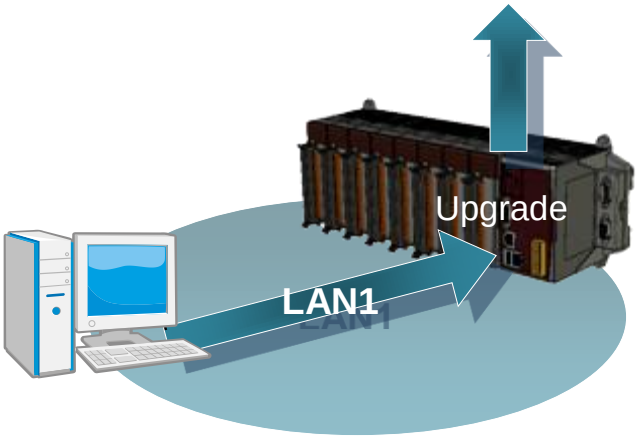
6.1.2. WinPAC OS updates using Eshell via Ethernet



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

Below is a step by step procedure for updating the WinPAC OS.

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

The latest version of the installation package can be obtained from:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\OS_Image\update_from_Eshell\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/os_image/update_from_Eshell/

- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\OS_Image\update_from_Eshell\
  http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/os_image/update_from_Eshell/

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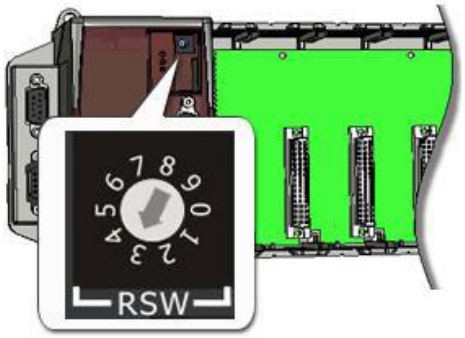
Step 2: Run the ESHELL on the PC

ESHELL you can be obtained at:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\PC_Tools\Eshell\
  ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x3x_ce50/pc_tools/eshell/
- For WP-8x4x series
  CD:\Napdos\wp-8x4x_ce50\PC_Tools\Eshell\
  ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x4x_ce50/pc_tools/eshell/

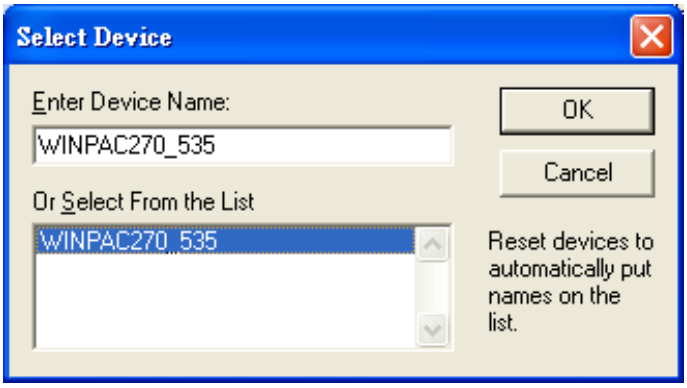
Step 3: Configure the reboot in OS update mode



Turn the rotary switch to “3”, and then reboot the WinPAC.

Step 4: Select the device which you want to update the OS image

After starting the ESHELL software, the “Select Device” dialog will appear, and then select the device which you want.



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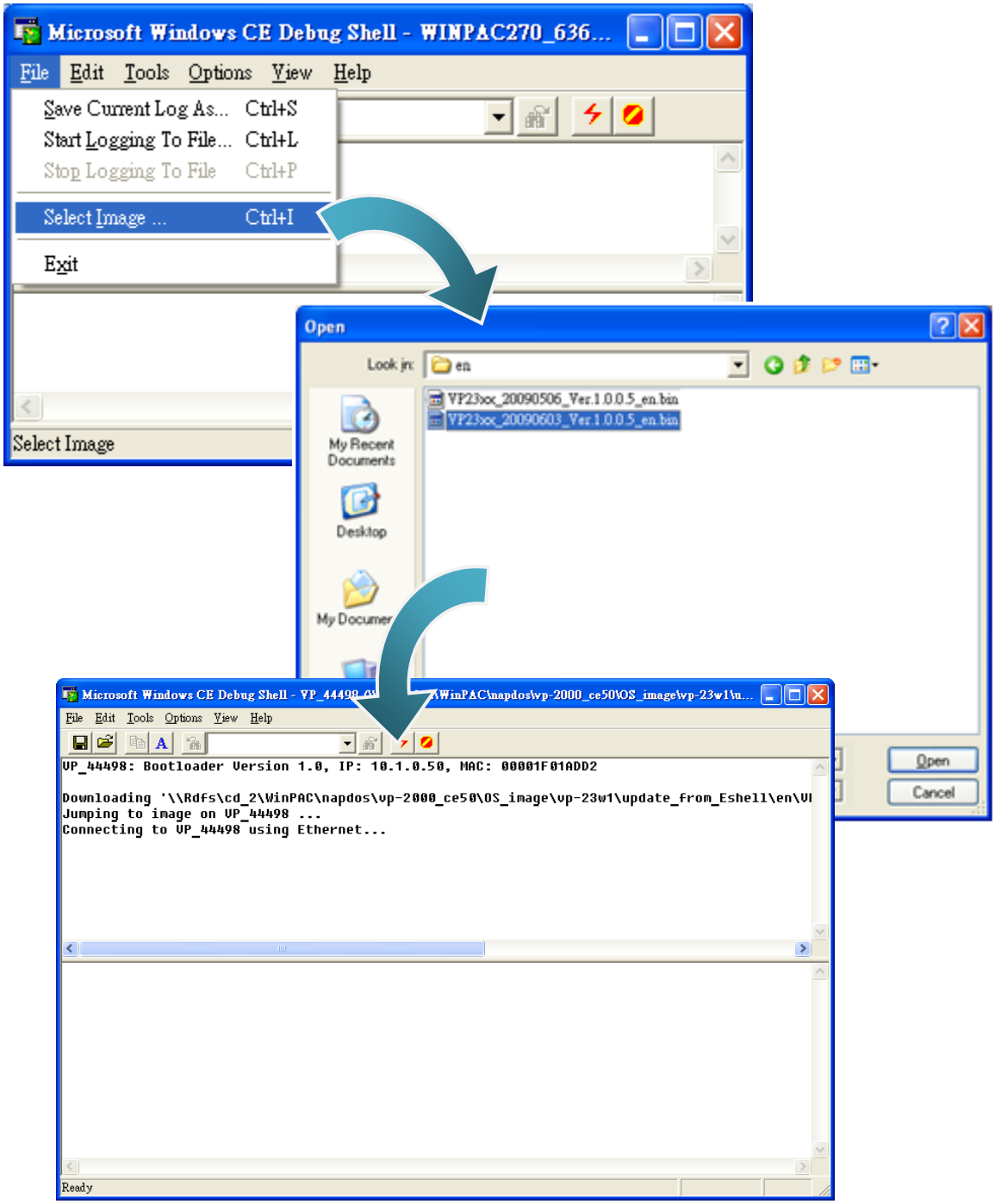
Step 5: Select the latest version of the OS image file



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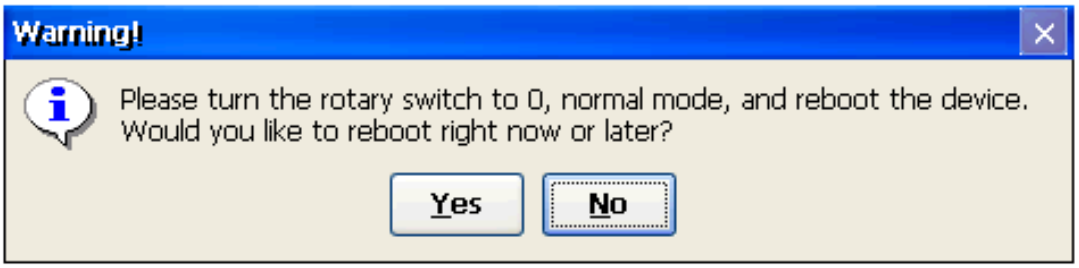
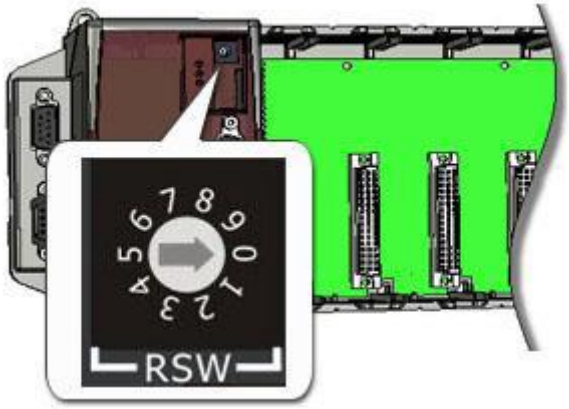
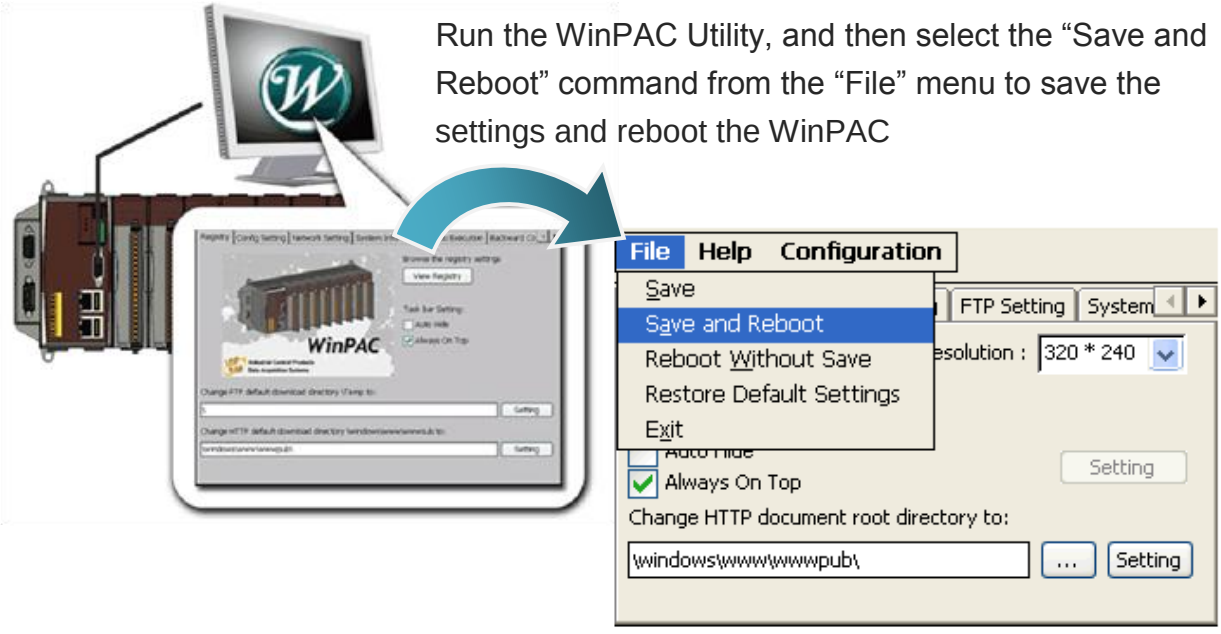
Step 6: Once the procedure is completed, the “Warning !” dialog box will Appear on WinPAC screen as below shown, click “No” to finish the process



Step 7: Configure the WinPAC to boot in normal mode



Step 8: Run the WinPAC Utility to save the settings and reboot the WinPAC



Run the WinPAC Utility, and then select the “Save and Reboot” command from the “File” menu to save the settings and reboot the WinPAC

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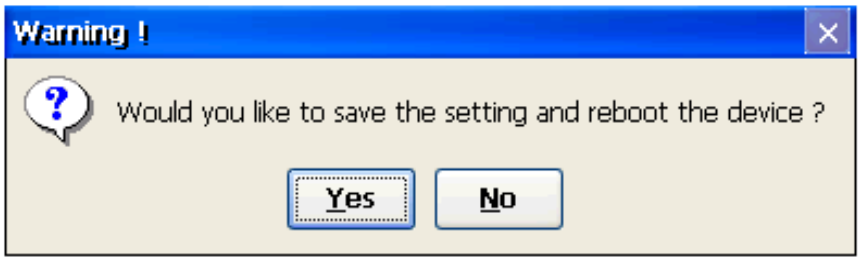
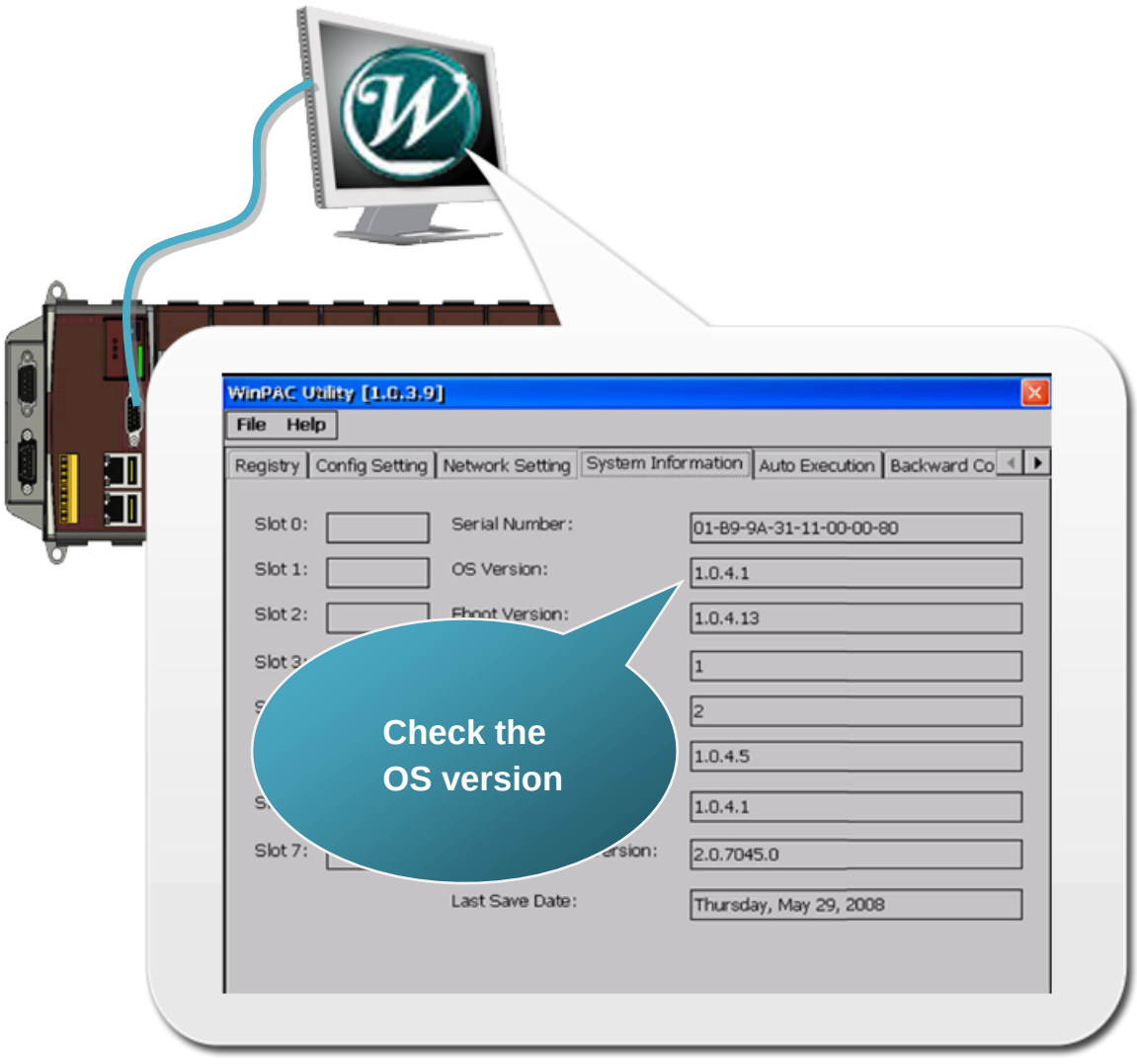
Step 9: Click “Yes” to reboot the WinPAC



Step 10: Check the WinPAC OS version

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



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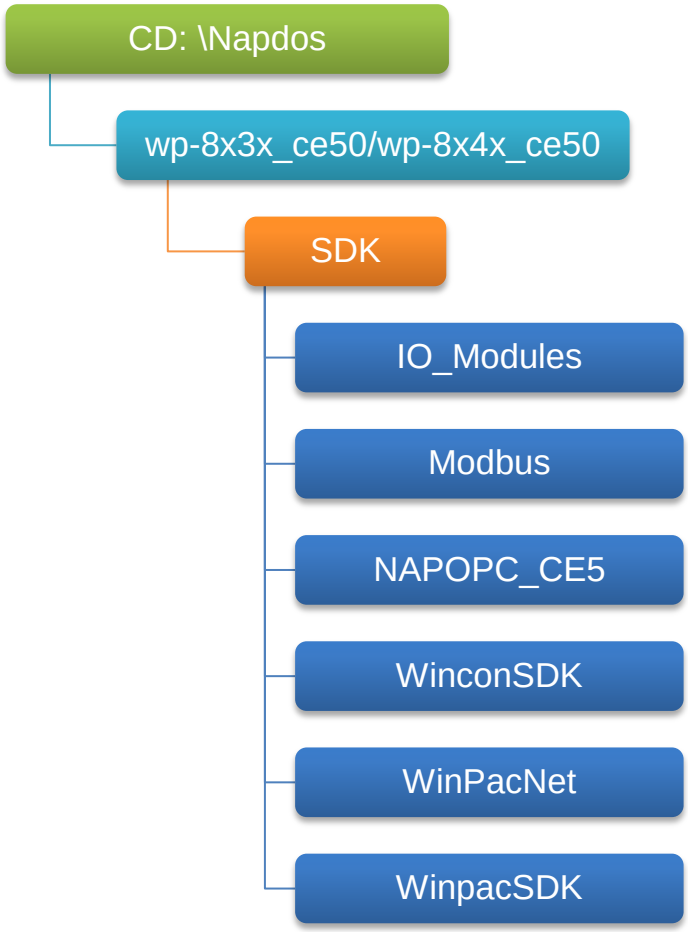
6.2. SDKs Updates

The updates files of SDK are located on:

- For WP-8x3x series
  CD:\Napdos\wp-8x3x_ce50\SDK\
- For WP-8x4x series
  CD:\Napdos\wp-8x4x_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
ii. WinPAC SDK updates for eMbedded Visual C++

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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:

- For WP-8x3x series
  ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x3x_ce50/sdk/WinPACNet/
- For WP-8x4x series
  ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x4x_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.

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6.2.2. WinPAC SDK updates for eMbedded Visual C++

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 eMbedded Visual C++ components

The latest version of the eMbedded Visual C++ components can be obtained from:

- For WP-8x3x series
  ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x3x_ce50/sdk/WinPACSDK /
- For WP-8x4x series
  ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x4x_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

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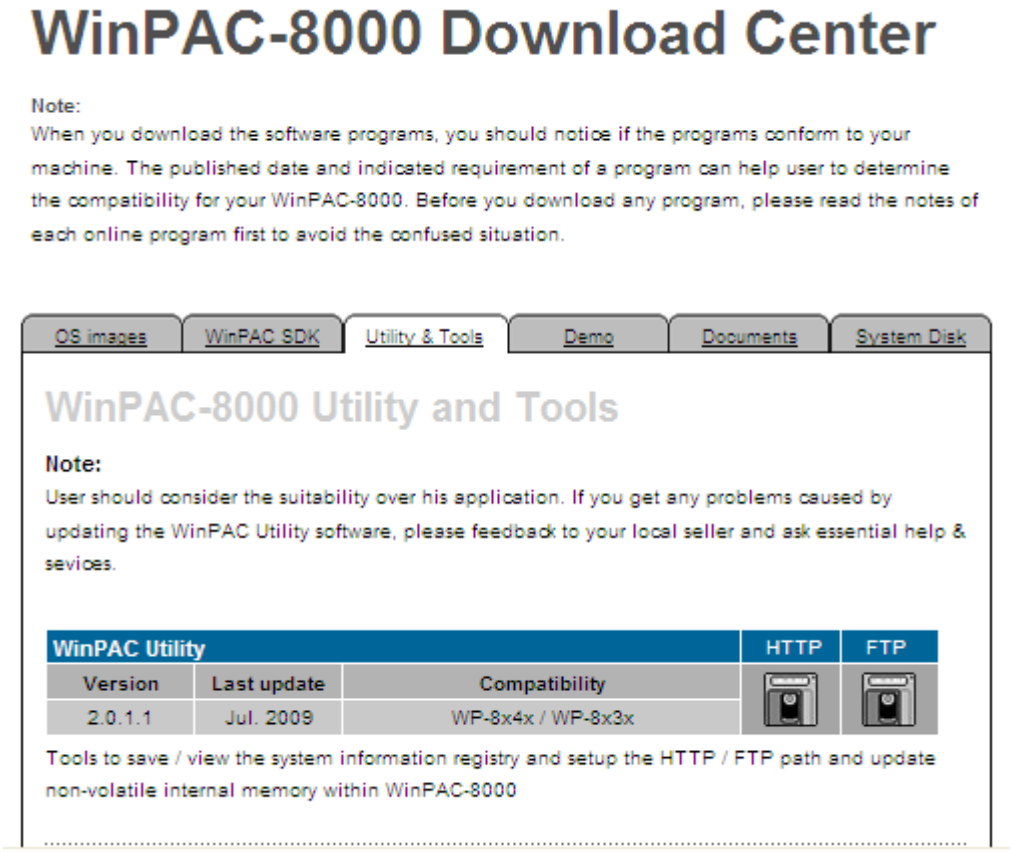
7. WinPAC Download Center

This chapter introduces the WinPAC Download Center.

Visit the WinPAC Download Center:
http://www.icpdas.com/products/PAC/winpac/download/winpac_8000/download_os_images.htm



The following update categories are available from the WinPAC Download Center.

✓ **OS images** Includes updates and the latest version of WinPAC OS.

✓ **WinPAC SDK** Includes updates and the latest version of each WinPAC component SDK, such as WinPAC SDK, NAPOPC_CE5 SDK, Modbus SDK, etc.

✓ **Utility & Tools** Includes updates and the latest version for WinPAC toolkits

✓ **Demo** Includes all related WinPAC demos.

✓ **Documents** Includes updates and the latest version for related WinPAC documents.

✓ **System Disk** Includes updates and the latest version for WinPAC toolkits

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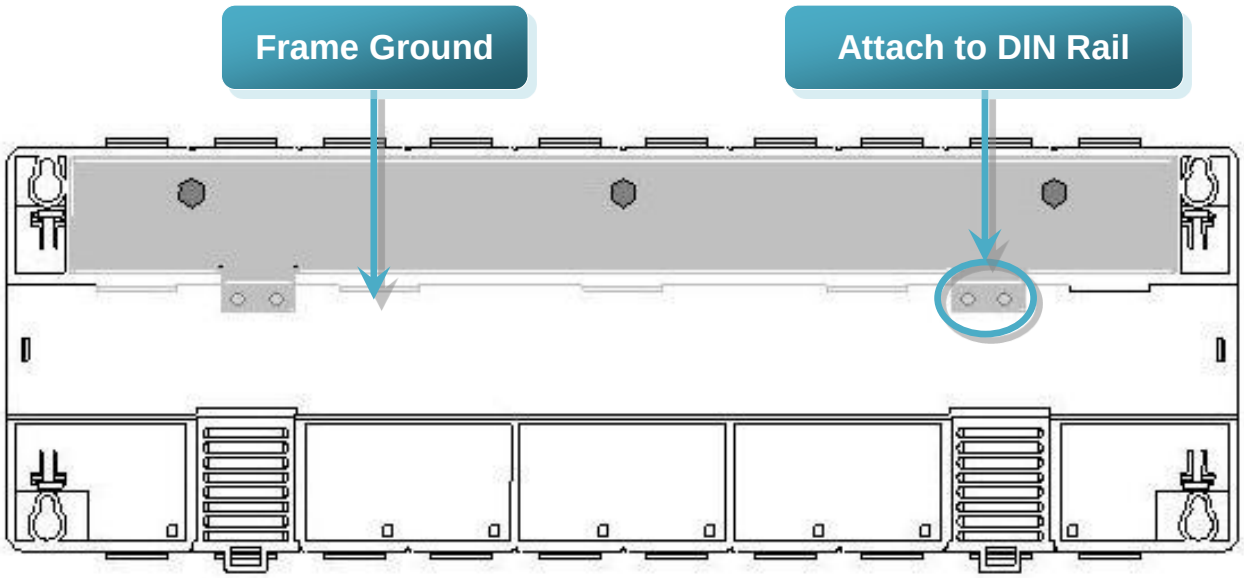
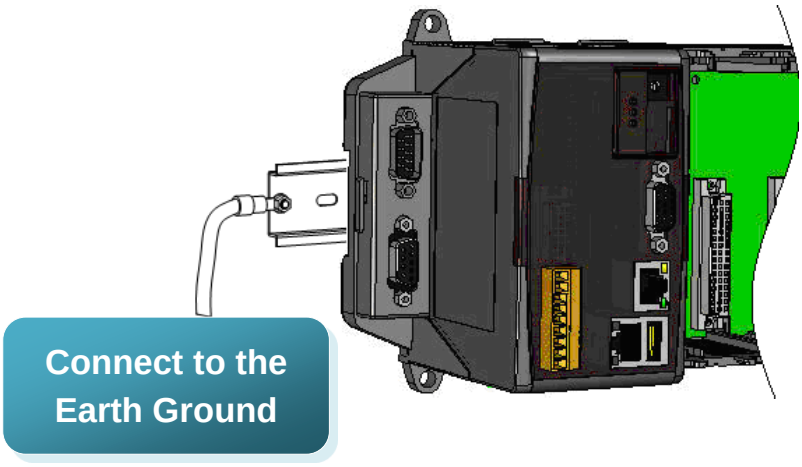
Appendix A. Frame Ground

Electronic circuits are constantly vulnerable to Electro-Static Discharge (ESD), which become worse in a continental climate area. Some I-7000 ,M-7000 and I-8000 series modules feature a new design for the frame ground, which provides a path for bypassing ESD, allowing enhanced static protection (ESD) capability and ensures that the module is more reliable.

The following options will provide a better protection for the module:

The I-8000 controller has a metallic board attached to the back of the plastic basket as shown in the Figure 2-1 below. When mounted to the DIN rail, connect the DIN rail to the earth ground because the DIN rail is in contact with the upper frame ground as shown in the Figure 2-2 below.





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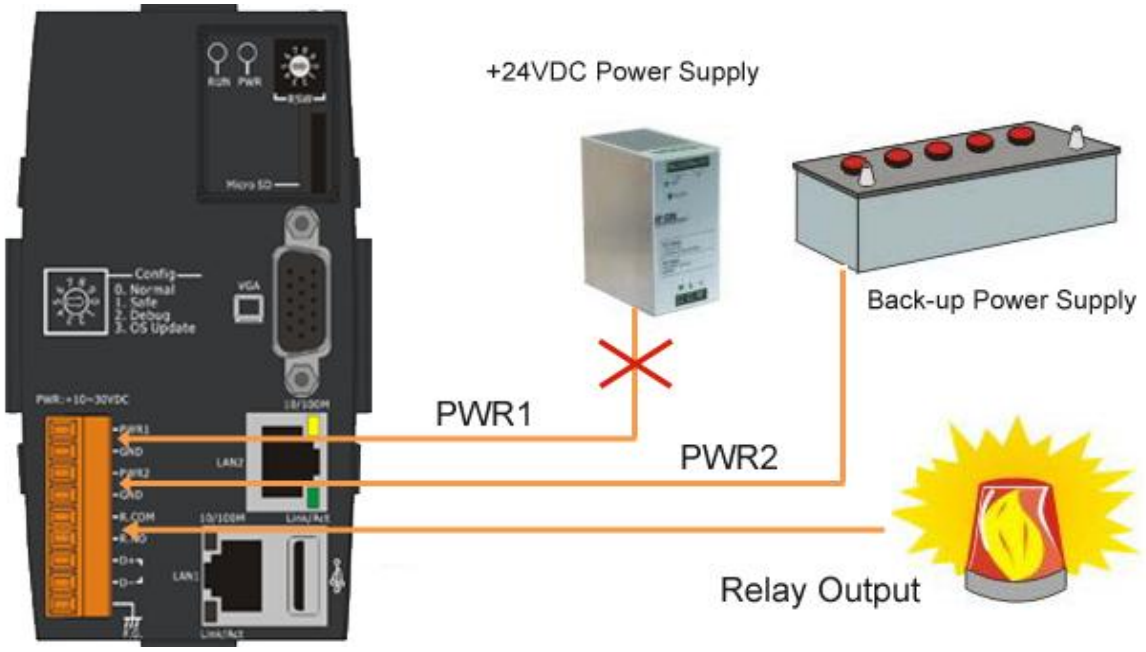
Appendix B. Redundant Power

The WinPAC provides two power inputs that can be connected simultaneously to live DC power sources. If one of the power inputs fails, the other live source acts as a backup to automatically support the WinPAC's power needs.

The WinPAC provides relay contact outputs to warn technicians on the shop floor when the power fails.



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Appendix C. I-8K and I-87K Modules

There are 1/4/8 slot options to expand local I/O. And the I/O modules can be parallel bus type (high profile I-8K series) and serial bus type (high profile I-87K series).

The difference between them is

Item	I-8K Series	I-87K Series
Microprocessor	No	Yes (8051)
Communication interface	Parallel bus	Serial bus
Communication speed	Fast	Slow
DI latched function	No	Yes
Counter input (for digital input module)	No	Yes (100 Hz)
Power on value	No	Yes
Safe value	No	Yes
Programmable slew-rate for AO module	No	Yes

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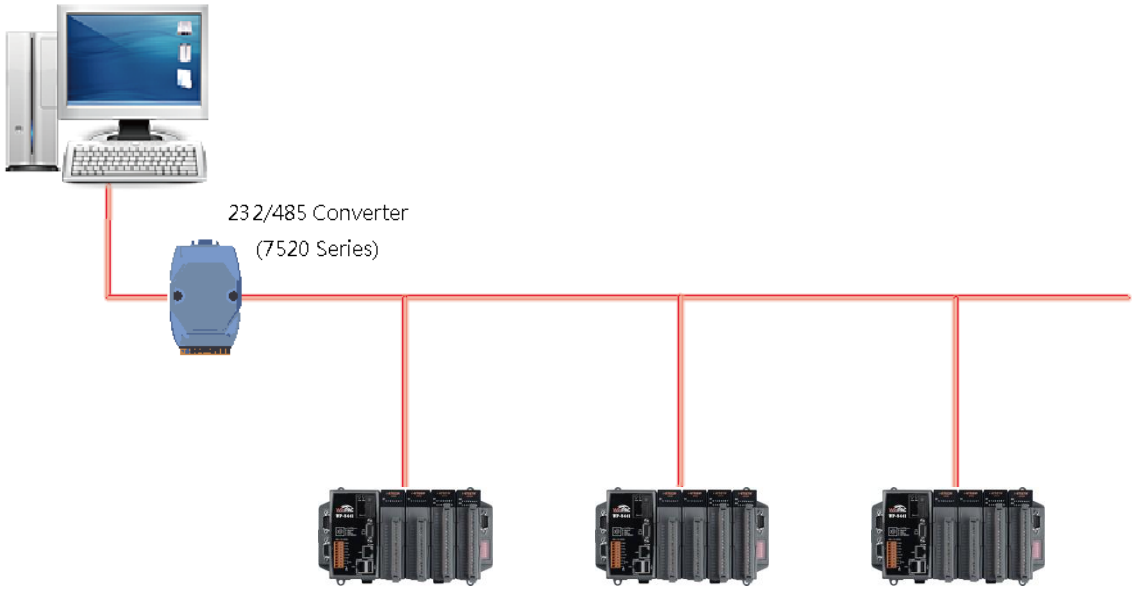
Appendix D. Application of RS-485 Network

The RS-485 length can be up to 4000 ft or 1.2 km over a single set of twisted–pair cables, if the RS-485 network is over 4000 ft or 1.2Km, the RS-485 repeater must be added to extend the RS-485 network.

D.1. Basic RS-485 Network

The basic component of the RS-485 network consist of a Master Controller (or using a PC as a host controller), and some RS-485 devices.



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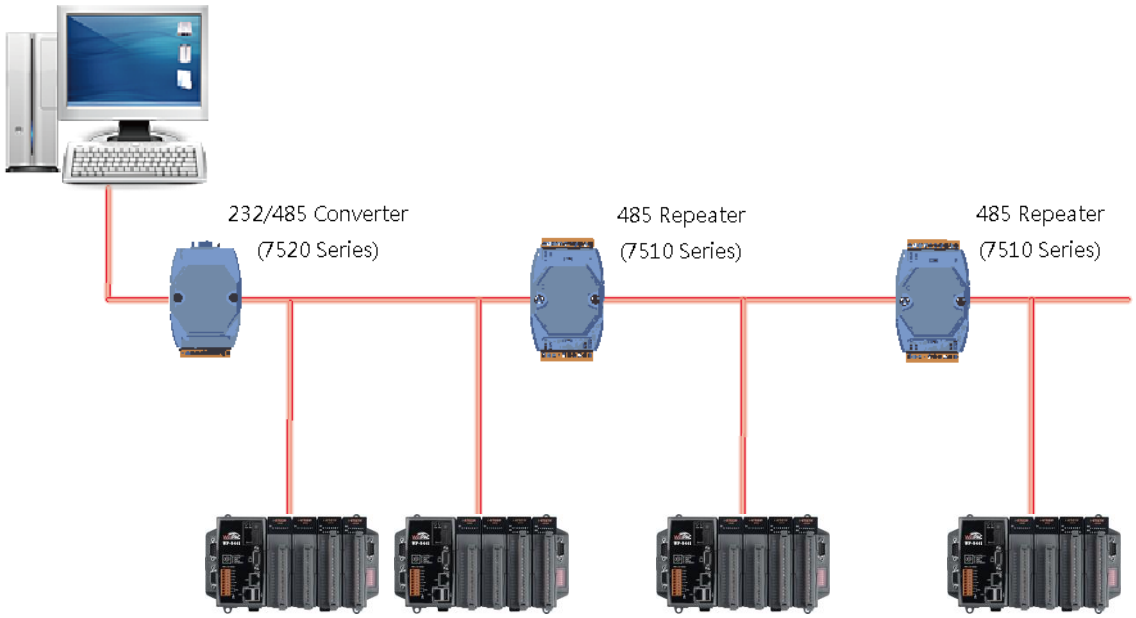
D.2. Daisy Chain RS-485 Network

All RS-485 devices are wired directly to the main network, If the network is up to 1.2 km, it will need a repeater (7510 series) to extend the network length.



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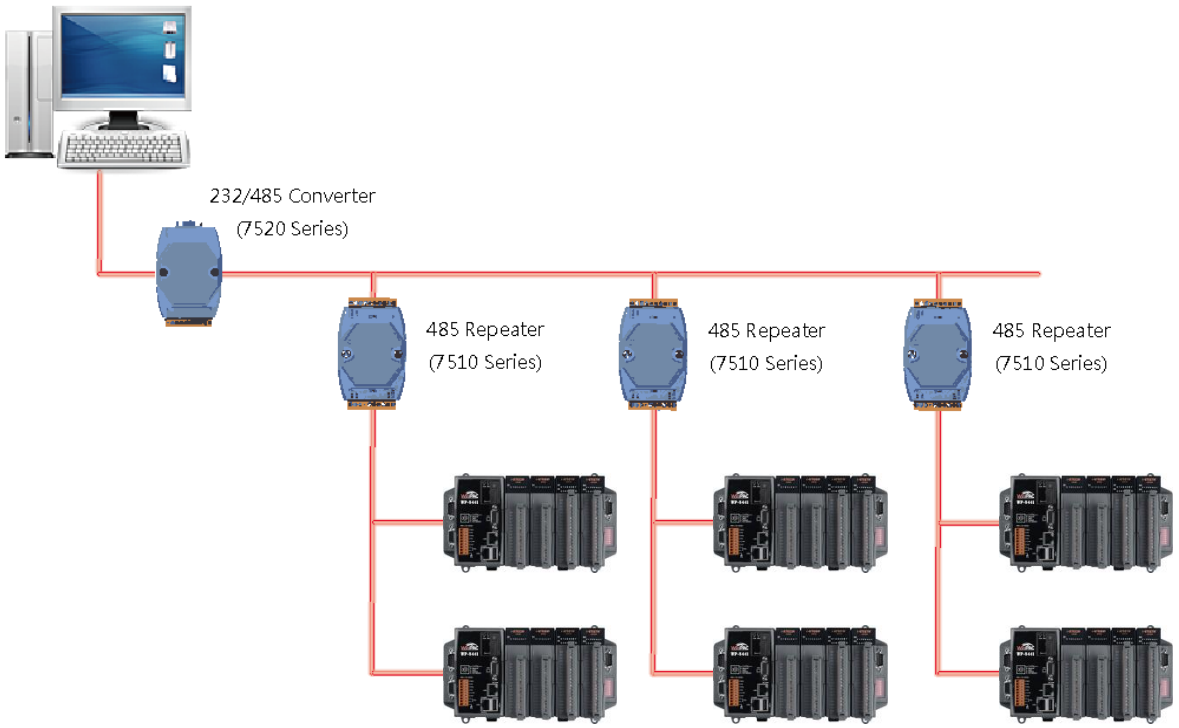
D.3. Star Type RS-485 Network

There are branches along the main network. In this case, it is better to have a repeater to isolate or filter the noise that is made by devices.



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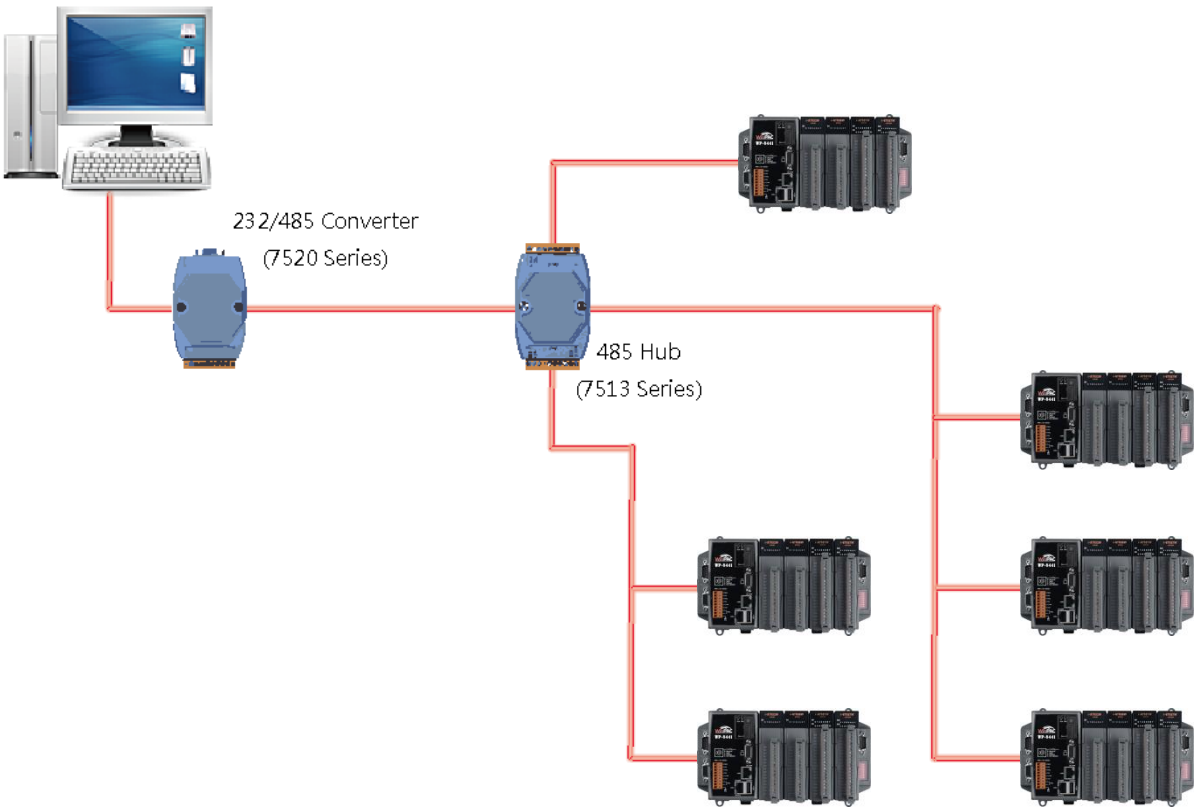
There is a better choice to use 7513 as a RS-485 hub on start type network.



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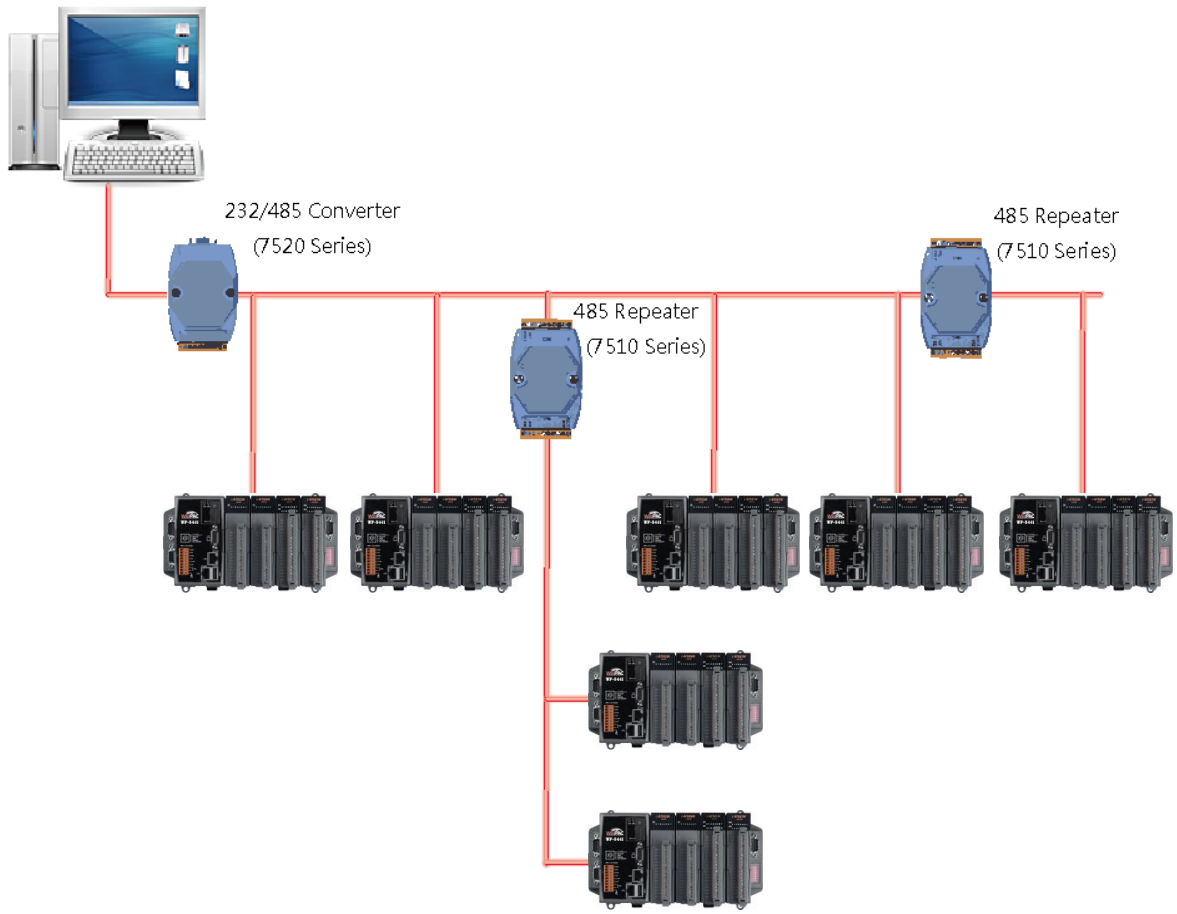
D.4. Random RS-485 Network

There are branches along the main wire. In this case, it is better to have a repeater to isolate or filter the noise that is made by devices.



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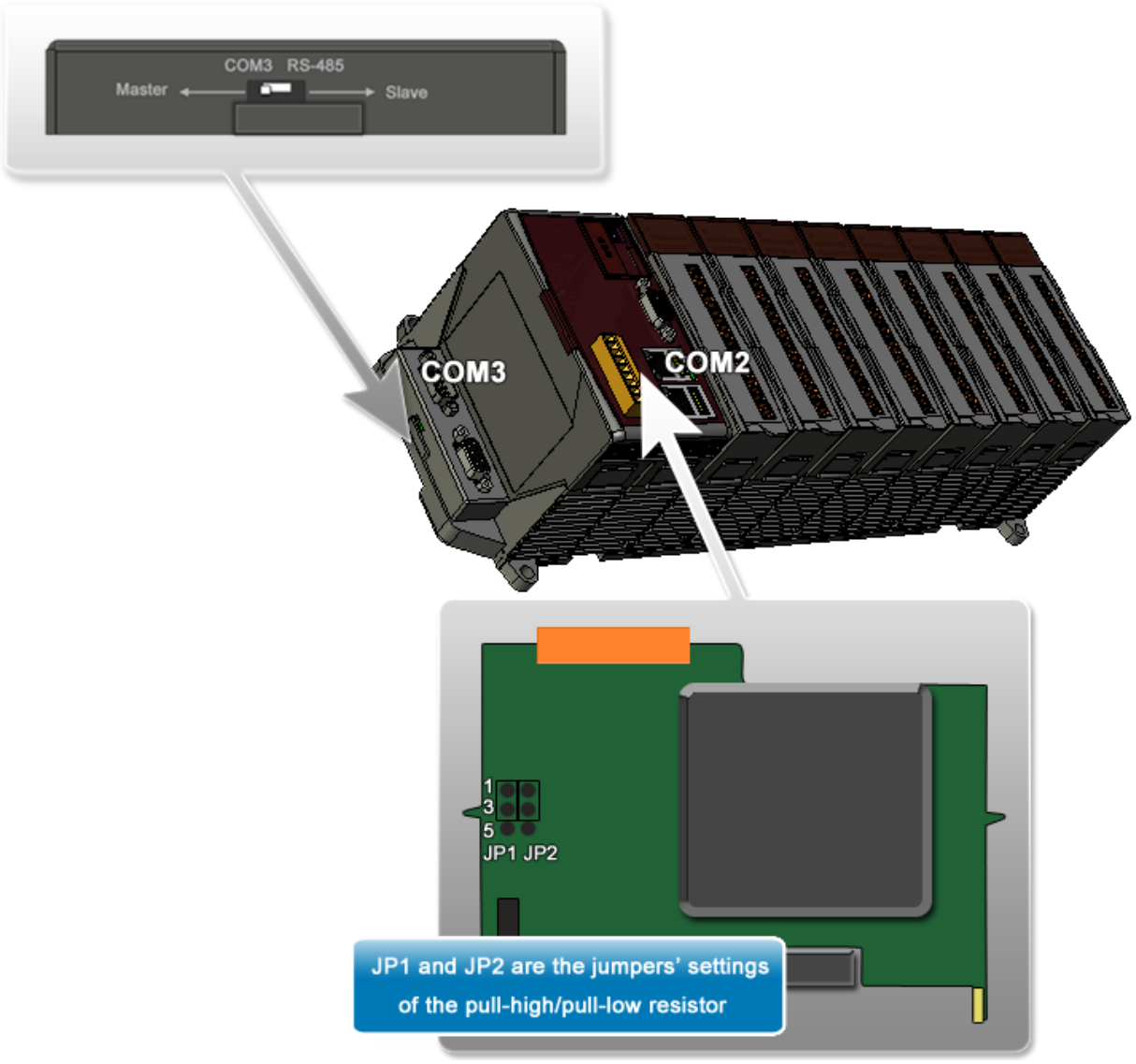
D.5. Master/Slaves Settings

The RS-485 network based on master-slave architecture consists of a single master device and one or more slave devices.

The WinPAC provides two RS-485 communication interfaces based on the master-slave system architecture, all of which have a pull-high/pull-low resistor, user can set it to master or slave for implementing an RS-485 multi-drop network.

One of the RS-485 communications, COM2, its pull-high/pull-low resistor located on power board, the other, COM3, located on the right side and its pull-high/pull-low resistor located on the bottom of the right side, as shown below.



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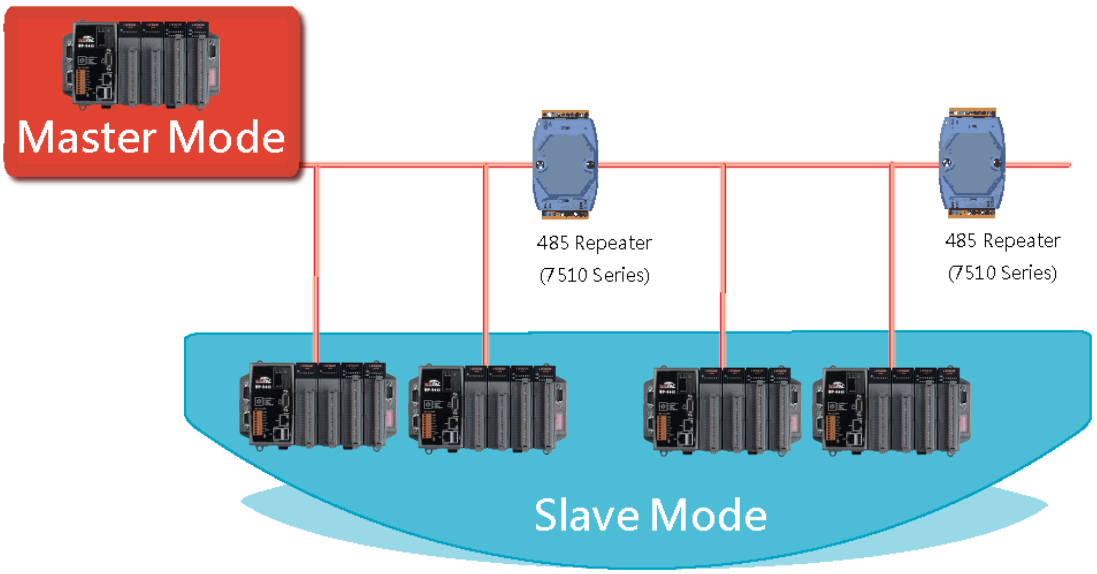
D.5.1. WinPAC as a Master (default):

When one of WinPAC is set to master, then all the other devices on the same network must be slave mode. If the network is up to 1.2 KM, it will need a repeater (7510 series) to extend the network length.



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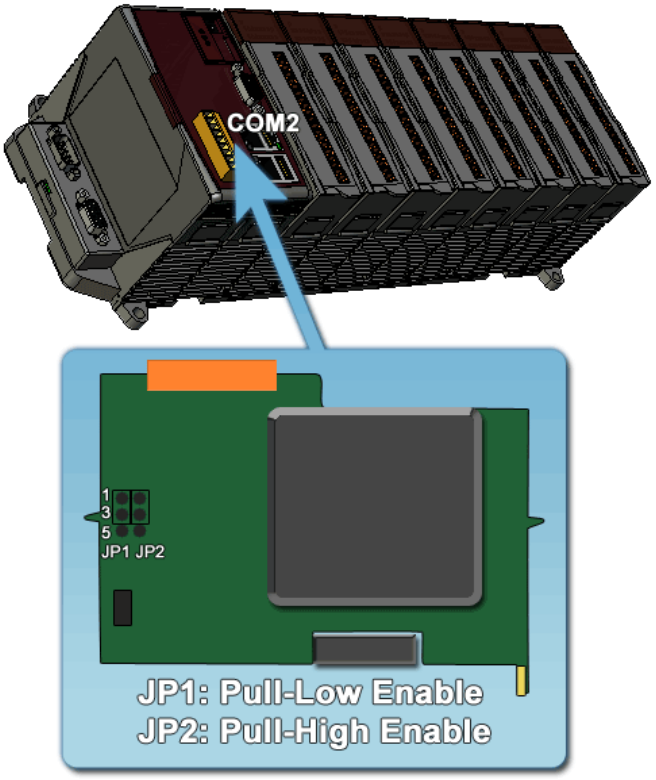
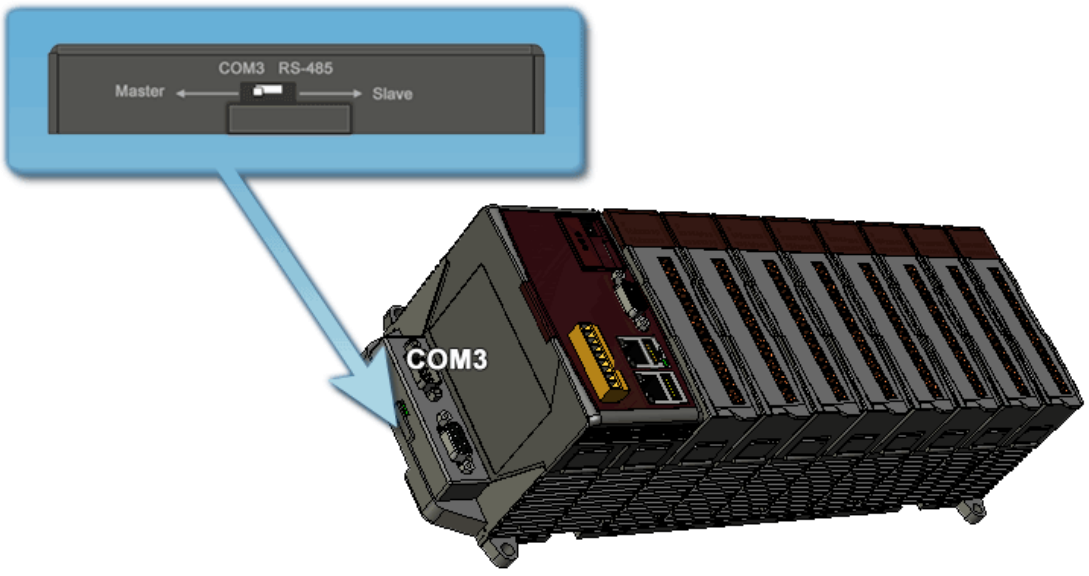
When WinPAC as a master using COM2 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.



When WinPAC as a master using COM3 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.



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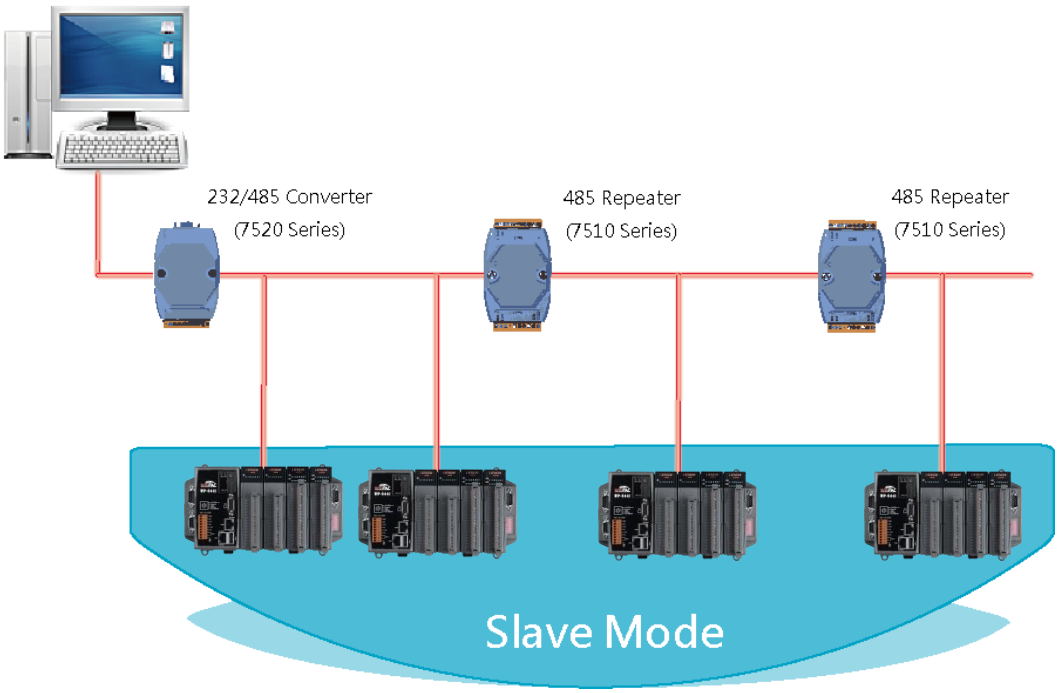
D.5.2. WinPAC as a Slave

For most of application, when using one 7520 series as RS-232/485 converter, its pull-high/pull-low resistors are set to enabled. Then the WinPAC-8000 and all the other devices on this network must be slave mode (the pull-high/pull-low resistors must be disabled).

If there are repeaters on the RS-485 network, there will be pull-high/pull-low resistors on both sides of the repeaters (I-7510)



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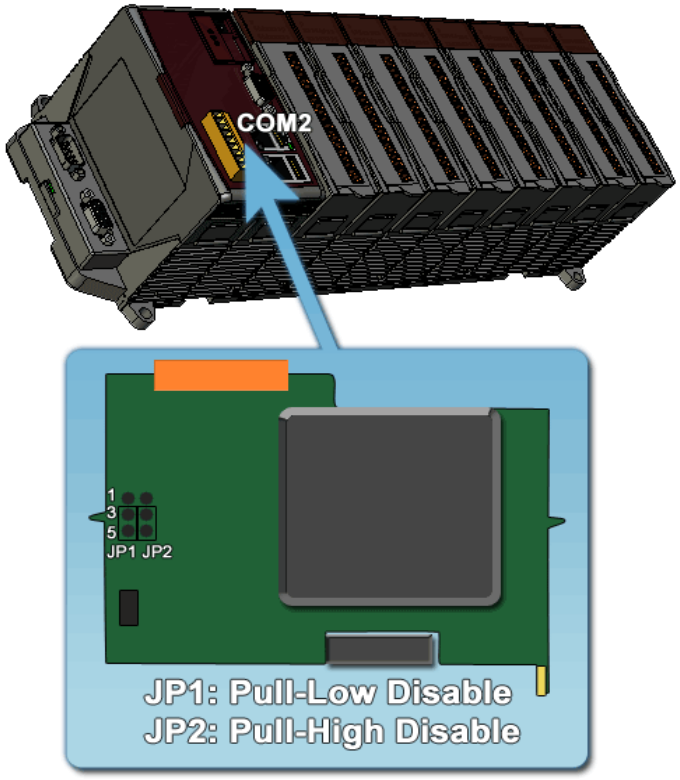
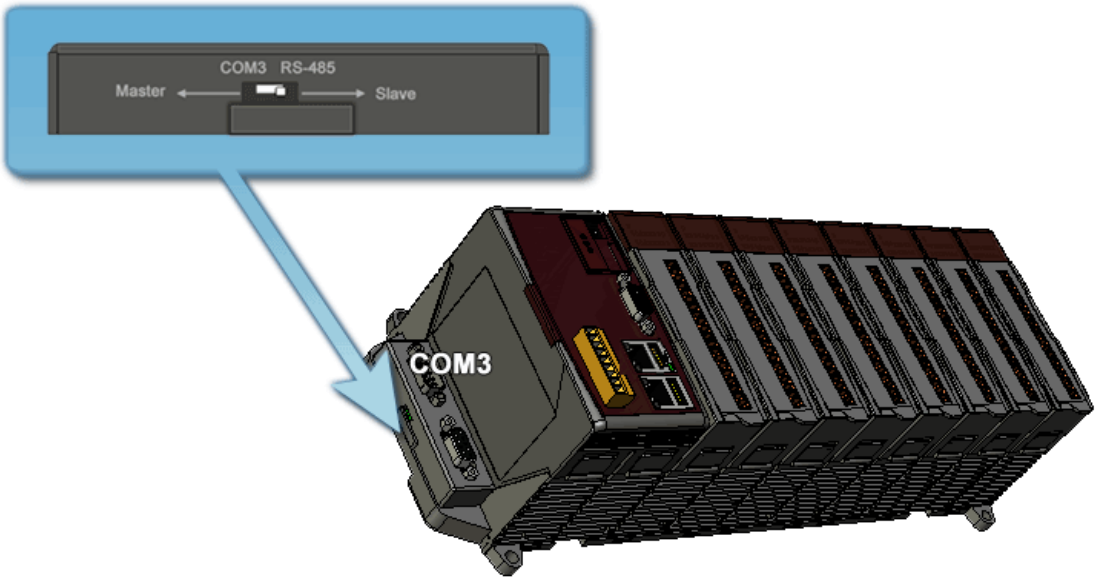
When WinPAC as a slave using COM2 communication interface, the pull-high/pull-low resistor located on the power board must adjust to disabled as shown below.



When WinPAC as a slave using COM3 communication interface, the pull-high /pull-low resistor located on the power board must set to “Slave” as shown below.



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Appendix E. Tips – How to

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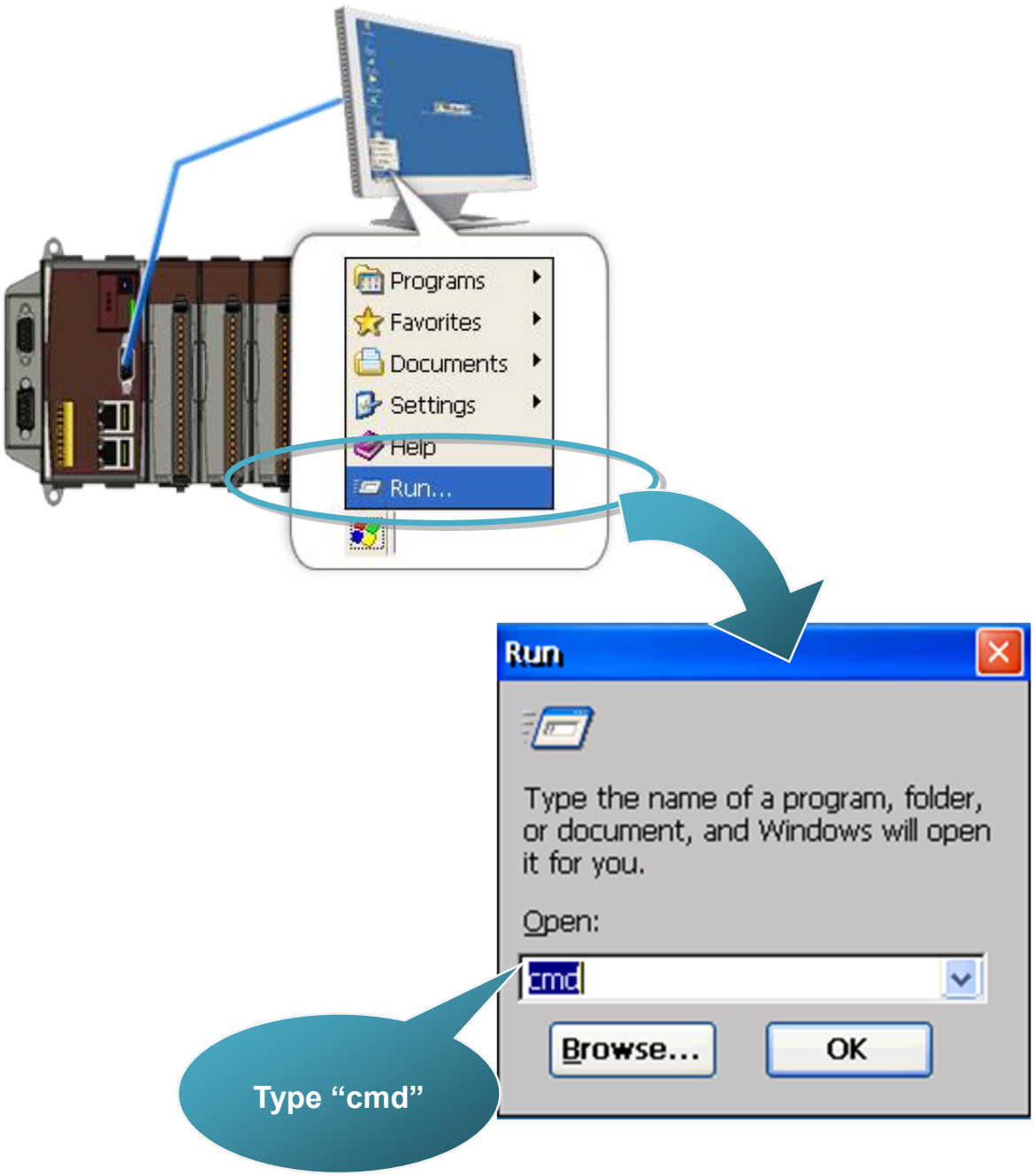
E.1. How to establish a new telnet and FTP account

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

Step 1: Open a MS-DOS command prompt



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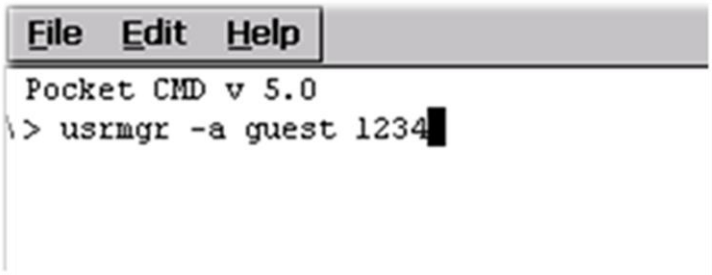
Step 2: Establish a new account

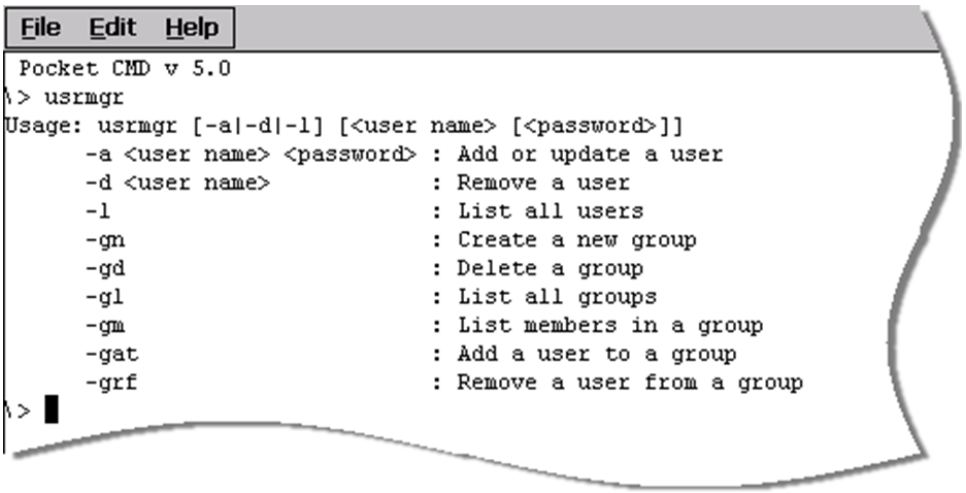
[Syntax] usrmgr –a <username> <password>



Tips & Warnings

For more information about managing accounts, you just type “usrmgr” command to get a complete list of supported commands.

The setting may not save. That is, after rebooted, the setting will disappear and you should set the account again.



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E.2. How to online debug WinPAC

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

E.2.1. Debug WinPAC programs in EVC++

Step 1: On the “Tools” menu, click “Configure Platform Manager…” command

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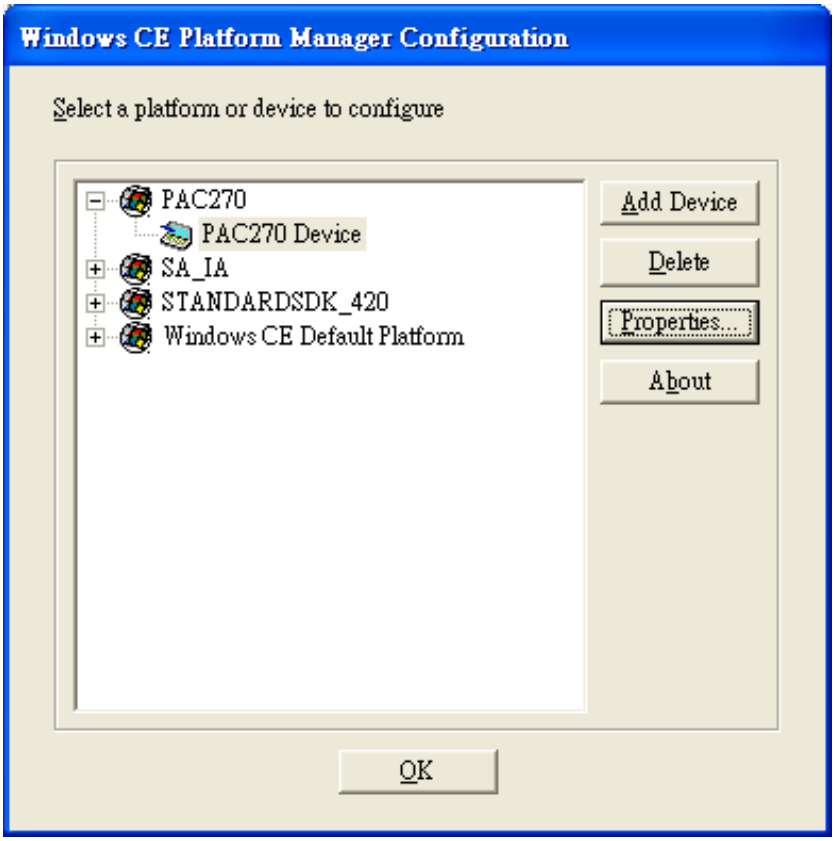
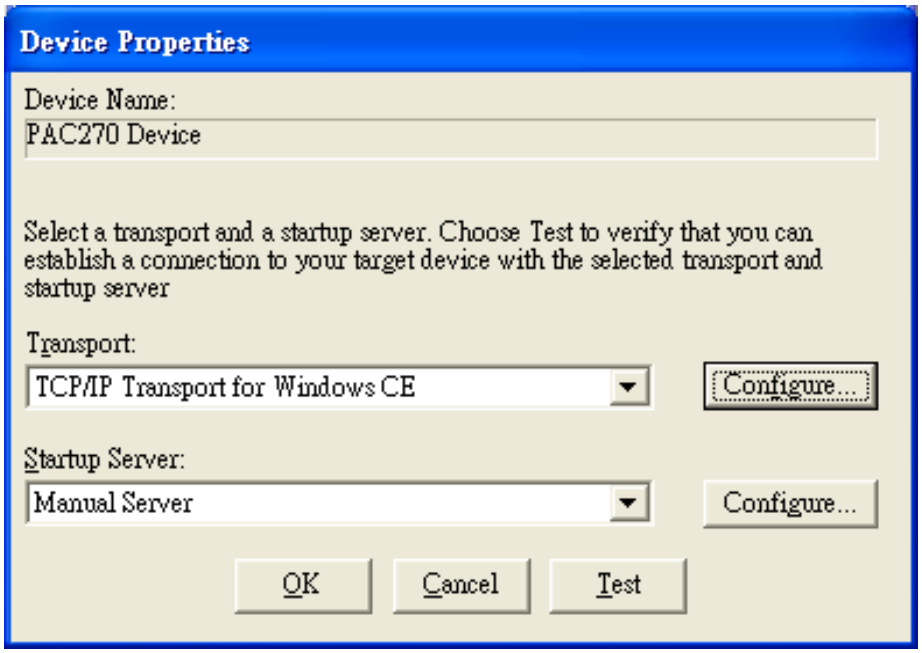
Step 2: On the “Windows CE Platform Manager Configuration” dialog, click the “Properties…” button



Step 3: On the “Device Properties” dialog, click the “Configure…” button



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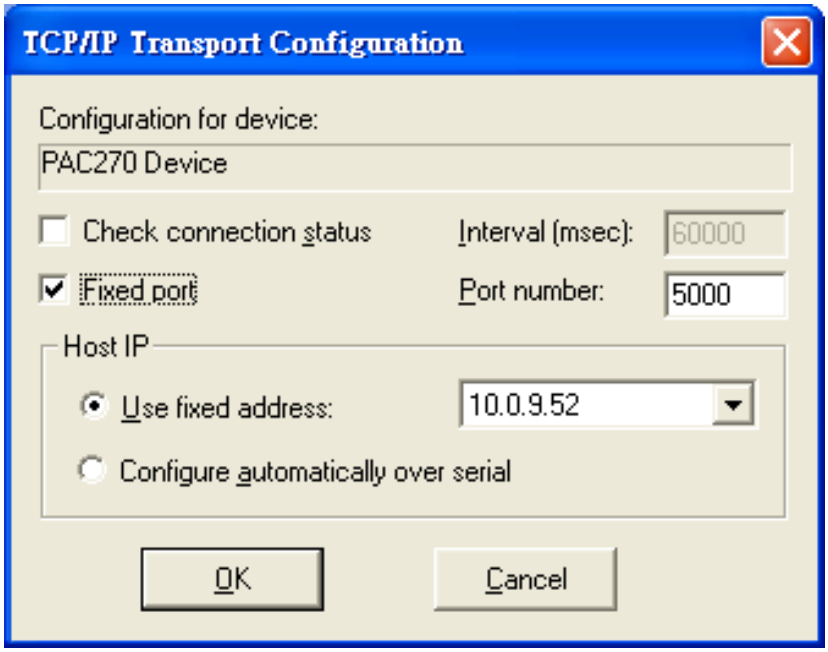
Step 4: On the “TCP/IP Transport Configuration” dialog, select the “Fixed port” check box, and then click the “OK” button



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

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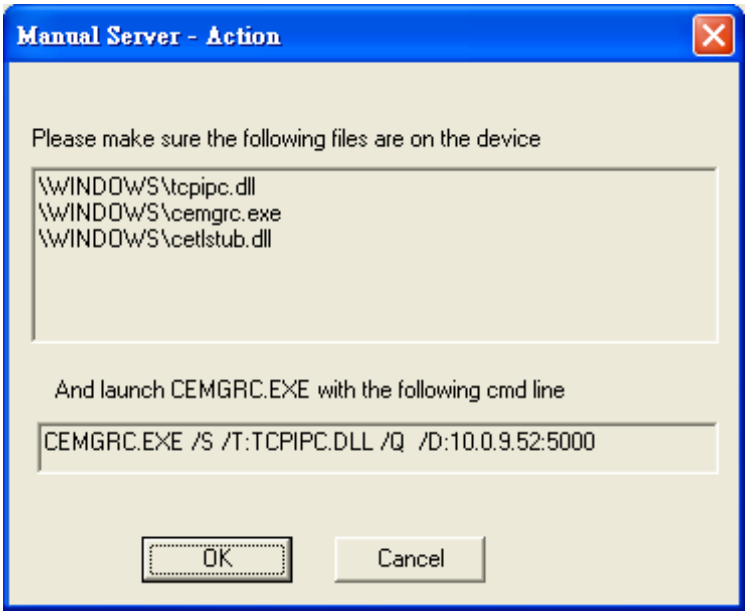
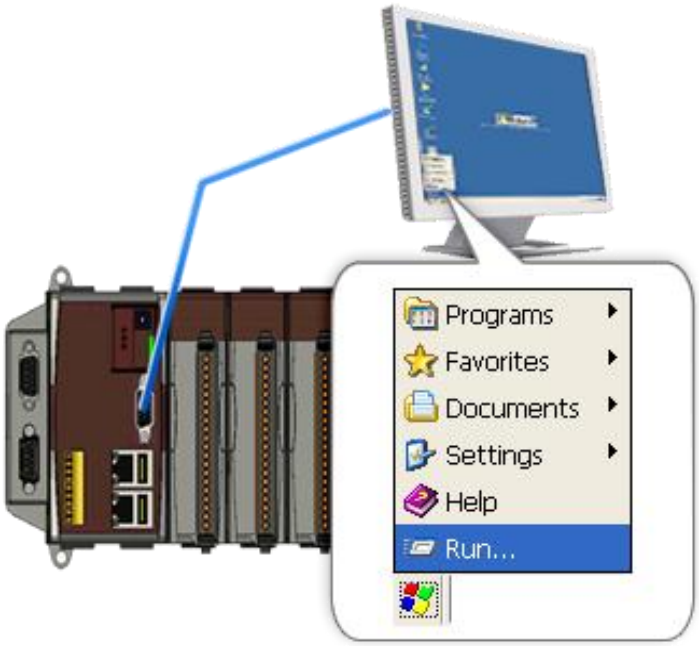
Step 6: The “Manual Server - Action” dialog will appear displaying a command line, before click the “OK” button to close dialog, turn to the WinPAC controller side to do the next two-steps



Step 7: On the WinPAC, select the “ Start” **menu, and then click the “Run…” command**



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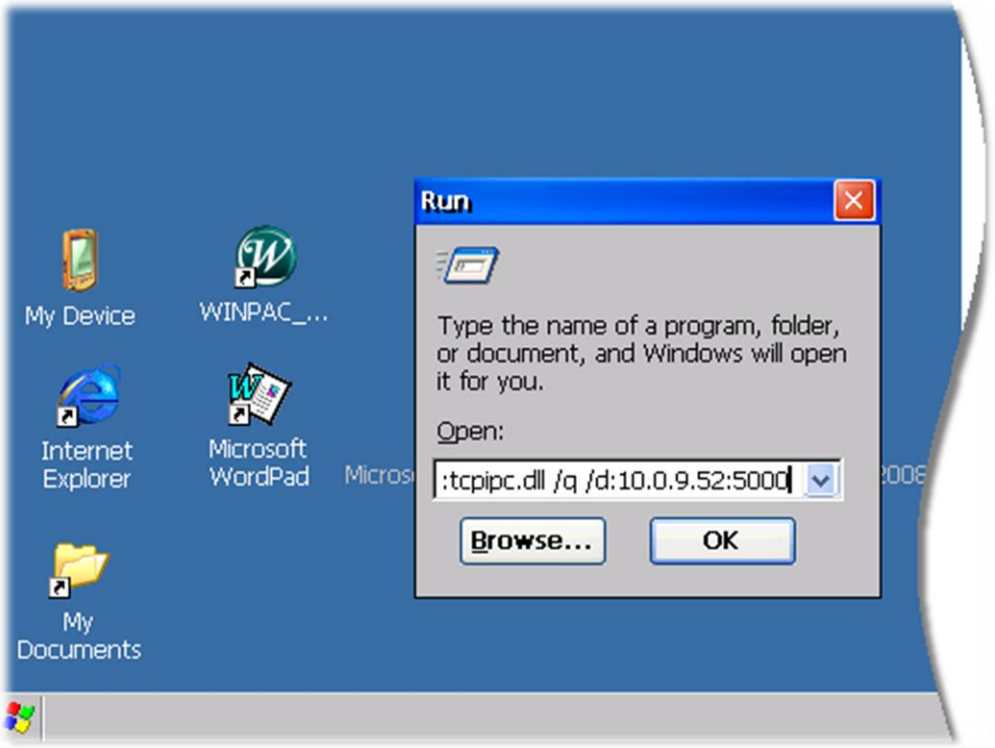
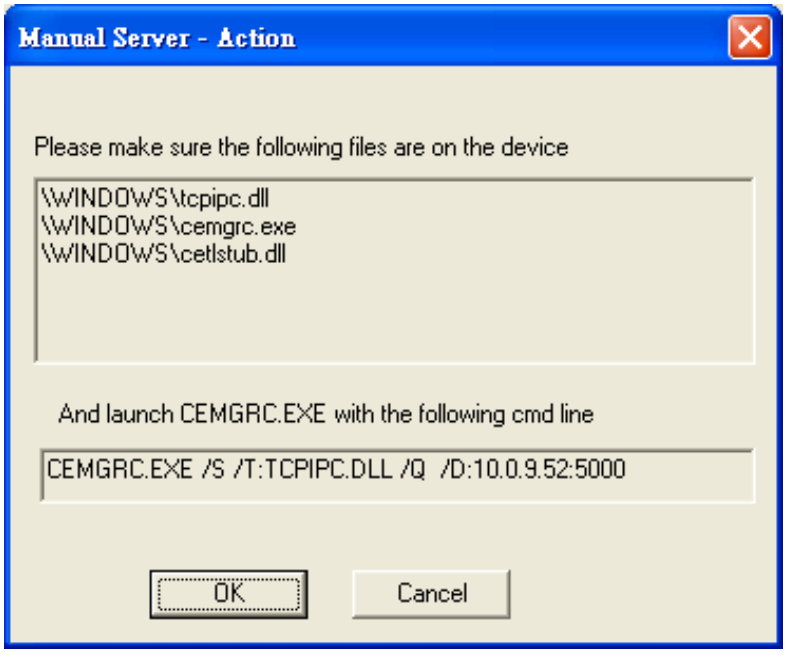
Step 8: On the “Run” dialog, type the command which displays in step 6 and then click the “OK” button



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



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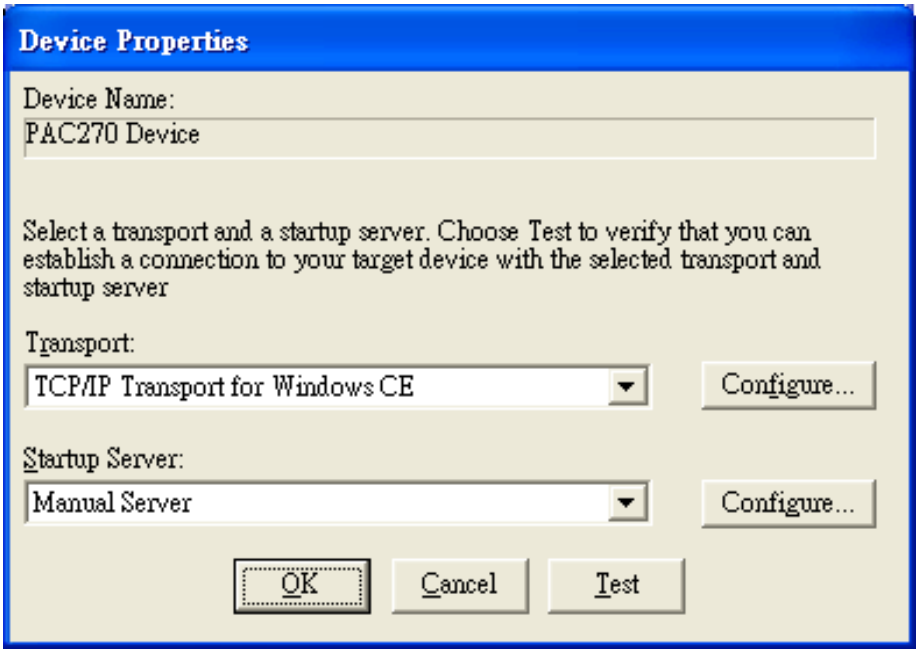
Step 10: On the “Testing Device Connection” dialog, click the “OK” button

Step 11: On the “Device Properties” dialog, click the “OK” button



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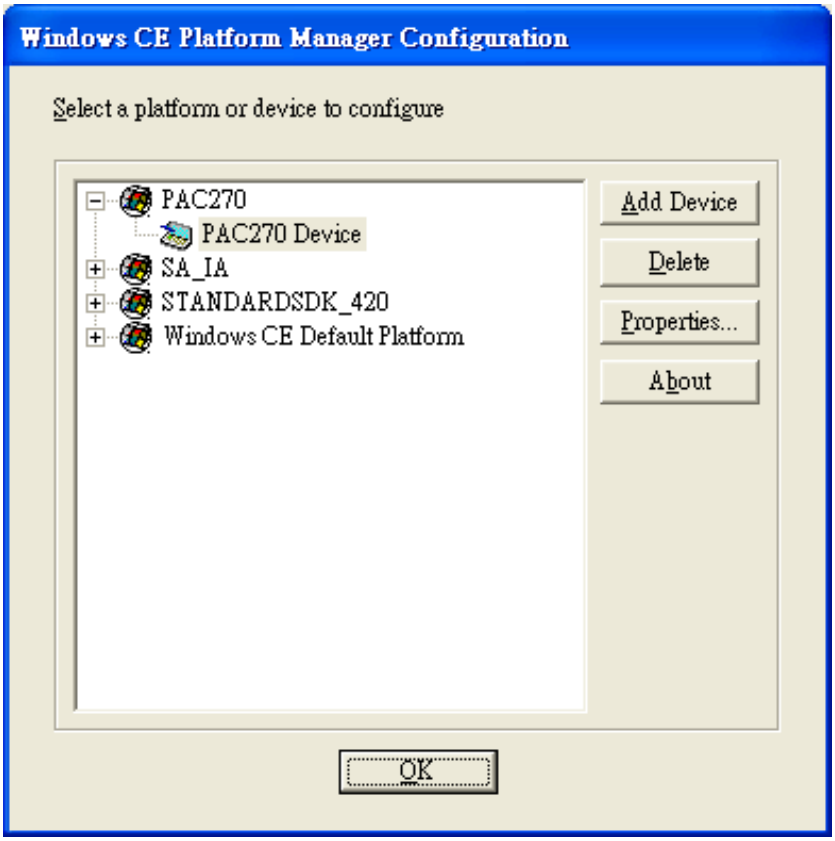
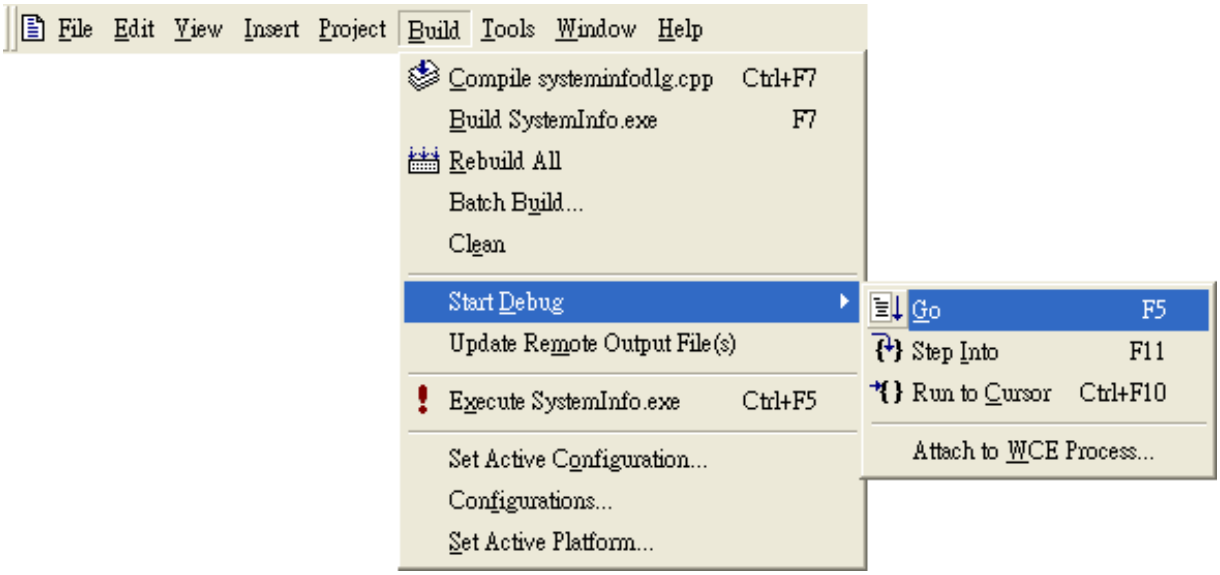
Step 12: On the “Windows CE platform or device to configure” dialog, click the “OK” button



Step 13: On the “Build” menu, select the “Start Debug” command and then click the “Go” command



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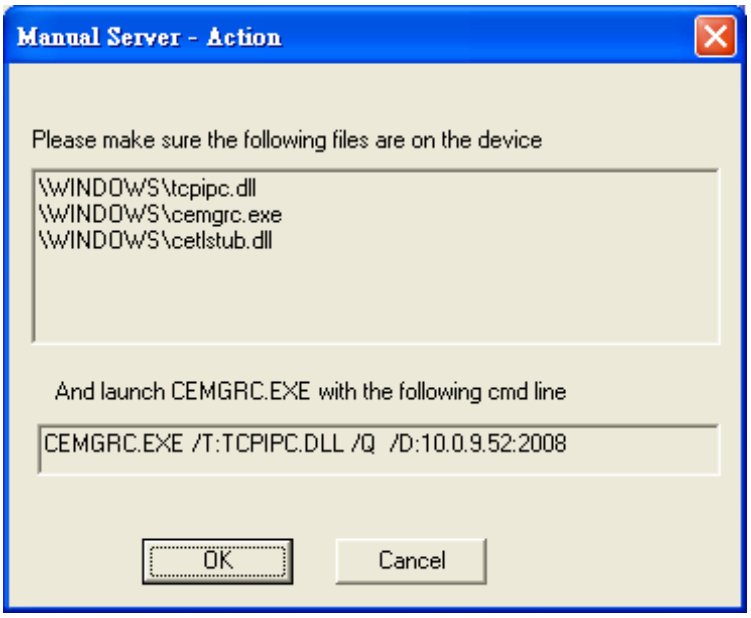
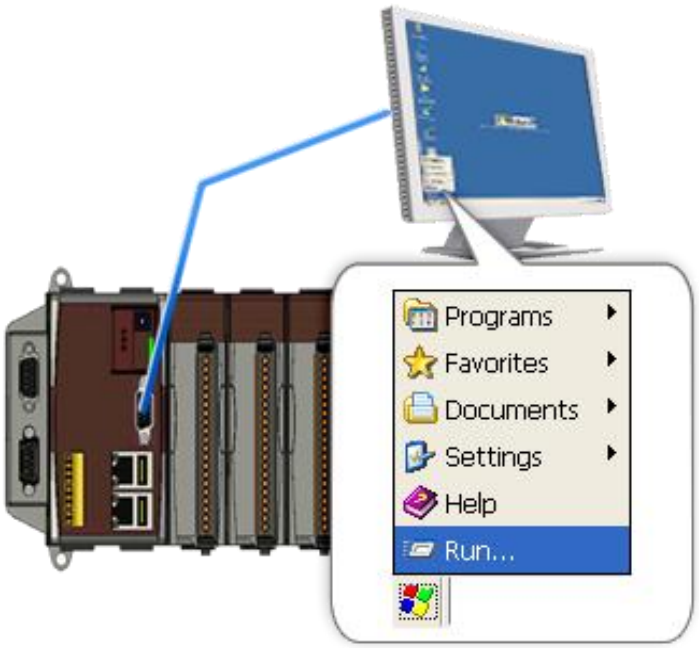
Step 14: The “Manual Server - Action” dialog will appear displaying a command line, before click the “OK” button to close dialog, turn to the WinPAC controller side to do the next two-steps



Step 15: On the WinPAC, select the “ Start” menu, and then click the “Run…” command



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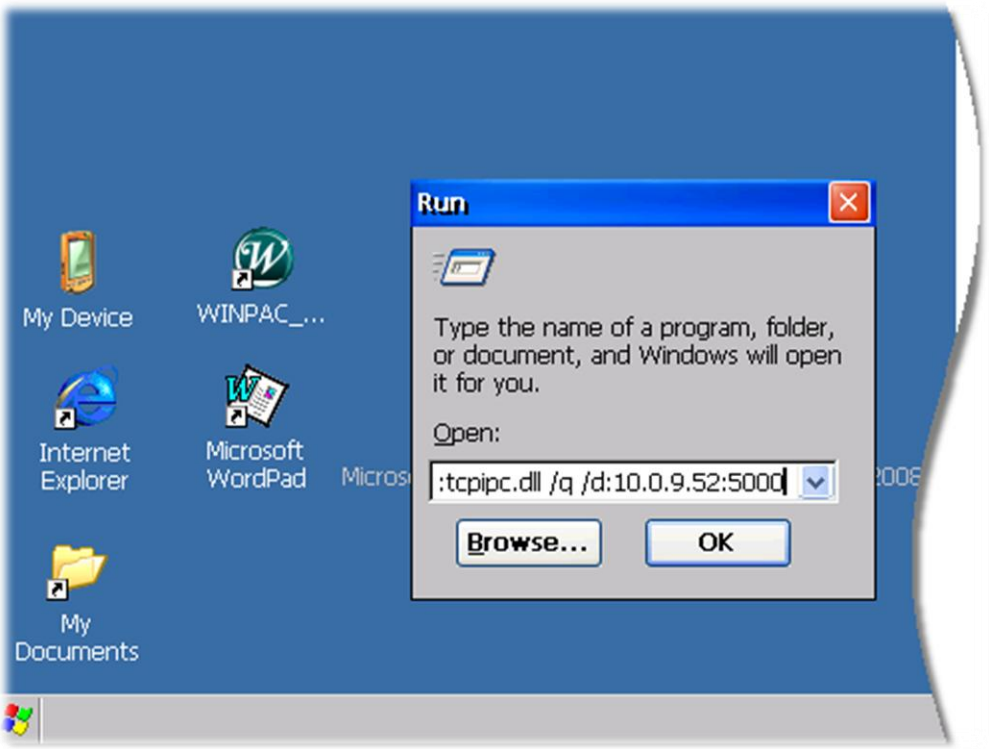
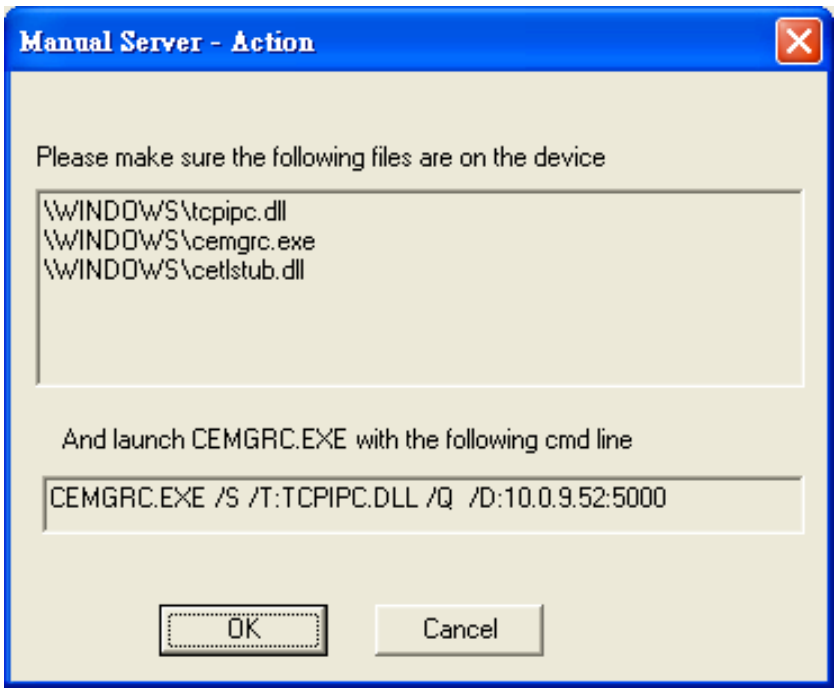
Step 16: On the “Run” dialog, type the command which displays in step 5 and then click the “OK” button



Step 17: Return to the Host PC side, on the “Manual Server – Action” dialog, click the “OK” button



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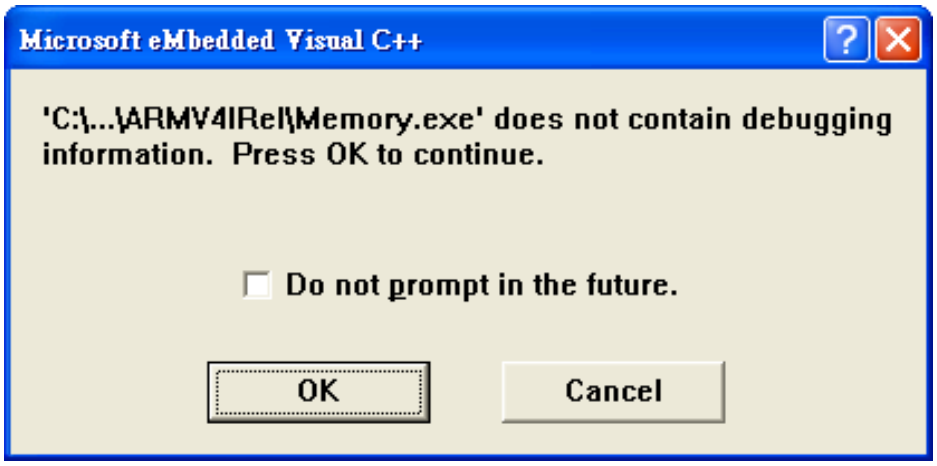
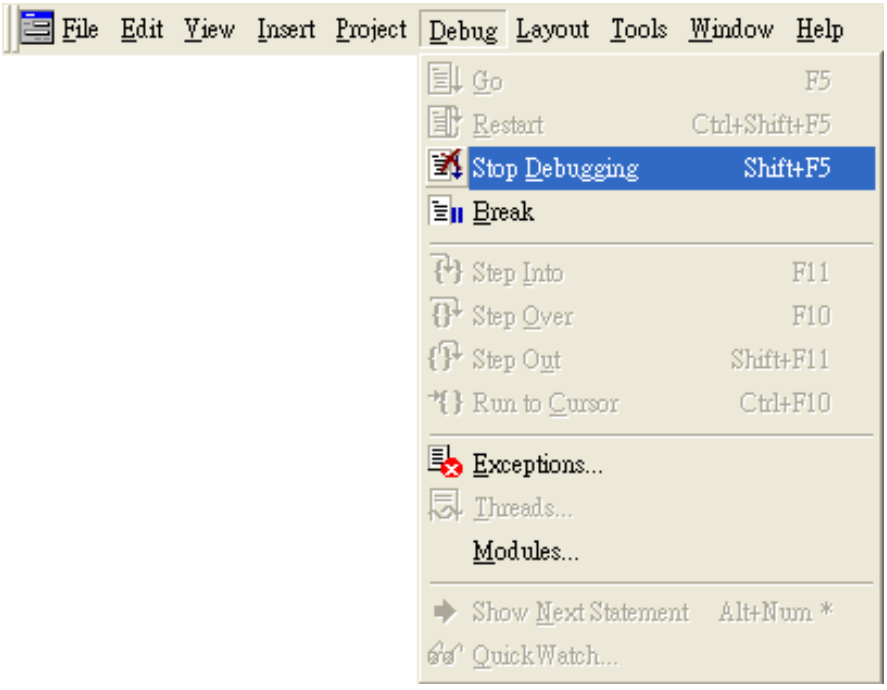
Step 18: On the “Manual Server - Action” dialog, click the “OK” button



Step 19: 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



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E.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	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	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

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

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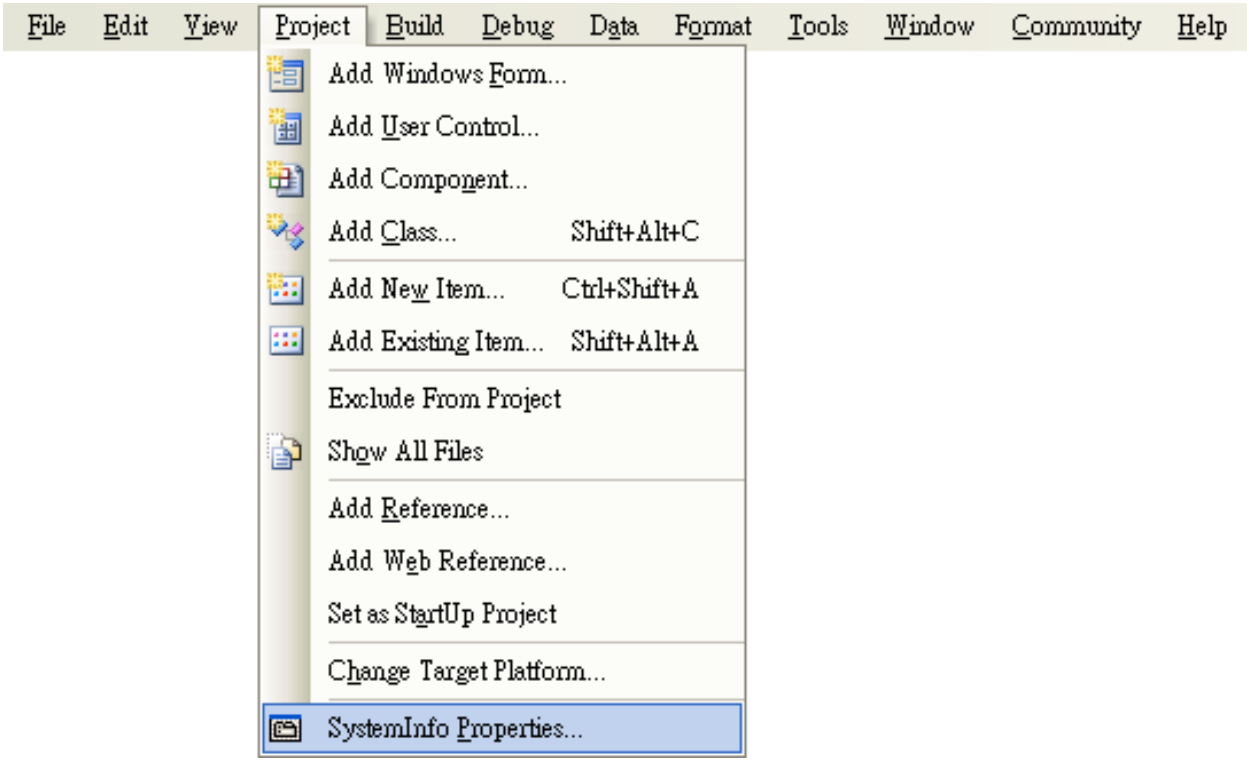
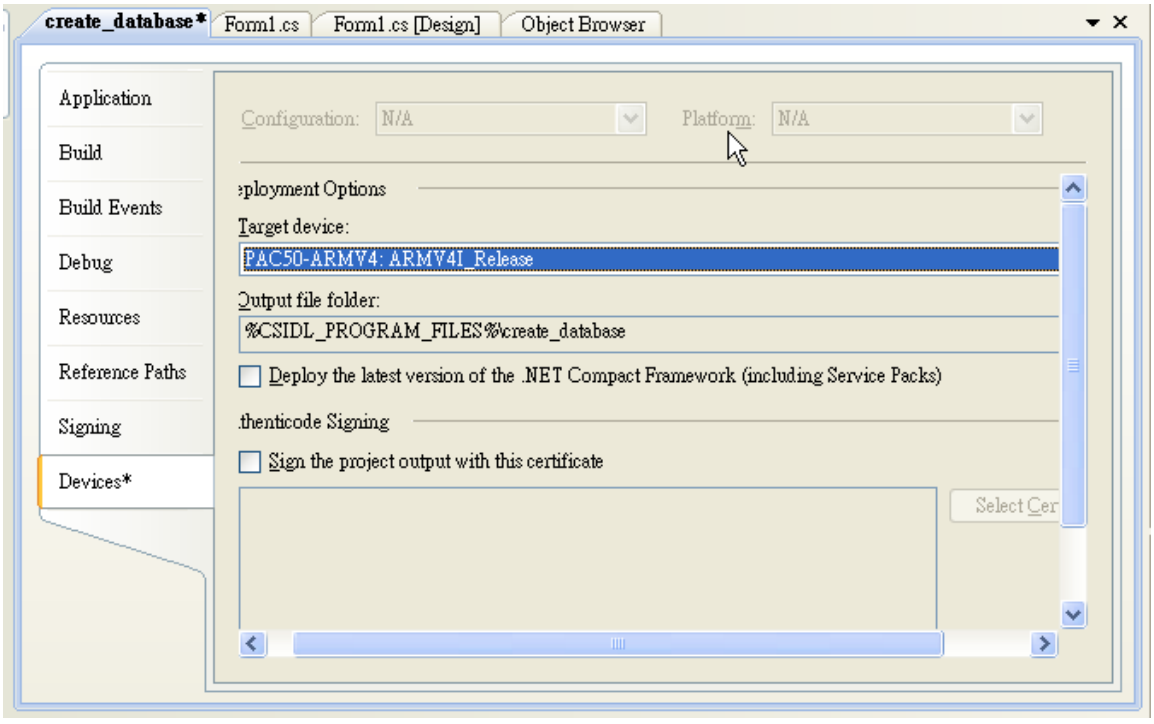
Step 3: On the “Project” menu, click “[Project Name] Properties…” command



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



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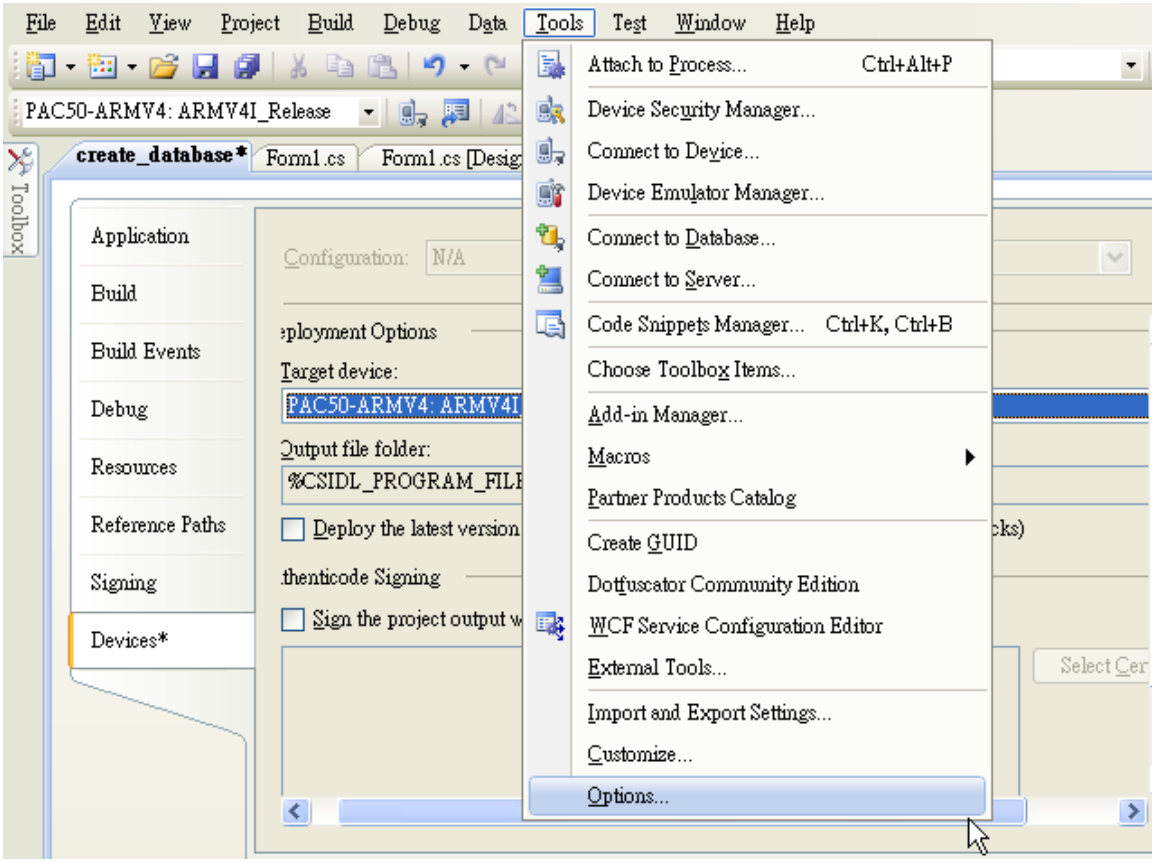
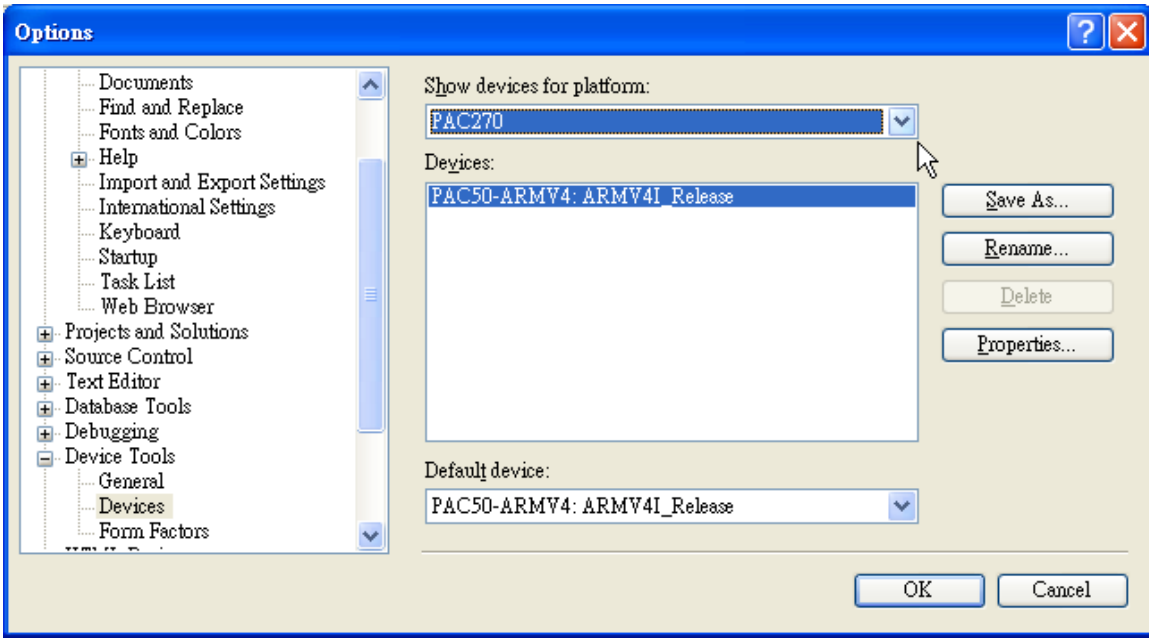
Step 5: On the “Tools” menu, click “Options…” command



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



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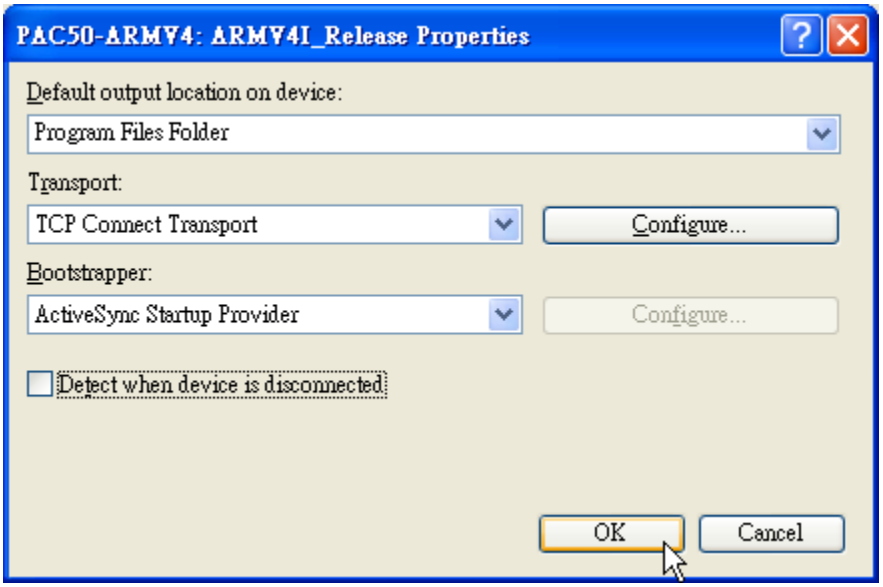
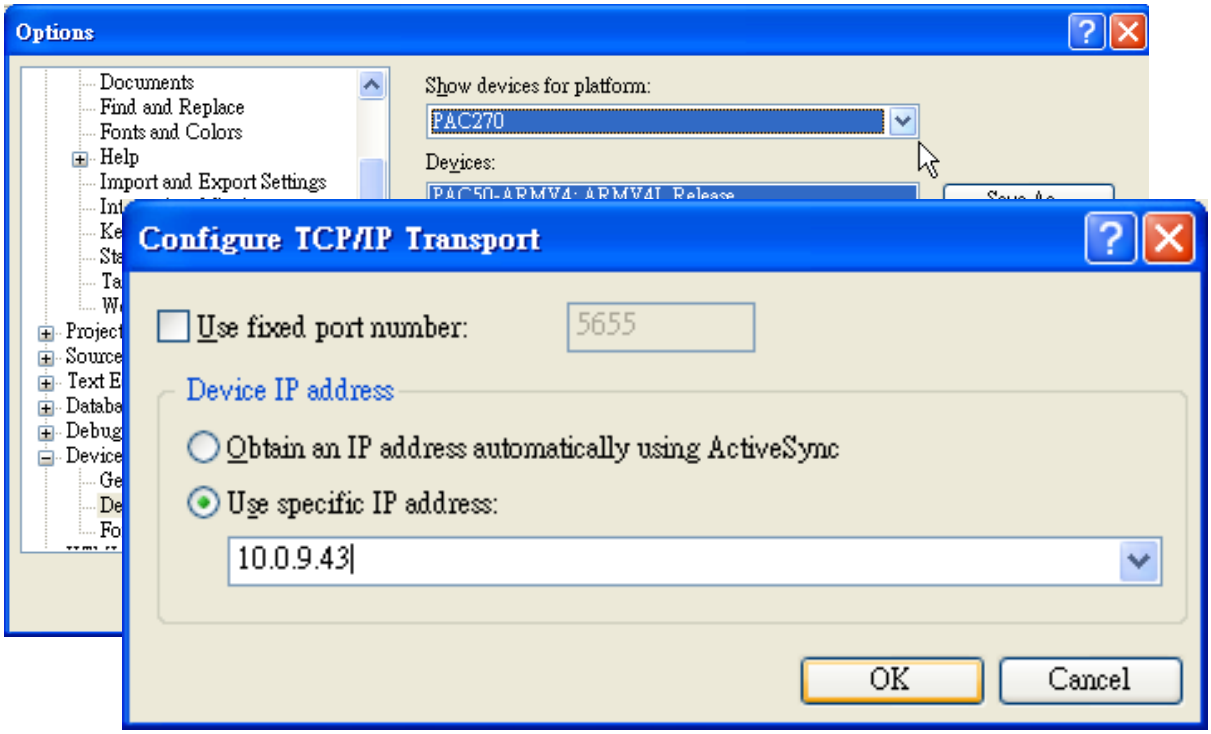
Step 7: On the “PAC50- ARMV4:ARMV4I_Release Properties” dialog, click the “Configure…” button



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 the “OK” button



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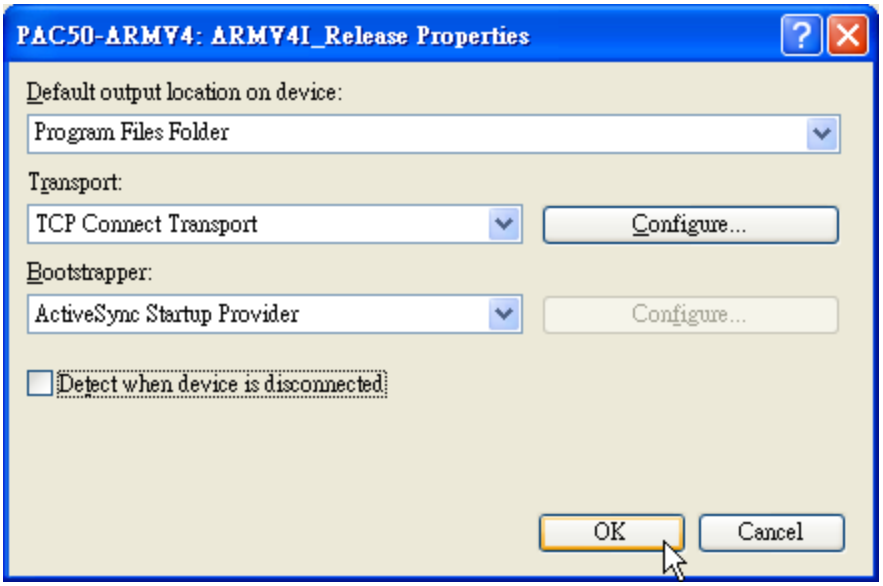
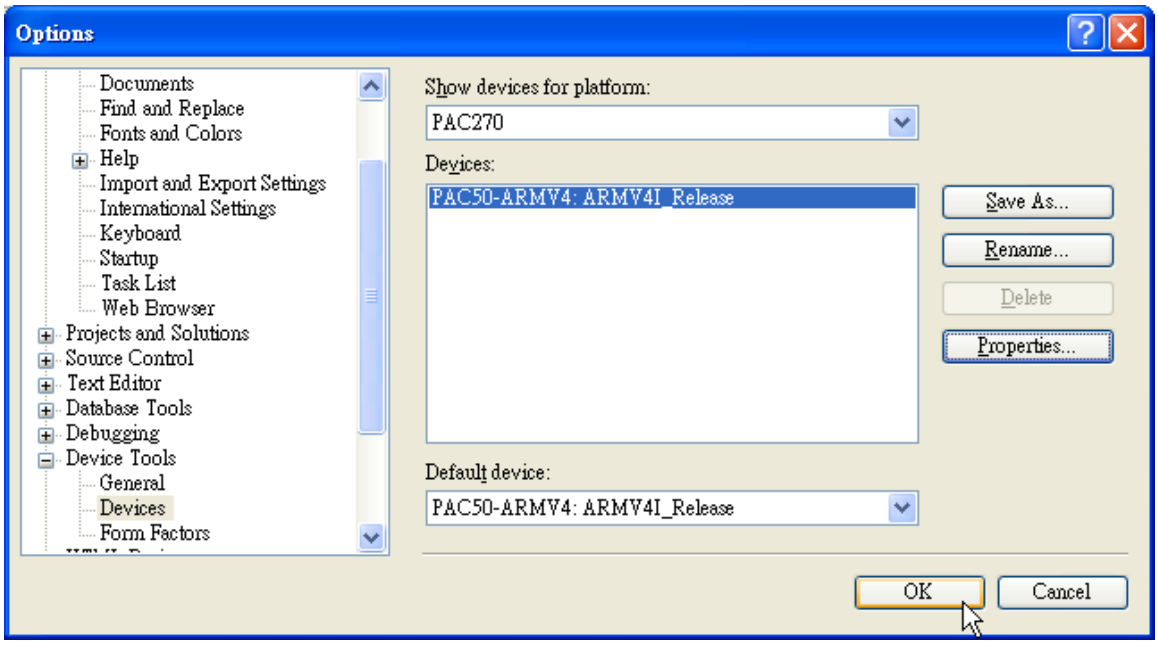
Step 9: On the “PAC50- ARMV4:ARMV4I_Release Properties” dialog, click the “OK” button



Step 10: On the “Options” dialog, click the “OK” button



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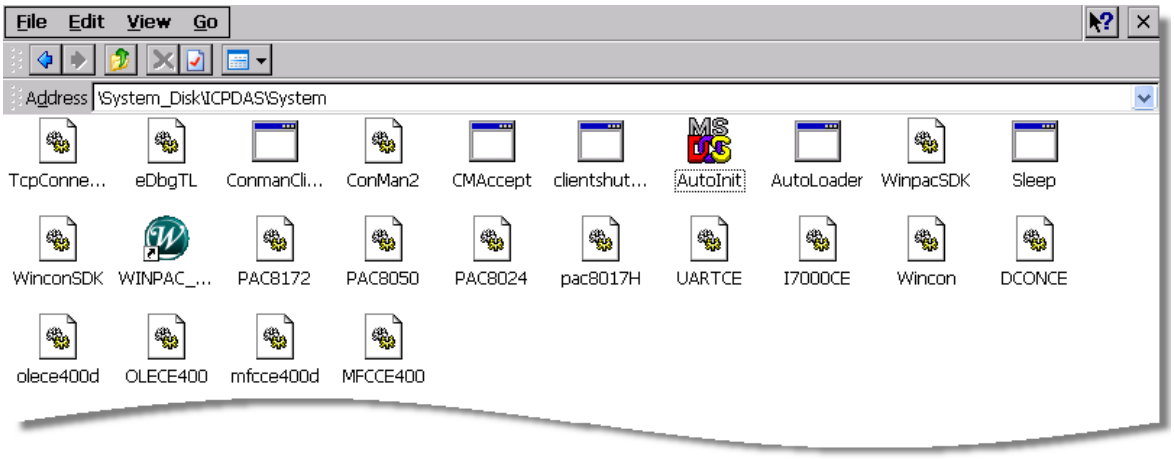
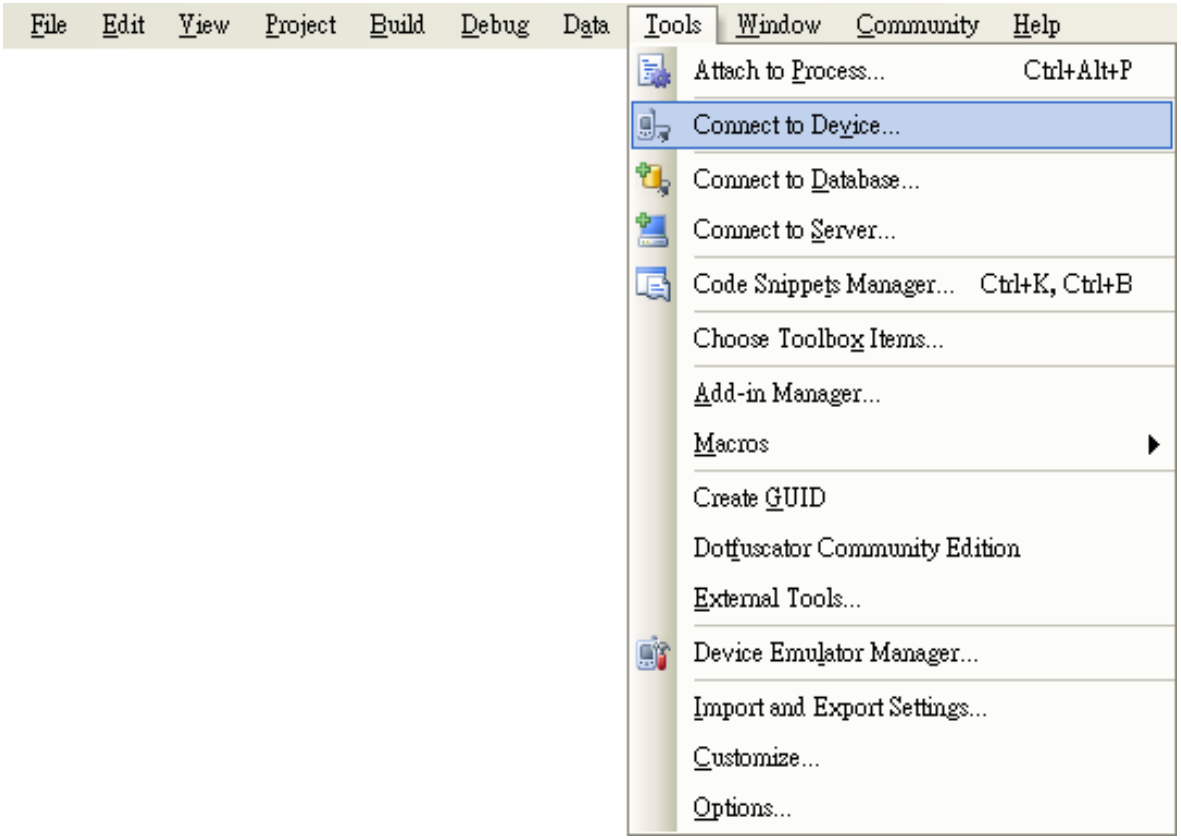
Step 11: On the WinPAC, run the "CommanClient2" and the "CMAccept.exe" applications which is located at: \System_Disk\ICPDAS\System



Step 12: On the "Tools" menu, click "Connect to Device…" command



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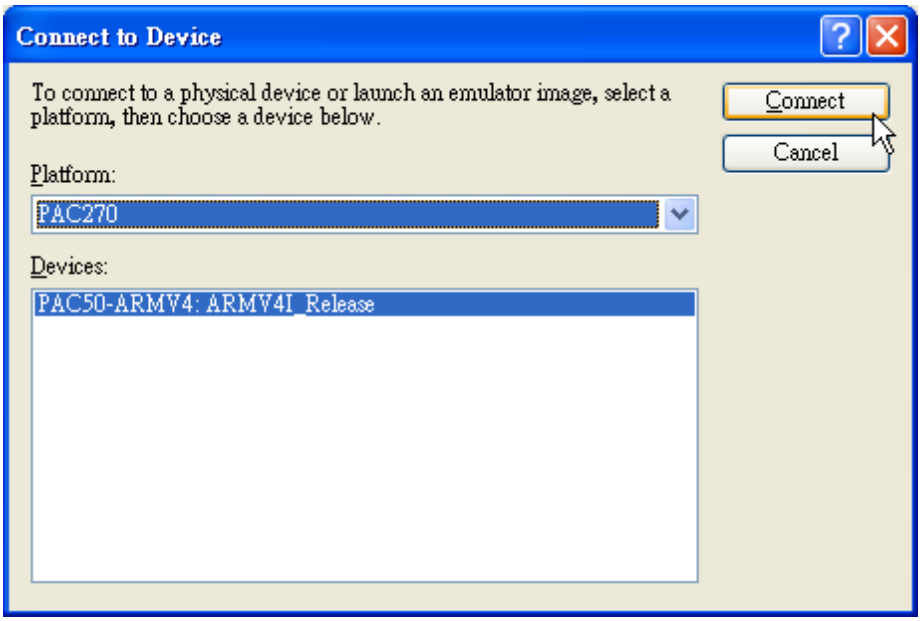
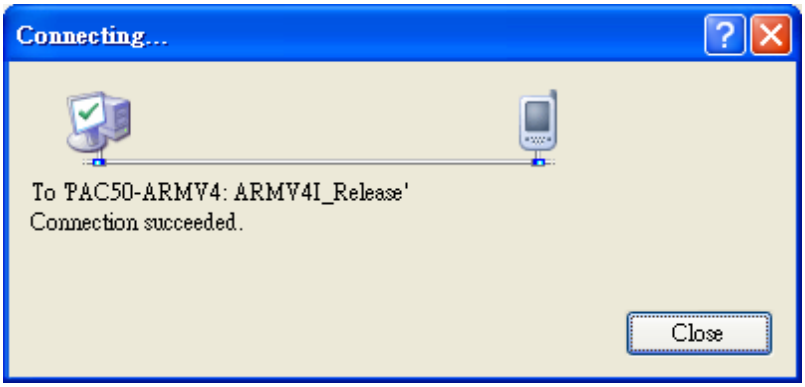
Step 13: On the “Connect to Device” dialog, select “PAC 270” from “Platform” list and then click the “Connect” button



Step 14: On the “Tools” menu, click “Connect to Device…” command



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

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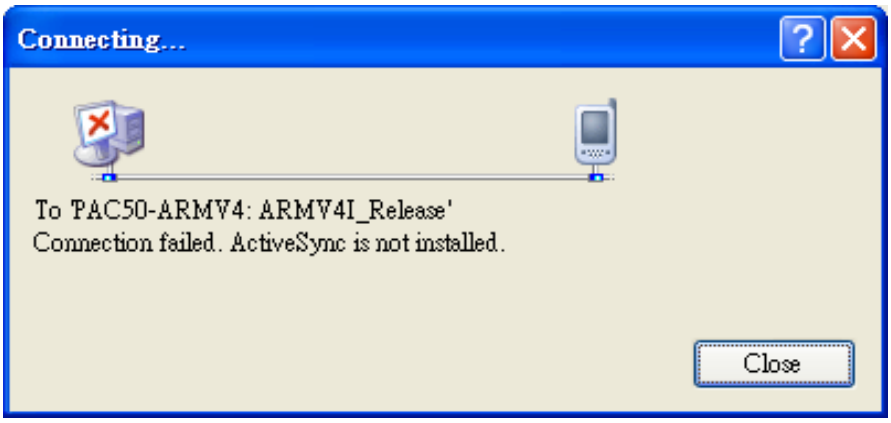
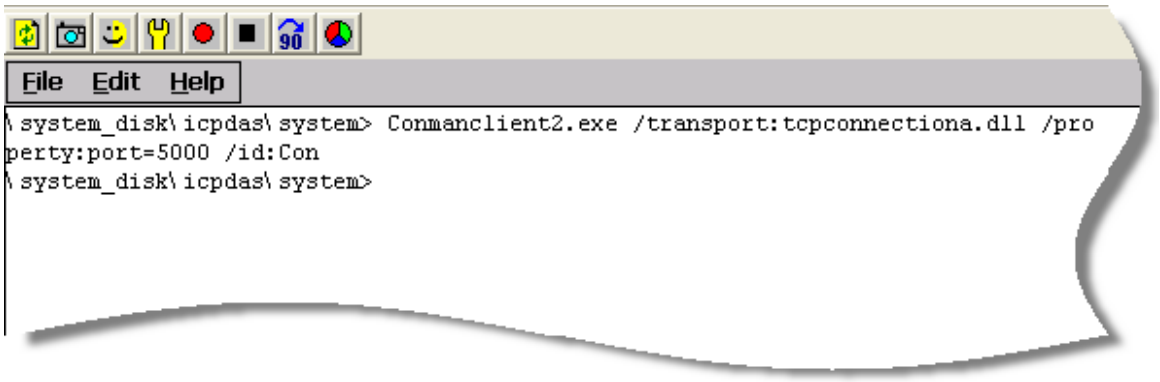
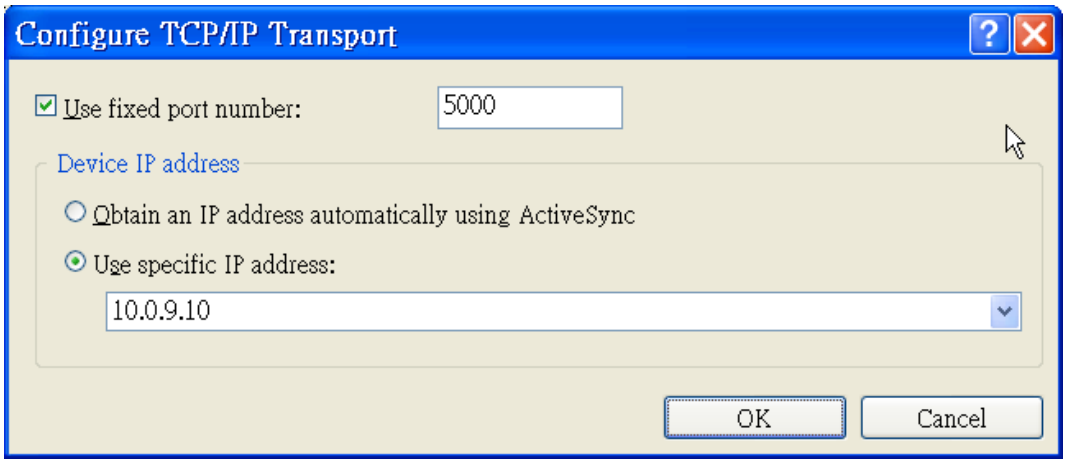
FAQ:

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/id:Con" at: \System_Disk\ICPDAS\System, and then run the "CMAccept.exe"





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E.3. How to recompile WinCon programs

To recompile Wincon programs to run on WinPAC, certain components of the programs require an adjustment that divides into two parts:

1. Compiler old programs which ran on Wincon 8x3x and 8x4x
2. Modify .vcp file to upgrade the old WinCon project

Tips & Warnings

In general, you only need to do part 1, after this, if the program still can’t be compiled to an application, the part 2 just need to do.

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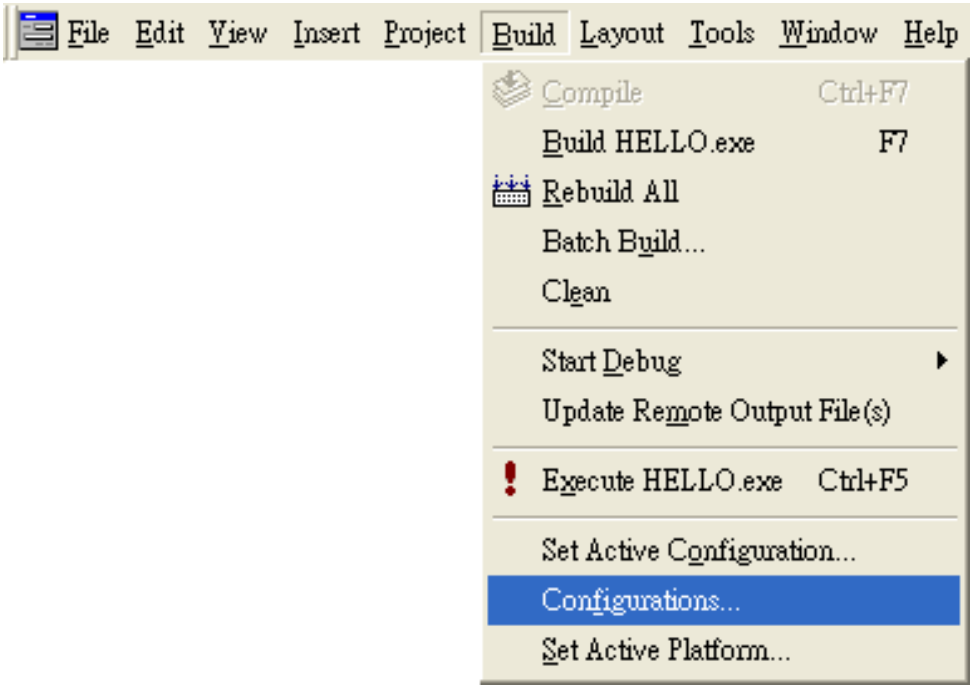
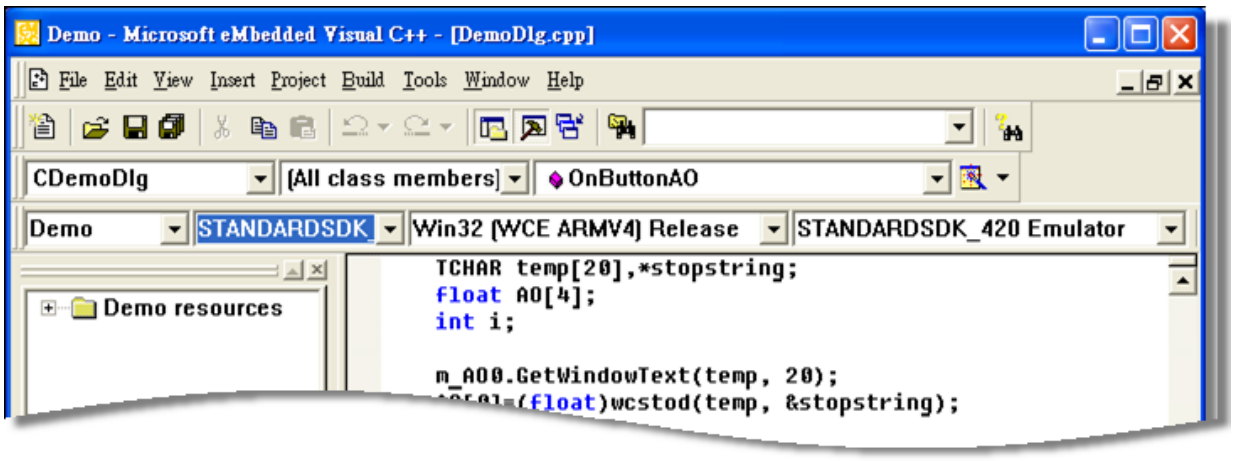
E.3.1. Compiler old programs which ran on Wincon 8x3x and 8x4x

Step 1: Open project which programmed in WinCon using eMbedded Visual C++

Step 2: On the "Build" menu, click "Configurations" command



Step 3: Make sure the CPU type is "STANDARDSDK"



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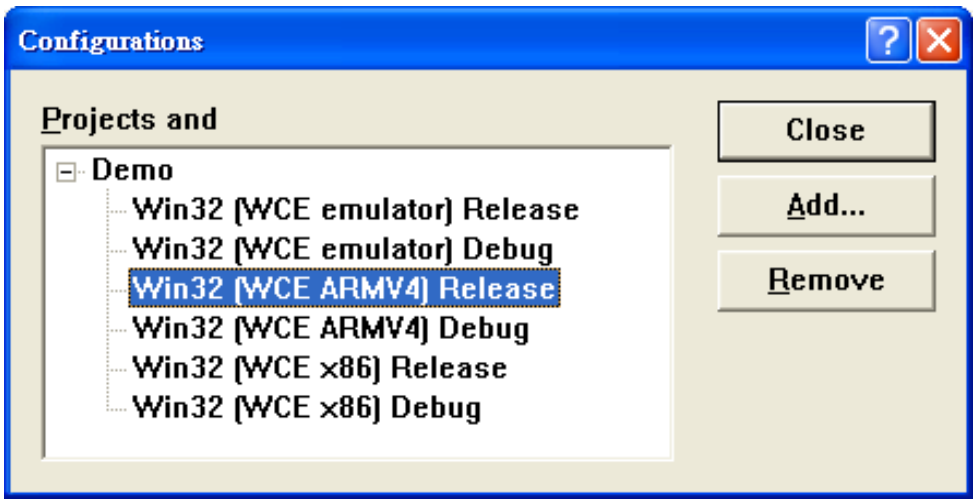
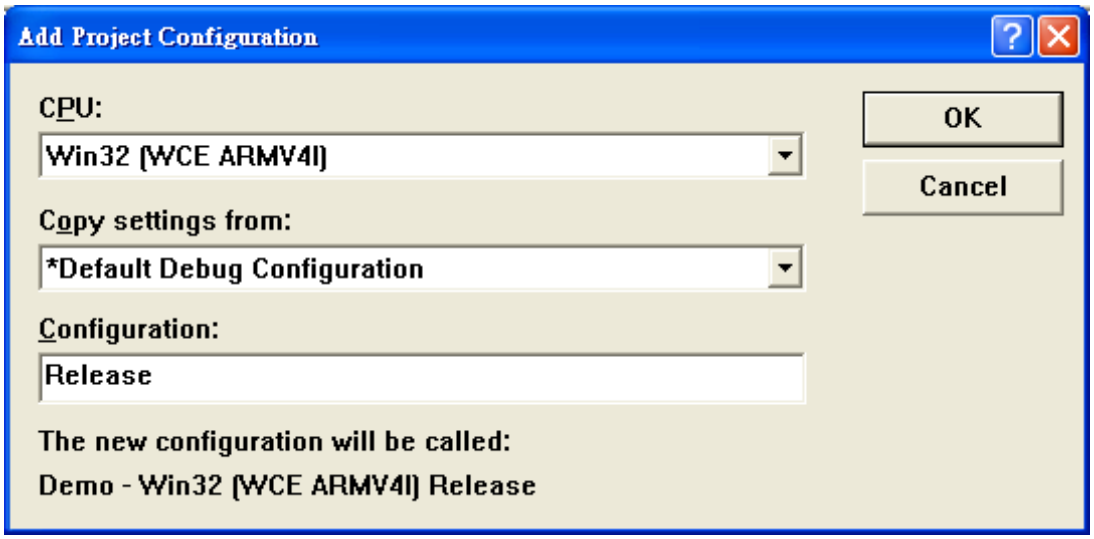
Step 4: On the “Configurations” dialog, click the “Add…” button



Step 5: On the “Add Project Configuration” dialog, choose one of the CPU type and then click the “OK” button.



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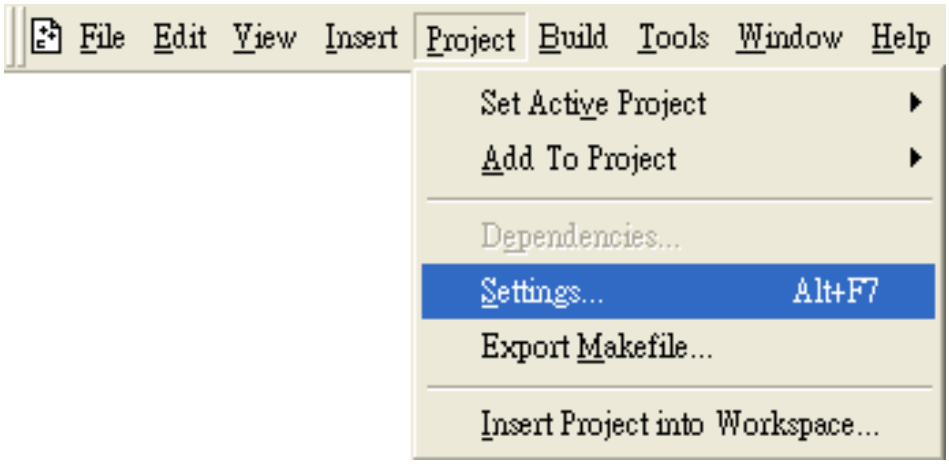
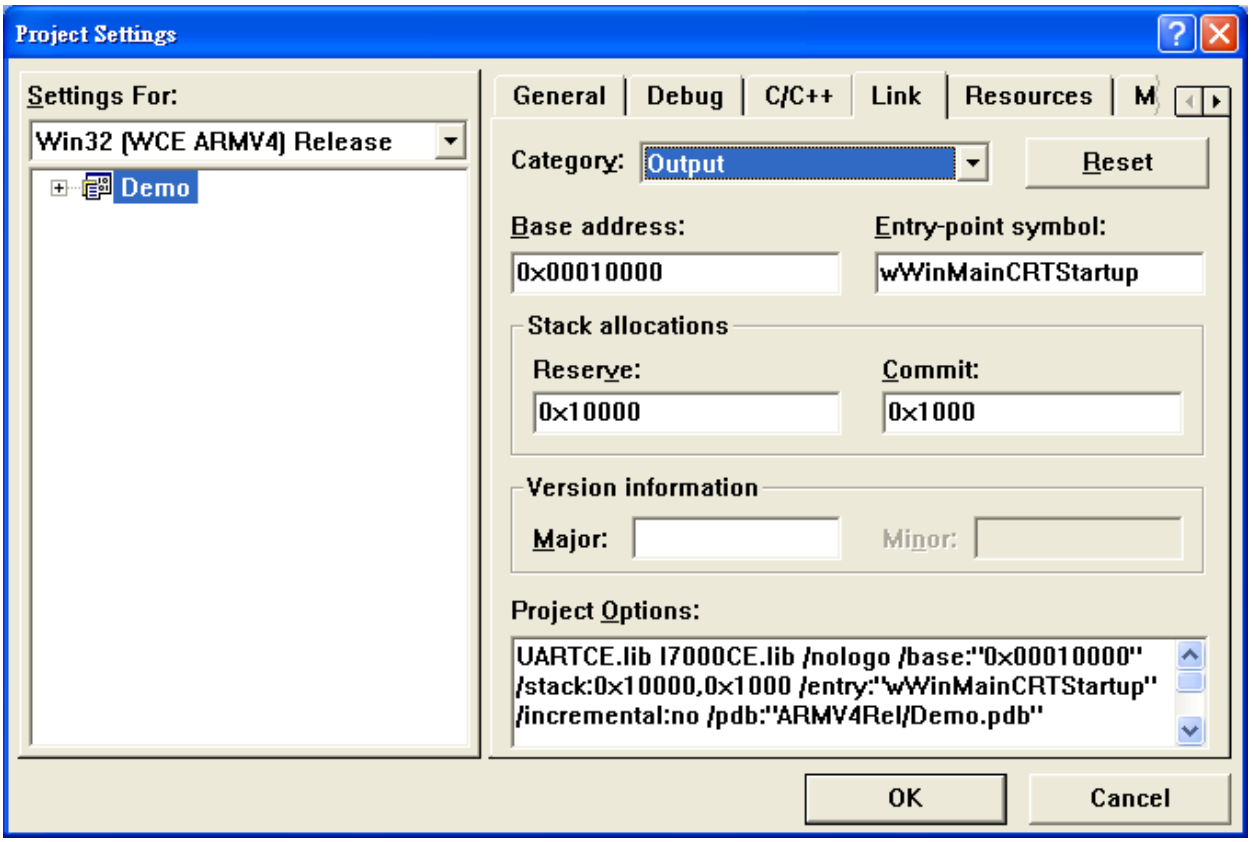
Step 6: On the “Project” menu, click “Settings…” command



Step 7: On the “Project Settings” dialog, select the “Link” tab and change the value of the “Entry-point symbol” field, “WinMainCRTStarup” to “wWinMainCRTStartup”,



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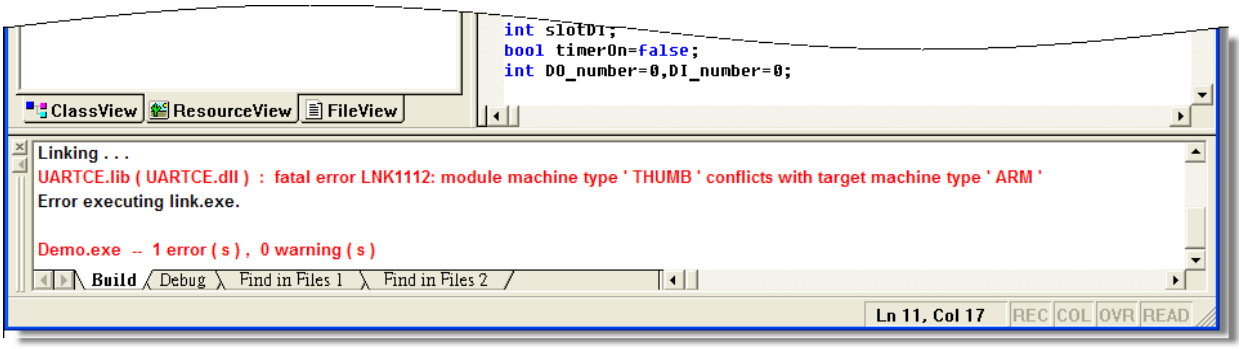
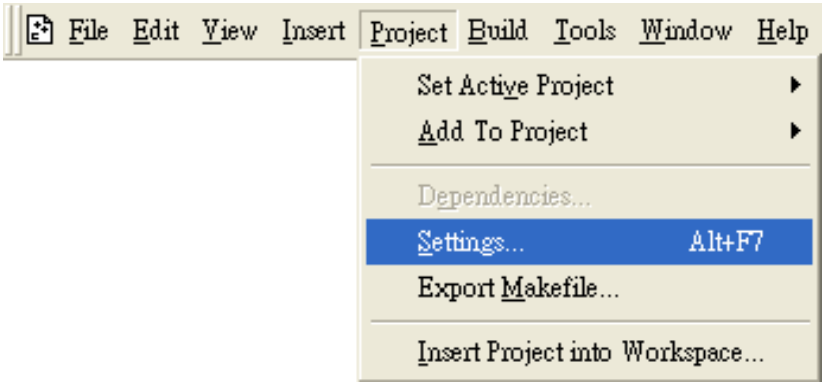
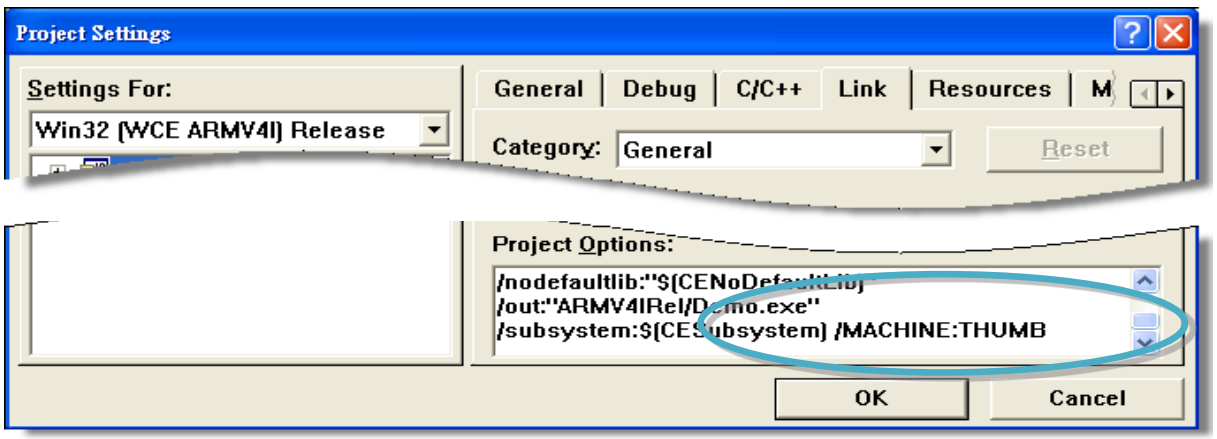
Step 8: After performing above-mentioned steps, build the project, your project should build success. If not, it will show error message as follow. Please continue with the following steps



Step 9: On the "Project" menu, click "Settings…" command



Step 10: On the "Project Settings" dialog, select the "Link" tab and change the value of the "Project Options" field, "ARM" to "THUMB", and then built the project



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E.3.2. Modify .vcp file to upgrade the old WinCon project

Step 1: Open a text editor to modify the .vcp file

Step 2: In the .vcp file, replace “0xa301” with “0xa501”

Step 3: In the .vcp file, replace “ARMV4” with “ARMV4I”

Step 4: In the .vcp file, replace “MACHINE:ARM” with “MACHINE:THUMB”

Step 5: Save the .vcp file just edited

Step 6: Open the old WinCon project and recompile it

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E.4. 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.

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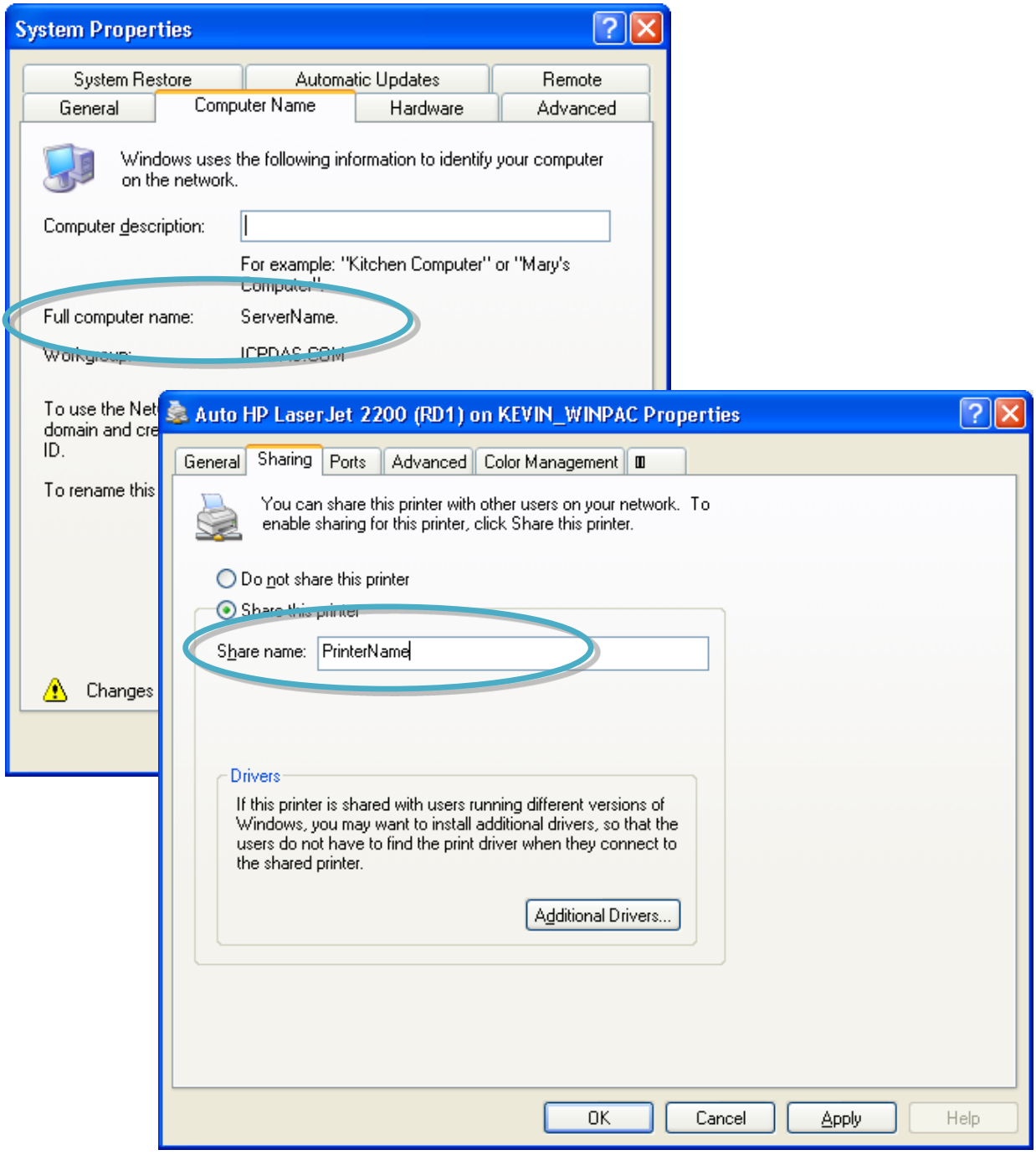
E.4.1. How to use network printer

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



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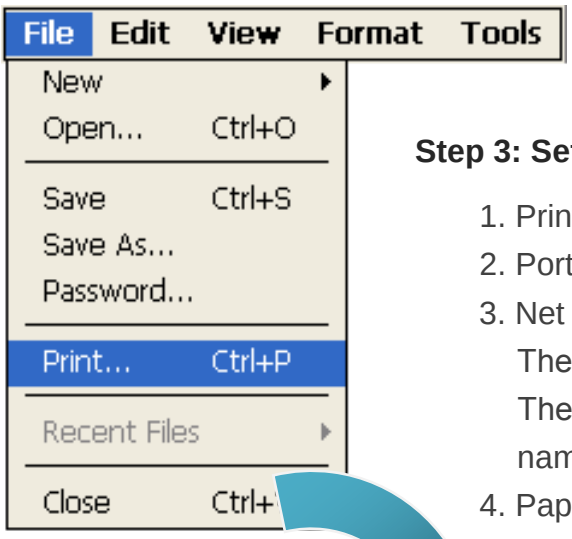
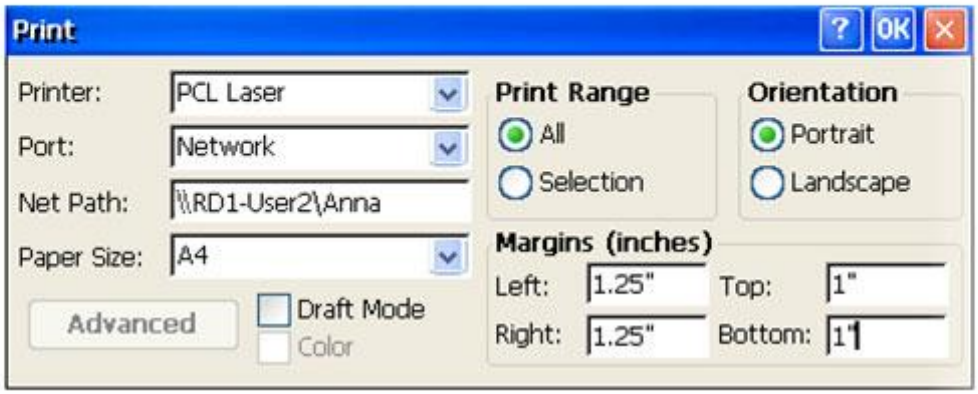
Step 2: On the WinPAC, open a WordPad format file



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



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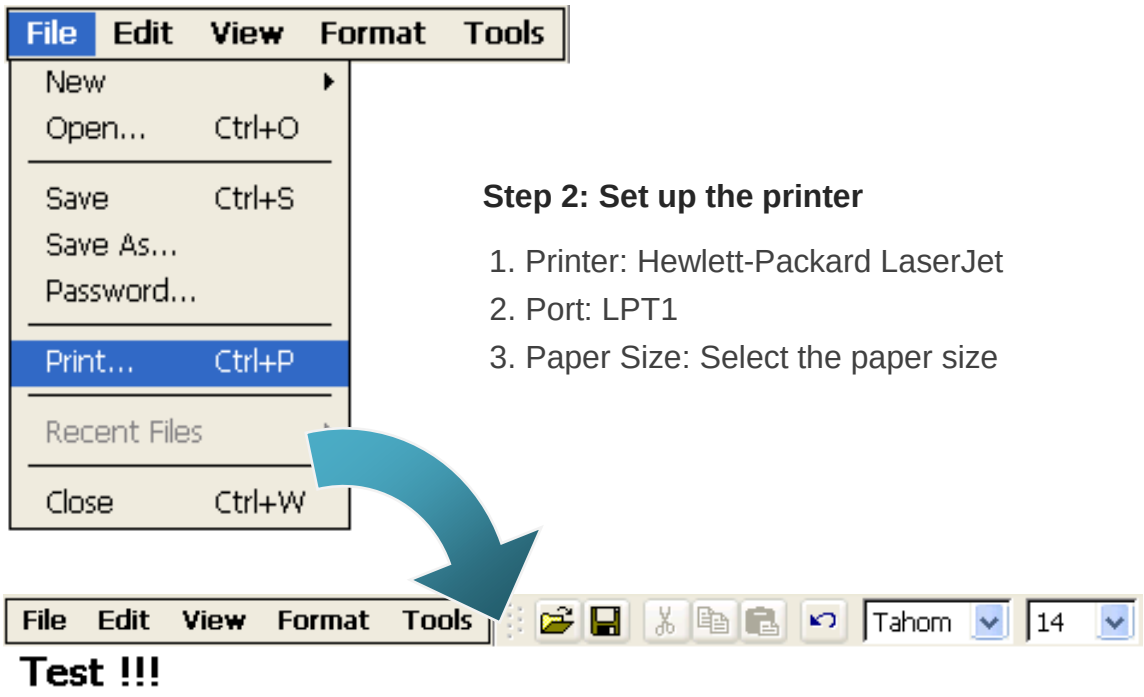
E.4.2. How to use printer via USB

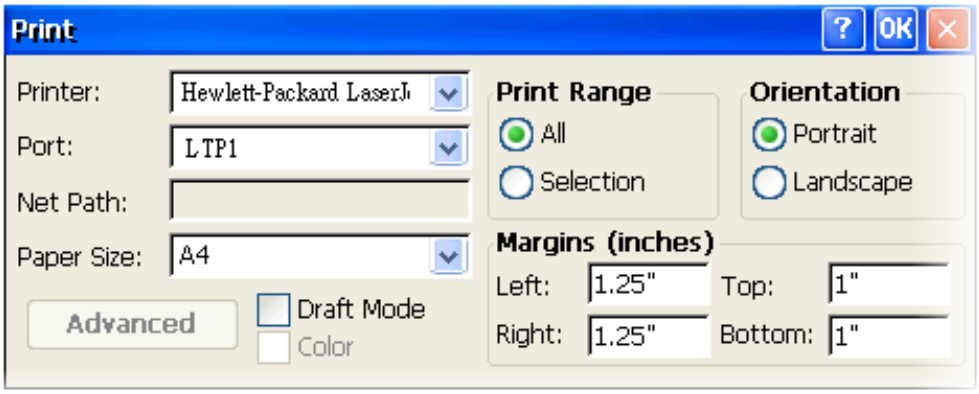
To use a shared network printer via USB, please perform the following steps:

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



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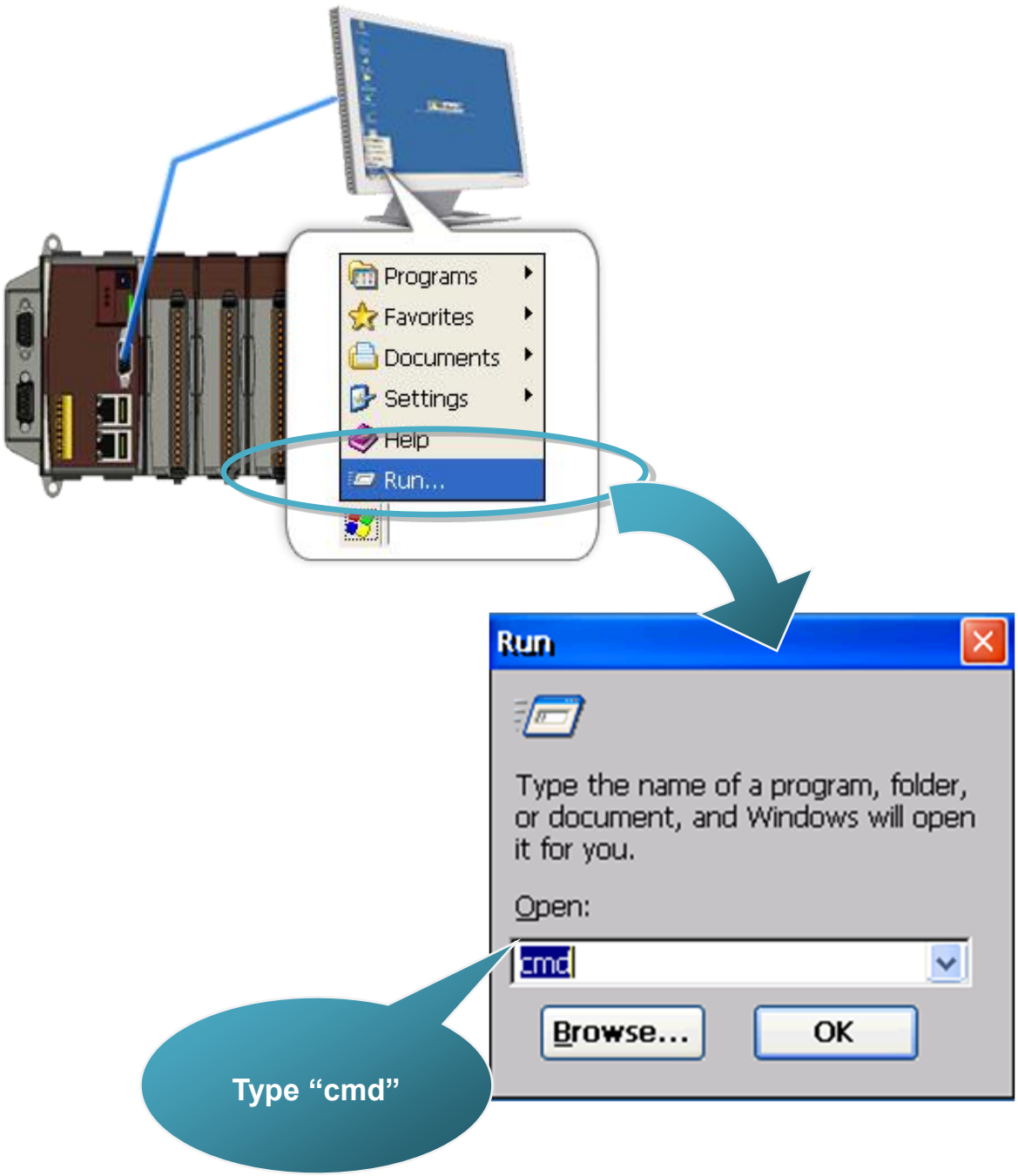
E.5. How to use services tool

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

Step 1: Open a MS-DOS command prompt



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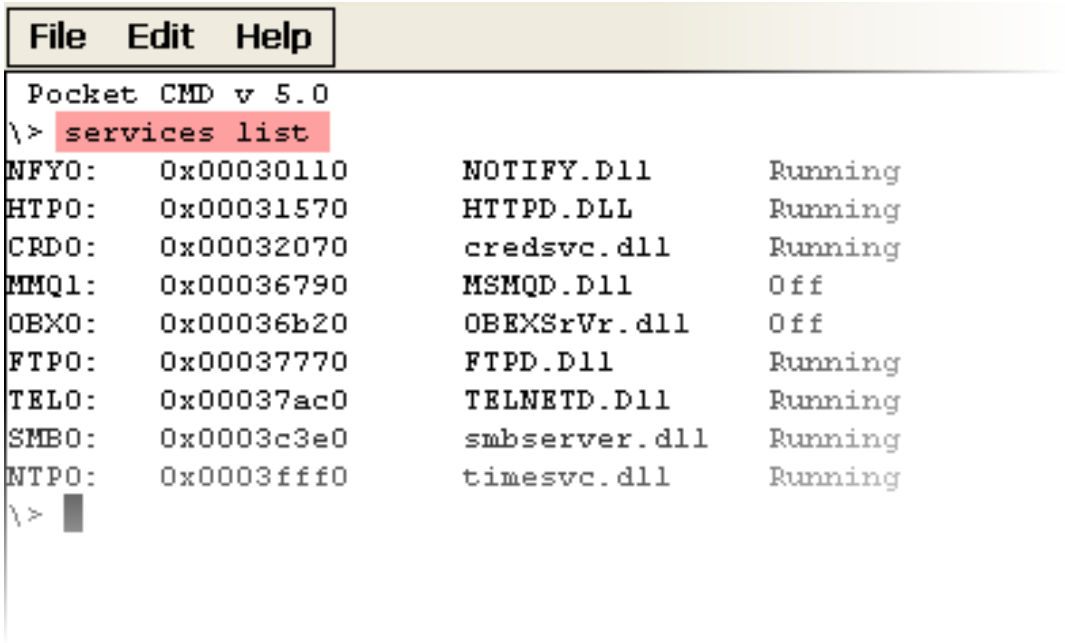
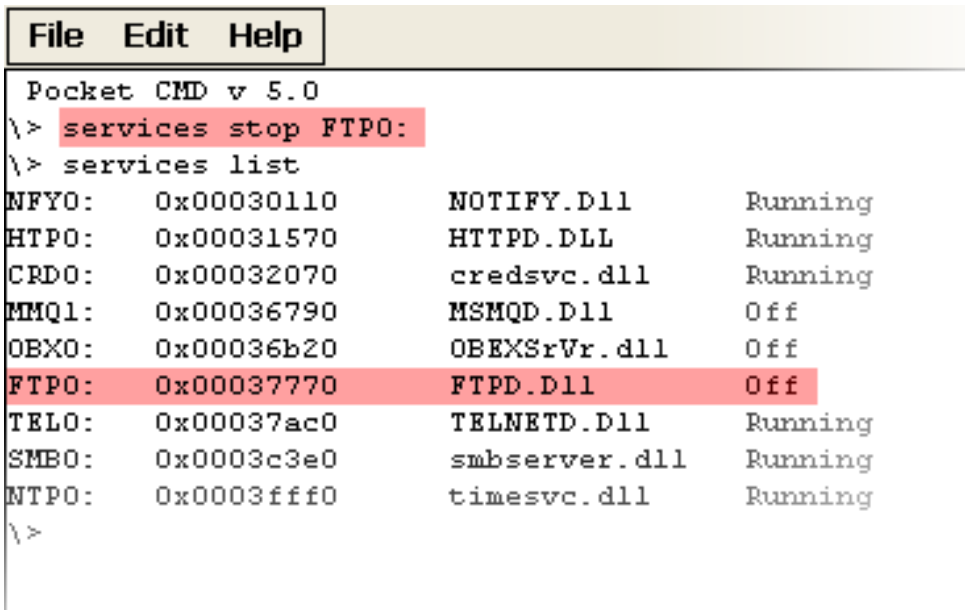
Step 2: List all services

[Syntax] services list



Step 3: Type the commands to configure service

[Syntax] services stop <services name>
For example, turn on the “FTP” service:
services stop FTP0:



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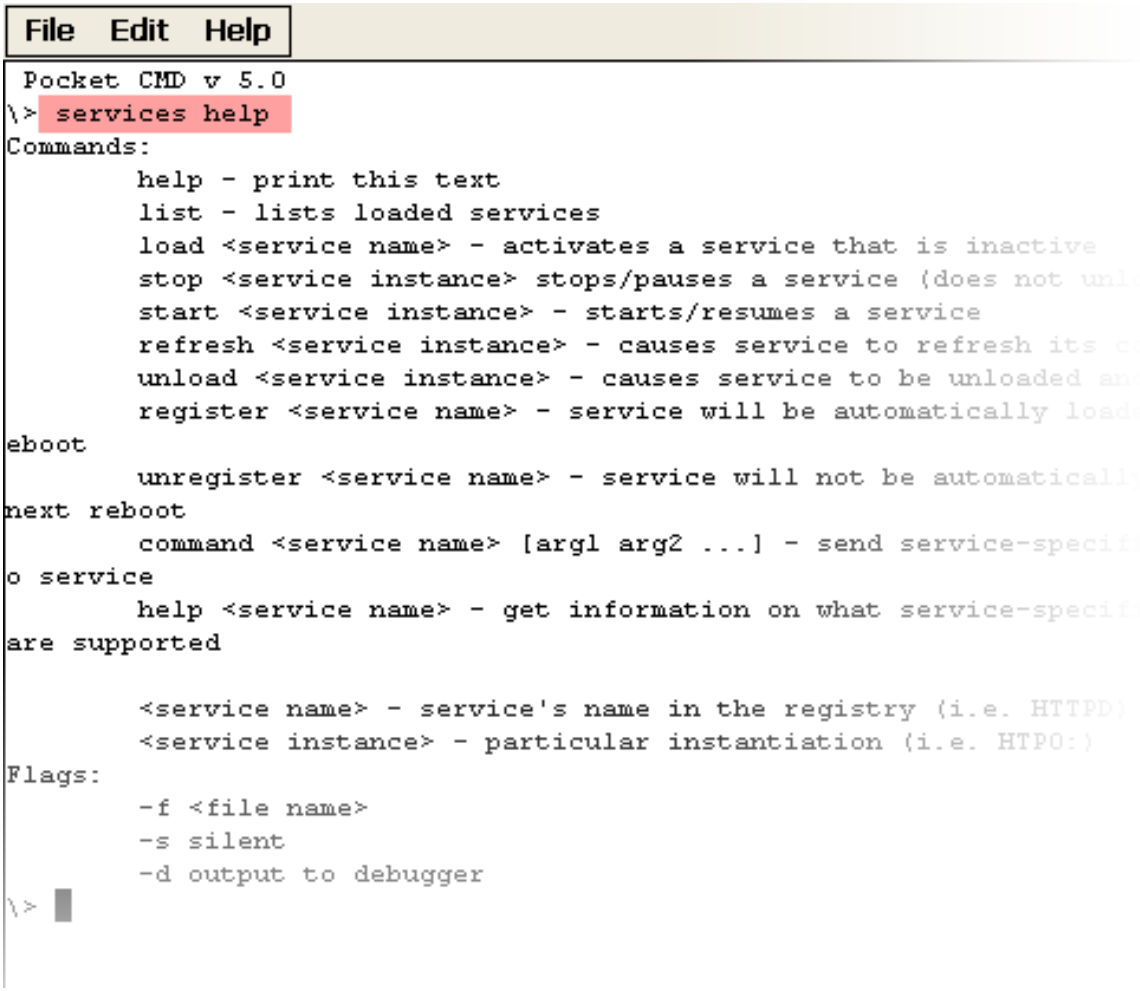
Tips & Warnings

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



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Appendix F. Revision History

Revision	Date	Description
1.0	July 2008	Initial issue
1.1	August 2008	Added more information about WinPAC Utility functions in section 3.5.
1.2	August 2008	1. Added additional information on how to establish a new telnet and FTP in Appendix E. 2. Added additional information on how to use services tool in Appendix E.
1.3	August 2008	1. Added additional information on how to use network printer in Appendix E. 2. Added additional information on how to use printer via USB in Appendix E.
1.4	September 2008	1. Added additional information on how to automatically update the WinPAC-8000 SDK in Appendix E. 2. Added additional information on how to manually update the WinPAC-8000 SDK in Appendix E. 3. Added additional information on how to update the WinPAC-8000 OS image from file
1.5	September 2008	Deleted WP-8041 information
1.6.0	July 2009	1. Changed the name of the version of this manual. 2. Moved the OS and SDK updates from the Appendix E to the Chapter 6. 3. Added information about the multilingual interface changes in section 2.6. 4. Added information about installing the touch panel driver in section 2.7. 5. Added information about the Multi-serial port wizard function of the WinPAC Utility in section 3.5 6. Added additional information about the revision history in Appendix F.
1.7.0	September 2009	1. Added a section about the module selection in 1.2. 2. Added information about the support of the printer

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		driver in Appendix E.4
1.8.0	October 2009	1. Modified the specification of the flash disk in section 1.1 and 1.2. 2. Deleted auto mdi/mdi-x or auto mdix to Ethernet port specification 3. Added additional information about the support of the Micro SD socket in section 1.2. 4. Modified the printer configuration in Appendix E.4
1.9.0	October 2009	1. Added information about two new OS mode (DCON_CE and VCEP mode) in section 2.3. 2. Replaced Quicker with NAPOPC_CE5
2.0.0	November 2009	Added information about WP-8x3x series modules
2.0.1	December 2009	1. Modified the WinPAC installation in section 2.1. 2. Added information about the requirements of the WinPAC SDK in section 4.3.
2.0.2	April 2010	1. Modified the specification of Dual Battery Backup SRAM feature in section 1.1. 2. Added information about I/O Expansion Slots in section 1.2. 3. Modified information about Operating Environment in section 1.2.
2.0.3.	July 2010	1. Modified information about the companion CD in section 1.5. 2. Modified information about using Backup_Utility to back up the settings and files in section 2.8. 3. Added information about WinPAC tools in chapter 3.

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