WP-5000-CE7 Series

User Manual

Version 1.1.2 April 2018

Service and usage information for

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Contents

1. Introduction

This chapter provides an overview of the WP-5000-CE7 and its components, and introduces the fundamental concepts for user familiar.

The WP-5000-CE7 includes the following models:

- WP-5231-CE7
- WP-5231M-CE7
- WP-5231PM-3GWA-CE7
- WP-5231PM-4GC-CE7
- WP-5231PM-4GE-CE7

WP-5231-CE7

WP-5231M-CE7

WP-5231PM-3GWA-CE7

WP-5231PM-4GC-CE7

WP-5231PM-4GE-CE7

The WP-5000-CE7 are equipped a Cortex-A8 CPU (1 GHz) and running a windows CE.NET 7.0 operating system. The optional I/O expansion board, XV-board, provides high-protection I/O. Using the built-in Flash and microSD, the WP-5000-CE7 can save application program, image file and data.

The WP-5231PM-3GWA-CE7 is equipped with the 3G module that work on frequencies of WCDMA 2100/1900/900/850 MHz and GSM 850/900/1800/1900 MHz. These modules utilize the 3G network for convenient and inexpensive data transfer from remote instruments, meters, computers or control systems in either live data or packet data. These modules has the integrated TCP/IP stack so that even simple controllers with serial communications ports can be connected to the modem without the need for special driver implementation. With the features of theirs, the systems can be SMS and GPRS or 3G connection applications with our PAC.

1.1. Features

The WP-5000-CE7 offer the most comprehensive configuration and remote system upgrade solutions to meet specific application requirements. The following list shows the hardware and software features designed to simplify installation, configuration and application.

- **Windows Embedded Compact 7.0**

  - Support PC based software: Visual Studio.NET
  - Web server, FTP server, Telnet server

- **Local I/O and Communication Expansion Board**

WP-5000-CE7 are equipped with an I/O expansion bus to support one optional expansion board, called XV-board. It can be used to implement various I/O functions such as DI, DO, A/D, D/A, Timer/Counter

For more information about these available expansion boards, please refer to http://www.icpdas.com/root/product/solutions/hmi_touch_monitor/touchpad/xv-board_selection.html

➢ **Various Memory Expansions**

WP-5000-CE7 provides various memory storage options, such as FRAM and microSD. Customers can choose the memory based on their characteristics.

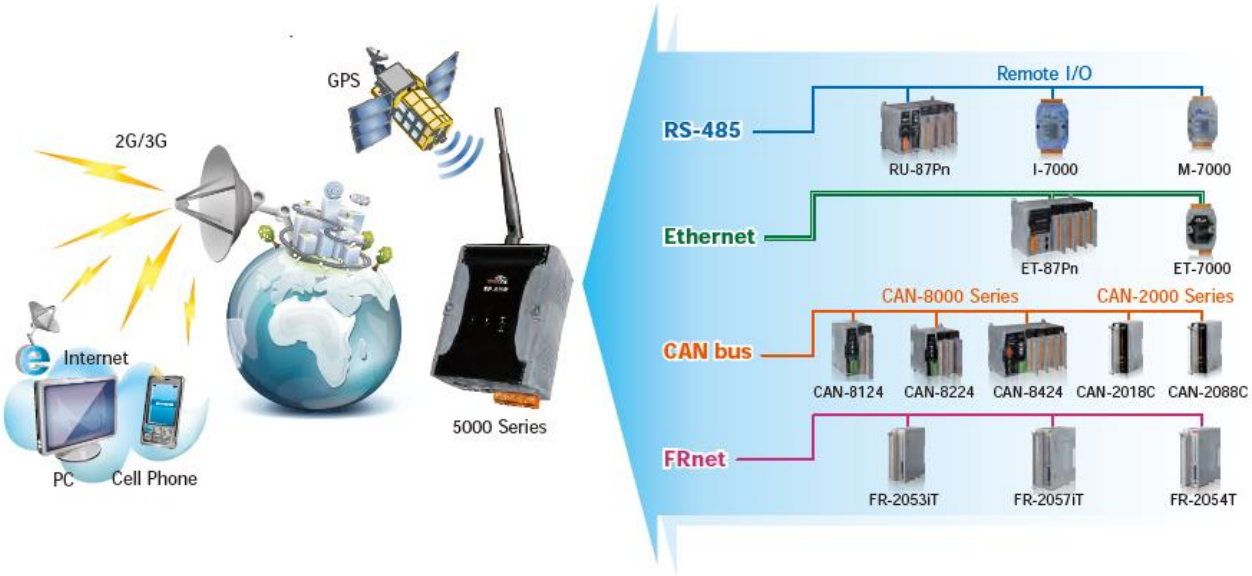
- 64 KB FRAM: no limit on the number of write-erase cycles.
- microSD/microSDHC: to implement portable data logging applications; supports up to 32 GB.

➢ **Unique 64-bit Hardware Serial Number to Protect Your Program**

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

➢ **Remote I/O Module and Expansion Unit**

With the built-in RS-485 and Ethernet port, the WP-5000-CE7 can connect RS-485/Ethernet remote I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000).

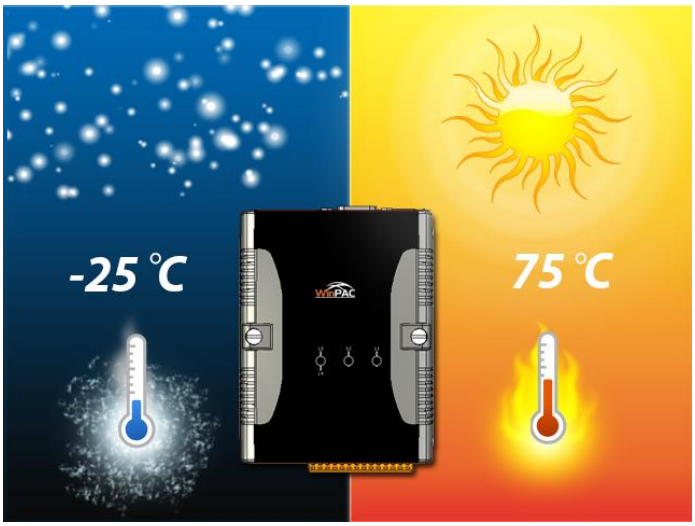


➢ **Plastic and Metal Housing**

The WP-5231-CE7 comes with the plastic casing, while the WP-5231M-CE7, WP-5231PM-3GWA-CE7 and WP-5231PM-4GE-CE7 come with the metal casing.

➢ **Highly Reliable Under Harsh Environment**

Our WP-5000-CE7 operates in a wide range of temperature and humidity.



- Operating Temperature: -25 ~ +75 °C
- Storage Temperature: -40 ~ +80 °C
- Humidity: 10% ~ 90% RH, non-condensing

1.2. Specifications

The table below summarizes the specifications of the WP-5000-CE7.

1.2.1. WP-5231-CE7 and WP-5231M-CE7

Models	WP-5231-CE7	WP-5231M-CE7
System Software		
OS	Windows CE 7.0 Professional	
Framework Support	.Net Compact Framework 3.5	
Embedded Service	FTP Server, Web Server	
SDK Provided	Dll for Visual Studio.Net 2008	
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese	
CPU Module		
CPU	Cortex-A8, 1 GHz	
DDR3 SDRAM	512 MB	
Flash	256 MB	
FRAM	64 KB	
Expansion Flash Memory	microSD socket with one 4 GB microSD card (support up to 32 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for software copy protection	
Dual Watchdog Timers	Yes	
Rotary Switch	Yes (0 to 9)	
LED Indicators	1 LED for Power and Running; 2 LEDs for user defined	

Models	WP-5231-CE7	WP-5231M-CE7
VGA & Communication Ports		
Resolution	640 x 480, 800 x 480, 800 x 600, 1024 x 768	
Ethernet	RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 2.0	1	
COM 1	RS-232 (RxD, TxD, and GND); Non-isolated	
COM 2	RS-232 (RxD, TxD, and GND); Non-isolated	
COM 3	RS-485 (Data+, Data-); Non-isolated	
COM 4	RS-485 (Data+, Data-); 2500 V_{DC} isolated	
I/O Expansion		
I/O Expansion Bus	Yes, one optional XV-board	
Mechanical		
Dimensions (W x H x D)	91 mm x 132 mm x 52 mm	117 mm x 126 mm x 58 mm
Housing	Plastic	Metal
Installation	DIN-rail mounting	Wall Mounting/DIN-rail mounting
Environmental		
Operating Temperature	-25 °C to +75 °C	
Storage Temperature	-40 °C to + 80 °C	
Ambient Relative Humidity	10 % to 90 % RH (non-condensing)	
Power		
Input Range	+12 V_{DC} to +48 V_{DC}	
Consumption	4.8 W (0.2 A @ 24 V_{DC})	

1.2.2. WP-5231PM-3GWA-CE7

Models	WP-5231PM-3GWA-CE7
System Software	
OS	Windows CE 7.0 Professional
Framework Support	.Net Compact Framework 3.5
Embedded Service	FTP Server, Web Server
SDK Provided	Dll for Visual Studio.Net 2008
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese
CPU Module	
CPU	Cortex-A8, 1 GHz
DDR3 SDRAM	512 MB
Flash	256 MB
FRAM	64 KB
Expansion Flash Memory	microSD socket with one 4 GB microSD card (support up to 32 GB microSDHC card)
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year
64-bit Hardware Serial Number	Yes, for software copy protection
Dual Watchdog Timers	Yes
Rotary Switch	Yes (0 to 9)
LED Indicators	1 LED for Power and Running; 2 LEDs for user defined
VGA & Communication Ports	
Resolution	640 x 480, 800 x 480, 800 x 600, 1024 x 768
Ethernet	RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)
USB 2.0	1
COM 1	Console Reserved for OS
COM 2	RS-232 (RxD, TxD, and GND); Non-isolated
COM 3	RS-485 (Data+, Data-); Non-isolated
COM 4	RS-485 (Data+, Data-); 2500 V_{DC} isolated

Models	WP-5231PM-3GWA-CE7
I/O Expansion	
I/O Expansion Bus	Yes, one optional XV-board
Mechanical	
Dimensions (W x H x D)	117 mm x 126 mm x 58 mm
Housing	Metal
Installation	Wall Mounting/DIN-rail mounting
Environmental	
Operating Temperature	-25 °C to +75 °C
Storage Temperature	-40 °C to + 80 °C
Ambient Relative Humidity	10 % to 90 % RH (non-condensing)
Power	
Input Range	+12 V_{DC} to +48 V_{DC}
Consumption	6.5 W
GSM System	
Frequency Band	GSM: 850/900/1800/1900 MHz
GPRS Connectivity	GPRS class 12/10; GPRS station class B
Data GPRS	Downlink transfer: Max. 85.6 kbps; Uplink transfer: Max 42.8k bps
3G System	
Frequency Band	WCDMA 850/900/1900/2100 MHz
Data Transmission	Downlink transfer: Max. 85.6 kbps; Uplink transfer: Max 42.8k bps
GPS System (option)	
Support Channels	32
Protocol Support	NMEA 0183

1.2.3. WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7

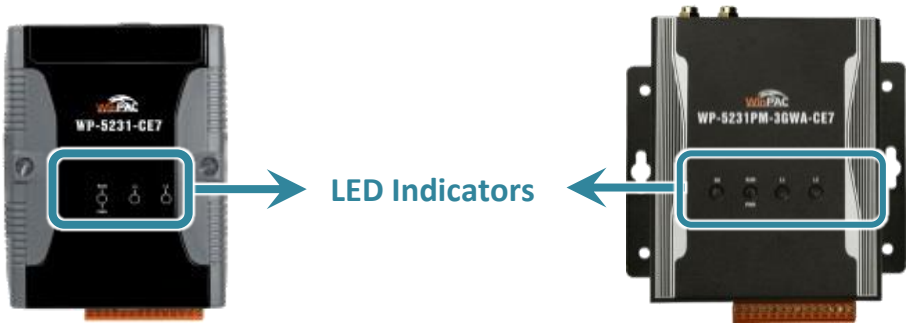
Models	WP-5231PM-4GC-CE7	WP-5231PM-4GE-CE7
System Software		
OS	Windows CE 7.0 Professional	
Framework Support	.Net Compact Framework 3.5	
Embedded Service	FTP Server, Web Server	
SDK Provided	Dll for Visual Studio.Net 2008	
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese	
CPU Module		
CPU	Cortex-A8, 1 GHz	
DDR3 SDRAM	512 MB	
Flash	256 MB	
FRAM	64 KB	
Expansion Flash Memory	microSD socket with one 4 GB microSD card (support up to 32 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for software copy protection	
Dual Watchdog Timers	Yes	
Rotary Switch	Yes (0 to 9)	
LED Indicators	1 LED for Power and Running; 2 LEDs for user defined	
VGA & Communication Ports		
Resolution	640 x 480, 800 x 480, 800 x 600, 1024 x 768	
Ethernet	RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
USB 2.0	1	
COM 1	Console Reserved for OS	
COM 2	RS-232 (RxD, TxD, and GND); Non-isolated	
COM 3	RS-485 (Data+, Data-); Non-isolated	
COM 4	RS-485 (Data+, Data-); 2500 V_{DC} isolated	

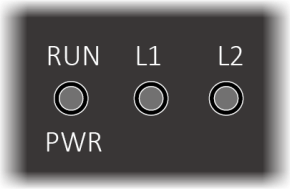
Models	WP-5231PM-4GC-CE7	WP-5231PM-4GE-CE7
I/O Expansion		
I/O Expansion Bus	Yes, one optional XV-board	
Mechanical		
Dimensions (W x H x D)	117 mm x 126 mm x 58 mm	
Housing	Metal	
Installation	Wall Mounting/DIN-rail mounting	
Environmental		
Operating Temperature	-25 °C to +75 °C	
Storage Temperature	-40 °C to + 80 °C	
Ambient Relative Humidity	10 % to 90 % RH (non-condensing)	
Power		
Input Range	+12 V_{DC} to +48 V_{DC}	
Consumption	6.5 W	
GSM System		
Frequency Band	GSM: 850/900/1800/1900 MHz	
GPRS Connectivity	GPRS class 12/10; GPRS station class B	
Data GPRS	Downlink transfer: Max. 85.6 kbps; Uplink transfer: Max 42.8k bps	
3G System		
Frequency Band	WCDMA 900/2100 TD-SCDMA 1900/2100 CDMA2000 (BC0) 800	WCDMA 850/900/2100 MHz
Data Transmission	DC-HSPA+ Download: Max. 42 Mbps; Upload: Max 5.76Mbps TD-SCDMA Download: Max. 4.2 Mbps; Upload: Max 2.2Mbps CDMA2000 EVDO Download: Max. 14.7 Mbps; Upload: Max 5.4Mbps	
4G System		
Frequency Band	FDD LTE: B1/B3/B8 TDD LTE: B38/B39/B40/B41	FDD LTE: B1/B3/B5/B7/B8/B20
Data Transmission	Download Max 100Mbps/Upload Max 50Mbps	
GPS System (option)		
Support Channels	32	
Protocol Support	NMEA 0183	

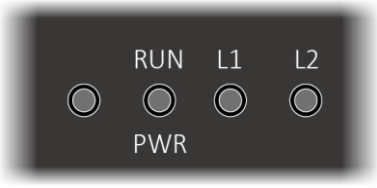
1.3. Overview

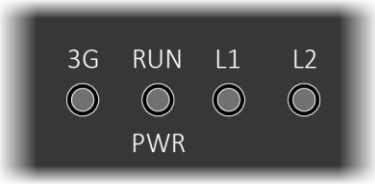
The WP-5000-CE7 is equipped with several interfaces and peripherals that can be integrated with external systems. Here is an overview of the components and its descriptions. The details of these items are as follows:

Front View



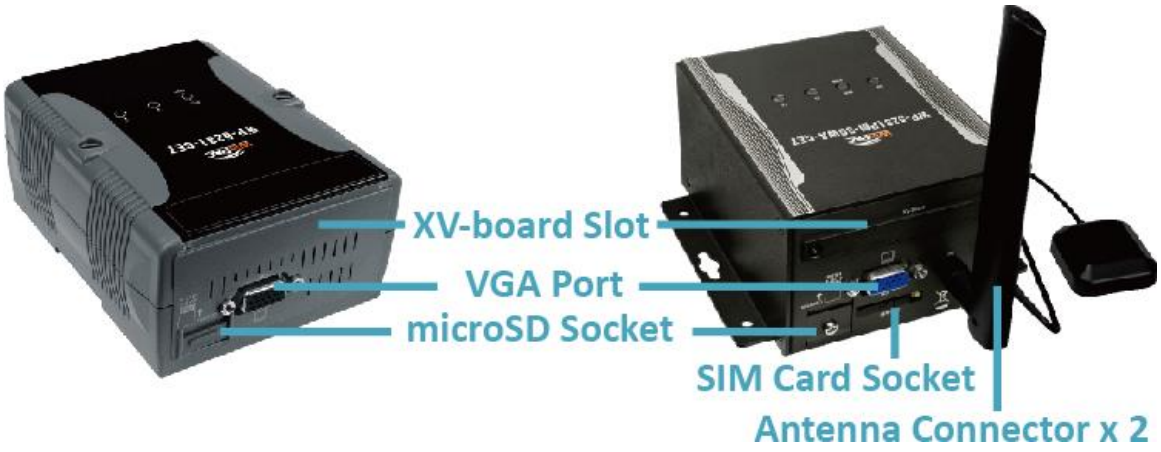
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>LED Indicators</td><td>The WP-5000-CE7 series modules has 3/4 LED indicators shown as below.
WP-5231-CE7
 

WP-5231M-CE7
 

WP-5231PM-3GWA-CE7
 

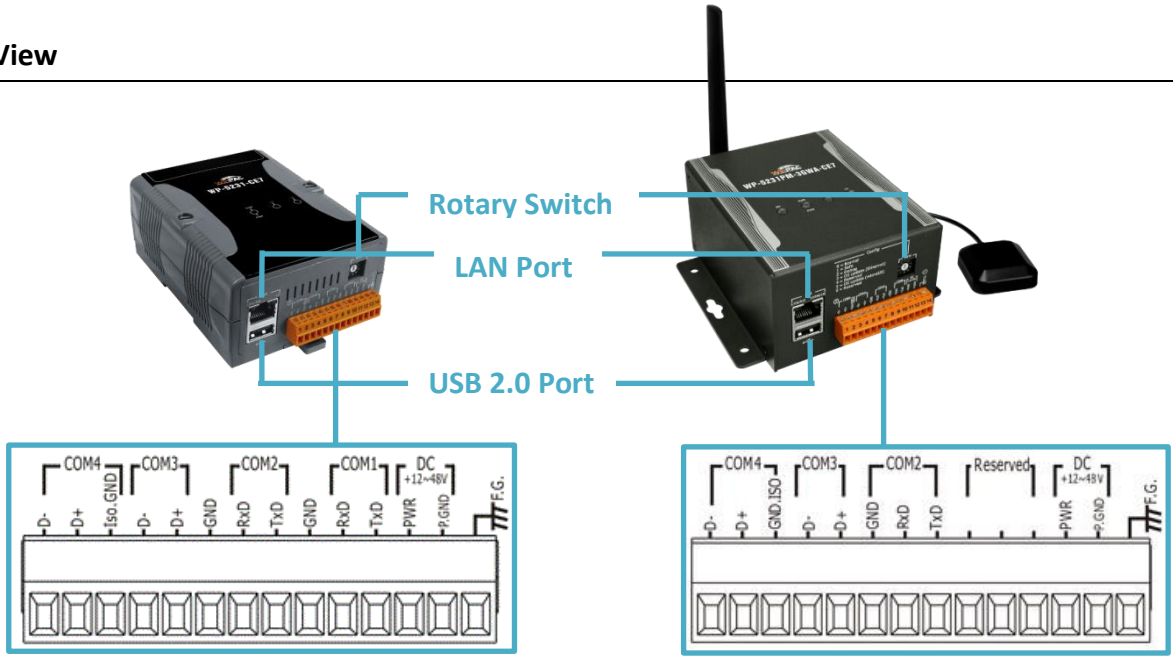
WP-5231PM-4GE-CE7
 
<table>
<tr><th>LED Indicator</th><th>Color</th><th>Meaning</th></tr>
<tr><td>3G/4G</td><td>Green</td><td>The 3G/4G LED indicates that the antenna is connected to 3G/4G network.</td></tr>
<tr><td rowspan="2">RUN/PWR</td><td>Green</td><td>Power is on</td></tr>
<tr><td>Orange</td><td>Power on and OS is running</td></tr>
<tr><td>L1</td><td>Orange</td><td rowspan="2">User programmable LED indicator.</td></tr>
<tr><td>L2</td><td>Orange</td></tr>
</table>
</td></tr>
</table>

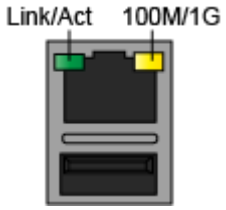
Top View



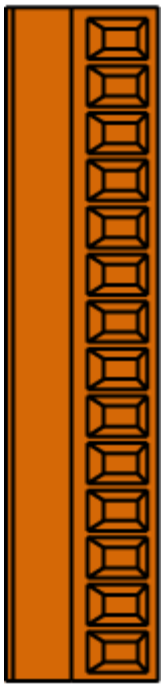
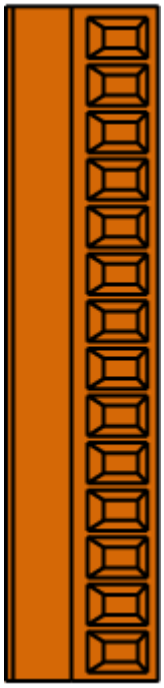
Item	Description
XV-board Slot	The XV-board slot can be used to support up to one XV-board service.
VGA port	A VGA connector is a 3-row 15-pin connector that can be used with a variety of supported VGA resolutions, and the output resolution covers 640x480, 800x480, 800x600, 1024x768.
microSD Slot	The microSD slot can be used to restore the WP-5000-CE7 system and expand the memory up to 32 GB.
SIM Card Socket	**(for WP-5231PM-3GWA-CE7/WP-5231PM-4GE-CE7 only)** TheWP-5231PM-3GWA-CE7/WP-5231PM-4GE-CE7 has a SIM card socket that supports 3G/4G network.
Antenna Connector	**(for WP-5231PM-3GWA-CE7/WP-5231PM-4GE-CE7 only)** TheWP-5231PM-3GWA-CE7/WP-5231PM-4GE-CE7 has 2/1 antenna connector(s) that can be used to connect the antenna.

Bottom View



Item	Description
LAN Port	The WP-5000-CE7 has an Ethernet port that can be connected to a computer or device via an Ethernet cable.  The Link/Act and 100M/1G LED indicators display the status of the WP-5000-CE7. The details are shown as below.
USB 2.0 Port	The WP-5000-CE7 has an USB 2.0 port that allows support for the USB devices such as mouse, keyboard or an external USB hard drive.
Rotary Switch	Rotary Switch is an operating mode selector switch which provides seven functions related to the selection of the operating mode. 

LED Indicator	State (Color)	Meaning
100M/1G	ON (Orange)	Network Speed: 1 G
	OFF	Network Speed: 10/100 M
Link/Act	ON (Green)	The Link is active
	OFF	The Link is inactive
	Blinking(Green)	Network activity

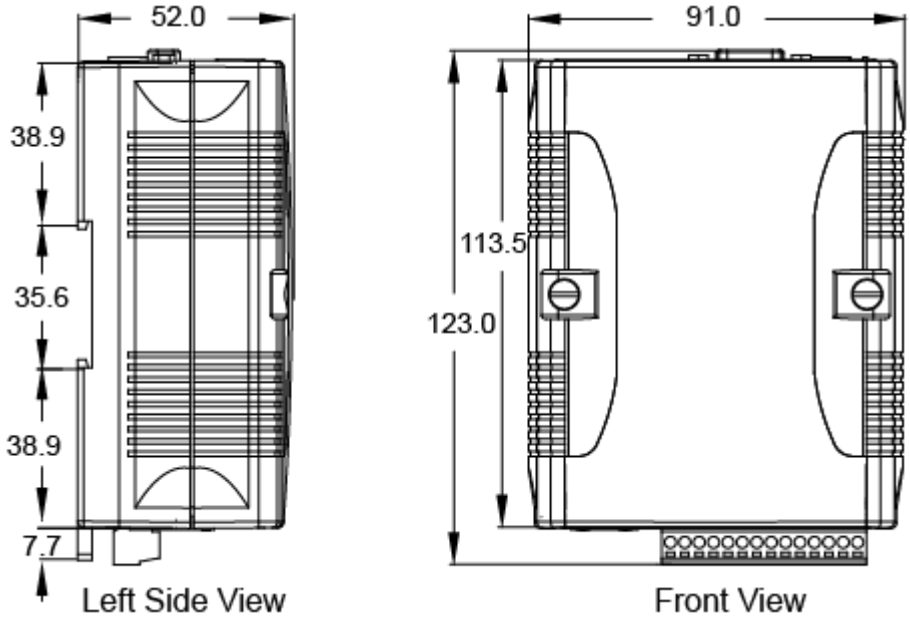
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>WP-5231-CE7/
WP-5231M-CE7
Pin Assignment</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Description</th></tr>
<tr><td rowspan="13">  </td><td>F.G</td><td>Frame Ground</td></tr>
<tr><td>P.GND</td><td rowspan="2">Power Input</td></tr>
<tr><td>PWR</td></tr>
<tr><td>TXD</td><td rowspan="3">COM 1: RS-232</td></tr>
<tr><td>RXD</td></tr>
<tr><td>GND</td></tr>
<tr><td>TXD</td><td rowspan="3">COM 2: RS-232</td></tr>
<tr><td>RXD</td></tr>
<tr><td>GND</td></tr>
<tr><td>D+</td><td rowspan="2">COM 3: RS-485</td></tr>
<tr><td>D-</td></tr>
<tr><td>ISO.GND</td><td rowspan="3">COM 4: RS-485</td></tr>
<tr><td>D+</td></tr>
<tr><td>D-</td></tr>
</table>
</td></tr>
<tr><td>WP-5231PM-3GWA-CE7/
WP-5231PM-4GC-CE7/
WP-5231PM-4GE-CE7
Pin Assignment</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Description</th></tr>
<tr><td rowspan="13">  </td><td>F.G</td><td>Frame Ground</td></tr>
<tr><td>P.GND</td><td rowspan="2">Power Input</td></tr>
<tr><td>PWR</td></tr>
<tr><td>TXD</td><td rowspan="3">Reserved</td></tr>
<tr><td>RXD</td></tr>
<tr><td>GND</td></tr>
<tr><td>TXD</td><td rowspan="3">COM 2: RS-232</td></tr>
<tr><td>RXD</td></tr>
<tr><td>GND</td></tr>
<tr><td>D+</td><td rowspan="2">COM 3: RS-485</td></tr>
<tr><td>D-</td></tr>
<tr><td>ISO.GND</td><td rowspan="3">COM 4: RS-485</td></tr>
<tr><td>D+</td></tr>
<tr><td>D-</td></tr>
</table>
</td></tr>
</table>

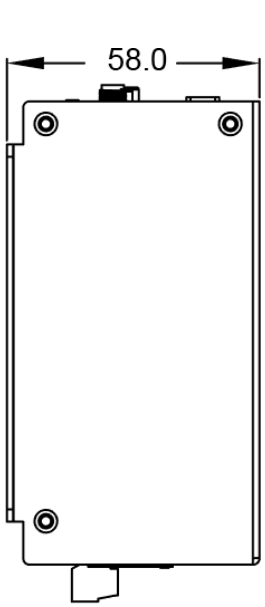
COM1 (3-wire RS-232)
(for WP-5231-CE7 and WP-5231M-CE7 only)
Note: 16C550 compatible
Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps
Data Bits: 5, 6, 7, 8
Parity: None, Even, Odd, Mark (Always 1), Space (Always 0)
Stop Bits: 1, 2
FIFO: 64 bytes
COM2 (3-wire RS-232)
Note: 16C550 compatible
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: 64 bytes
COM3 (2-wire 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: 64 bytes
COM4 (2-wire 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: 64 bytes

1.4. Dimensions

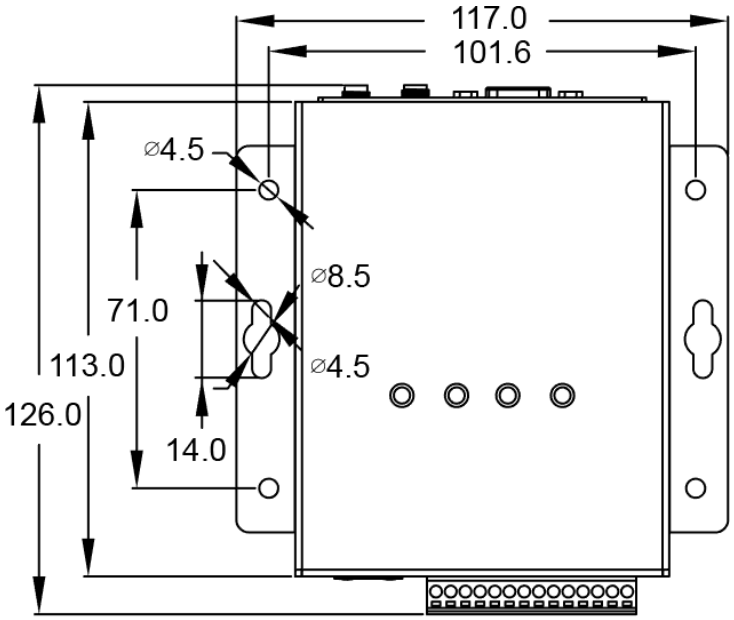
The diagrams below provide the dimensions of the WP-5000-CE7 to use in defining your enclosure specifications. Remember to leave room for potential expansion if you are using other components in your system. All dimensions are in millimeters.

WP-5231-CE7





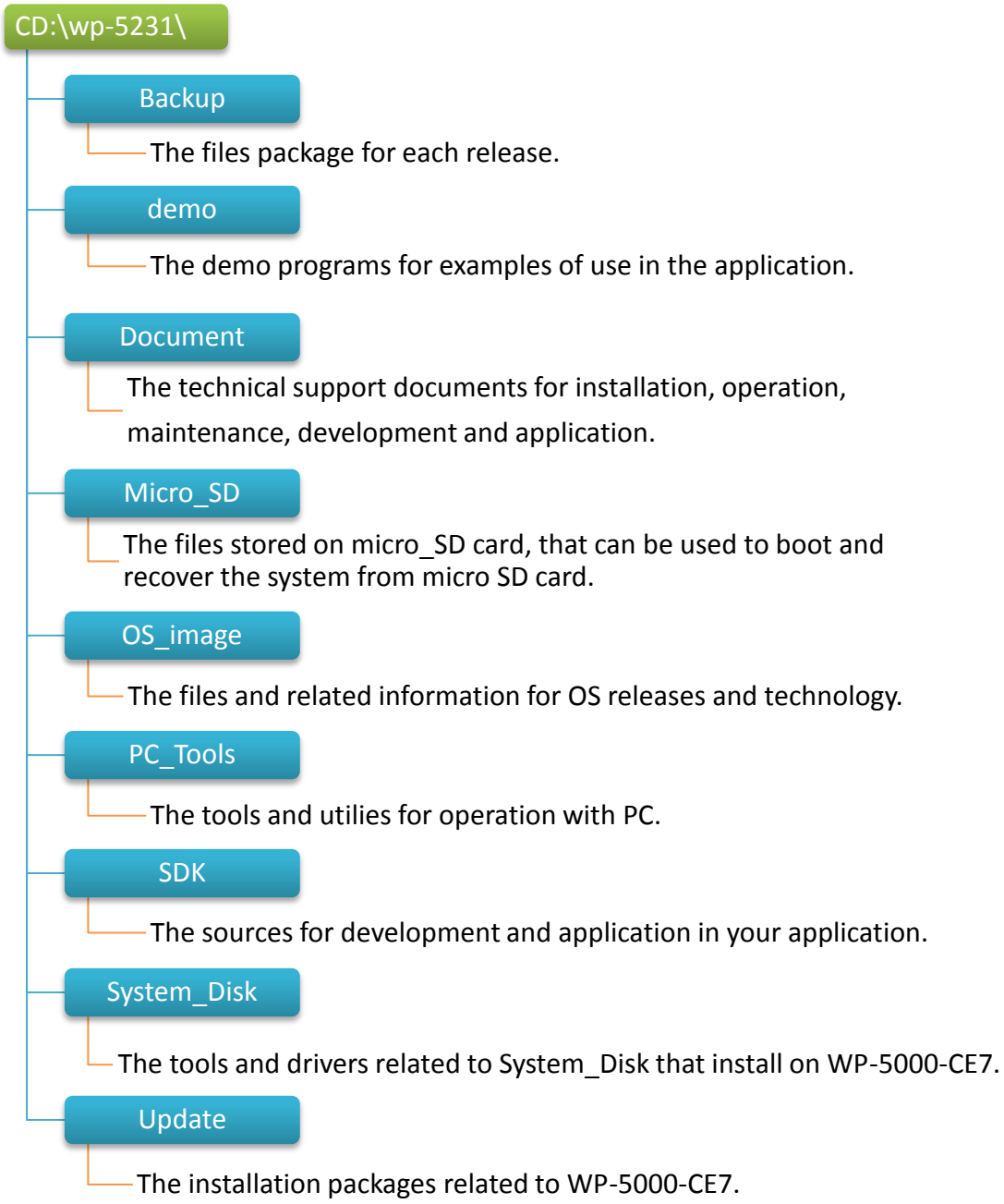
Left Side View



Front View

1.5. Companion CD

This package comes with a CD that provides a collection of the software utility, documentation, drivers, demo program and application. The CD contains several subdirectories located in \WP-5231-CE7 directory. All of them are listed below.



2. Getting Started

This chapter provides a guided tour of the WP-5000-CE7 installation and configuration that describes the steps needed to download, install, configure, and run the basic procedures for user working with the WP-5000-CE7 for the first time.

Before starting any task, please check the package contents. If any of the following package contents are missing or damaged, contact your dealer, distributor.

WP-5231-CE7/WP-5231M-CE7
WP-5231PM-3GWA-CE7/WP-5231PM-4GC-CE7
/WP-5231PM-4GE-CE7

WP-5000-CE7
Quick Start Guide

A microSD card and
a micro SD/SD adapter

Software Utility CD

Screw Driver
(1C016) 2.4 mm

The following items are DIN-rail mounting kit included with WP-5231M-CE7, WP-5231PM-3GWA-CE7, WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 only

44 mm DIN-Rail Clip

M3x6L Screw * 4

Pin Terminal * 16

The following items are included with WP-5231PM-3GWA-CE7, WP-5231PM-4GC-CE7and WP-5231PM-4GE-CE7 only

GSM/GPRS External
Antenna (ANT-421-04)

GPS Active External
Antenna (ANT-115-03)

2.1. Mounting the Hardware

By hardware mechanism, the WP-5000-CE7 installation guide is divided into two sections, as follows:

1. For WP-5231-CE7 – section 2.1.1. WP-5231-CE7 Installation
2. For WP-5231PM-3GWA-CE7 – section 2.1.2. WP-5231PM-3GWA-CE7 Installation

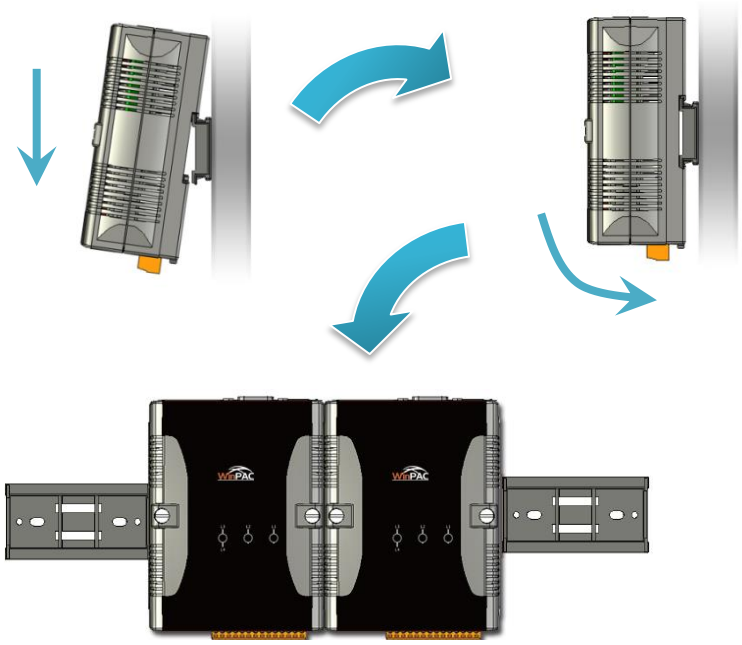
2.1.1. WP-5231-CE7 Installation

Here is a brief of the steps to install the WP-5231-CE7.

2.1.1.1. Installing the WP-5231-CE7

The WP-5231-CE7 has simple rail clips for mounting reliably on a standard 35 mm DIN rail.

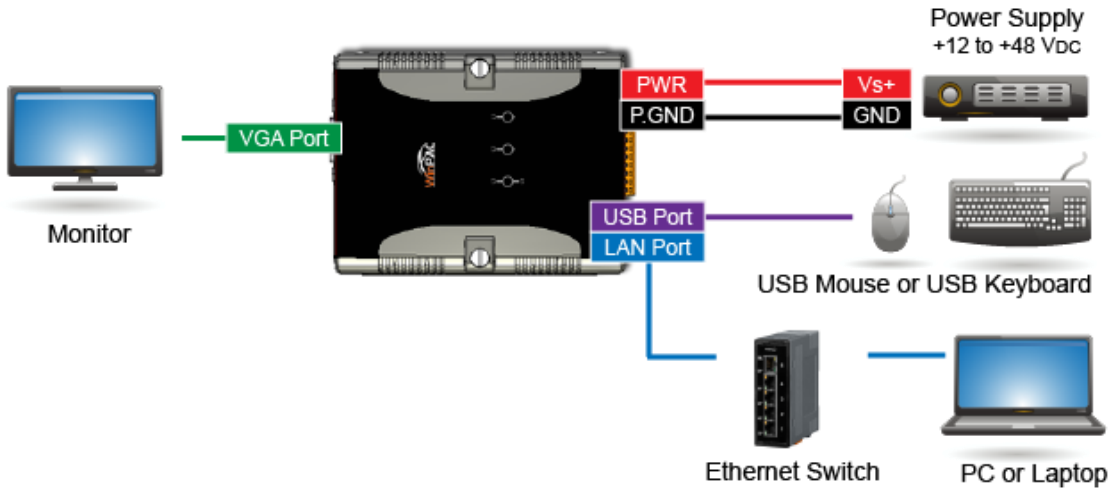
Step 1: Mounting WP-5231-CE7 onto a 35 mm DIN rail



Remove the WP-5231-CE7 from the DIN rail

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

i. Connect the mouse or keyboard to the USB port.
ii. Connect PC to the Ethernet port through an Ethernet switch.
iii. Connect the power supply (+12 to +48 VDC) to PWR and P.GND terminals.
iv. Connect the monitor to the VGA port.

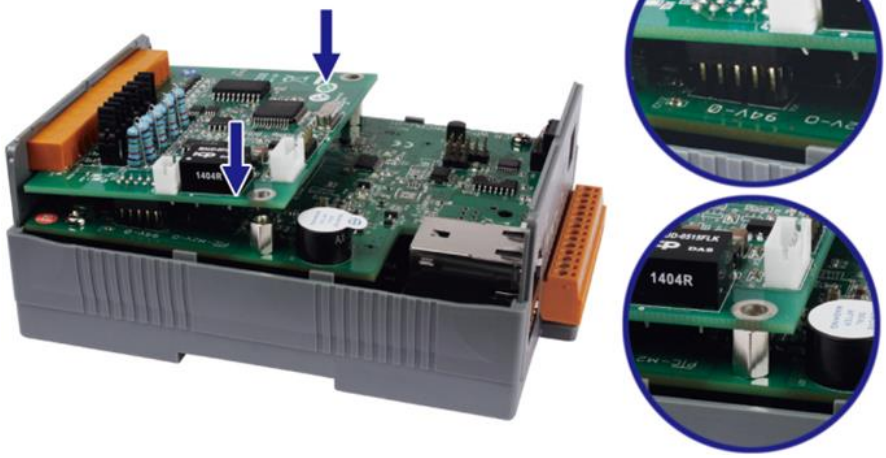


2.1.1.2. Installing the XV-Board

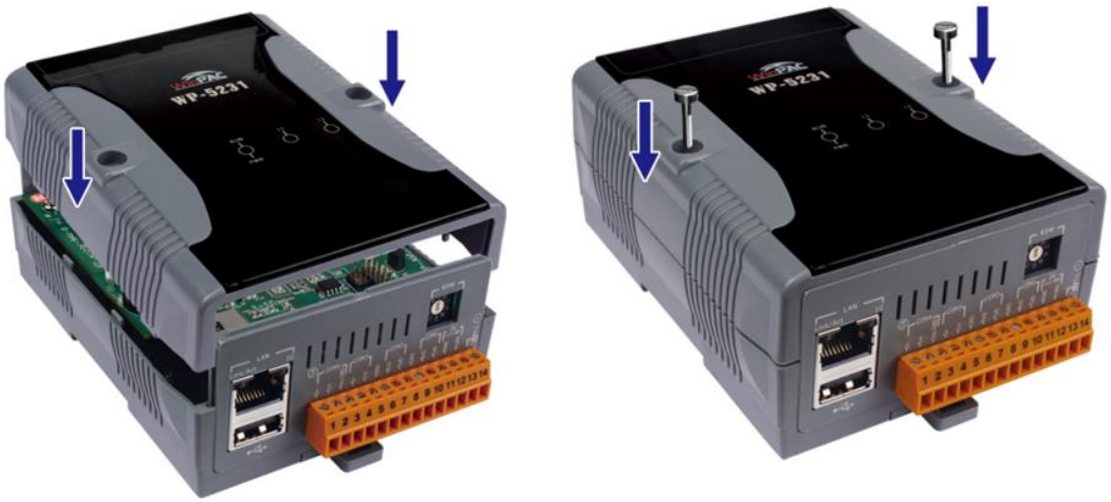
WP-5231-CE7 has one expansion I/O slots to expand the functions. For more detailed information about the XV-board specifications, please refer to Appendix B. XV-Board Modules.

Step 1: Remove stripped screws and then remove the cover

Step 2: Hold the XV-board vertically and align the socket, and then carefully press the XV-board onto the socket



Step 3: Close the cover and then fasten the screws



Step 4: Insert the I/O terminal and then stick the I/O sticker

2.1.2. WP-5231M-CE7/WP-5231PM-3GWA-CE7/WP-5231PM-4GC-CE7/ WP-5231PM-4GE-CE7 Installation

Here is a brief of the steps to install the WP-5231M-CE7/WP-5231PM-3GWA-CE7/WP-5231PM-4GC-CE7/WP-5231PM-4GE-CE7.

2.1.2.1. Installing the WinPAC

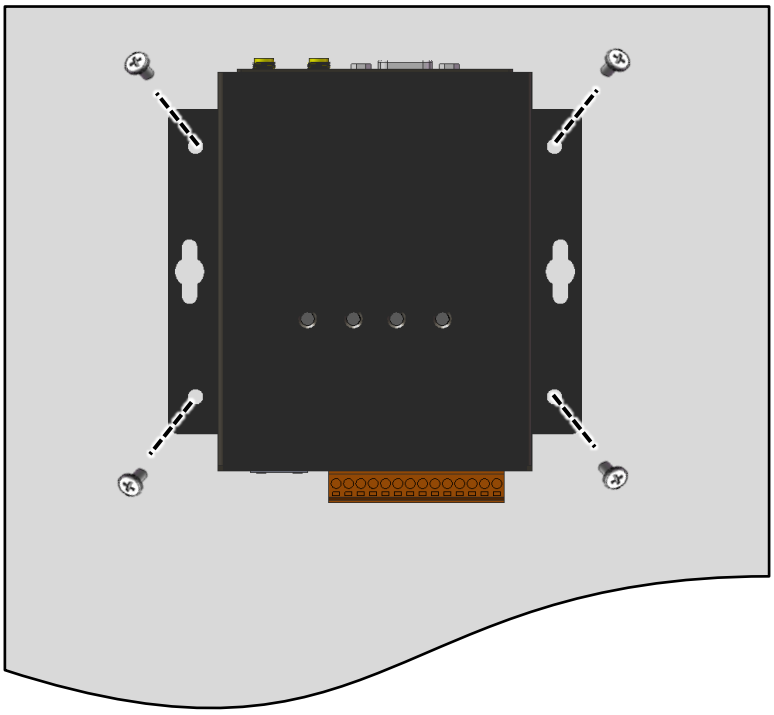
The WP-5231M-CE7/WP-5231PM-3GWA-CE7/WP-5231PM-4GC-CE7/WP-5231PM-4GE-CE7 can be mounted either directly to a wall/panel.

Step 1: Install the four mounting screws into the 4 keyhole mounting holes

Tips & Warnings

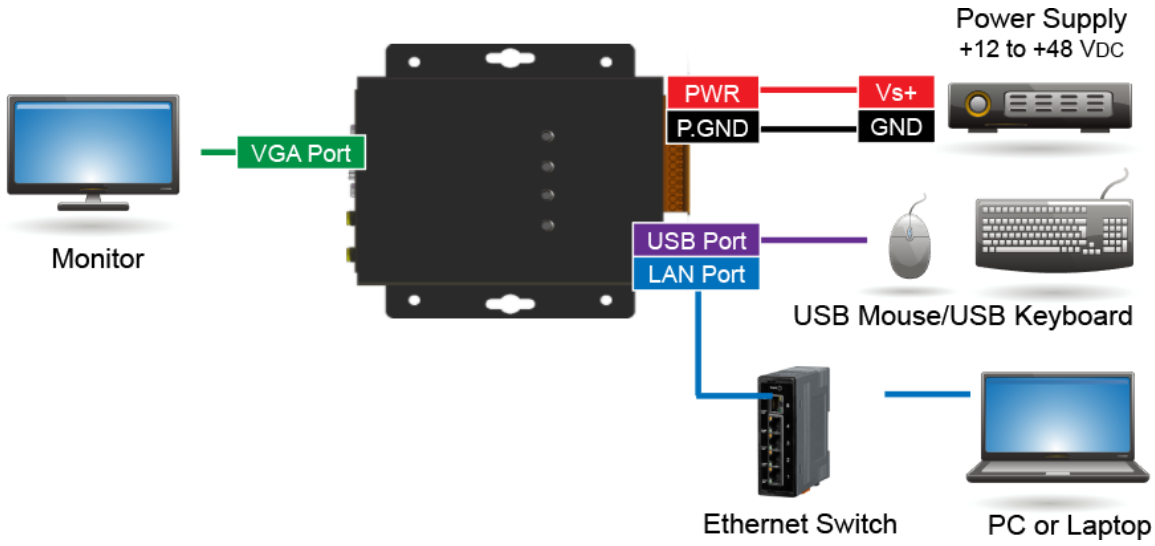
Recommended screw for mounting is M4 x 12L.

Step 2: Fasten the screws securely



Step 3: Connecting to a PC, the USB device, and the power supply

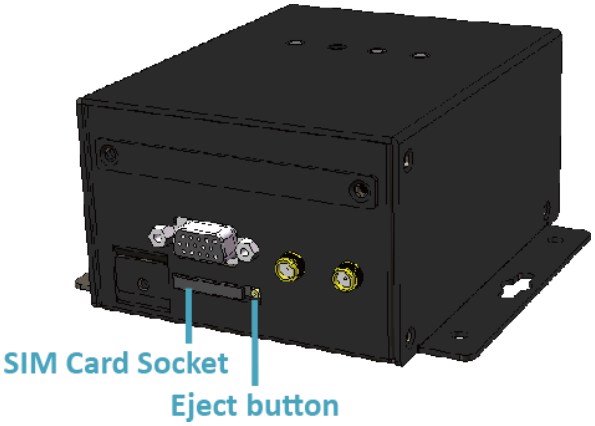
i. Connect the mouse or keyboard to the USB port.
ii. Connect PC to the Ethernet port through an Ethernet switch.
iii. Connect the power supply (+12 to +48 VDC) to PWR and P.GND terminals.
iv. Connect the monitor to the VGA port.



2.1.2.2. Inserting the SIM card

(for WP-5231PM-3GWA-CE7, WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 only)

The SIM card tray is located on the top side of the module. The eject button is on the right side of the tray door.



Step 1: Push the ejection button until the SIM card tray pops out

Step 2: Pull out the tray completely and set it on a flat surface

Step 3: Put the SIM card in the tray, and then push the tray back into the socket

Tips & Warnings

Make sure to turn the WP-5231PM-3GWA-CE7/WP-5231PM-4GE-CE7 off before inserting or removing the SIM card. Do not bend or scratch the SIM card.

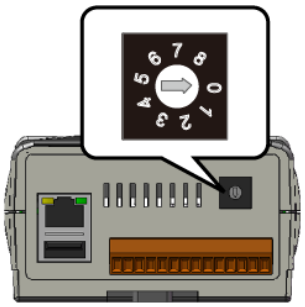
2.1.2.3. Installing the antenna

(for WP-5231PM-3GWA-CE7, WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 only)

The WP-5231PM-3GWA-CE7/WP-5231PM-4GE-CE7 has 2/1 antenna connectors that can be used to connect the 3G antenna. To install the antenna, just screw the antenna tightly into the connector, and put the antenna in the purpose place.

2.2. Configuring the Boot Mode

The WP-5000-CE7 has several operating modes, which can be selected by a rotary switch.



The table below lists the operation modes available with the WP-5000-CE7.

Position	Operating Mode
0	Normal mode (Default)
1	Safe mode
2	Debug mode
3	OS update mode by Ethernet
4	Reserve
5	OS update mode by Micro_SD
6	Reserve (OS Development Mode)
7 ~ 9	User Mode

The following is a brief introduction of these modes.

Normal Mode (Default mode)

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

Safe Mode

Safe mode is a trouble shooting. The mode loads the minimum required device drivers and system services to boot the WP-5000-CE7.

If you have malicious software or a program caused the WP-5000-CE7 cannot be boot or run the normal mode, you can boot in safe mode to solve the problem.

Debug Mode

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

Debug mode is unsupported.

OS Update Mode

OS update mode is a way used to update OS. For more information on updating the WP-5000-CE7 OS image, please refer to section 6.1. OS updates

Reserve → OS Development Mode

The positions 4, 6, of rotary switch are reserved for OS development.

User Mode

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

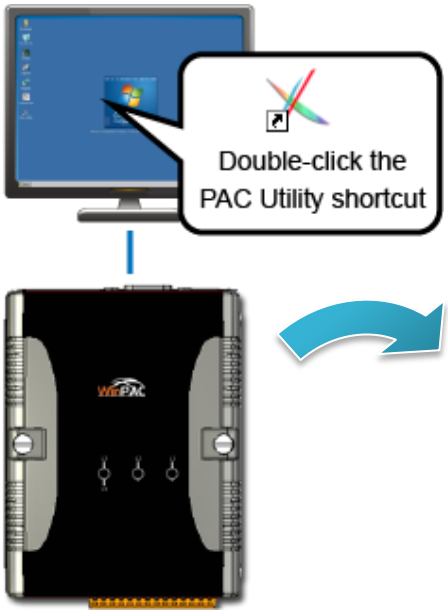
When WP-5000-CE7 is boot with one of these positions, it is boot at normal mode. User's application can check the position of the rotary switch position to run at different mode.

2.3. Using PAC Utility to Manage WinPAC

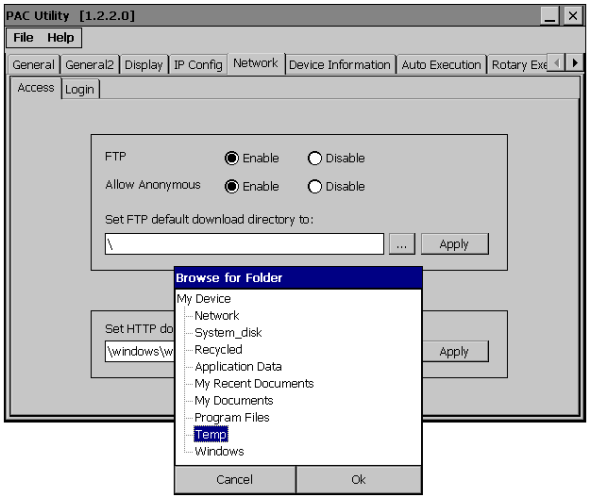
The PAC Utility is a collection of the WinPAC system tool that allows user quickly and easily manage and configure the WinPAC.

For more detailed information on PAC Utility applications, please refer to “3.1. PAC Utility”

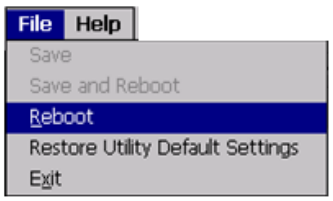
Step 1: Double-click the PAC Utility on the desktop



Step 2: Configure IP address (DHCP), FTP Server, Auto Execution files…, etc



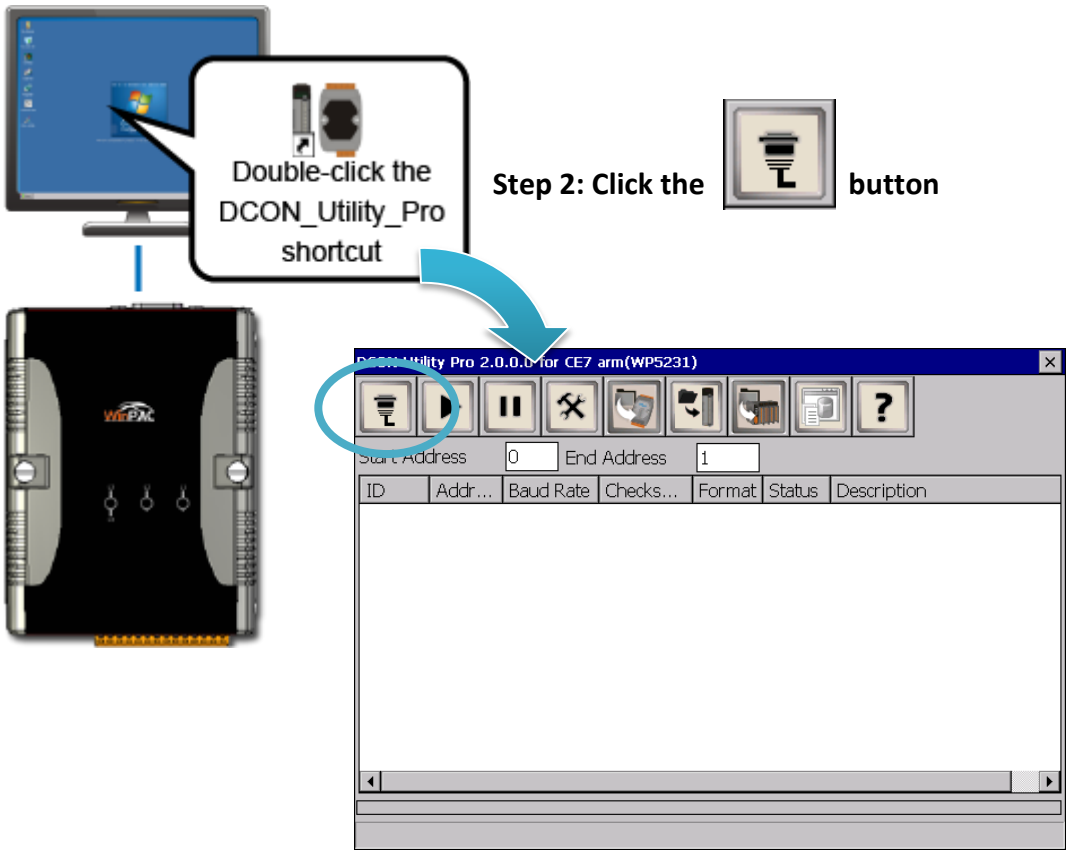
Step 3: Reboot the WP-5000-CE7



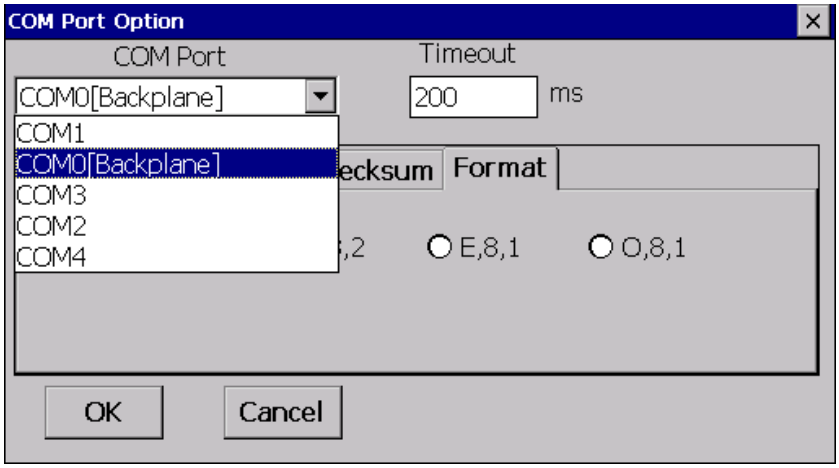
2.4. Using DCON Utility Pro to Configure I/O Modules

DCON Utility Pro enables users easily to configure and manage the I/O modules via Ethernet or serial ports (RS-232/RS-485).

Step 1: Double-click the DCON_Utility_Pro on the desktop



Step 3: Configure the communication settings



Tips & Warnings

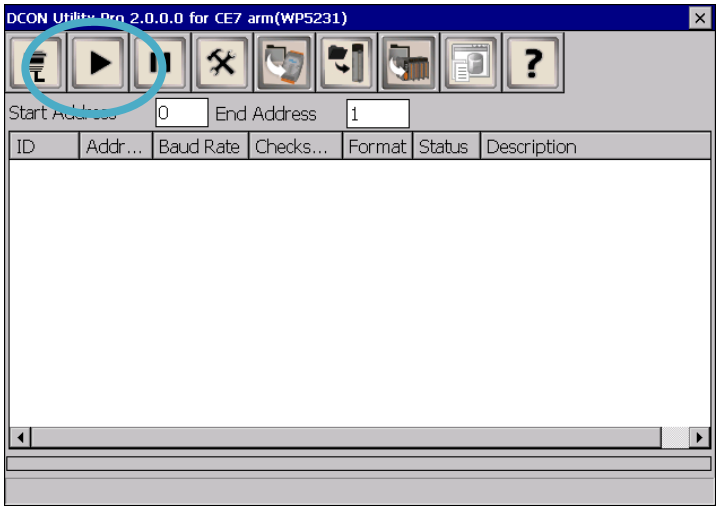
The COM port settings for expansion I/O modules are listed below.

COM0[Backplane]

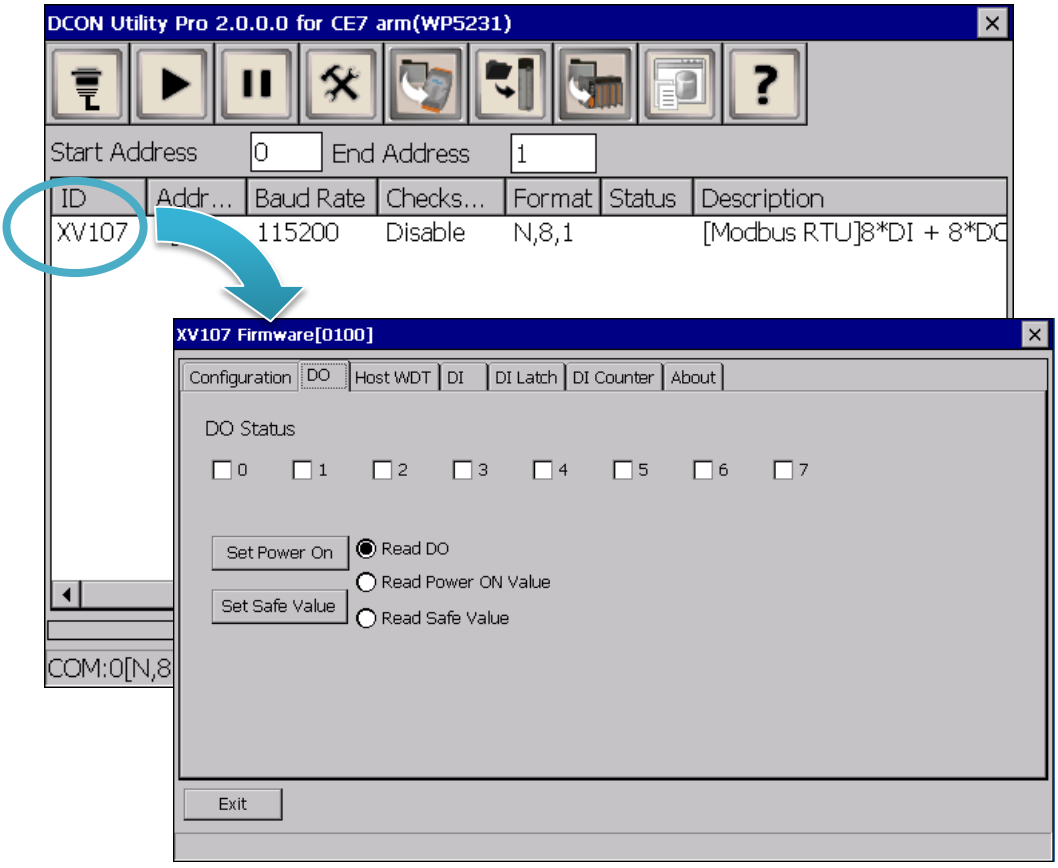
COM1/2/3/4

For more information on these COM port selections, please refer to the specification of the pin assignments in section 1.3. Overview

Step 4: Click the  **button**



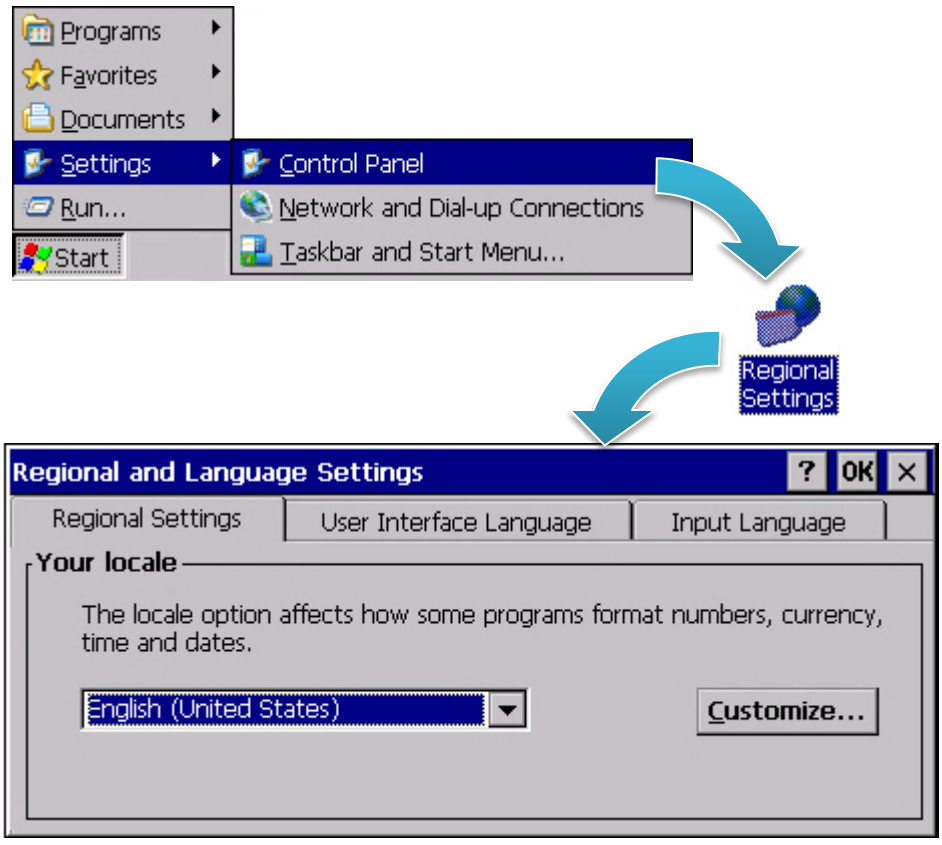
Step 5: Click the module name to configure the I/O module



2.5. Changing the User Interface Language

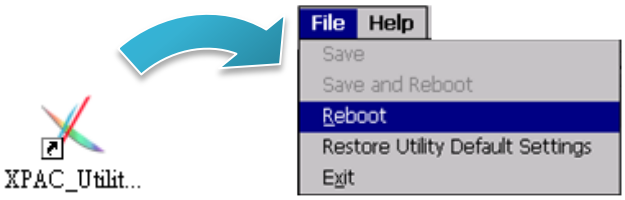
The Windows CE operating system on the WP-5000-CE7 comes with several built-in functions.

Step 1: Click Start menu, point to Settings, click Control Panel, and then click Regional Settings Options



Step 2: Click User Interface Language tab, choose to your local language, and then click OK

Step 3: Run the PAC Utility, and then reboot the WinPAC for changes to take effect

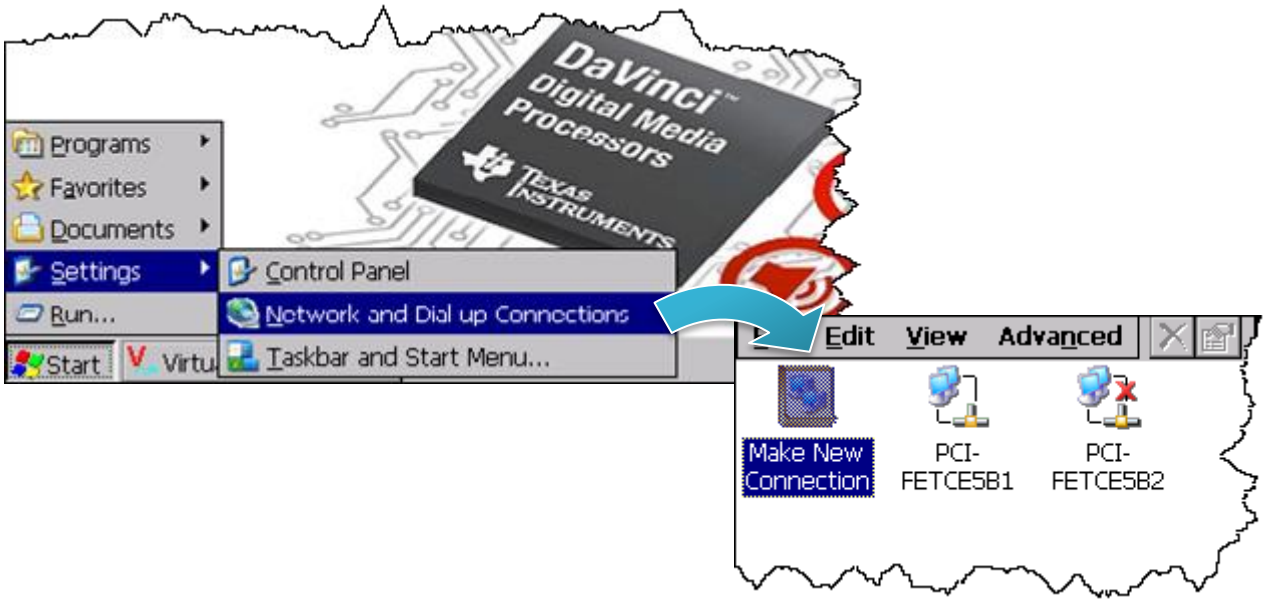


2.6. Using Dial-up Networking to Make a GPRS Connection

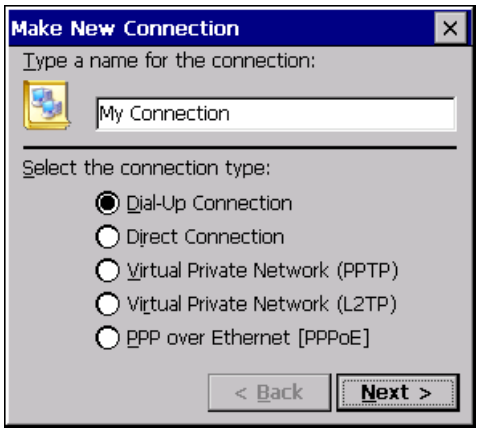
(for WP-5231PM-3GWA-CE7, WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 only)

The Windows CE dial-up networking component driver can be efficiently used to include support for transferring data over GPRS modems in WP-5000-CE7

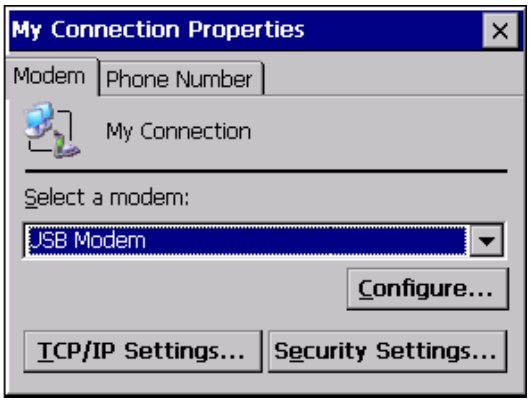
Step 1: Click Start menu, point to Settings, click Network and Dial up Connections, and then click Make New Connection



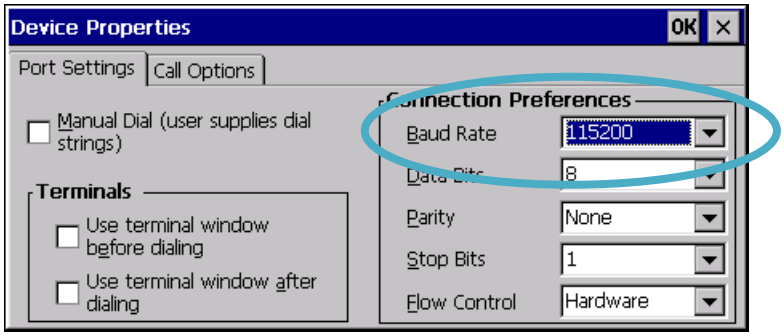
Step 2: Type the name of the connection, select the Connection type as the Dialup connection, and then click Next button



Step 3: Select USB Modem as a modem diver in the select a modem option and then click Configure button



Step 4: Select 115200 in the Baud Rate option and click then click OK button



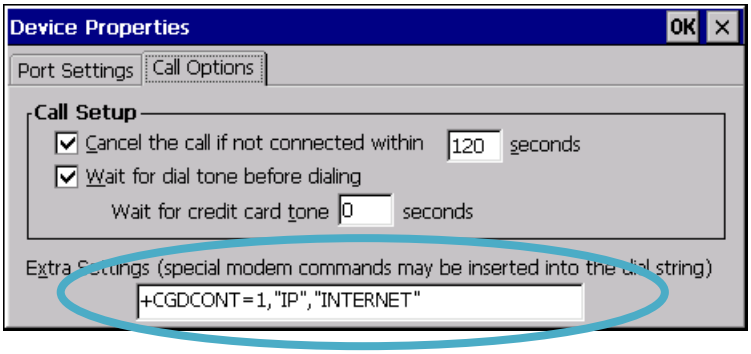
Step 5: Select Call Options tab, enter the modem dialing settings in the commands field, and then click OK button

The modem dialing settings depends on each of the telecom company. For example, the settings provided by Telecom Company in Taiwan is

+CGDCONT=1,”IP”,”INTERNET”

and a Telecom Company in China is

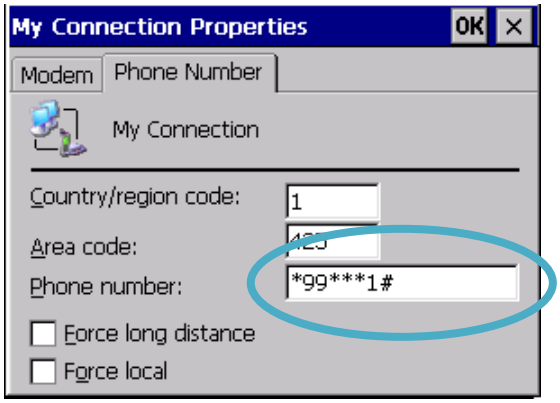
+CGDCONT=1,”IP”,”CMNET”



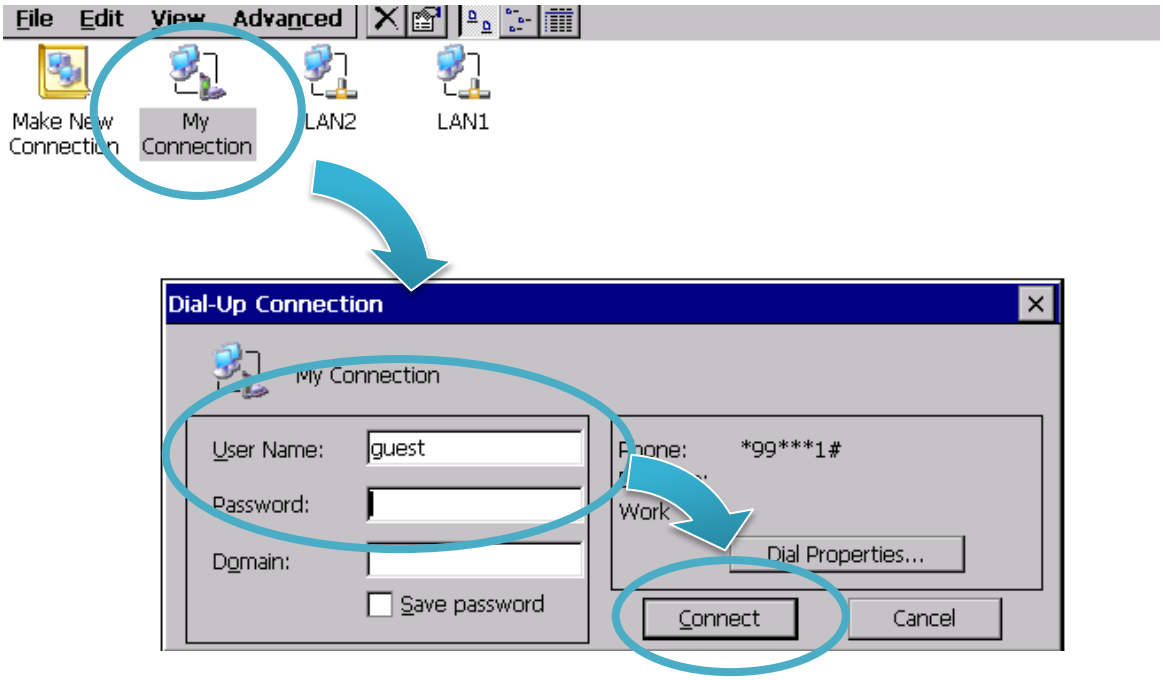
Step 6: Select Phone Number tab, enter the phone number settings in the Phone number option, and then click OK button

The phone number settings should fit the Telecom Company's setting. For example, the following setting is for Telecom Company in Taiwan.

991#**



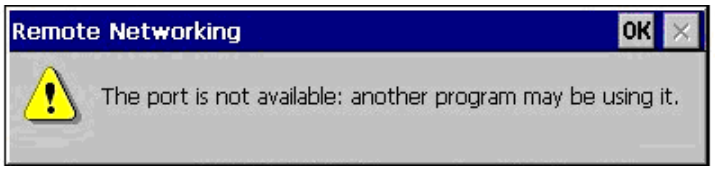
Step 7: Double-click the new connection that you have created, and enter the User name and Password, and then Click Connect button



Step 8: Wait for the connection to be established

Tips & Warnings

If the connection fails, as shown below, please repeat the instructions to view the settings.



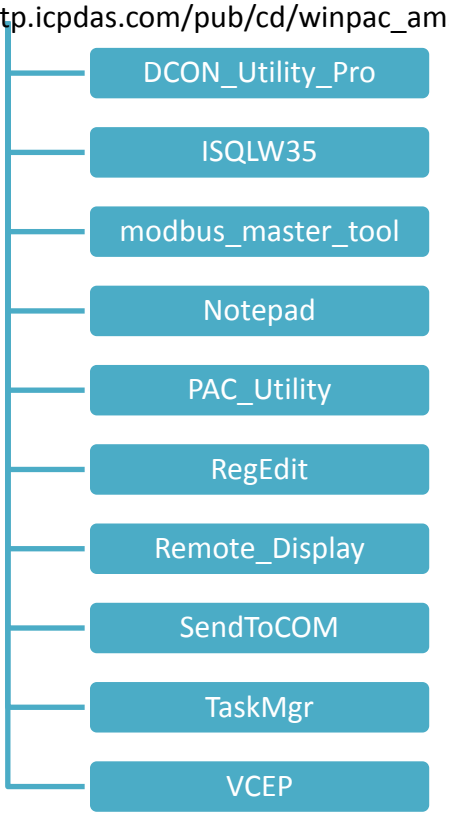
3. Tools and Tasks

This chapter provides a brief introduction of the WP-5000-CE7 service tools and its benefits.

There are several tools and utilities built-in and designed for use with WP-5000-CE7. Some of these are pre-installed on WP-5000-CE7 and can work directly on WP-5000-CE7, and some of these are supporting tools and can help you to manage the WP-5000-CE7 remotely on a PC.

The following tools are pre-installed on WP-5000-CE7 and can work directly on WP-5000-CE7 that can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

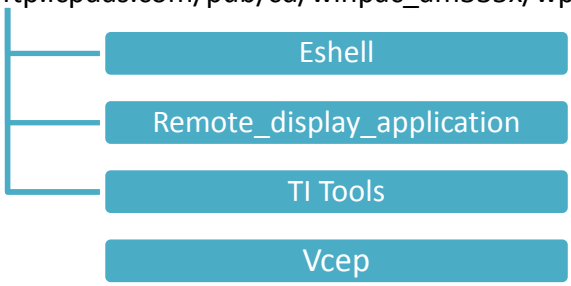
CD:\wp-5231\System_Disk\Tools\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/system_disk/tools/



The following tools are supporting tools for remote managing the WP-5000-CE7 used on PC that can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

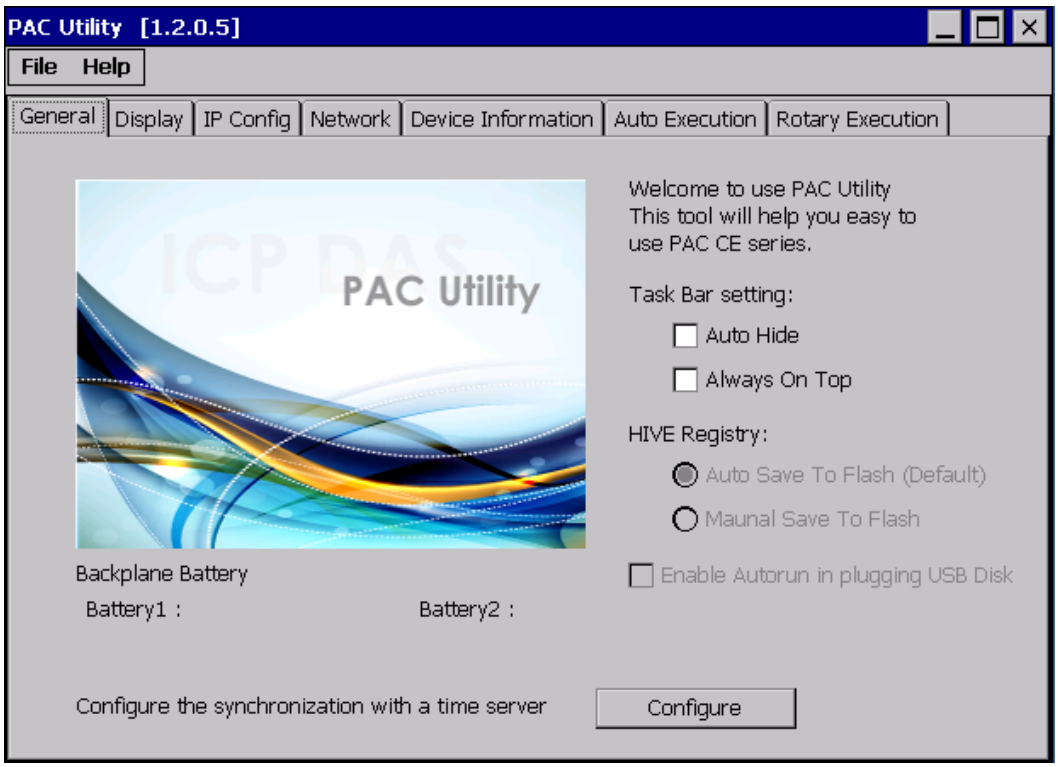
CD:\wp-5231\PC_Tools\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/pc_tools/



3.1. PAC Utility

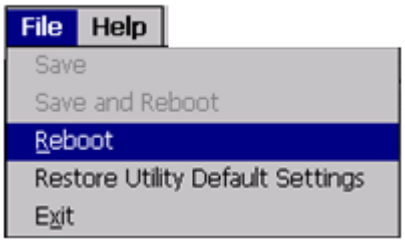
PAC Utility is a collection of software applications that enable management and configuration of WinPAC system and features.



The PAC Utility includes the following menu bars and property tabs. All of these functions will be explained later.

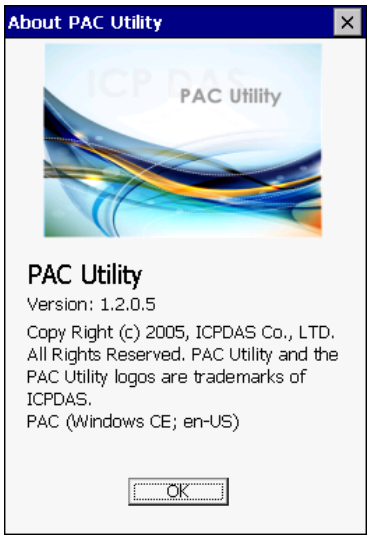
Menu bar	Property Tab
➢ File ➢ Help	➢ General ➢ General2 ➢ Display ➢ IP Config ➢ Network ➢ Device Information ➢ Auto Execution ➢ Rotary Execution

3.1.1. Menu Bar – File



The menus use to	How to use
Reboot	Restarts the WinPAC
Restore Default Settings	Restore the settings of WinPAC to its default.
Exit	Exits the PAC Utility.

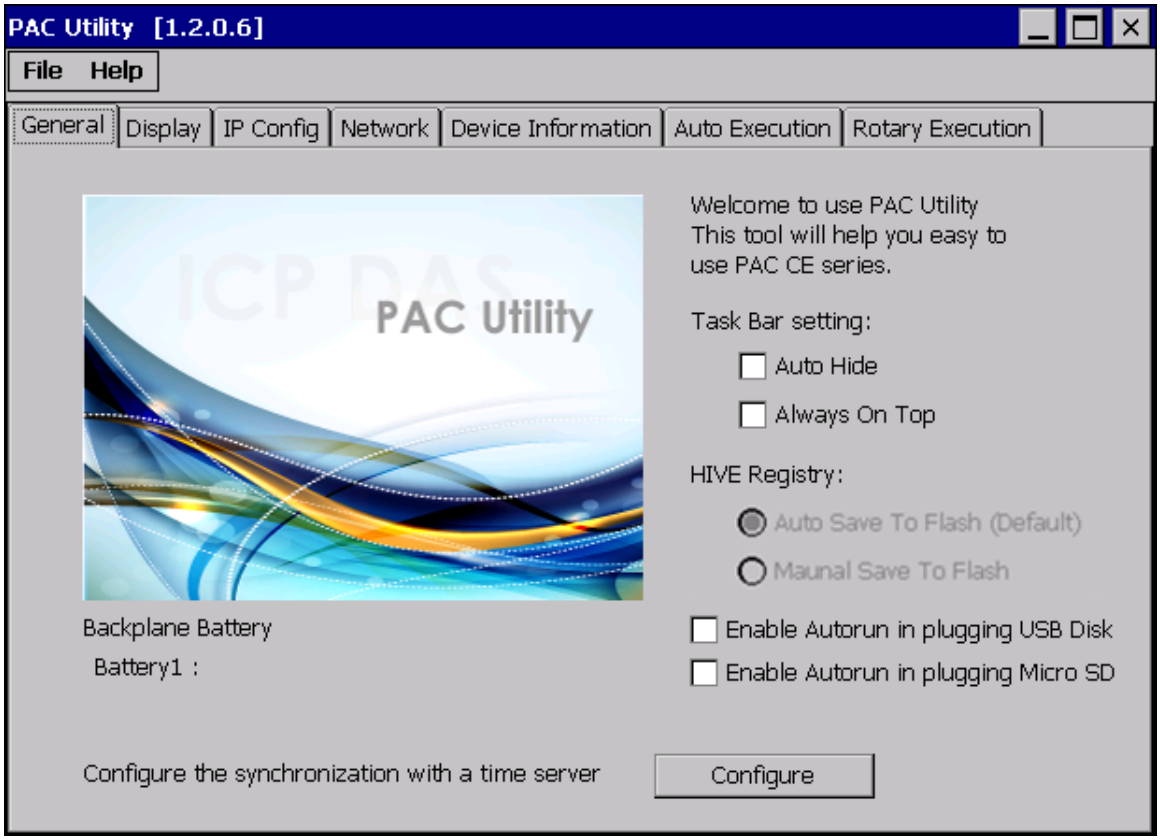
3.1.2. Menu Bar – Help



The menus use to	How to use
About	Displays a dialog box with information about PAC Utility, including the current version and copyright information.

3.1.3. Property Tab - General

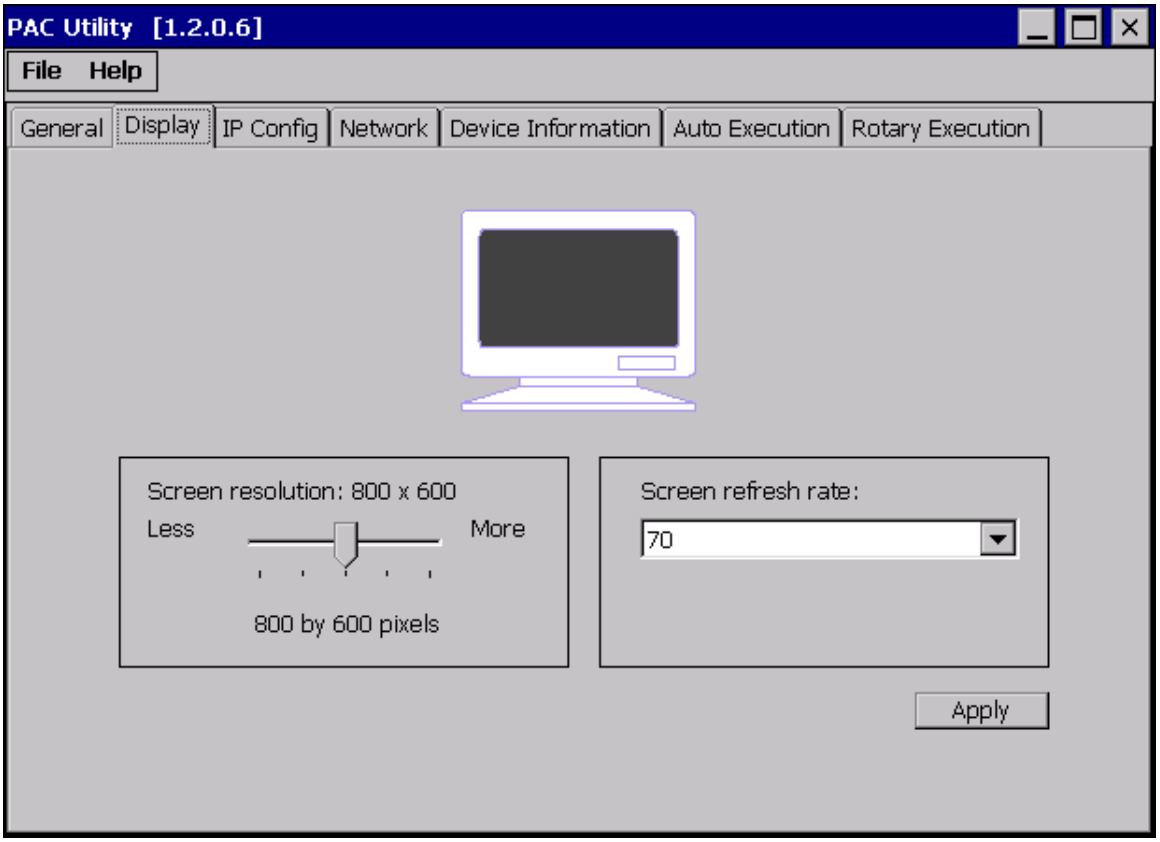
The General tab provides functions to configure the task bar, check the status of the battery…, etc.



The tab use to	How to use
Lock or Auto-Hide the taskbar	**Auto-Hide:** Select the **Auto Hide** check box. **Lock:** Select the **Always On Top** check box.
Auto save or manual save to flash	By default, these options are unavailable. **Auto save to flash:** This option is checked by default. Any changes made to the WP-5000-CE7 will be saved and only take effect after the WP-5000-CE7 reboots. **Manual save to flash:** This option is useless.
Check the status of the battery	See the Battery1 field that displays the display resolution.
Automatic synchronization of system time	Refer to the Appendix A.2. How to Automatically Synchronize WinPAC Clock with an Internet Time Server.

3.1.4. Property Tab – Display

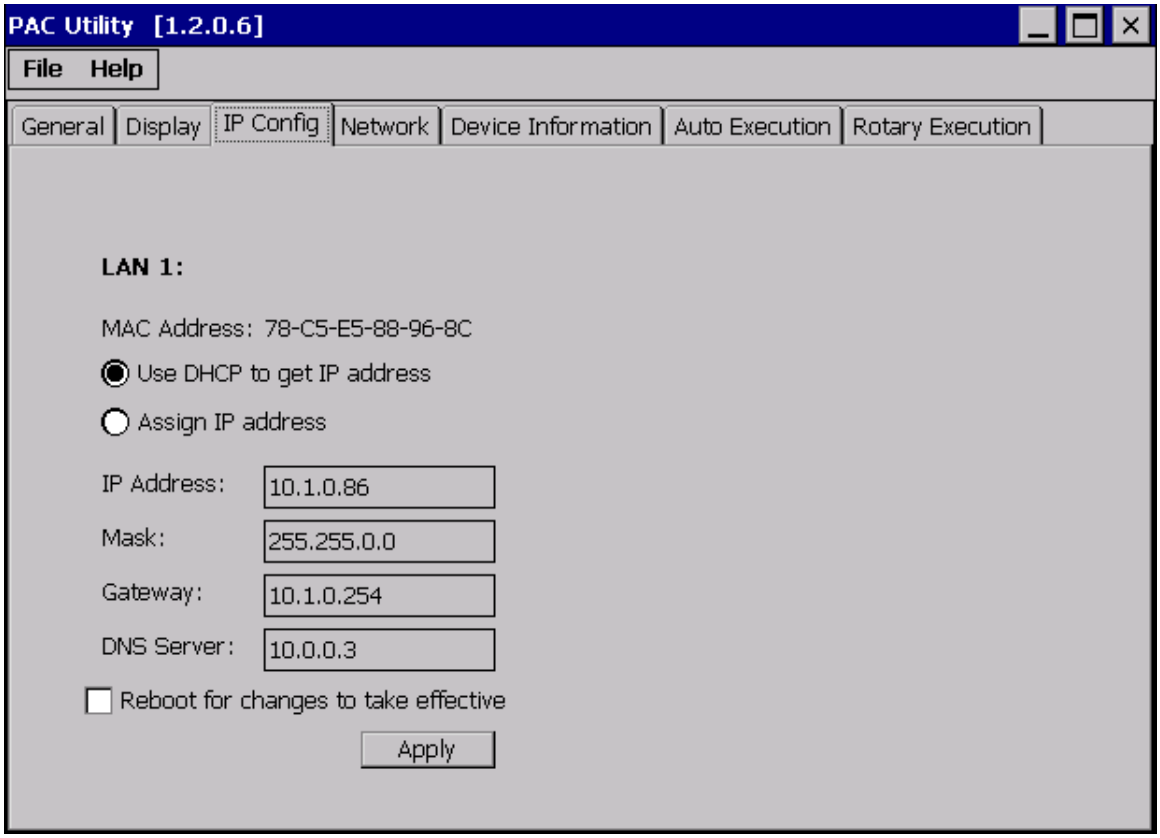
The Display tab provides functions to configure the monitor settings.



The tab use to	How to use
Adjust the screen resolution	Move the slider to the left to decrease the resolution or move the slider to the right to increase the resolution, and then click the **Apply** button.
Change the screen refresh rate	Select the desired refresh rate from the **Screen refresh rate** drop-down list, and then click the **Apply** button.

3.1.5. Property Tab – IP Config

The IP Config 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.



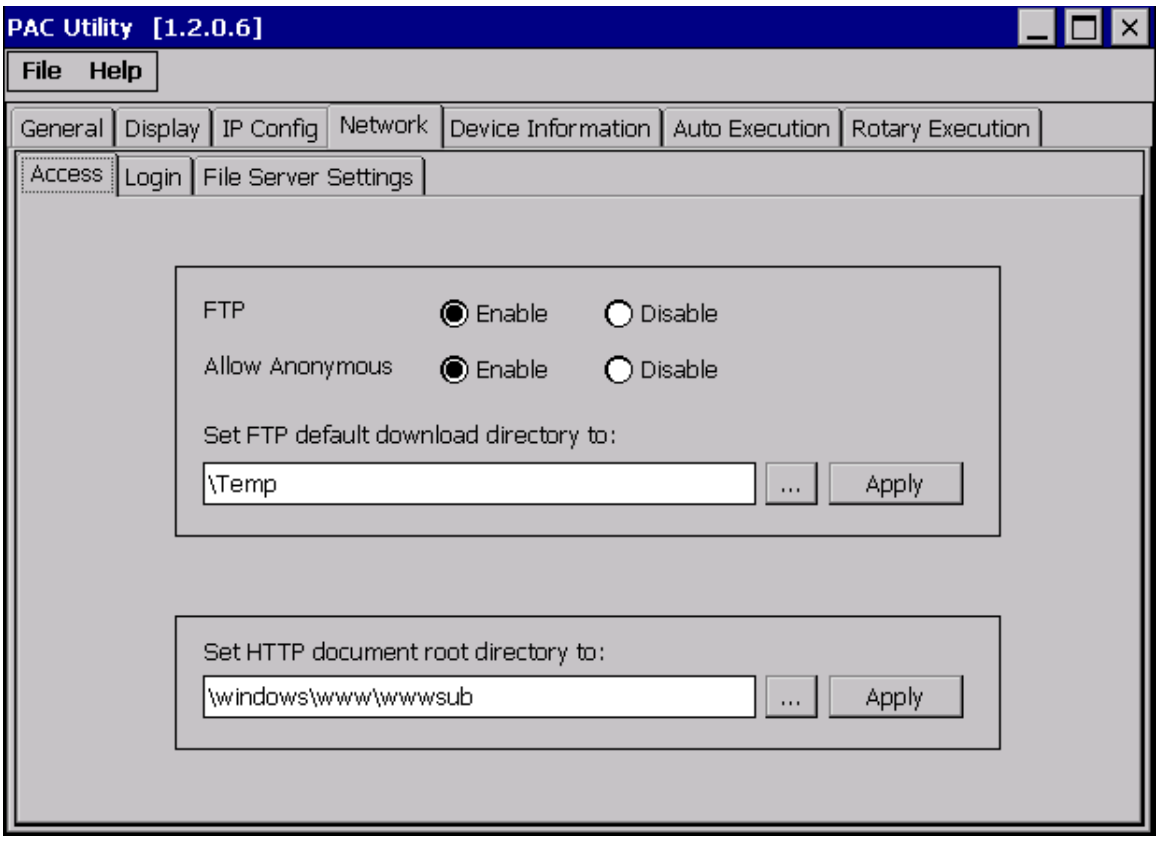
The tab use to	How to use
Set the network settings	**Use DHCP to get IP address:** Select the **Use DHCP to get IP address** option, and then click the **Apply** button. **Assign an IP address:** Select the **Assign IP address** option, and then click the **Apply** button.

3.1.6. Property Tab – Network

The Network tab comprises three tabs – Access, Login and File Server Settings.

Access

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

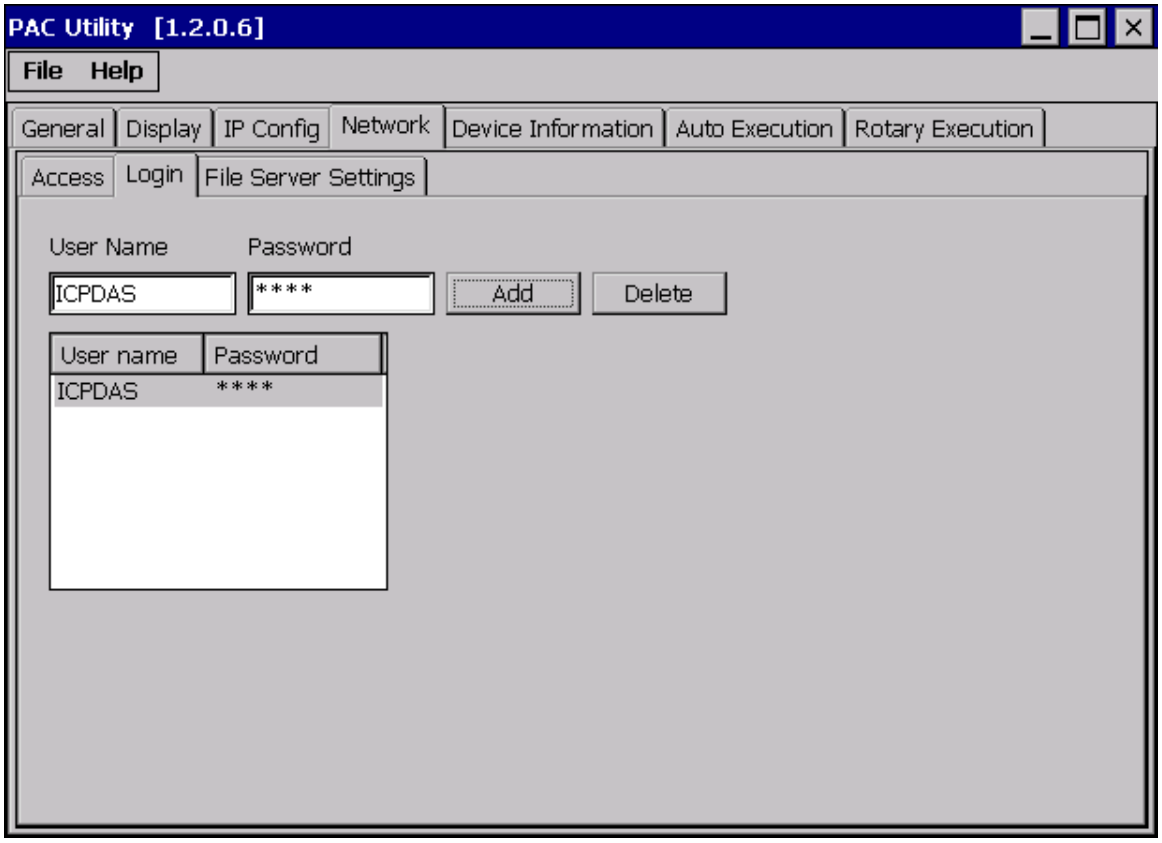


The tab use to	How to use
Enable or disable the FTP access	**Enable:** Select the **Enable** check box in the **FTP** field, and then click the **Apply** button. **Disable:** Select the **Disable** check box in the **FTP** field, and then click the **Apply** button.

The tab use to	How to use
Enable or disable anonymous FTP access	**Enable:** Select the Enable check box in the **Allow Anonymous** field, and then click the **Apply** button. **Disable:** Select the Disable check box in the **Allow Anonymous** field, and then click the **Apply** button.
Set the FTP directory path	Enter a new path in the **Set FTP default download directory to:** field, and then click the **Apply** button.
Set the HTTP directory path	Enter a new path in the **Set HTTP document root directory to:** field, and then click the **Apply** button.

Login

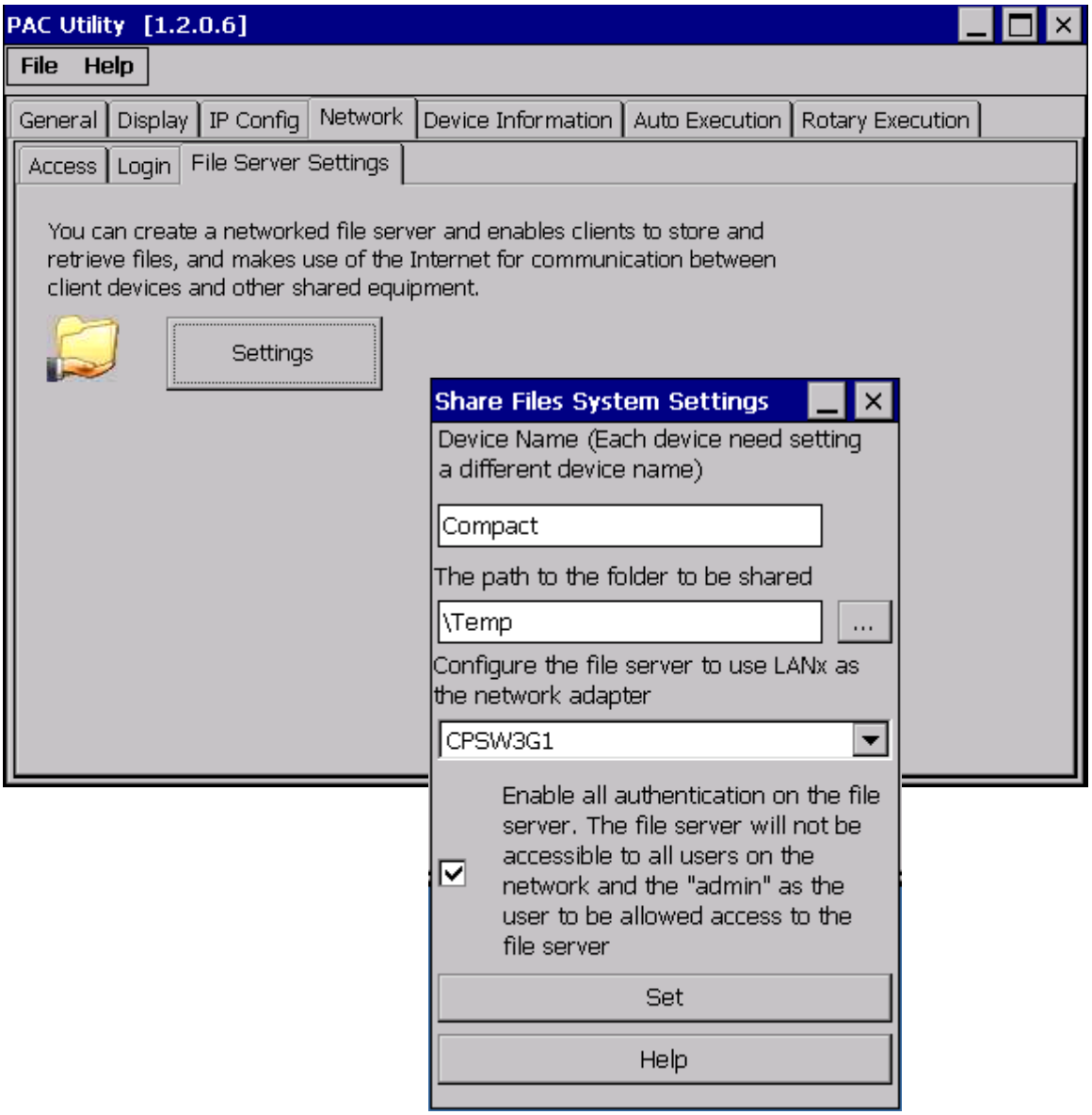
The Login tab provides functions to maintain the FTP accounts.



The tab use to	How to use
Maintain the FTP accounts	Refer to the Appendix C.1 How to add a user account to remote login the WinPAC from PC.

File Server Settings

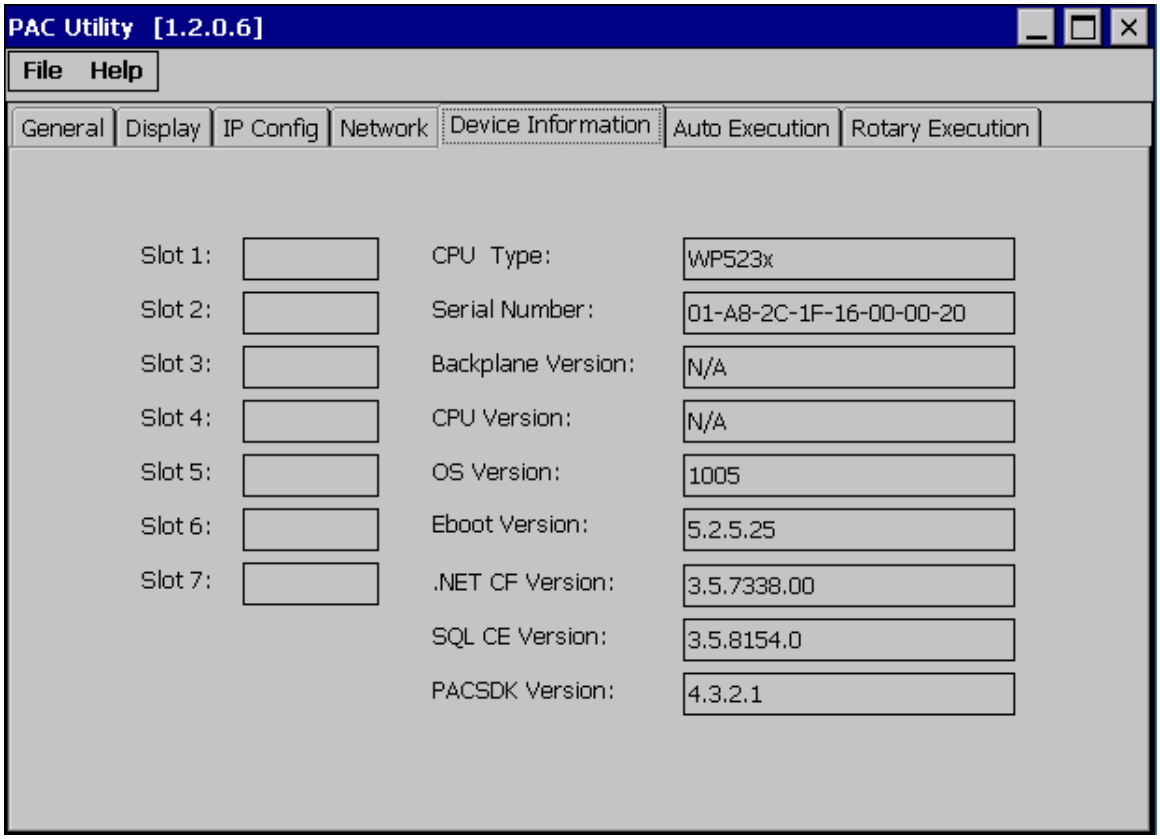
The File Server Settings tab provides functions to set the SMB server.



The tab use to	How to use
Set the SMB server	Click the Settings button to set the SMB server path.

3.1.7. Property Tab – Device Information

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

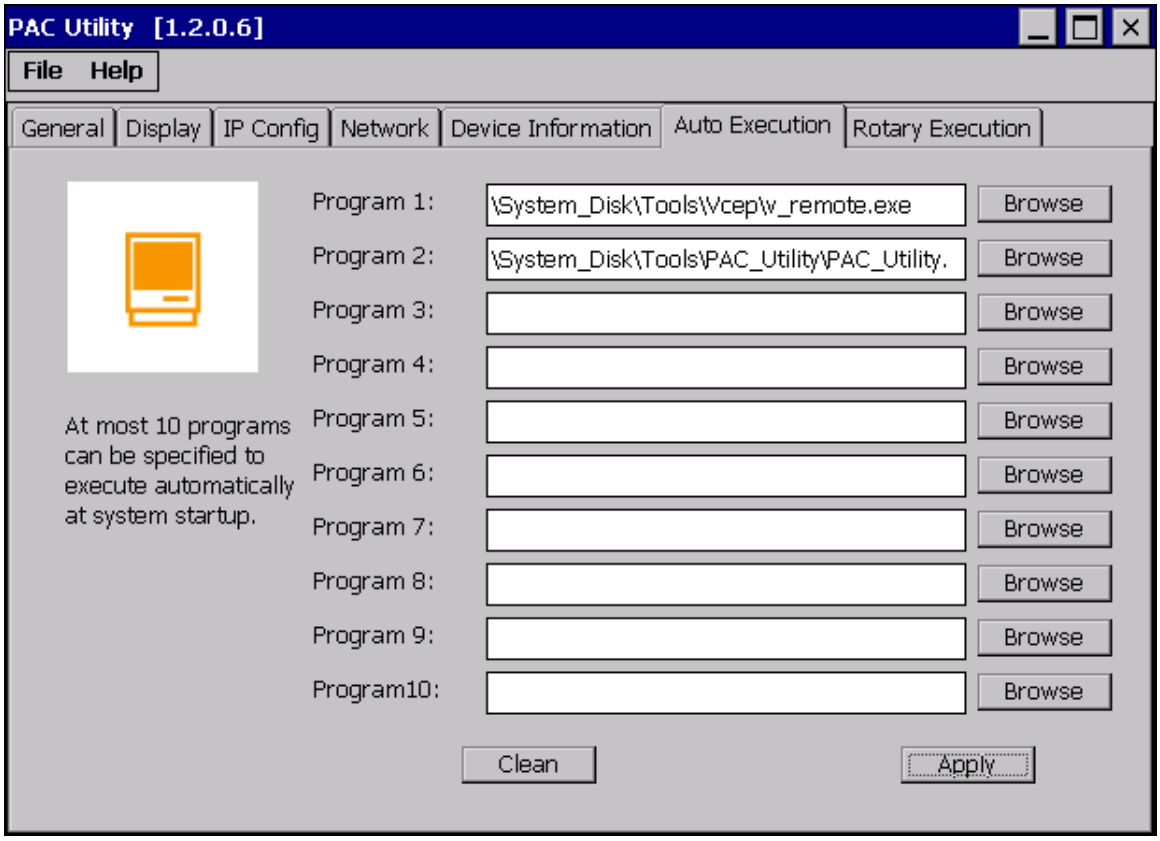


3.1.8. Property Tab – Auto Execution

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

Tips & Warnings

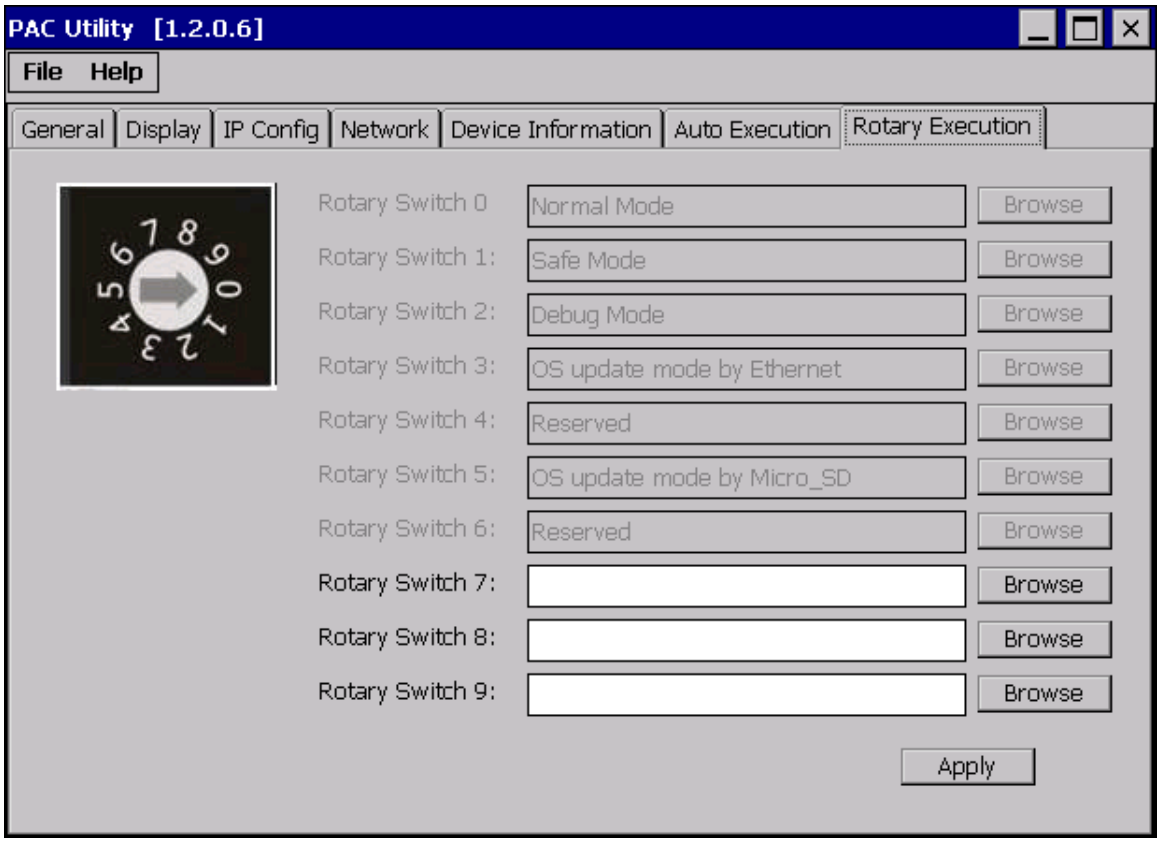
The specific extensions are .exe and .bat, and they are executed in order of program 1, program 2, etc.



The tab use to	**How to use**
Configure programs running at startup	Click the **Browse** button to select the execute file which you want, and then click the **Apply** button.

3.1.9. Property Tab – Rotary Execution

The Rotary Execution tab provides functions to configure programs running at WinPAC startup in one of the user defined mode, it allows users to configure ten execute files at most.

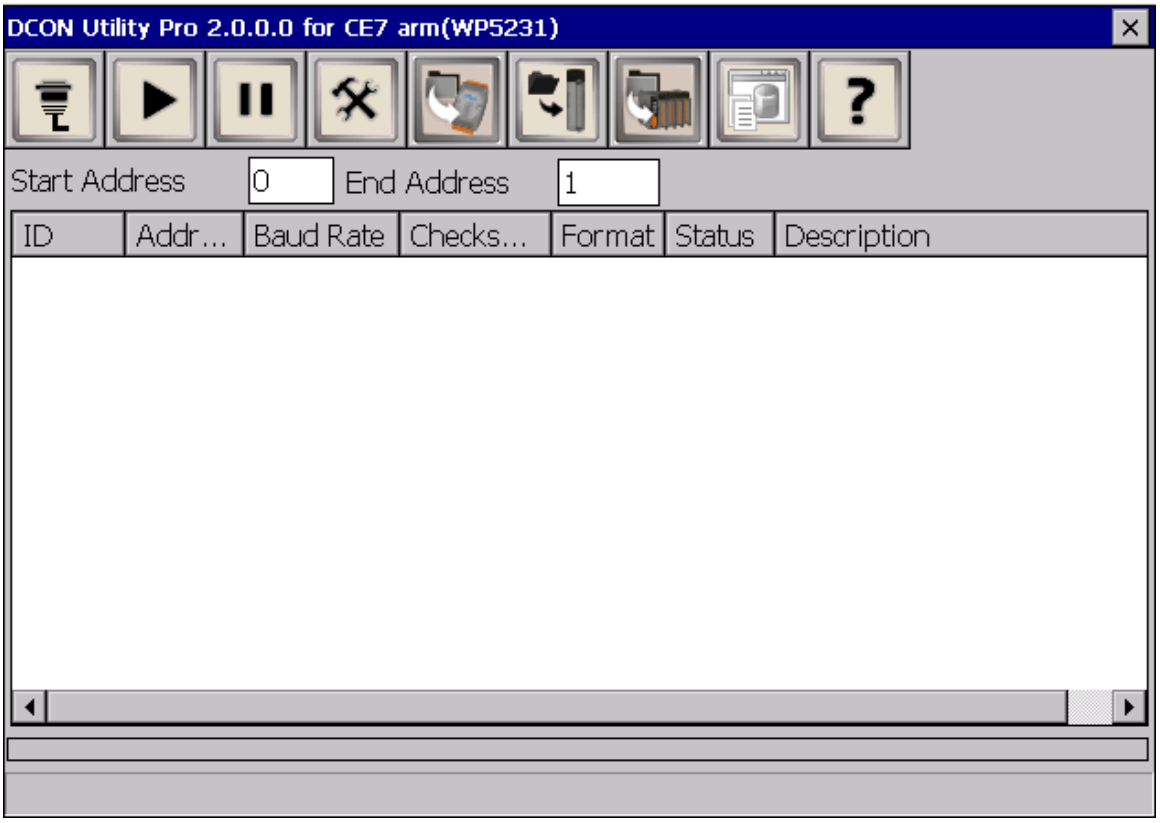


The tab use to	**How to use**
Configure programs running at startup in one of the user defined mode	Click the **Browse** button to select the execute file which you want, and then click the **Apply** button.

3.2. DCON Utility Pro

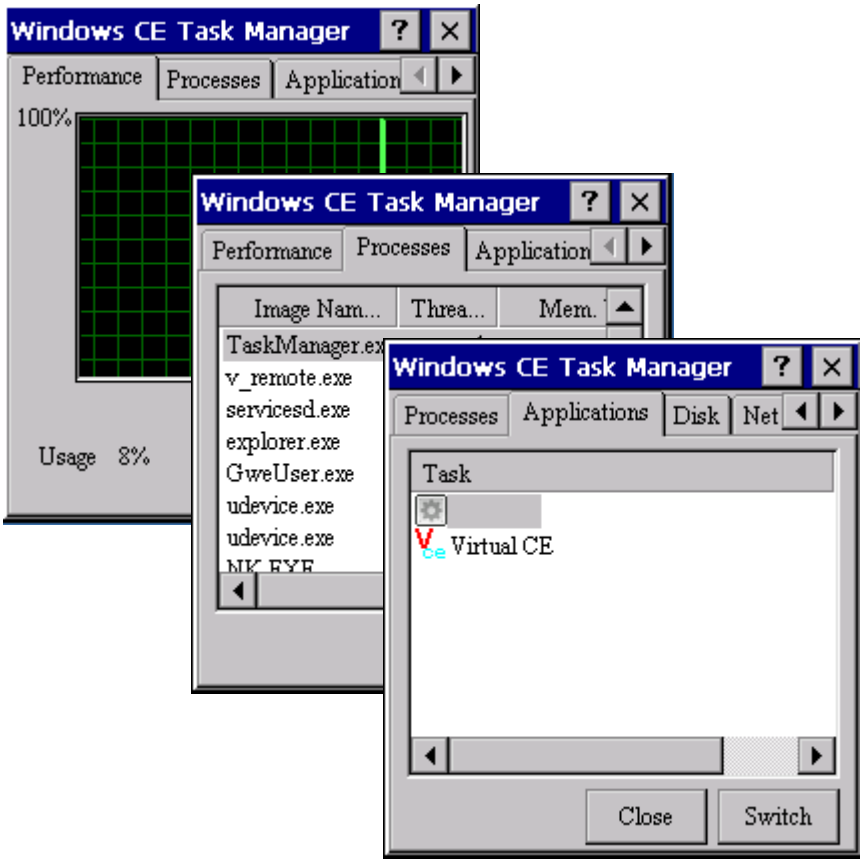
DCON Utility Pro enables users easily to configure and manage the I/O modules via Ethernet or serial ports (RS-232/RS-485).

For more detailed information on how to use DCON Utility Pro to configure I/O modules, please refer to “2.4. Using DCON Utility Pro to Configure I/O Modules”



3.3. TaskMgr

The TaskMgr is a Windows CE application, which provides real time info on all processes and threads including System threads, similar in appearance to the Windows Task Manager.



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 lets you control your WinPAC remotely.

ICPDAS VCEP is composed of two main components: The “Server” which runs on WinPAC and 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://ftp.icpdas.com.tw/pub/cd/winpac/napdos/wp-8x4x_ce50/pc_tools/vcep_5.0.0.0/

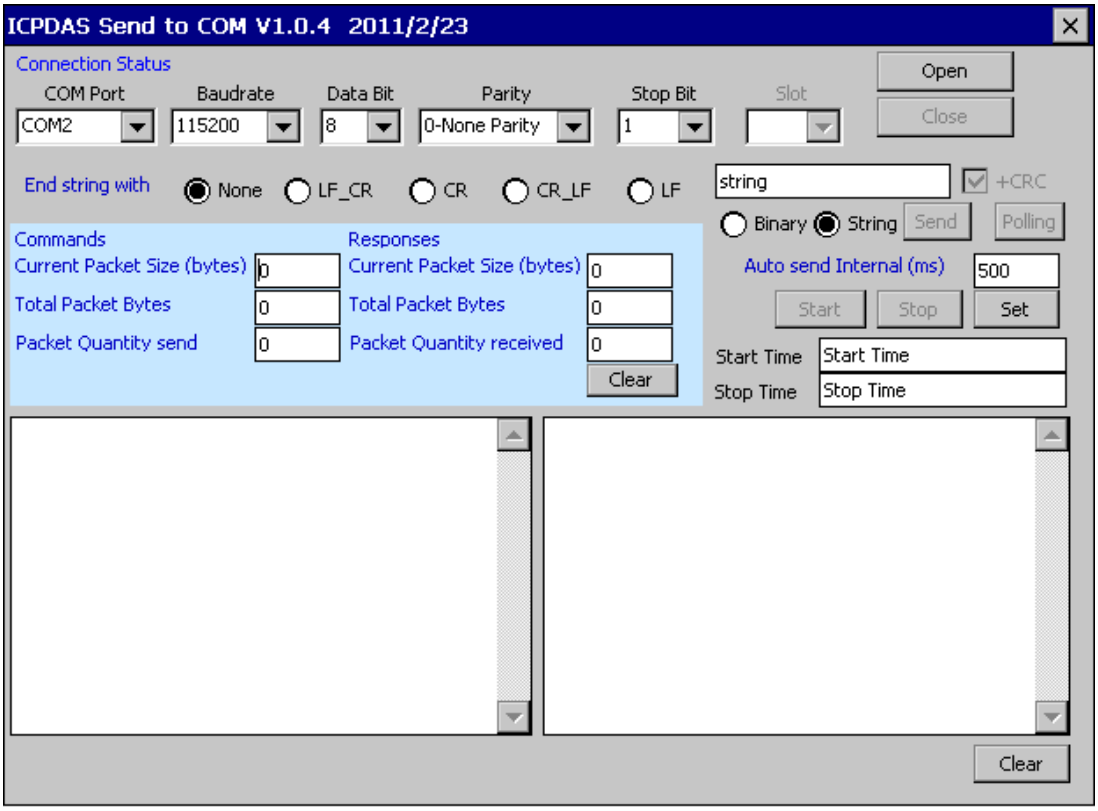
3.5. Remote_Display

The "Remote Display" allows WinPAC to be controlled and monitored from a remote location. This tool is composed of two parts, a client and a server. The server is a program named cerdisp.exe running on WinPAC. The client is a PC-based program named cerhost.exe running on the PC.

3.6. SendToCOM

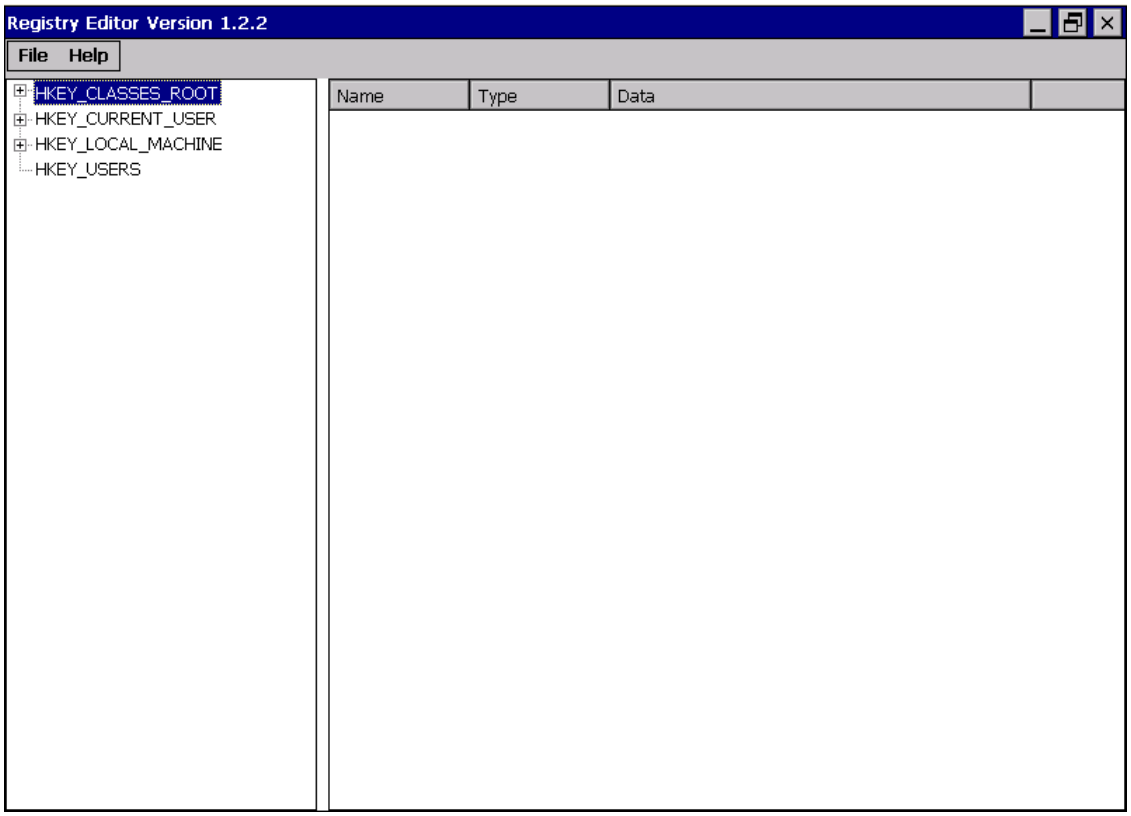
The SendToCOM uses the serial port to communicate with expansion module. To use the SendToCOM, you can send data to expansion module through the serial port, and receive data from other device through the serial port.

For more information about these commands for communicating with expansion module, please refer to:
http://www.icpdas.com/root/product/solutions/remote_io/rs-485/i-8k_i-87k/i-8k_i-87k_selection.html#b



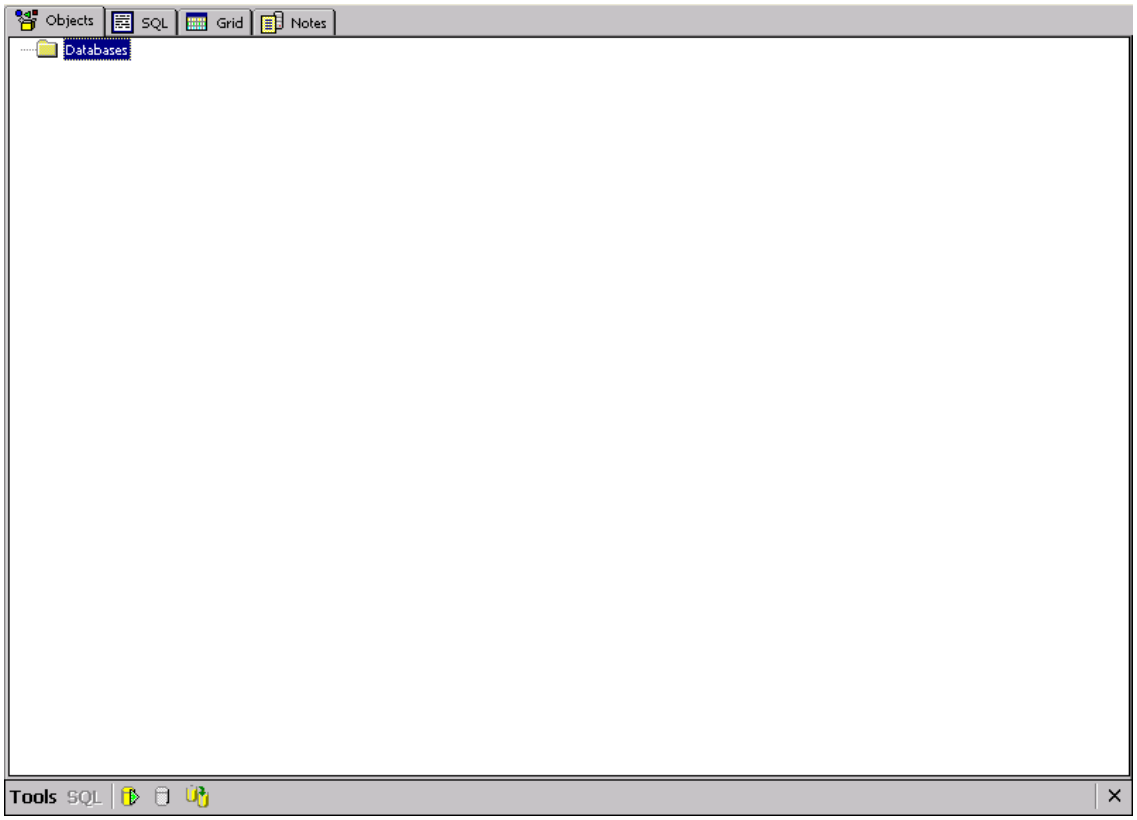
3.7. RegEdit

The RegEdit provides a hierarchical representation of the registry on a target computer, similar in appearance to the Windows Registry Editor. The standard registry roots are represented; you can add keys beneath a root to point to existing registry keys, or you can add your own keys. Values can be changed for existing keys, or added for new keys, and default keys can be specified. For more information, see Registry Settings Management in Deployment.



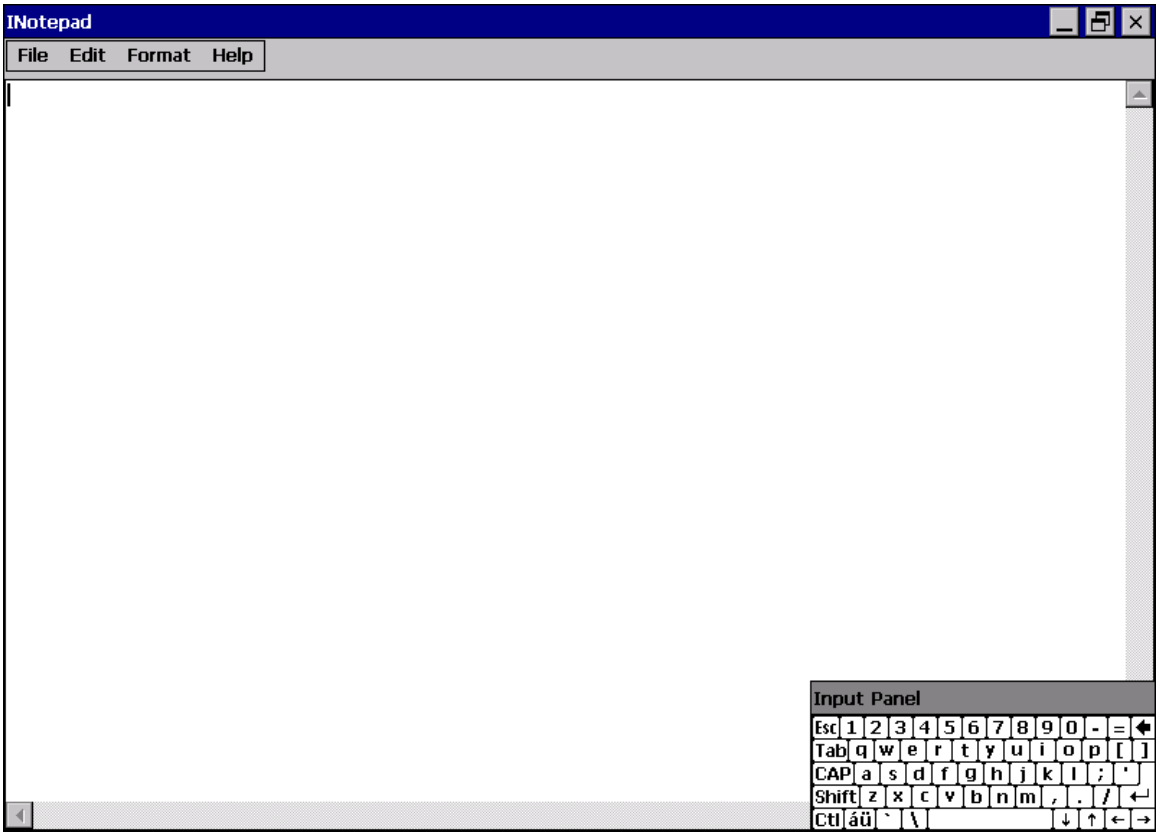
3.8. ISQLW35

The "ISQLW35" is a Windows Embedded Compact 7 functionality that implements SQL Server Compact 3.5 Query.



3.9. INotepad

The INotepad is a common text-only editor. The resulting files have no format tags or styles.



4. Your First WinPAC Program

This chapter provides a guided tour that describes the steps needed to set-up a development environment, download, install, configure for user programming with the WP-5000-CE7 series modules.

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

Development Tools

WP-5000-CE7 series modules are Windows CE-based units. Windows CE is a mature embedded operating system which supports rapid development.

The table below lists the supported development tools and development languages to develop WP-5000-CE7 applications.

Development Tools \ Languages		Visual Basic.Net	Visual C#	Visual C++
Visual Studio 2005 or earlier	Any versions except Professional	-	-	-
	Professional	-	-	-
Visual Studio 2008	Any versions except Professional	-	-	-
	Professional	√	√	√
Visual Studio 2012 or later	Any versions except Professional	-	-	-
	Professional	-	-	-

4.1. Preparing the Development Tools

WP-5000-CE7 is a Windows CE-based unit. Windows CE is a mature embedded operating system which supports rapid development. The standard development tool is list as follows which is highly integrated, with comprehensive support for developing applications of Windows CE-based WP-5000-CE7.

- **Visual Studio 2008**

WP-5000-CE7 has .NET Compact Framework 3.5 installed. Visual Studio 2008 takes full advantage of the .NET Compact Framework, which uses public Internet standards to enable integration with new and existing applications running on any platform. Supported languages include Visual C#, Visual C++ and Visual Basic .NET.

Installation Steps:

1. **Visual Studio 2008 Professional**

   Purchase from MSDN subscription

   Microsoft DreamSpark: https://www.dreamspark.com/Product/Product.aspx?productid=1

2. **Visual Studio 2008 Service Pack 1**

   http://www.microsoft.com/en-us/download/details.aspx?id=10986

3. **Visual Studio 2008 update for Windows Embedded Compact 7**

   http://www.microsoft.com/en-us/download/confirmation.aspx?id=11935

4. **Windows Embedded Compact 7 ATL Update for Visual Studio 2008 SP1**

   http://support.microsoft.com/kb/2468183/en-us

4.2. Installing WP-5000-CE7 SDK

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

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

Step 2: Execute the "AM335x_WINCE7_SDK_YYYYMMDD.msi"

The AM335x_WinCE7_SDK_YYMMDD.msi can be obtained from:
CD:\wp-5231\SDK\PlatformSDK\

The installation program for the latest version of the WinPAC Platform SDKs can be obtained from:
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/platformsdk/

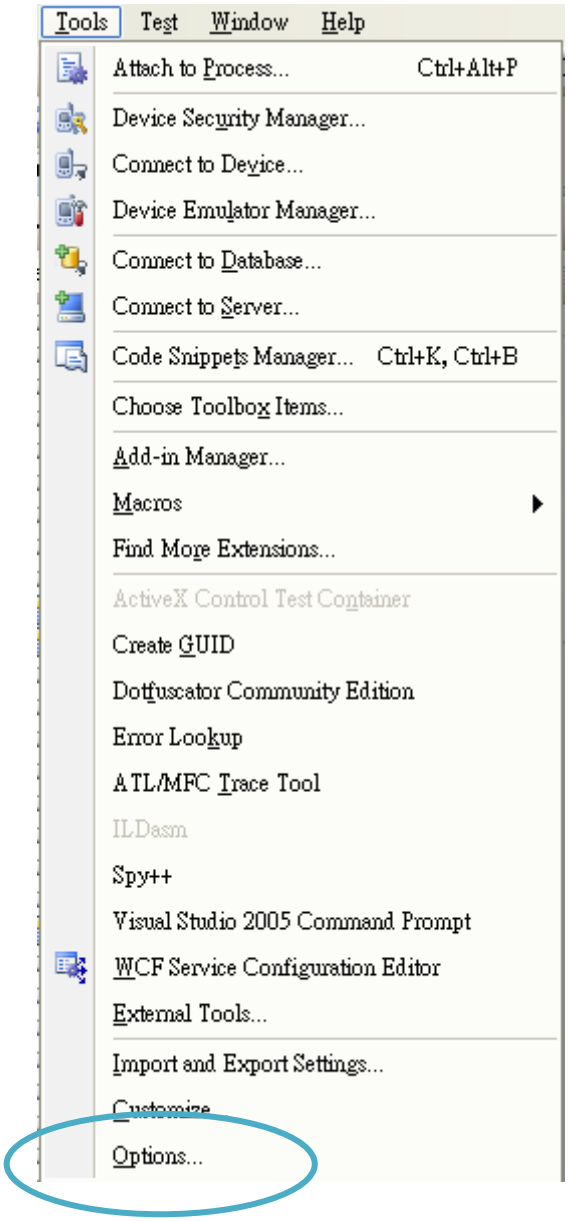
File name: am335x_wince7_sdk_yyyymmdd.msi
yyyymmdd: platform sdk released date

Step 3: Follow the prompts until the installation is complete

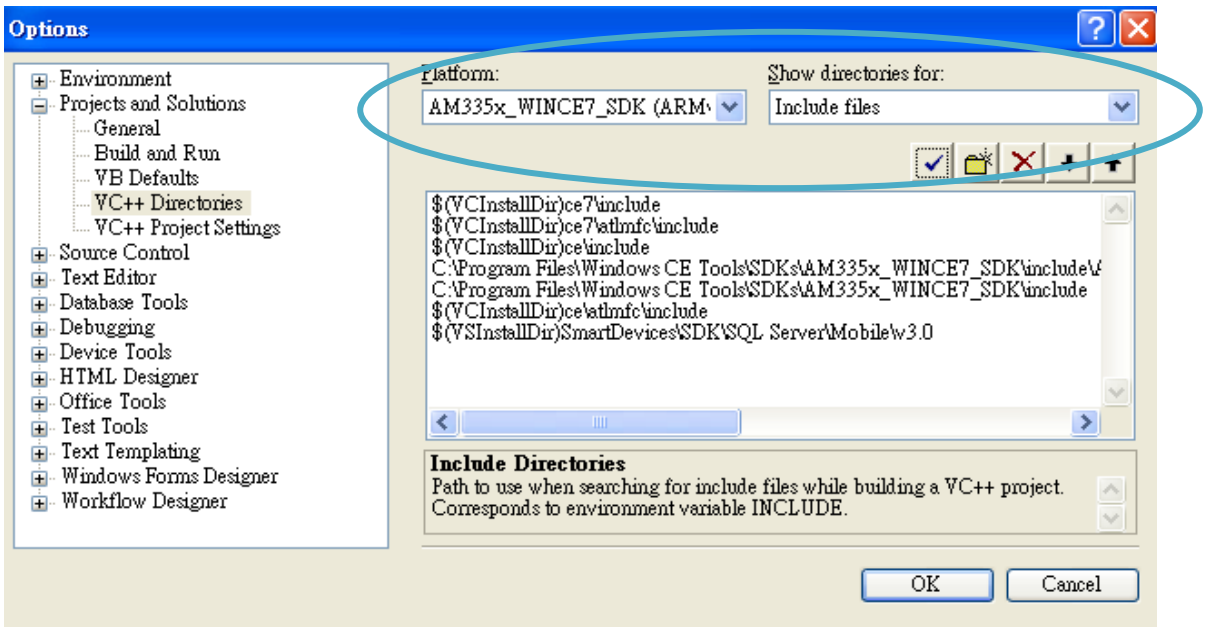
Step 4: Execute the "VisualStudioDeviceWindowsEmbeddedCompact7.msi"

The VisualStudioDeviceWindowsEmbeddedCompact7.msi can be obtained from:
CD:\wp-5231\SDK\PlatformSDK\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/platformsdk/

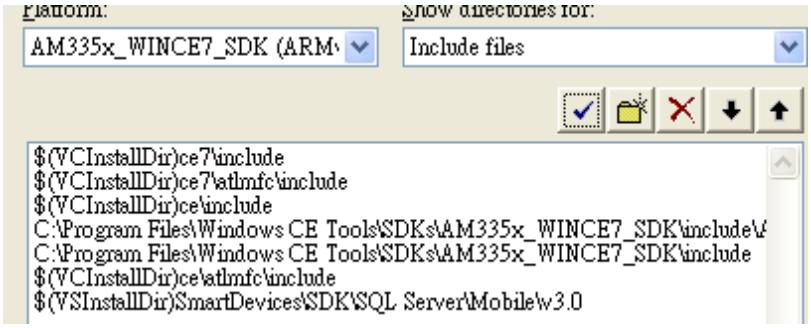
Step 5: Execute any VS2008 C++ project include the AM335x_WINCE7_SDK(ARMv4I) platform and the click the "Tools"->"Options…"



Step 6: Click the “Projects and Solutions”->”VC++ Directories” and then select the “AM335x_WINCE7_SDK (ARMv4I)” 、“Include files” at “Platform:” and “Show directories for:” item



Step 7: Add the path “$(VCInstallDir)ce7\include” and “$(VCInstallDir)ce7\atlmfc\include” and then click the OK button.



Tips & Warnings

The path “$(VCInstallDir)ce7\include” and “$(VCInstallDir)ce7\atlmfc\include” must be on the top of box.

4.3. First WinPAC Program in VB.NET

The best way to learn programming with WinPAC is to actually create a WinPAC program.

The example below demonstrates how to create a demo program running on WinPAC with VB.NET.

To create a demo program with VB.NET that includes the following main steps:

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

All main steps will be described in the following subsection.

In this tutorial, we will assume that you have installed WP-5000-CE7 SDK on PC and used the Visual Studio 2008 for application development.

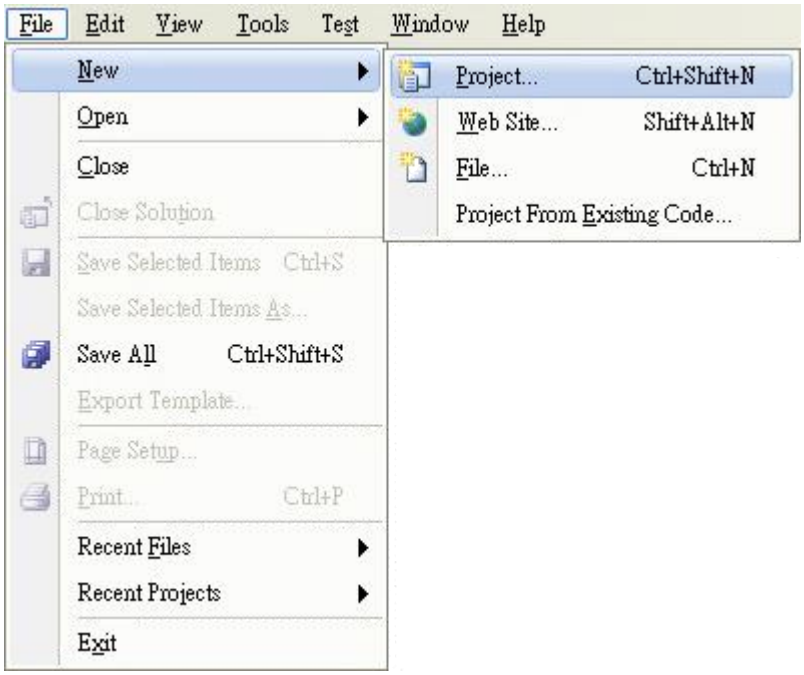
4.3.1. Create a New Project

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

Step 1: Run the Visual Studio 2008

Visual Studio 2008

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

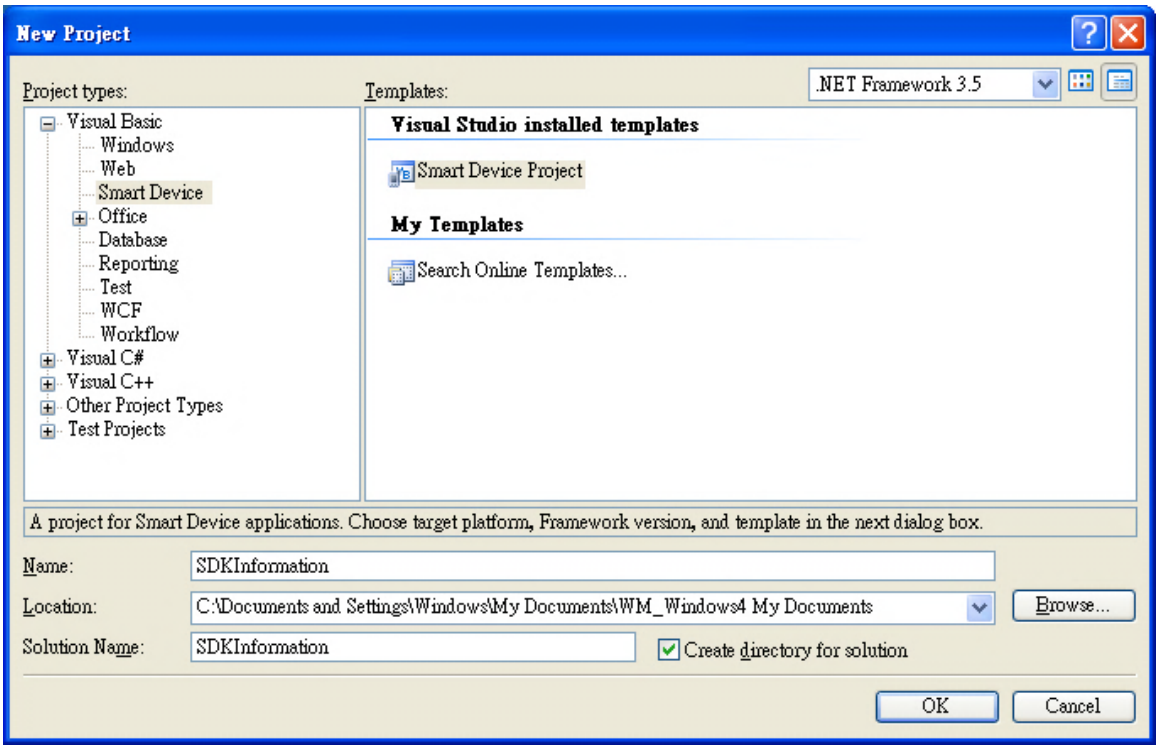


Step 3: In the Project types pane, expand Visual Basic, and then click Smart Device

Step 4: In the Templates pane, click Smart Device

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

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



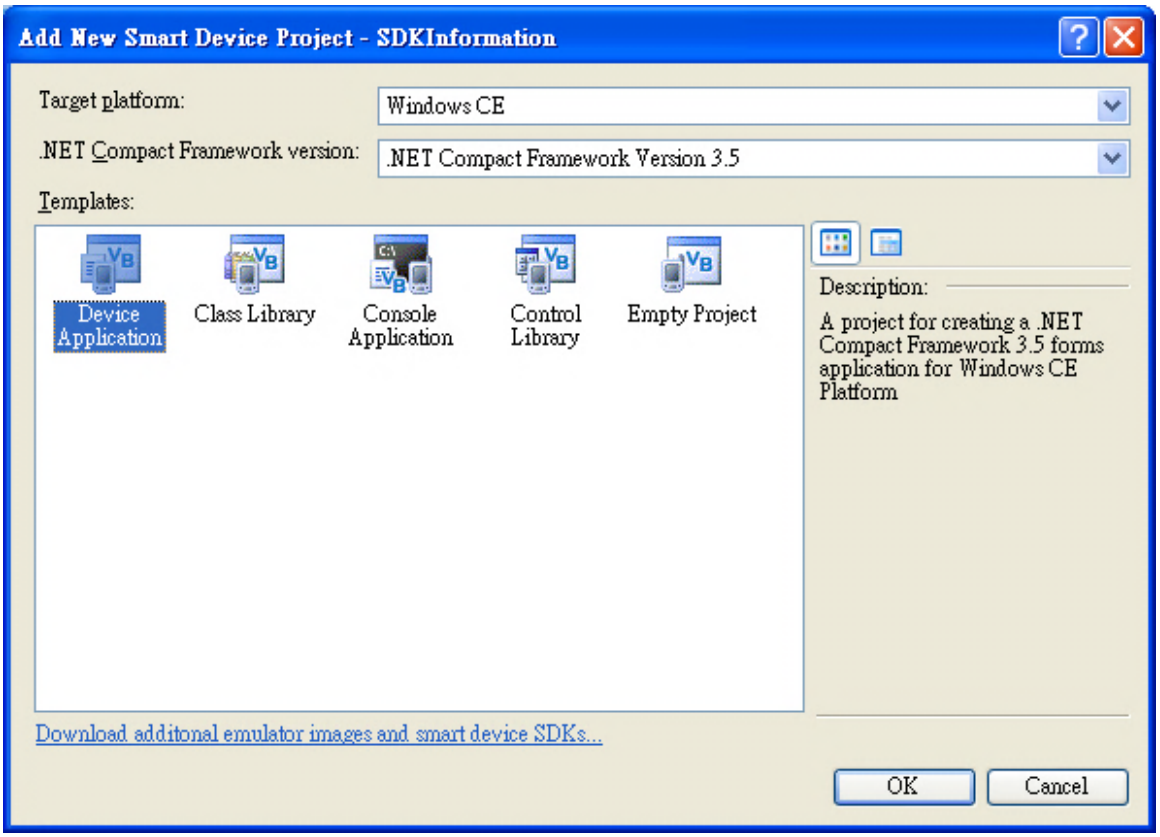
Tips & Warnings

The WCE7 only support .NET Compact Framework Version 3.5, if your application uses .NET Compact Framework Version 2.0 there is no guarantee that the program will function correctly.

Step 6: In the Target platform item, choose Windows CE

Step 7: in the .NET Compact Formwork version item, choose .NET Compact Framework Version 3.5

Step 8: in the Templates pane, choose Device Application, and then click Next



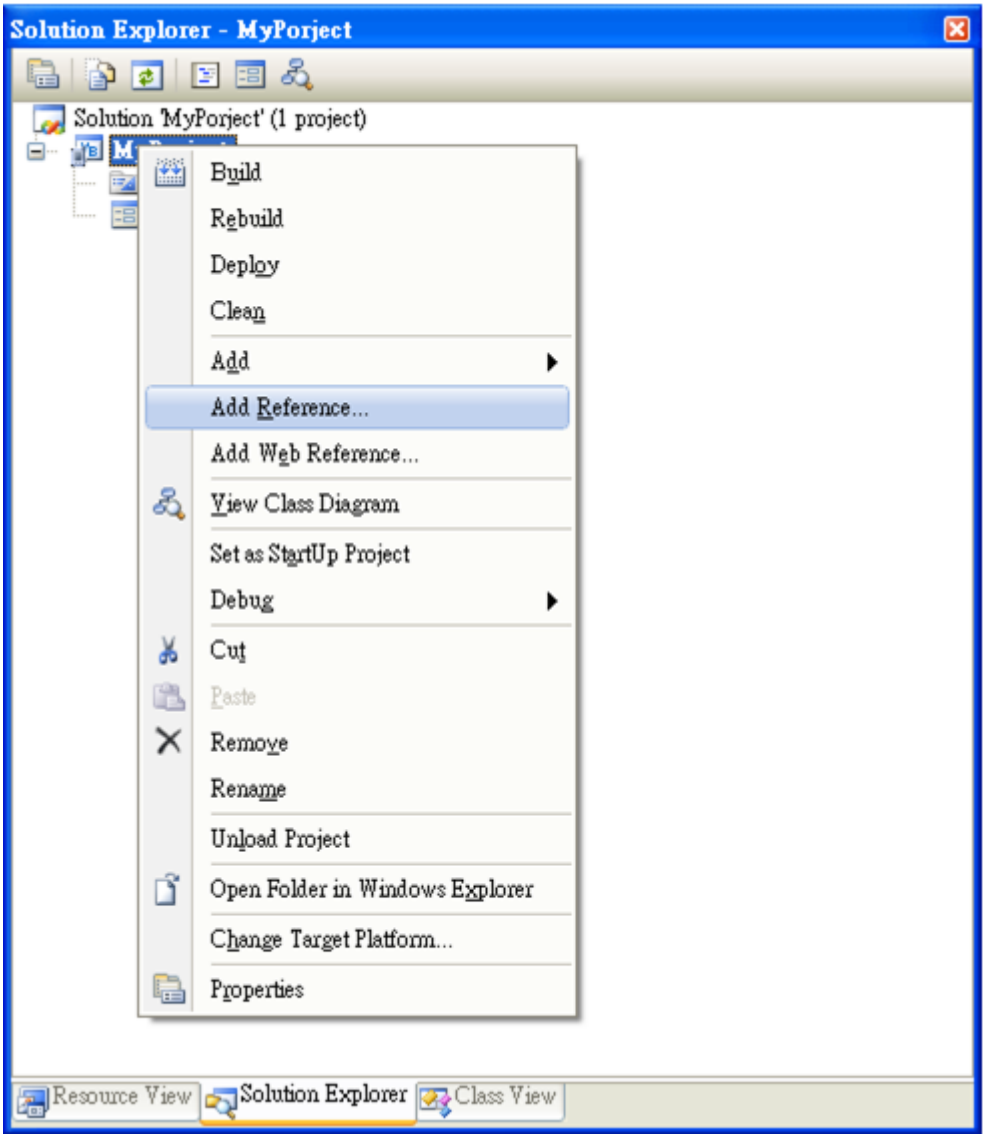
4.3.2. Specify the Path of PAC Reference

The PAC SDK provides a complete solution to integrate with WP-5000-CE7 and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

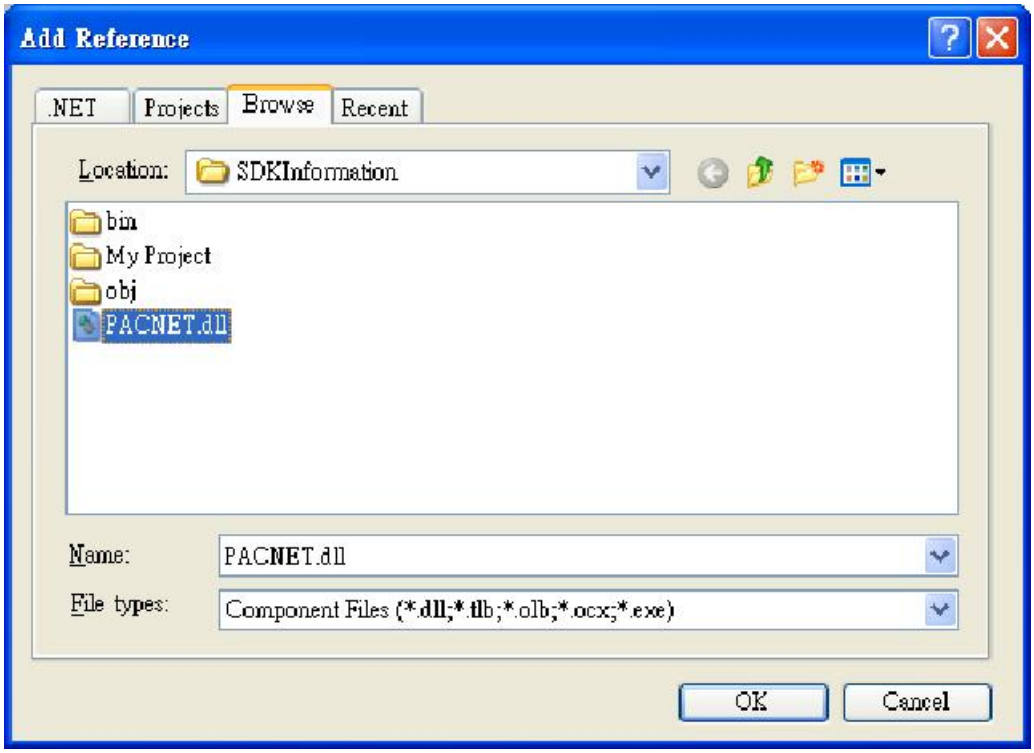
Step1: Get the PACNET.dll and copy it to the project folder

The PACNET.dll can be obtained from the link below that has been provided on the CD or by downloading the latest version from ICP DAS web site.
CD:\wp-5231\SDK\PACNET\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/pacnet/

Step 2: In Solution Explorer, right-click the References node, and then click Add Reference…



Step 3: Select Browse tab and add the PACNET.dll

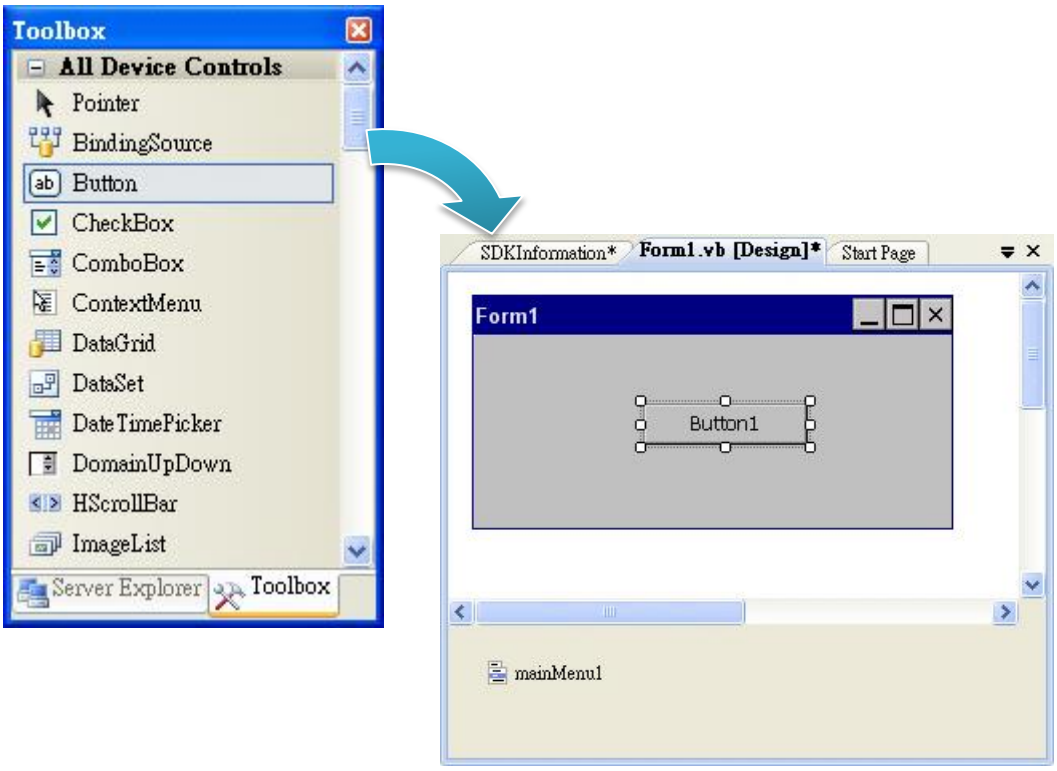


4.3.3. Add the Control to the Form

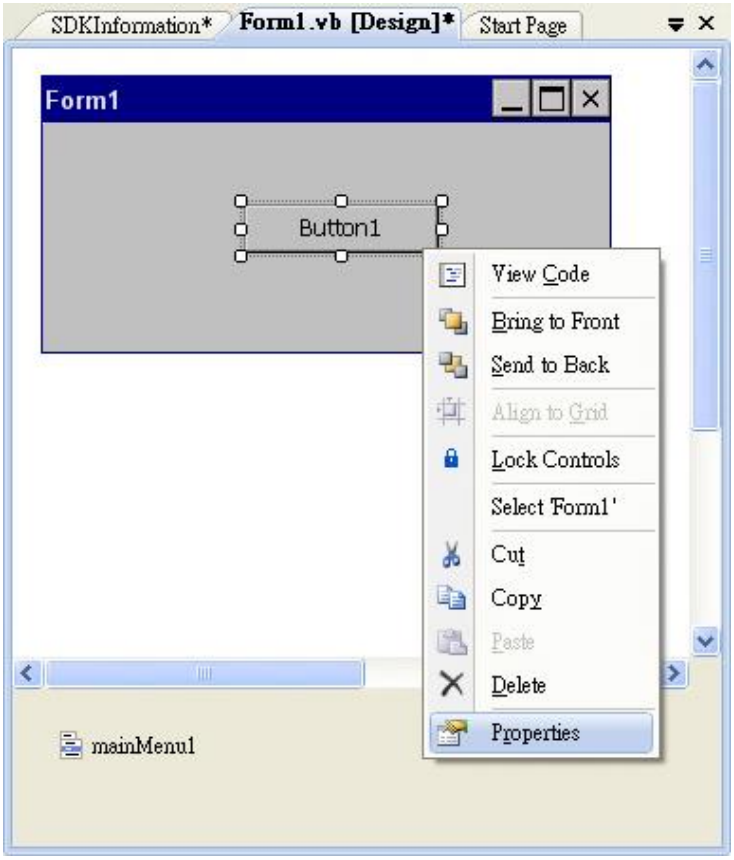
You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

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

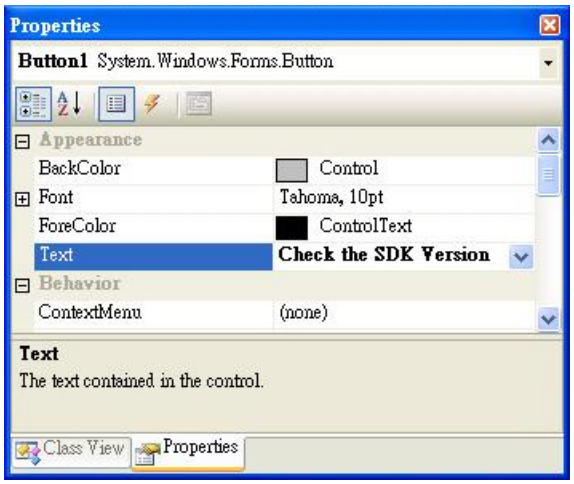
Step 1: From the Toolbox, drag a Button control onto the form



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



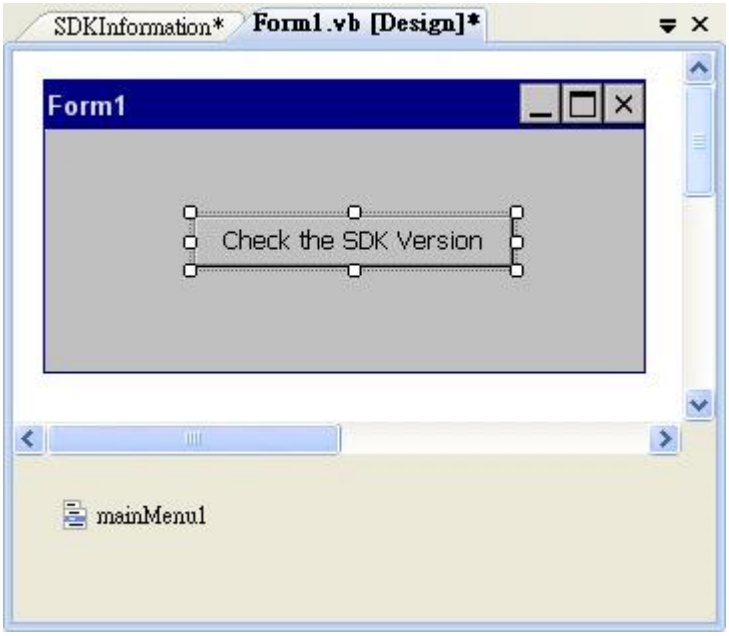
Step 3: In the Properties window, type Check the SDK version, and press ENTER to set the Text property



4.3.4. Add the Event Handling for the Control

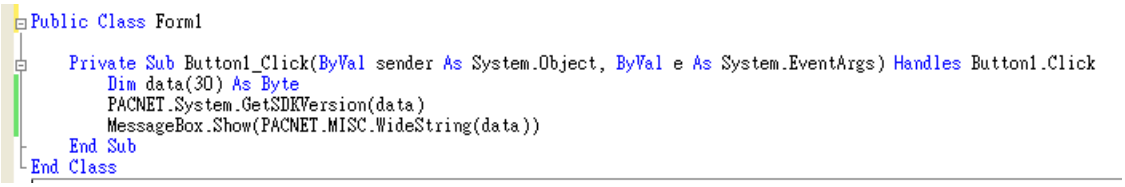
You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

Step 1: Double-click the button on the form



Step 2: Inserting the following code

Dim data(30) As Byte
PACNET.Sys.GetSDKVersion(data)
MessageBox.Show(PACNET.MISC.WideString(data))



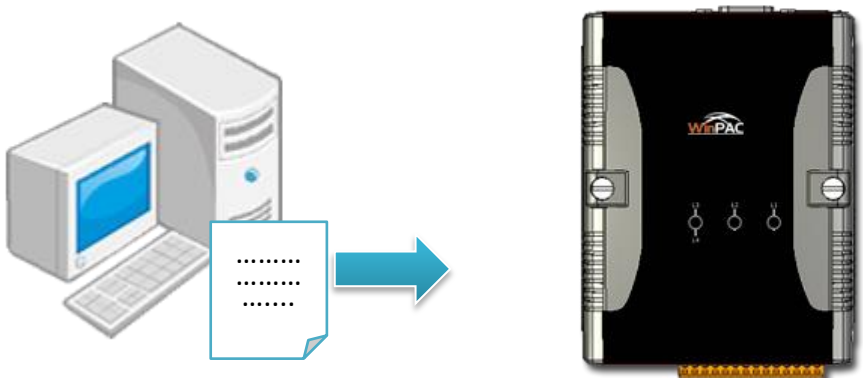
```
Public Class Form1

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        Dim data(30) As Byte
        PACNET.System.GetSDKVersion(data)
        MessageBox.Show(PACNET.MISC.WideString(data))
    End Sub
End Class
```

Tips & Warnings

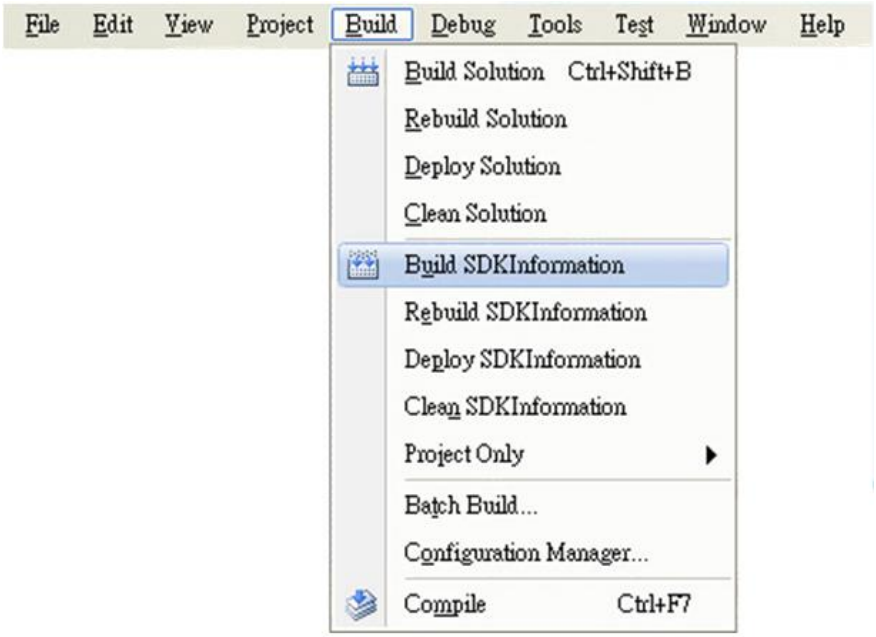
The “PACNET” of “using PACNET” is case- sensitive.

4.3.5. Upload the Application to WinPAC

WinPAC supports FTP server service. You can upload files to WinPAC or download files from a public FTP server.



Step 1: On the Build menu, click Build SDKInformation

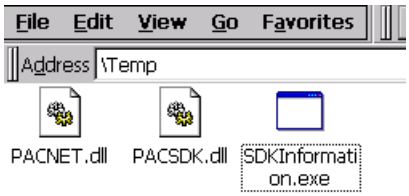


Step 2: Open the browser and type the IP address of WinPAC

Step 3: Upload the SDKInformation.exe application and the corresponding PACSDK.dll and PACNET.dll files to WinPAC

Tips & Warnings

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



4.3.6. Execute the Application on WinPAC

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

4.4. First WinPAC Program in Visual C#

The best way to learn programming with WinPAC is to actually create a WinPAC program.

The example below demonstrates how to create a demo program running on WinPAC with C#.

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

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

All main steps will be described in the following subsection.

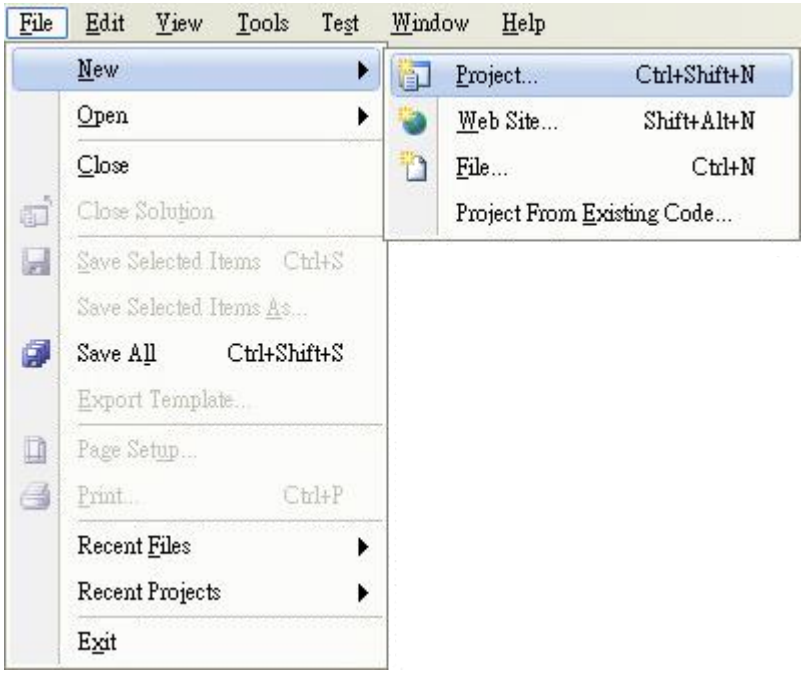
4.4.1. Create a New Project

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

Step 1: Run the Visual Studio 2008

Visual Studio 2008

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

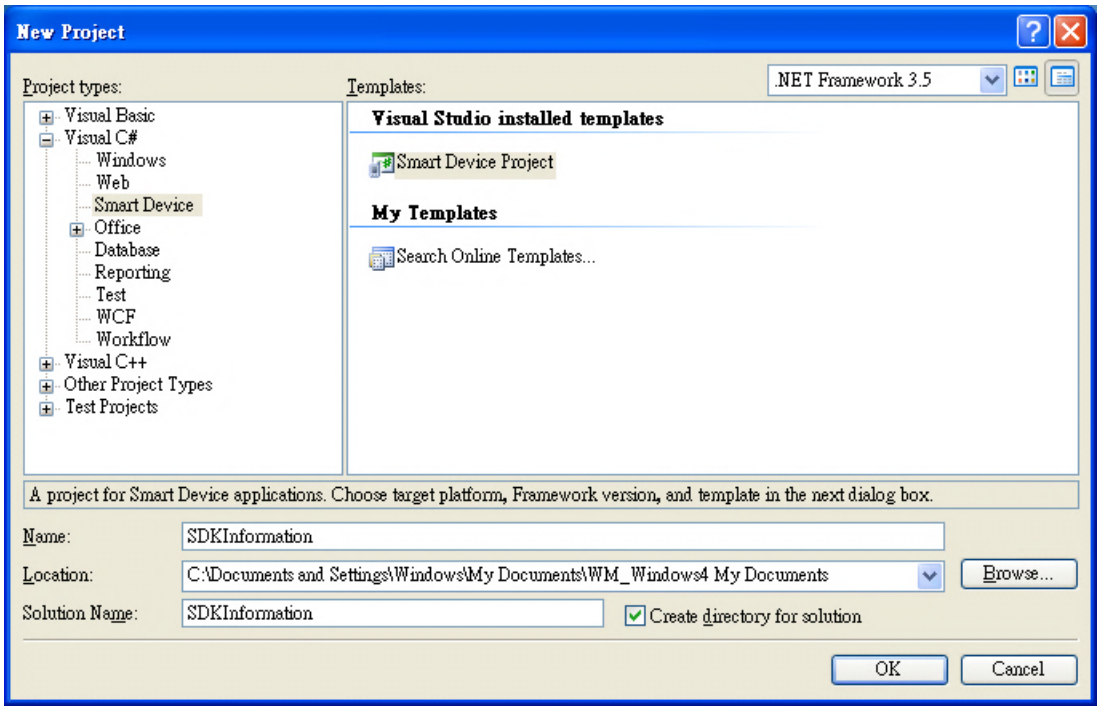


Step 3: In the Project types pane, expand Visual C#, and then click Smart Device

Step 4: In the Templates pane, click Smart Device

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

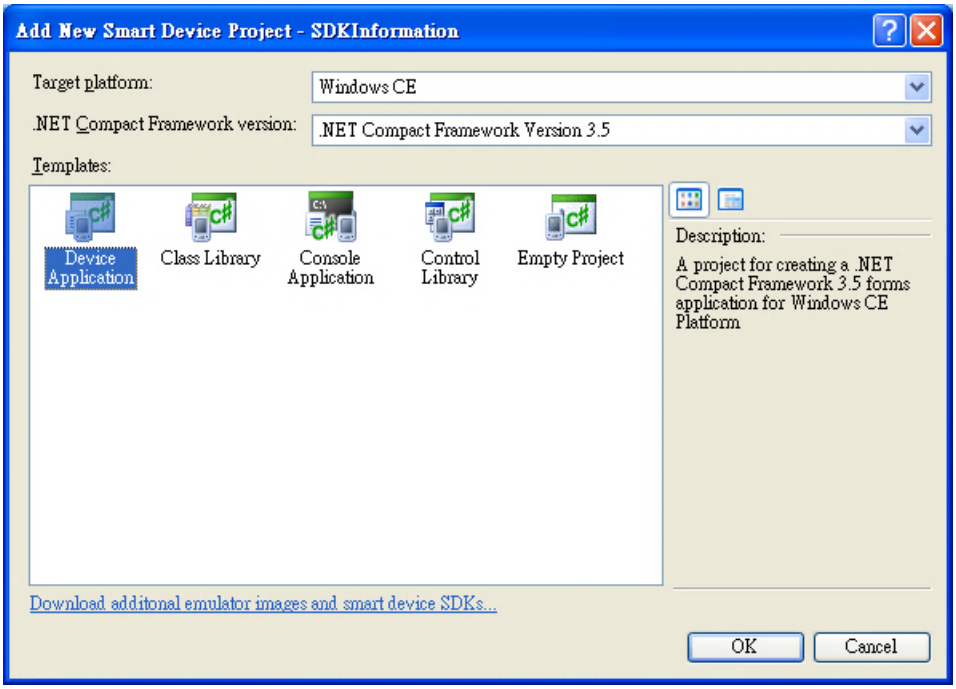
Here we will enter the name “SDKInformation” and a different location for the project if you wish.



Step 6: In the Target platform item, choose Windows CE

Step 7: in the .NET Compact Formwork version item, choose .NET Compact Framework Version 3.5

Step 8: in the Templates pane, choose Device Application, and then click Next



Tips & Warnings

The WCE7 only support .NET Compact Framework Version 3.5, if your application uses .NET Compact Framework Version 2.0 there is no guarantee that the program will function correctly.

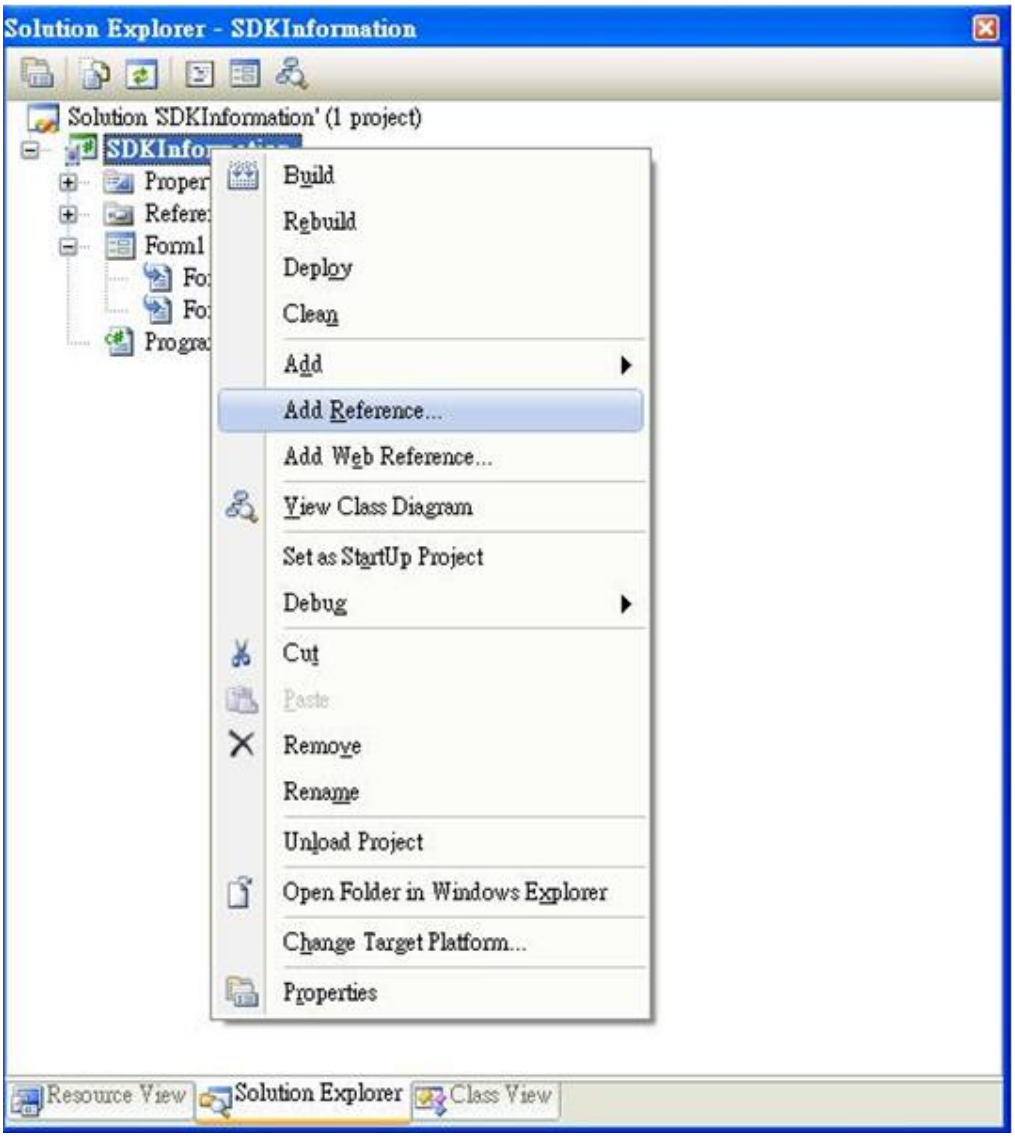
4.4.2. Specify the Path of PAC Reference

The PAC SDK provides a complete solution to integrate with WP-5000-CE7 and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

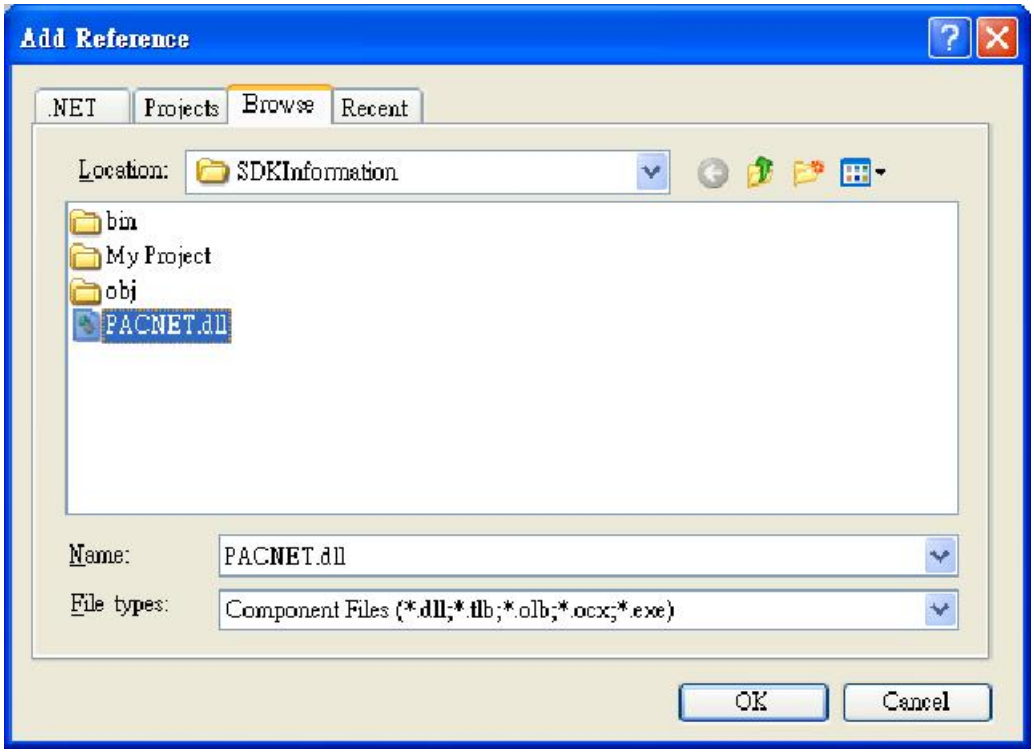
Step1: Get the PACNET.dll and copy it to the project folder

The PACNET.dll can be obtained from the link below that has been provided on the CD or by downloading the latest version from ICP DAS web site.
CD:\wp-5231\SDK\PACNET\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/pacnet/

Step 2: In Solution Explorer, right-click the References node, and then click Add Reference…



Step 3: Select Browse tab and add the PACNET.dll



4.4.3. Add the Control to the Form

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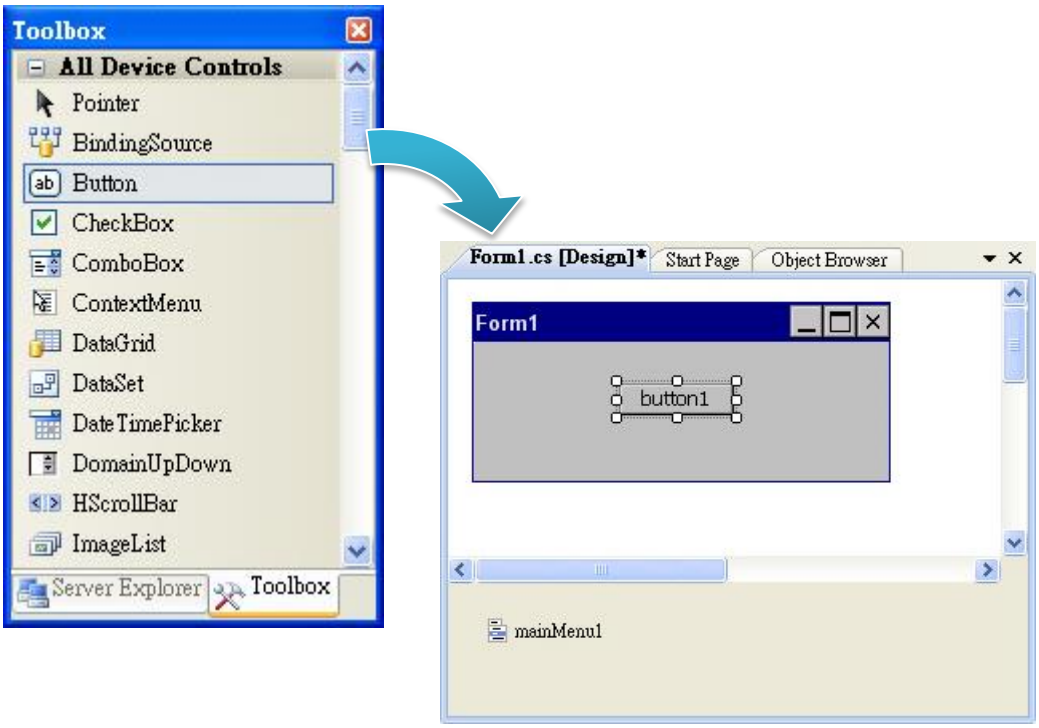
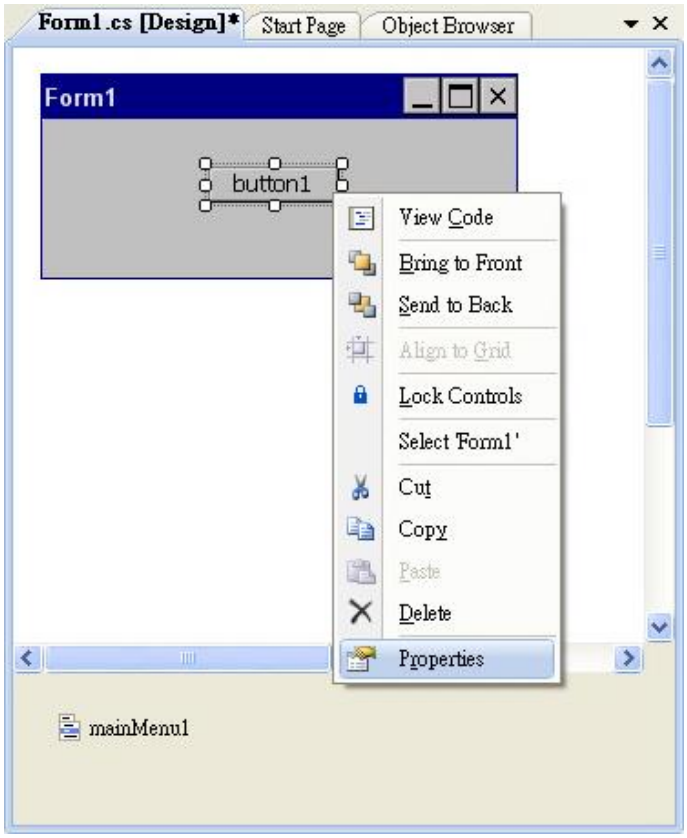
After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

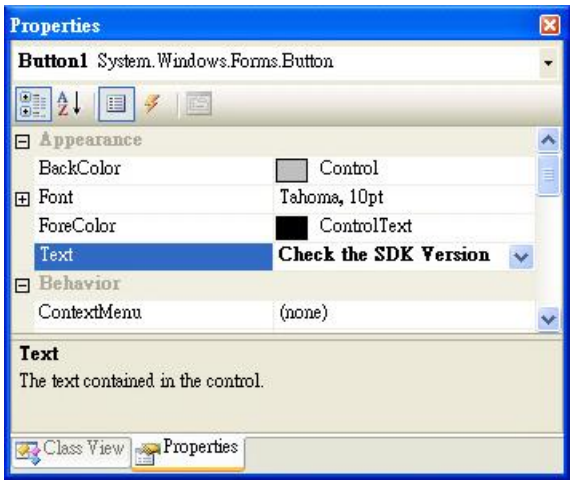
Step 1: From the Toolbox, drag a Button control onto the form



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



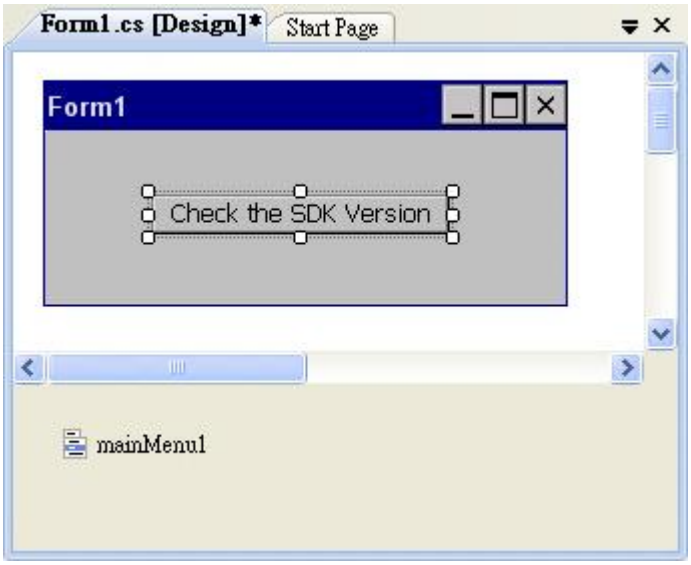
Step 3: In the Properties window, type Check the SDK version, and press ENTER to set the Text property



4.4.4. Add the Event Handling for the Control

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

Step 1: Double-click the button on the form



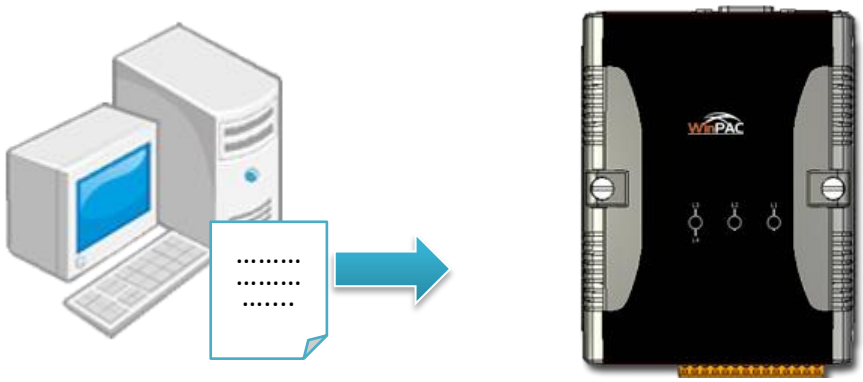
Step 2: Inserting the following code

byte []data = new byte[30];
PACNET.Sys.GetSDKVersion(data);
MessageBox.Show(PACNET.MISC.WideString(data));

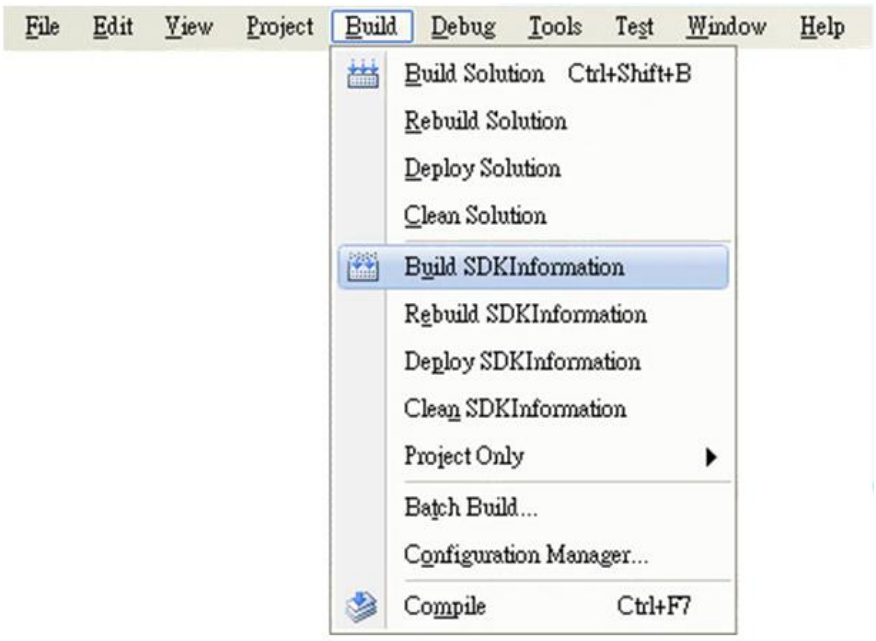
```
namespace SDKInformation
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            byte []data = new byte[30];
            PACNET.Sys.GetSDKVersion(data);
            MessageBox.Show(PACNET.MISC.WideString(data));

        }
    }
}
```

4.4.5. Upload the Application to WinPAC

WinPAC supports FTP server service. You can upload files to WinPAC or download files from a public FTP server.



Step 1: On the Build menu, click Build SDKInformation

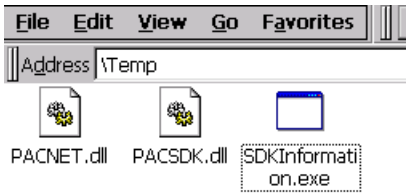


Step 2: Open the browser and type the IP address of WinPAC

Step 3: Upload the SDKInformation.exe application and the corresponding PACSDK.dll and PACNET.dll files to WinPAC

Tips & Warnings

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



4.4.6. Execute the Application on WinPAC

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

4.5. First WinPAC Program in Visual C++

The best way to learn programming with WinPAC is to actually create a WinPAC program.

The example below demonstrates how to create a demo program running on WinPAC with Visual C++

To create a demo program with Visual C++ that includes the following main steps:

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

All main steps will be described in the following subsection.

Tips & Warnings

Before beginning a new project, the “Embedded Compact 7 ATL Update” must be installed. If this update is not installed, the error message “atlconv.h error C2039: lstrlenW" will be displayed after the program is compiled.

The update can be found on the CD that was provided with the package or by downloading the latest version from Microsoft.

CD:\wp-5231\SDK\VisualStudioDeviceWindowsEmbeddedCompact7.msi

http://download.microsoft.com/download/9/D/D/9DDBD3EC-A43C-4BCE-A7A9-AEE9B1007BCE/VisualStudioDeviceWindowsEmbeddedCompact7.msi

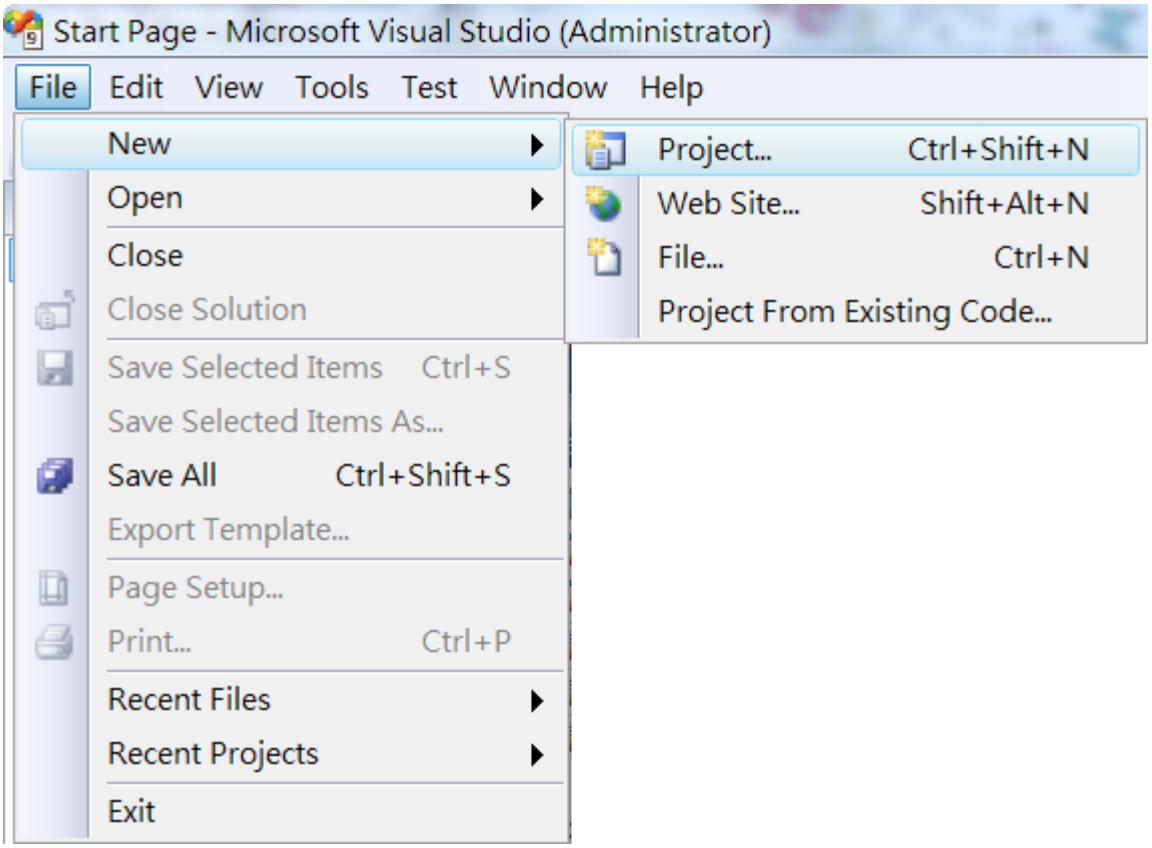
4.5.1. Create a New Project

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

Step 1: Run the Visual Studio 2008

Visual Studio 2008

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

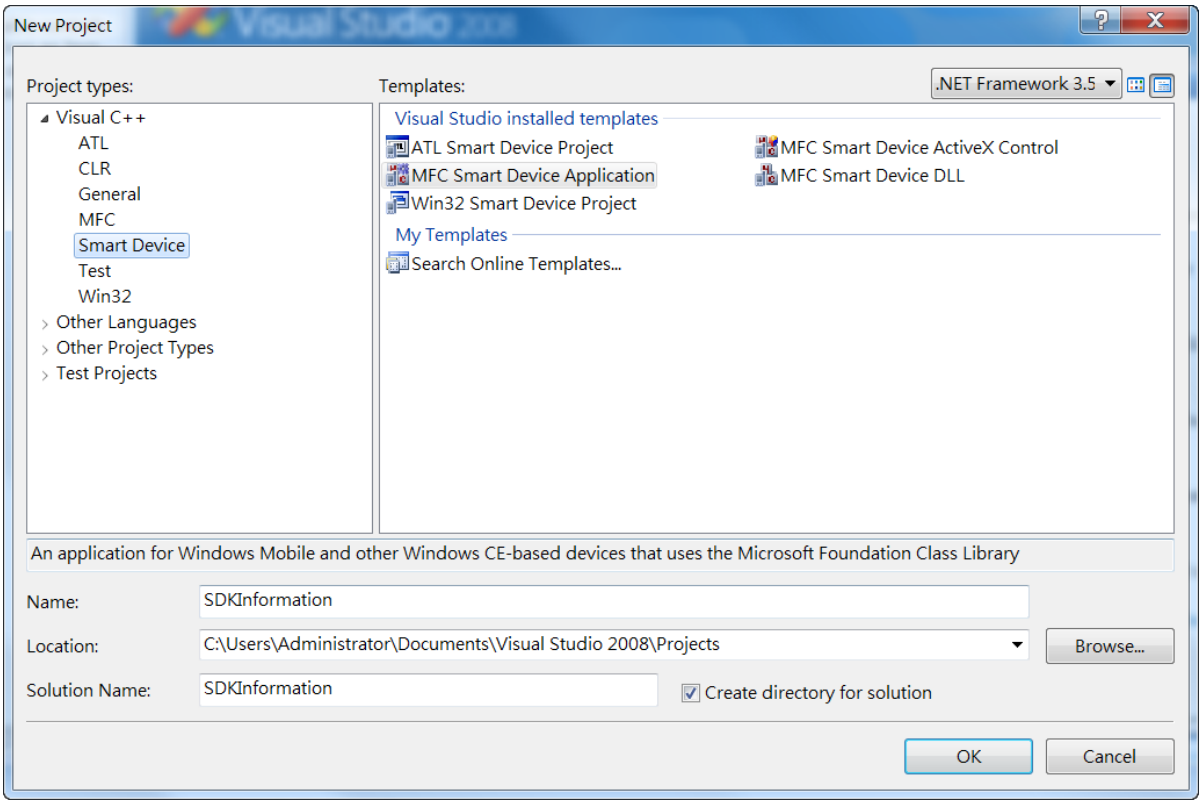


Step 3: In the Project types pane, expand Visual C++, and then click Smart Device

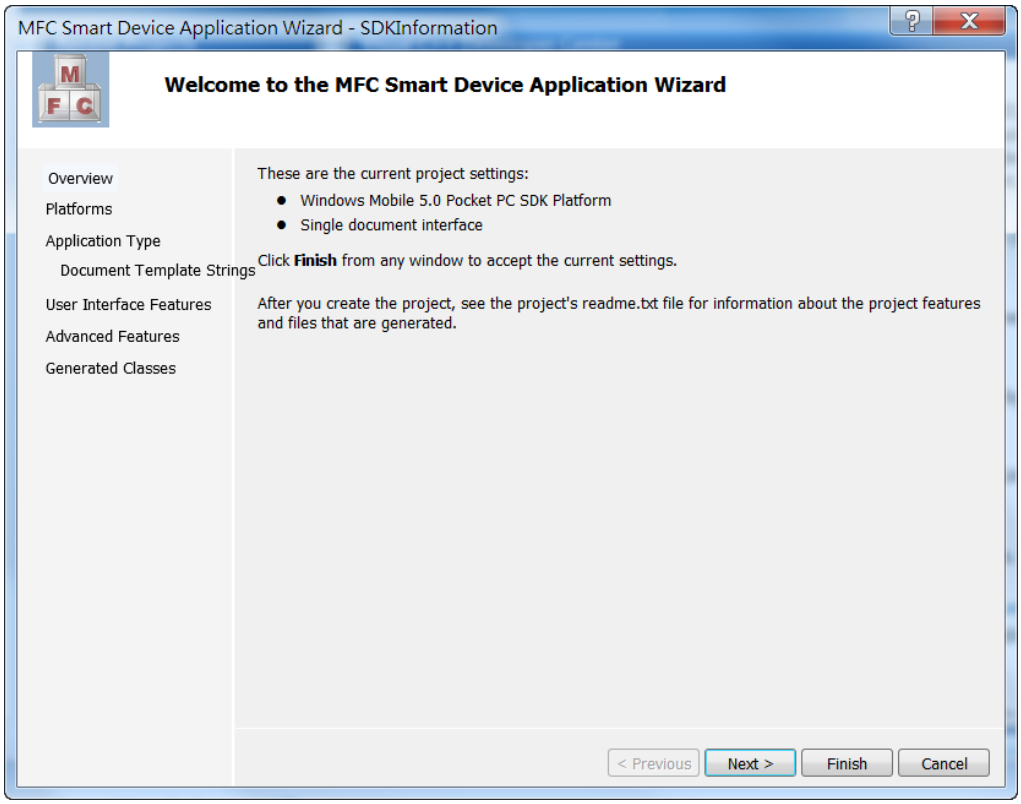
Step 4: In the Templates pane, click MFC Smart Device Application

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

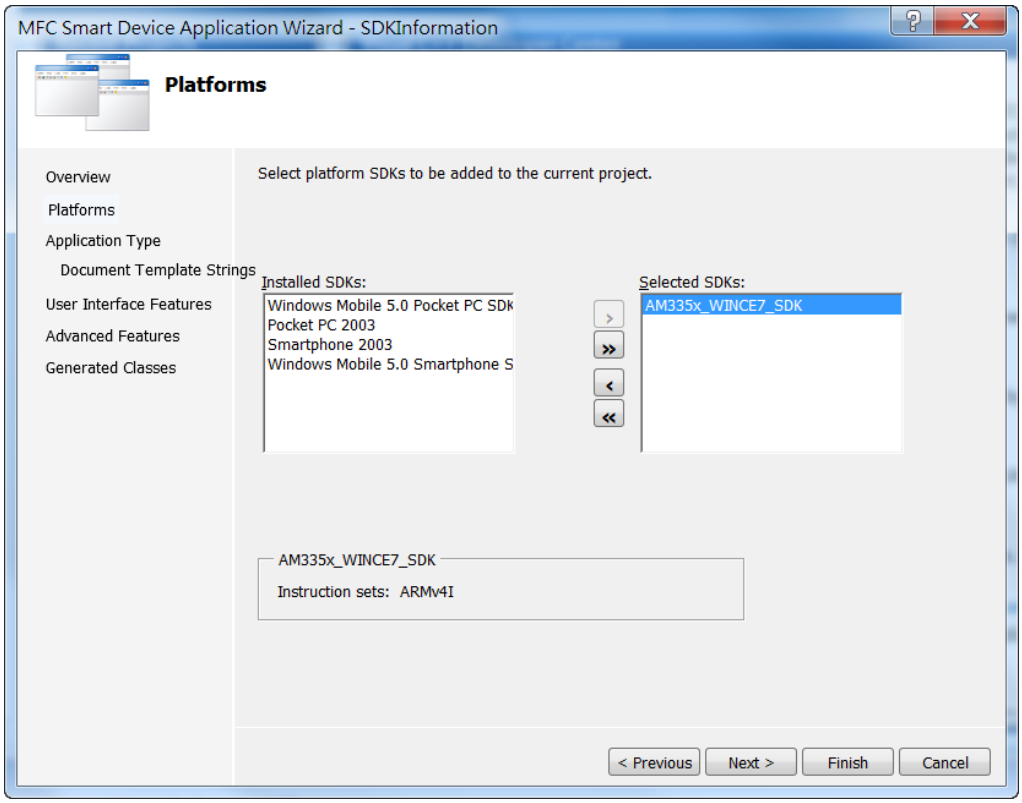
Here we will enter the name “SDKInformation” and a different location for the project if you wish



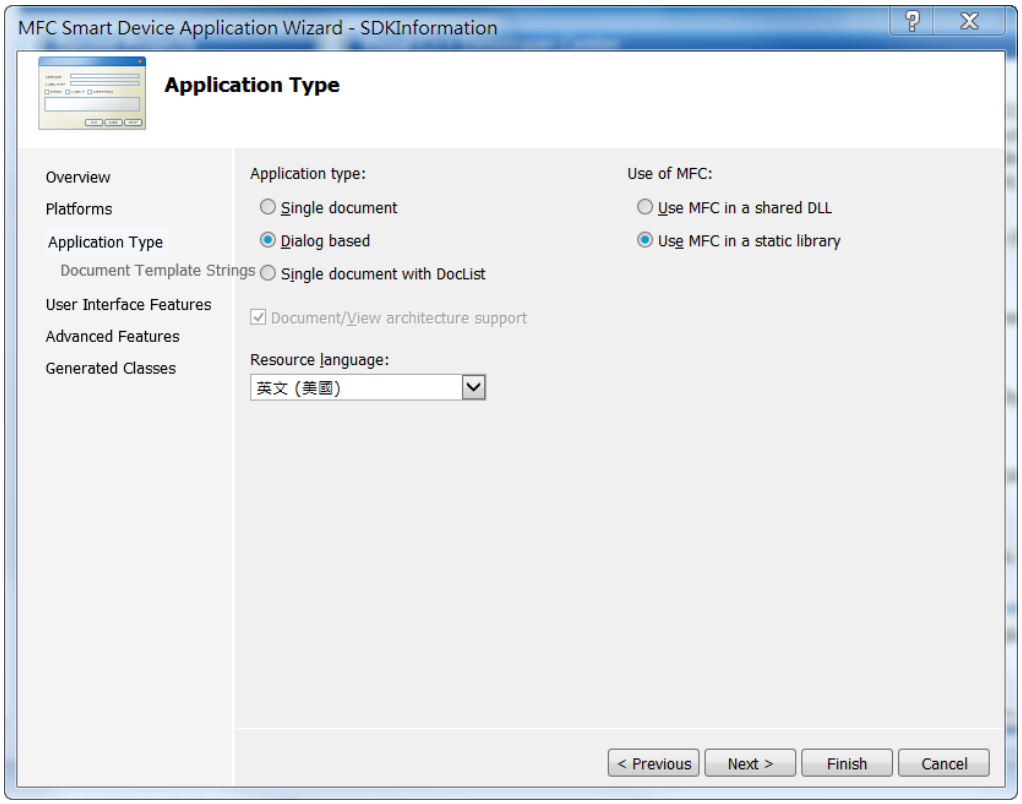
Step 6: On the first page of the wizard, click Next



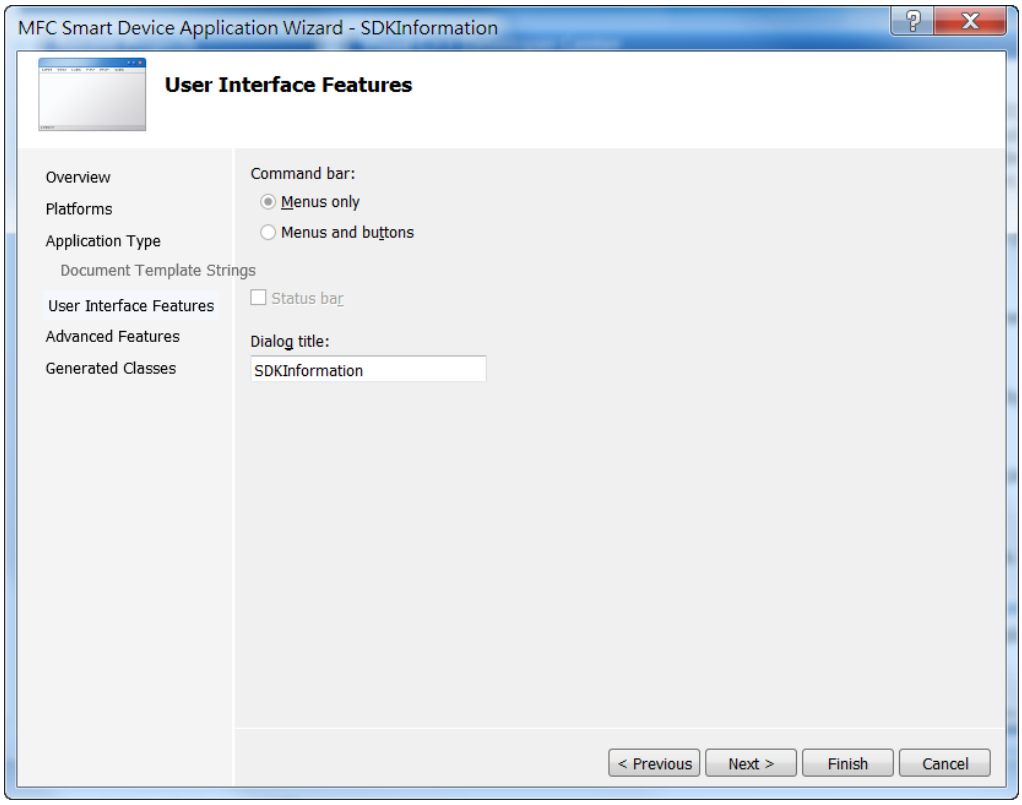
Step 7: On the next page of the wizard, select AM335x_WINCE7_SDK to be added to the project, and then click Next



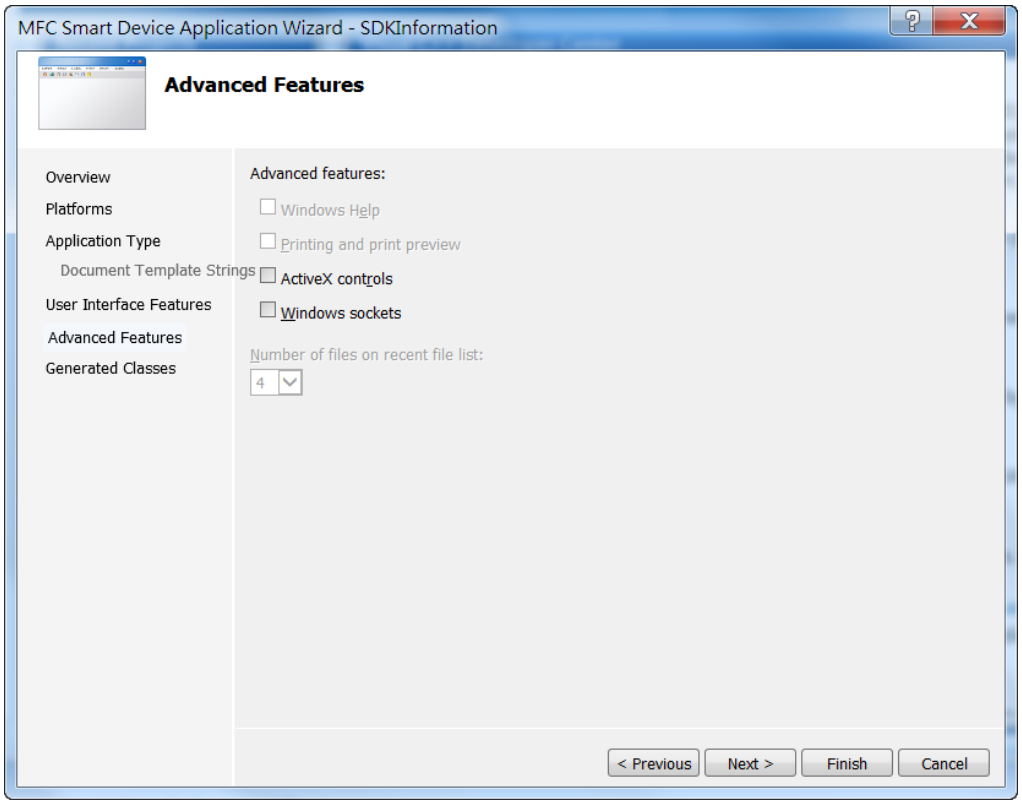
Step 8: On the next page of the wizard, select Dialog based, and then click next



Step 9: On the next page of the wizard, click next

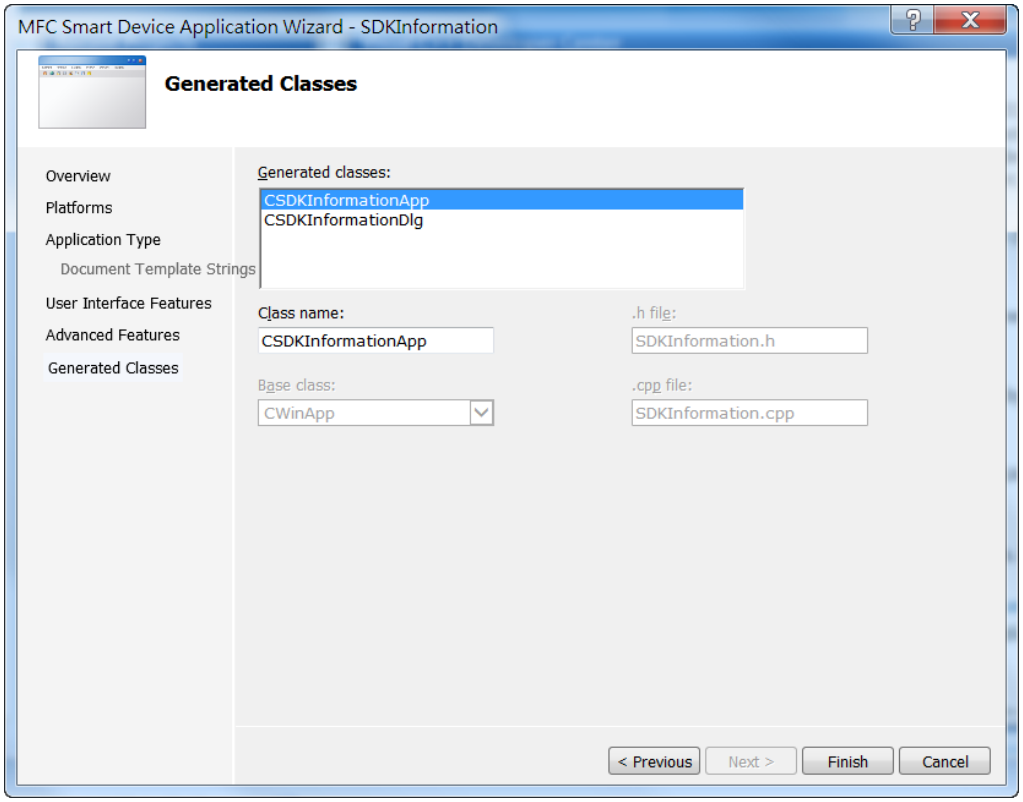


Step 10: On the next page of the wizard, click next



Step 11: On the next page of the wizard, click Finish

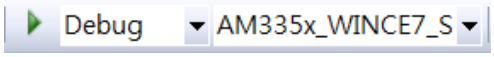
(A**



4.5.2. Configure the Platform

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

On the Debug configuration toolbar, select Release, and then on the Pocket PC 2003 (ARMV4) configuration toolbar, select AM335x_WINCE7_SDK(ARMv4I), as shown in the following illustration.

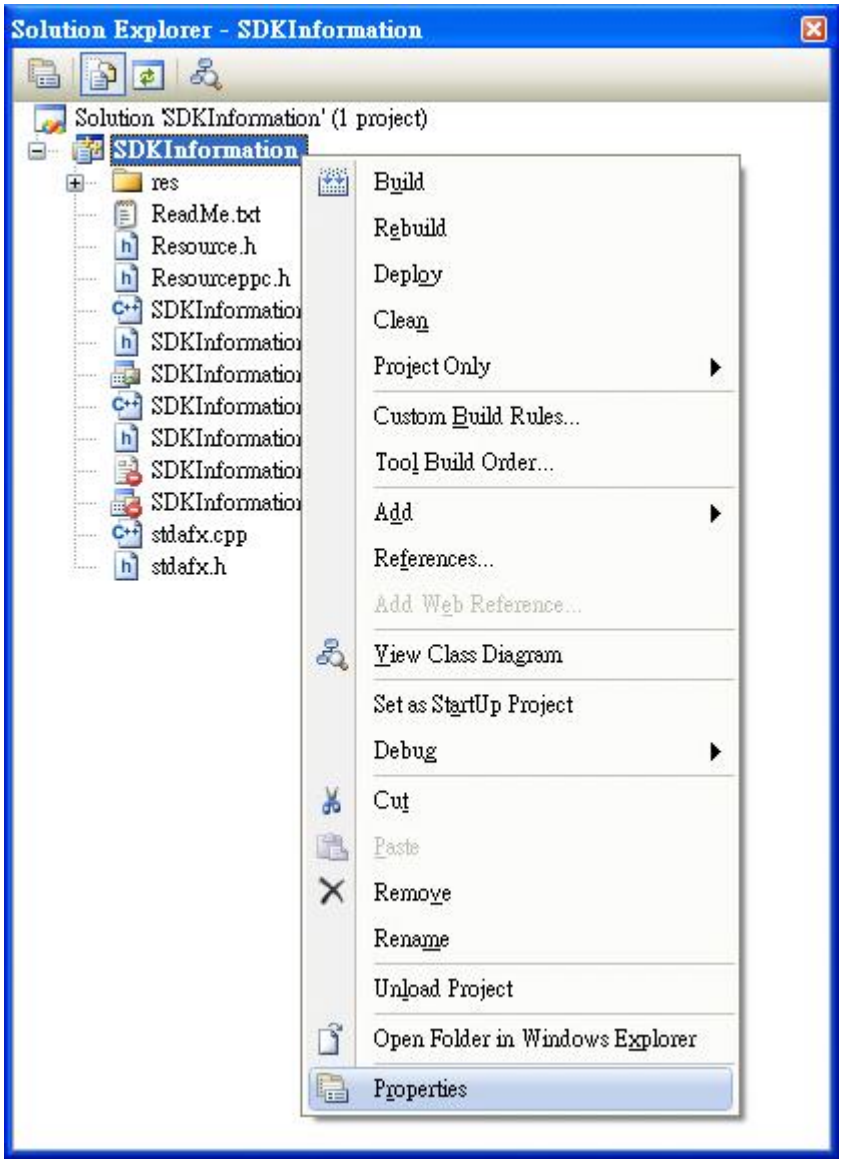


4.5.3. Specify the Path of PACSDK library and header files

The PAC SDK provides the PACSDK library and header files with WP-5000-CE7.

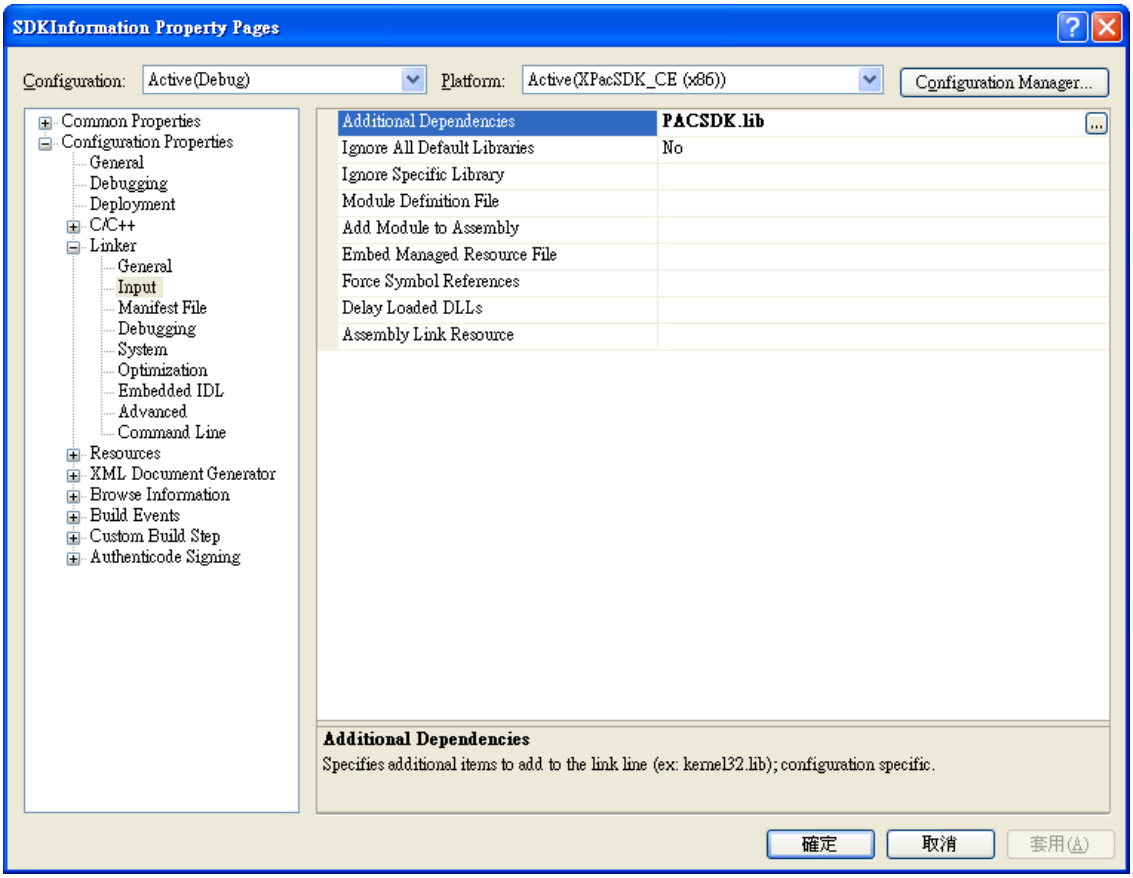
It's compatible with C++. In order to use a component in your application, you must first add a reference to it.

Step 1: Right-click the project name, and then click Properties



Step 2: In left pane, expand Configuration Properties, and then click Link

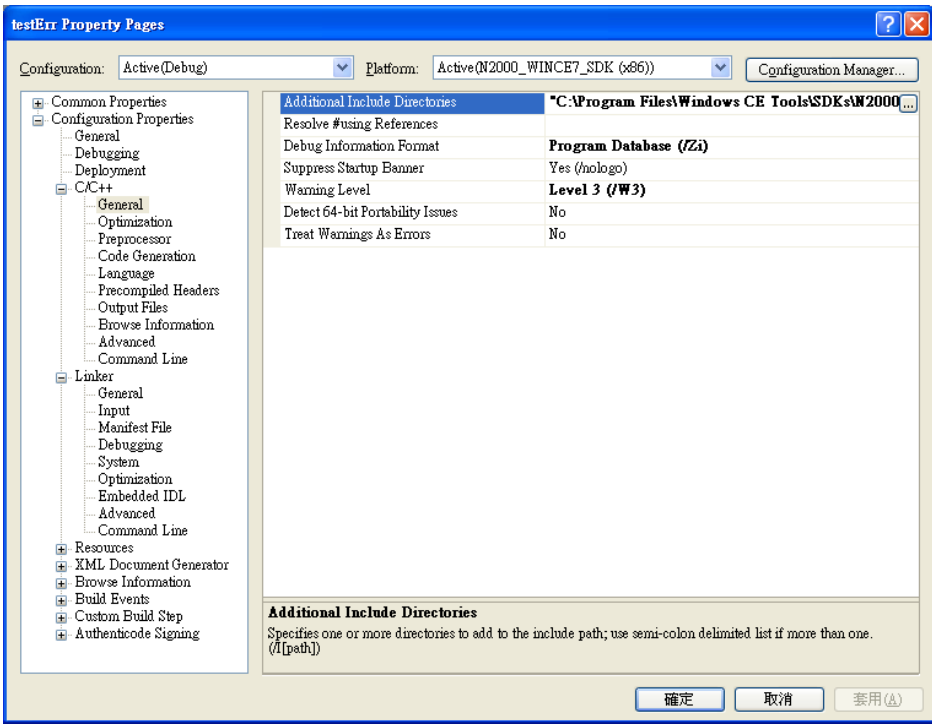
Step 3: In the right pane, choose the PACSDK_CE.lib in the Additional Dependencies item



Step 4: In the right pane, choose the following path in the “Additional Include Directories” item

C:\Program Files\Windows CE Tools\SDKs\N2000_WINCE7_SDK\Include\X86

C:\Program Files\Microsoft Visual Studio 9.0\VC\ce7\atlmfc\include



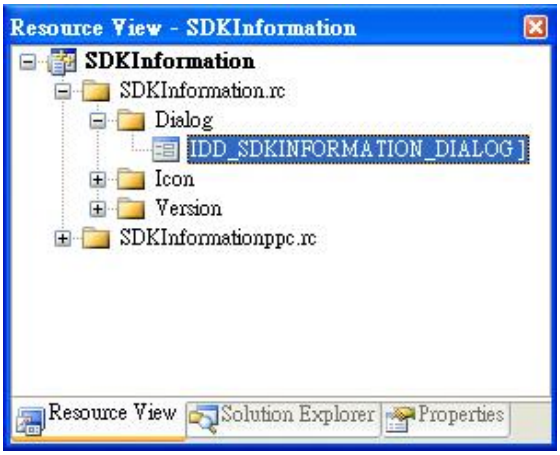
4.5.4. Add the Control to the Form

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

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

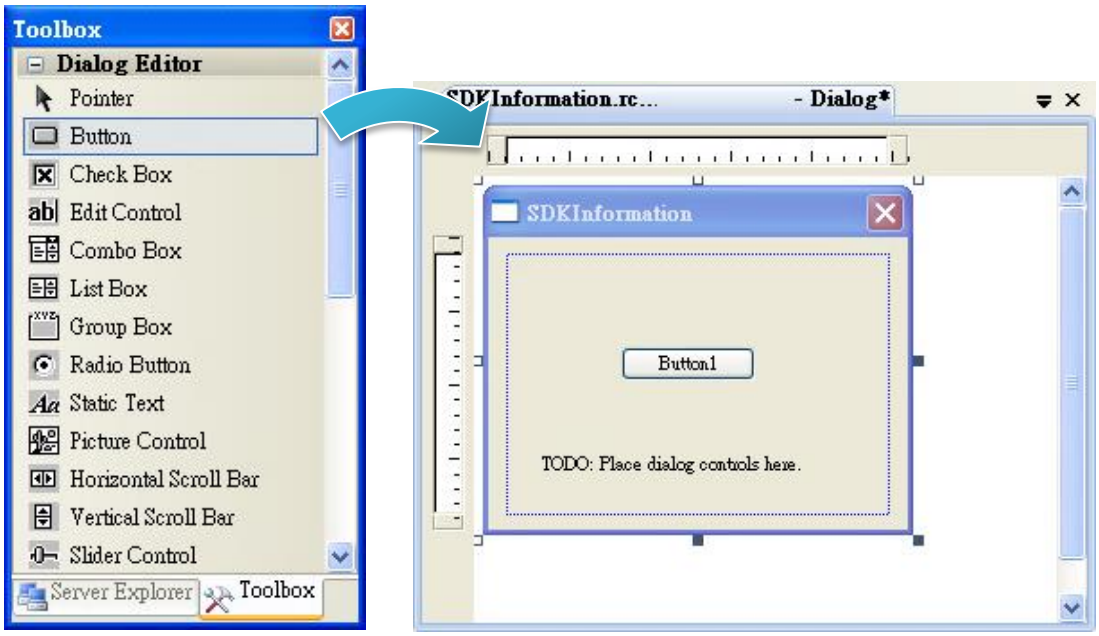
Step 1: In Resource View, expand the resources tree by opening the top level folder

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

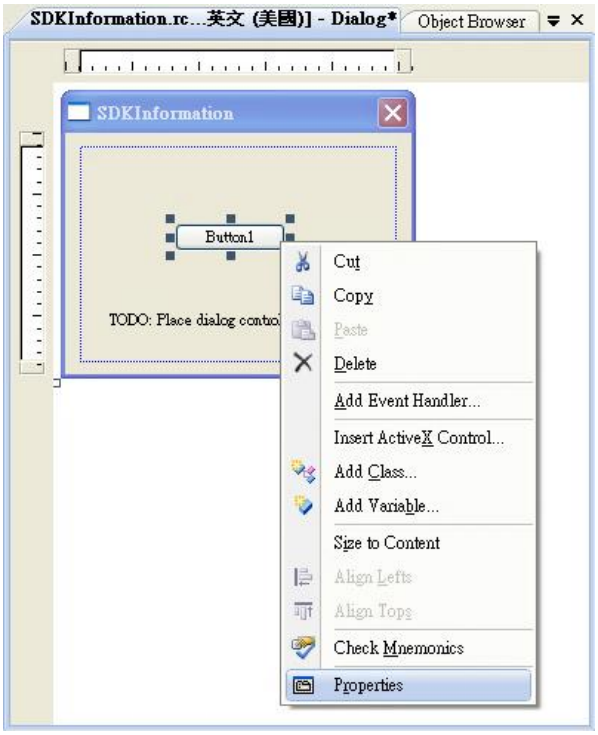


The resource editor appears in the right pane.

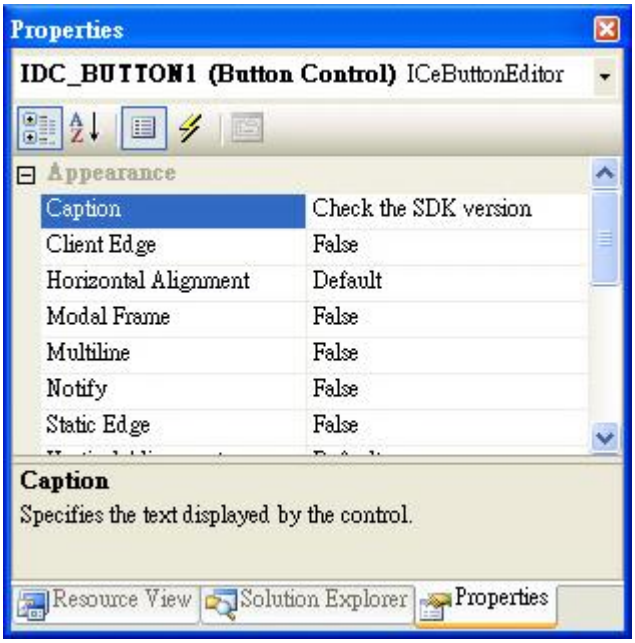
Step 3: From the Toolbox, drag a Button control onto the form



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



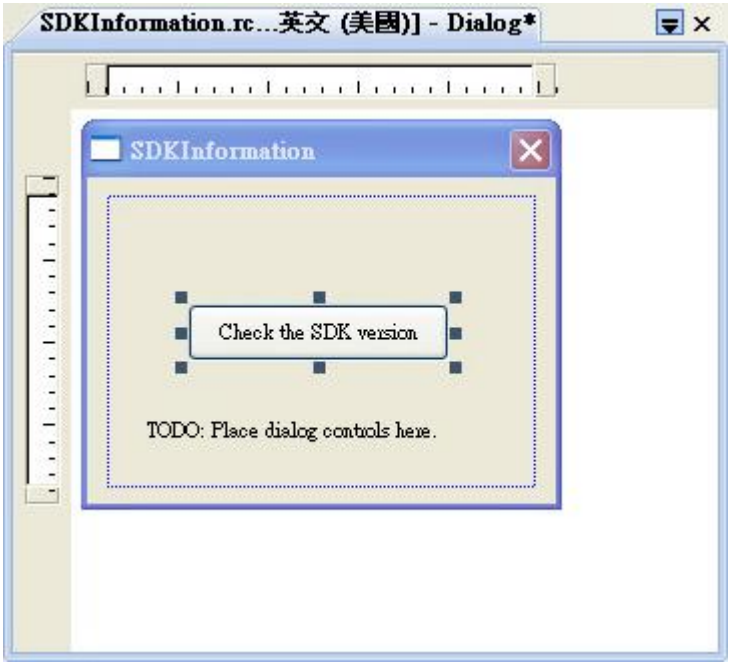
Step 5: In the Properties window, type Check the SDK version, and press ENTER to set the Text property



4.5.5. Add the Event Handling for the Control

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

Step 1: Double-click the button on the form



Step 2: Inserting the following code

```
char sdk_version[32];
TCHAR buf[32];
pac_GetSDKVersion(sdk_version);
pac_AnsiToWideString(sdk_version, buf);
MessageBox(buf,0,MB_OK);
```

```
void CSDKInformationDlg::OnBnClickedButton1()
{
    // TODO: Add your control notification handler code here
    char sdk_version[32];
    TCHAR buf[32];
    pac_GetSDKVersion(sdk_version);
    pac_AnsiToWideString(sdk_version, buf);
    MessageBox(buf,0,MB_OK);
}
```

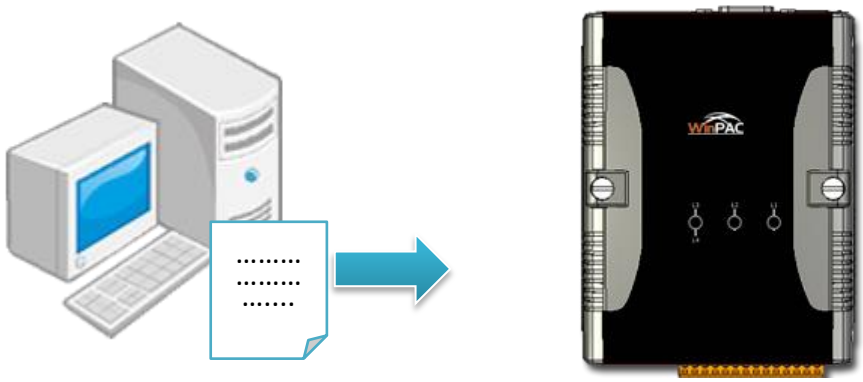
Step 3: Inserting the following code into the header area

```
#include “PACSDK.h”
```

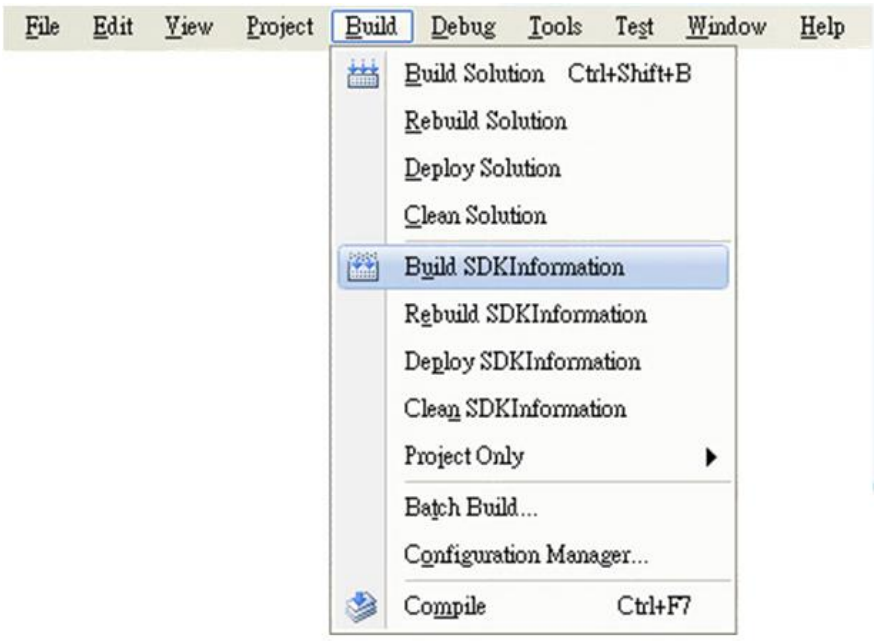
```
#include "stdafx.h"
#include "SDKInformation.h"
#include "SDKInformationDlg.h"
#include "PACSDK.H"
```

4.5.6. Upload the Application to WinPAC

WinPAC supports FTP server service. You can upload files to WinPAC or download files from a public FTP server.



Step 1: On the Build menu, click Build SDKInformation



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

Step 3: Upload the SDKInformation.exe application to WinPAC

4.5.7. Execute the Application on WinPAC

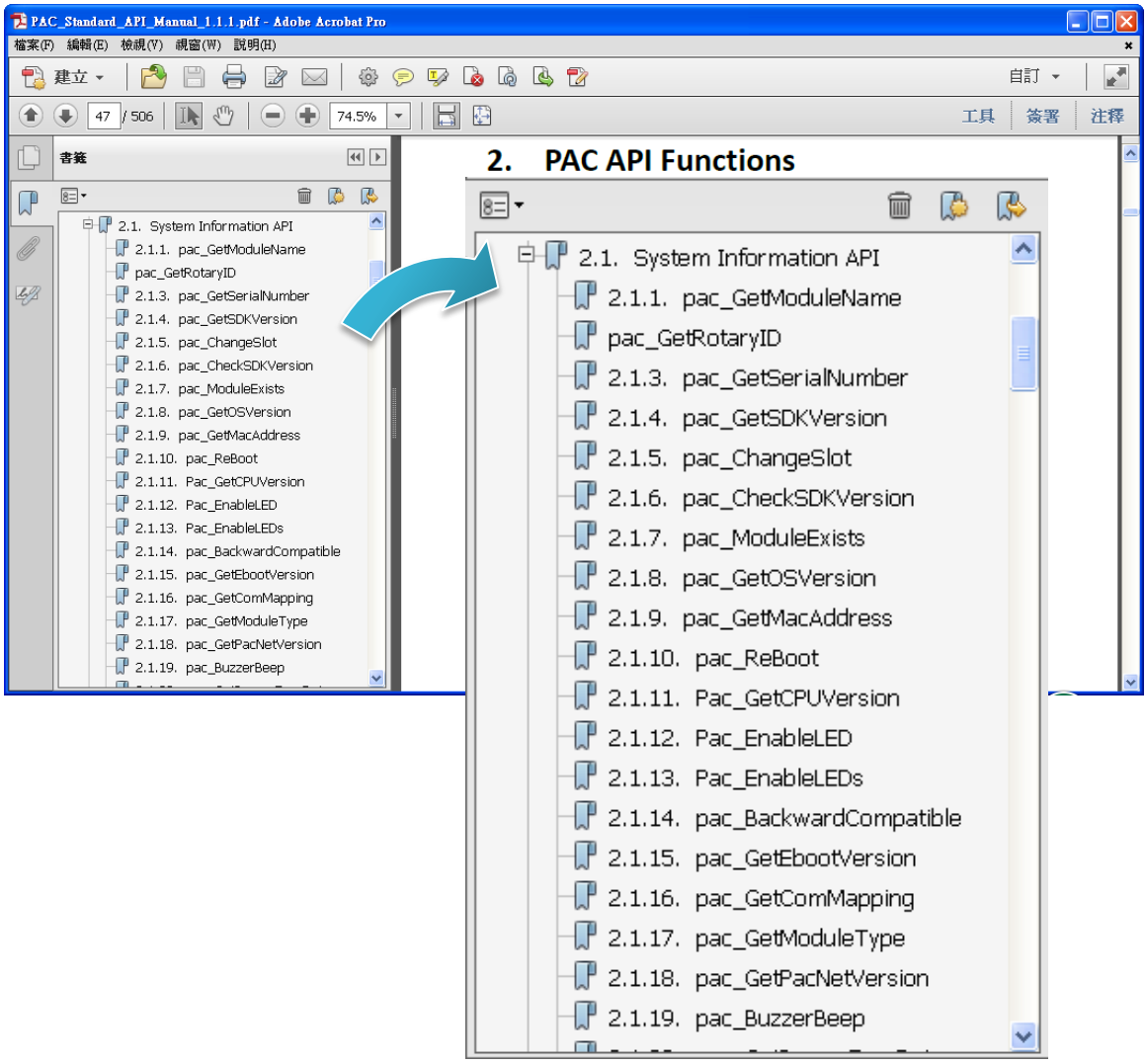
After uploading the application to WinPAC, you can just double-click it on WinPAC to execute it.

5. APIs and Samples

This chapter provides a brief overview of PAC APIs and samples that have been designed for WinPAC.

ICP DAS provides a set of samples in different programming languages. You can examine the sample codes, which includes numerous comments, to familiarize yourself with the PAC APIs. This will allow developing your own applications quickly by modifying these demo programs.

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



5.1. PAC Standard APIs

The diagram below shows the set of each system operation API provided in the PACSDK.

5.1.1. VB.NET Samples for PAC Standard APIs

The PAC SDK includes the following samples that demonstrate the use of the PAC Standard APIs in a VB.NET language environment. The following samples can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

For VB.NET applications, these demo programs can be obtained from:

CD:\wp-5231\Demo\PAC\Vb.net\Standard\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/vb.net/standard/

Folder	Demo	Explanation
buzzer	buzzer	Shows how to make a simple buzzer beep.
DeviceInformation	DeviceInformation	Retrieves information about the OS version, CPU version, SDK version, etc.
GetRotaryID	GetRotaryID	Retrieves information about the status of the rotary switch
Memory	Memory	Shows how to read/write data values from/to the EEPROM or the backplane of the SRAM
MicroSD	MicroSD_Management	Shows how to manage the microSD
RealTimeTest	VB_UI_Call_VC_Realtime	Writes the managed cod for the rich graphical user interface that does not require true real-time performance
	VBOnly	Shows how to use the function of JIT compiler and garbage collector
Registry	Registry	Shows how to read/write data values from/to the registry
UART	UART	Shows how to read the name of a local I/O modules via a UART
WatchDog	WatchDog	Displays information about how to operate the watchdog

5.1.2. C# Samples for PAC Standard APIs

The PAC SDK includes the following samples that demonstrate the use of the PAC Standard APIs in a C# language environment. The following samples can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

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

CD:\wp-5231\Demo\PAC\C#\Standard\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/c%23/standard/

Folder	Demo	Explanation
buzzer	buzzer	Shows how to make a simple buzzer beep.
DeviceInformation	DeviceInformation	Retrieves information about the OS version, CPU version, SDK version, etc.
GetRotaryID	GetRotaryID	Retrieves information about the status of the rotary switch
Memory	Memory	Shows how to read/write data values from/to the EEPROM or the backplane of the SRAM
MicroSD	MicroSD_Management	Shows how to manage the microSD
RealTimeTest	CSharp_UI_call_VC_Realtime	Writes the managed cod for the rich graphical user interface that does not require true real-time performance
	CSharpOnly	Shows how to use the function of JIT compiler and garbage collector
Registry	Registry	Shows how to read/write data values from/to the registry
UART	UART	Shows how to read the name of a local I/O modules via a UART
WatchDog	WatchDog	Displays information about how to operate the watchdog

5.1.3. Visual C++ Samples for PAC Standard APIs

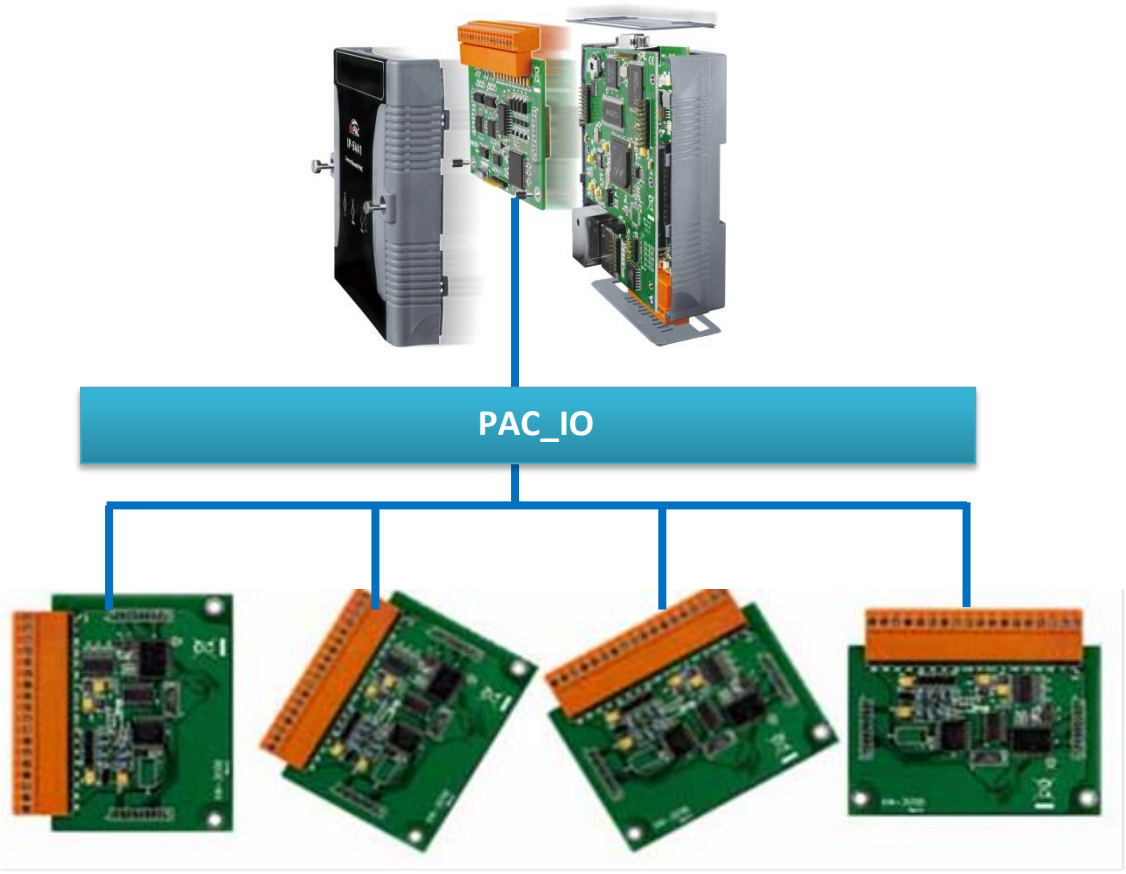
The PAC SDK includes the following samples that demonstrate the use of the PAC Standard APIs in a Visual C++ language environment. The following samples can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.
For Visual C++ applications, these demo programs can be obtained from:
CD:\wp-5231\Demo\PAC\Vc2008\Standard\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/vc2008/standard/

Folder	Demo	Explanation
buzzer	buzzer	Shows how to make a simple buzzer beep.
DeviceInformation	DeviceInformation	Retrieves information about the OS version, CPU version, SDK version, etc.
GetRotaryID	GetRotaryID	Retrieves information about the status of the rotary switch
Memory	Memory	Shows how to read/write data values from/to the EEPROM or the backplane of the SRAM
MultiRT	MultiRT	Shows how to manage the microSD
RealTimeTest	RealTimeTest	Writes the managed cod for the rich graphical user interface that does not require true real-time performance
Registry	Registry	Shows how to read/write data values from/to the registry
UART	UART	Shows how to read the name of a local I/O modules via a UART
WatchDog	WatchDog	Displays information about how to operate the watchdog

5.2. PAC IO APIs

The diagram below shows the types of the PAC IO APIs provided in the PACSDK or the specified SDK.

For more information about the APIs and samples provided by the expansion I/O modules, please refer to chapter 6. I/O Modules and SDK Selection.



5.2.1. VB.NET Samples for PAC Standard APIs

The PAC SDK includes the following samples that demonstrate the use of the PAC IO APIs in a VB.NET language environment. The following samples can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

For VB.NET applications, these demo programs can be obtained from:

CD:\wp-5231\Demo\PAC\Vb.net\IO\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/vb.net/io/

Folder	Demo	Explanation
XVBoard/XV107	XV107_Modbus_RTU_Master_VB_demo	Shows how to use the XV107 module of the XV-board
Remote (I-7000 or I-87K modules in RU-87Pn I/O unit)	For full details regarding the remote I/O modules and its demos, please refer to: http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/applicabled_demo_for_7k_module.pdf	

5.2.2. C# Samples for PAC Standard APIs

The PAC SDK includes the following samples that demonstrate the use of the PAC IO APIs in a C# language environment. The following samples can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

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

CD:\wp-5231\Demo\PAC\C#\IO\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/c%23/io/

Folder	Demo	Explanation
XVBoard/XV107	ModbusRTU_Master_Console	Shows how to use the XV107 module of the XV-board in console mode
	XV107_Modbus_RTU_Master_demo	Shows how to use the XV107 module of the XV-board
Remote (I-7000 or I-87K modules in RU-87Pn I/O unit)	For full details regarding the remote I/O modules and its demos, please refer to: http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/applicabled_demo_for_7k_module.pdf	

5.2.3. Visual C++ Samples for PAC Standard APIs

The PAC SDK includes the following samples that demonstrate the use of the PAC Standard APIs in a Visual C++ language environment. The following samples can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

For Visual C++ applications, these demo programs can be obtained from:

CD:\wp-5231\Demo\PAC\Vc2008\IO\

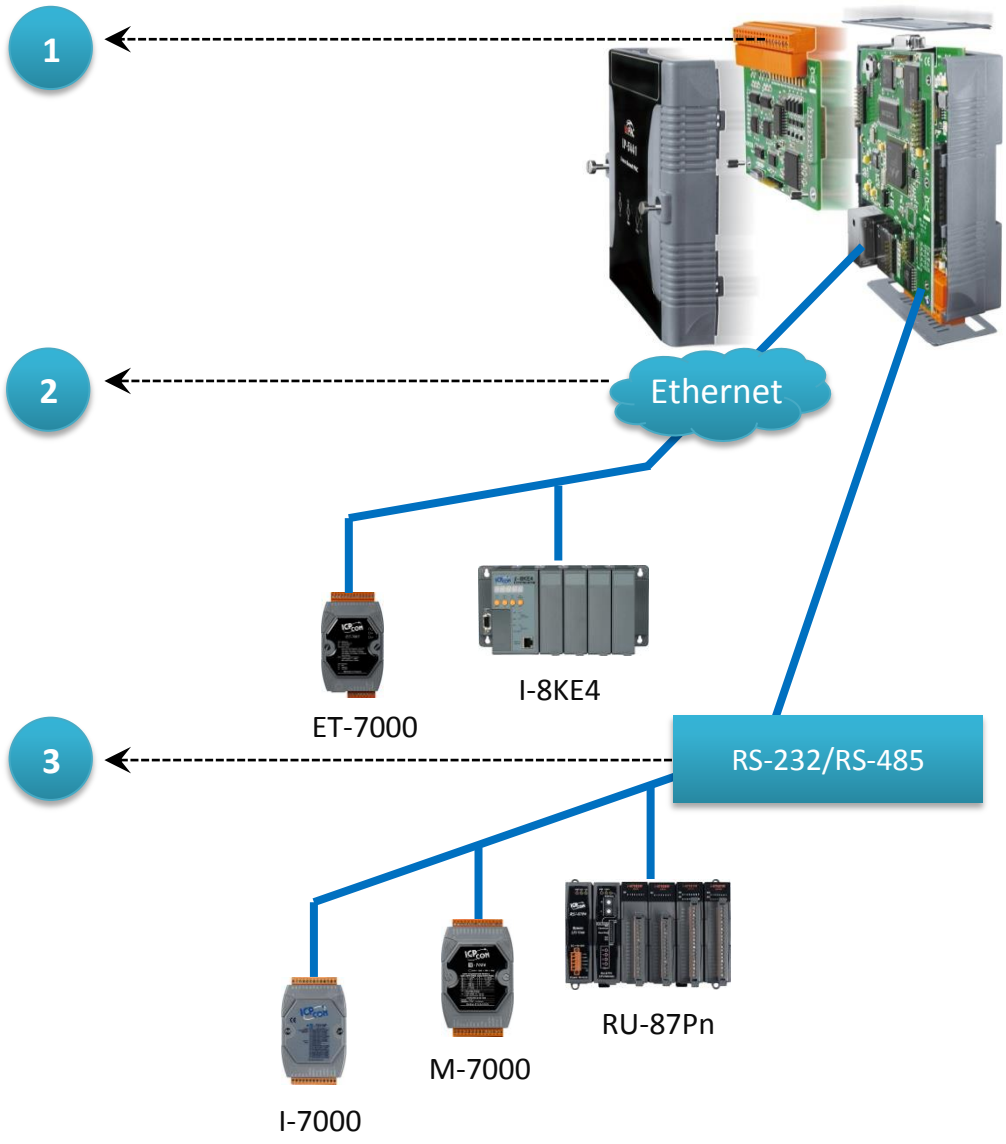
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/vc2008/io/

Folder	Demo	Explanation
Remote (I-7000 or I-87K modules in RU-87Pn I/O unit)	For full details regarding the remote I/O modules and its demos, please refer to: http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/applicabled_demo_for_7k_module.pdf	

6. I/O Modules and SDK Selection

This chapter describes how to select a suitable I/O expansion module and the corresponding SDK library to be used for developing programs on WinPAC series devices.

Selecting an SDK Library for I/O Expansion



❶ Local I/O Module (XV-Board)

There are more than 8 XV-Board available for expanding the function of the WP-5000-CE7
The following table shows the appropriate SDK library to be used for I/O modules.

Module	Native SDK	.NET CF SDK
XV-Board	Modbus Demo	Modbus Demo

For more detailed information about these support modules, please refer to
http://www.icpdas.com/root/product/solutions/hmi_touch_monitor/touchpad/xv-board_selection.html

❷ RS-485 (I-7000 series and M-7000 series)

I-7000, M-7000, RU-87Pn and high profile I-87K series modules connect to WP-5000-CE7 via a twisted-pair, multi-drop, 2-wire RS-485 network.

➢ I-7000 series I/O modules

Module	Native SDK	.NET CF SDK
I-7000 series	PACSDK.dll	PACNET.dll
I-7000 series with I-7088 (D)	PACSDK_PWM.dll	PACNET.dll

For full details regarding I-7000 series I/O modules and its demos, please refer to:
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/pac/applicabled_demo_for_7k_module.pdf

➢ **M-7000 series I/O modules**

Module	Native SDK	.NET CF SDK
M-7000 series	Modbus Demo	Modbus Demo

For more detailed information about M-7000 series modules using Modbus protocol and its demos, please refer to:
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/nmodbus/

➢ **RU-87Pn + I-87K series I/O modules**

Module	Native SDK	.NET CF SDK
RU-87Pn + I-87K	PACSDK.dll	PACNET.dll

➢ **Other specified I/O**

Module	Native SDK	.NET CF SDK
I-7088W	PACSDK_PWM.dll	PACNET.dll

❸ Ethernet (ET-7000 series and I-8KE4/8-MTCP)

The Ethernet I/O devices available include ET-7000 and I-8KE4/8-MTCP, and support the Modbus/TCP communication protocol.

Module	Native SDK	.NET CF SDK
ET-7000	Modbus Demo	Modbus Demo
I-8KE4/8-MTCP	Modbus Demo	Modbus Demo

For more detailed information about ET-7000 and I-8KE4/8-MTCP series modules using Modbus protocol and its demos, please refer to:
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/nmodbus/

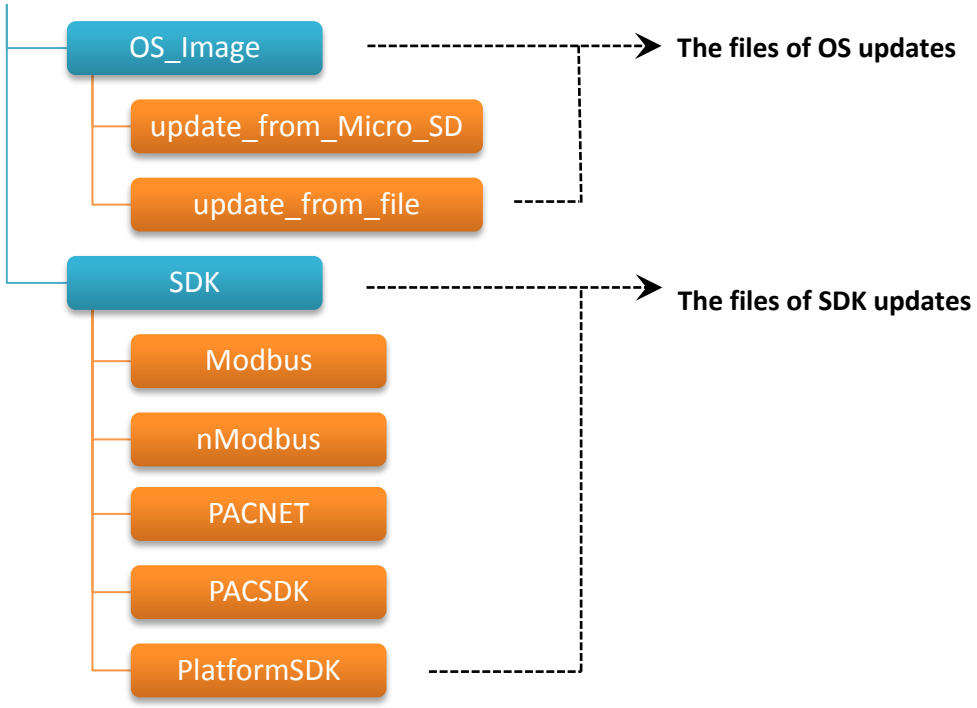
7. WP-5000-CE7 Updates

This chapter provides information of the WinPAC OS and SDKs, and a guided tour that demonstrates the steps needed to update the WinPAC OS and SDKs.

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.

Both the files of OS updates and SDK updates can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\wp-5231\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/

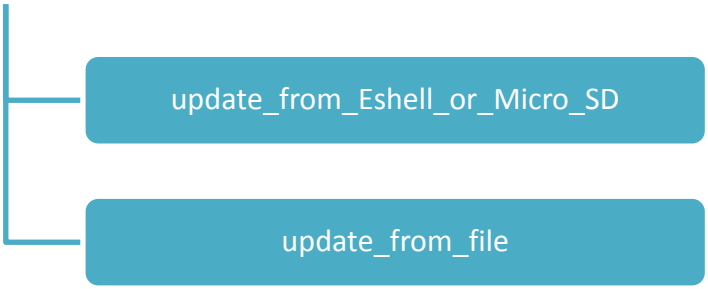


7.1. OS Updates

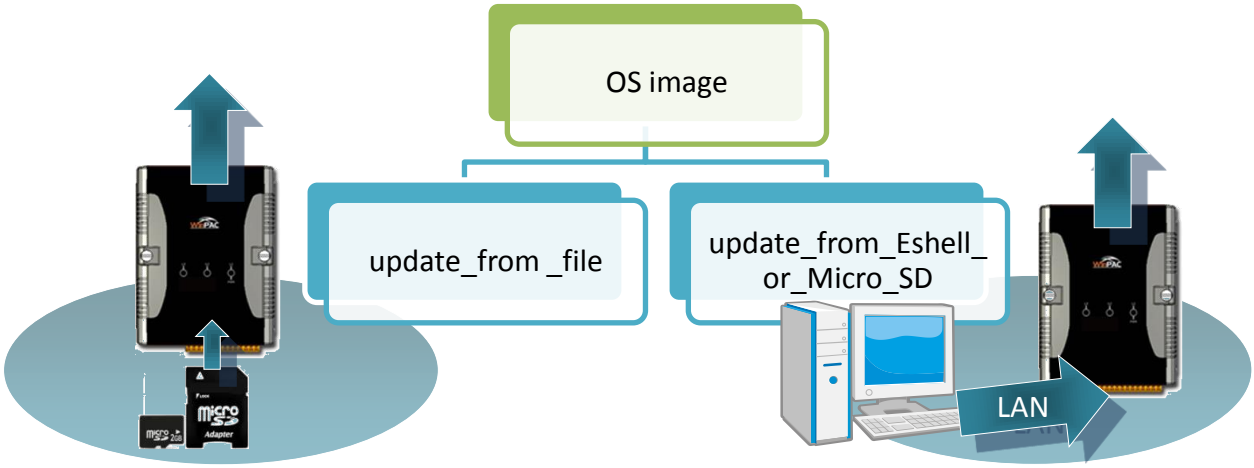
OS updates are part of the WP-5000-CE7 updates services to provide additional and more efficient features and functionality for WP-5000-CE7 operating system.

The updates files of OS image can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\wp-5231\OS_Image\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/os_image/



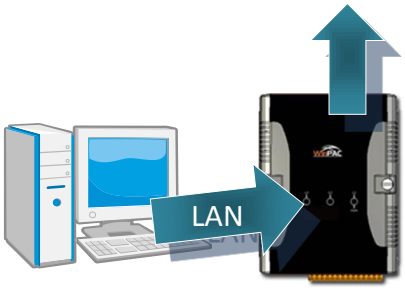
There are two ways to update the OS:



1. Update from eshell (Please refer to section 7.1.1)
(We recommend that you use this one for more quicker and easier to update)
2. Update from micro_SD (Please refer to section 7.1.2)

7.1.1. OS Updates using Eshell

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



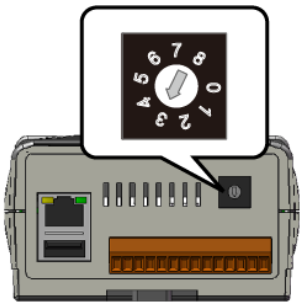
Step 1: Get the latest version of the installation package file and then unzip it

The latest version of the installation package file can be found from ICP DAS web site.
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/os_image/update_from_eshell_or_micro_sd\

Step 2: Run the registry clear.exe

The registry.exe can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.
CD:\wp-5231\PC_Tools\Eshell
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/pc_tools/eshell

Step 3: Place the rotary switch in position 3, OS update mode

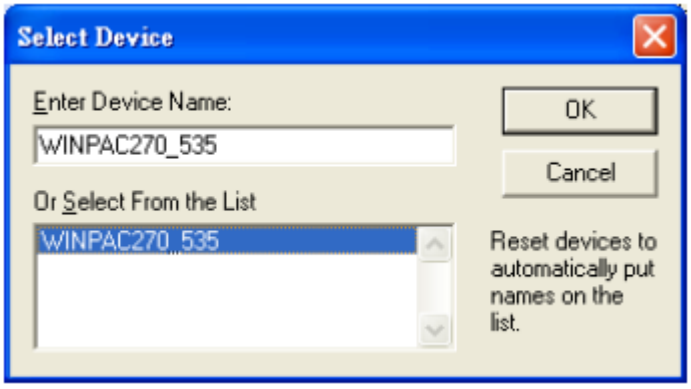


Step 4: Run the ESHELL.exe, and then restart the WP-5000-CE7

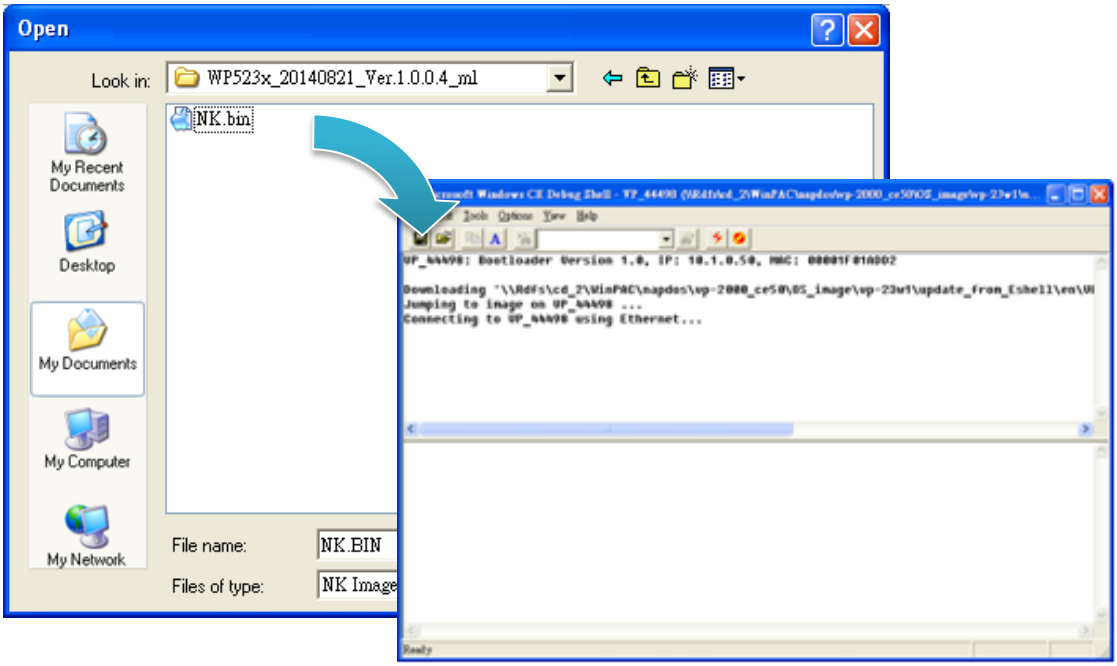
The ESHELL.exe can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.
CD:\wp-5231\PC_Tools\Eshell
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/pc_tools/eshell

Step 5: Select the device which you want to update the OS image, and then click OK

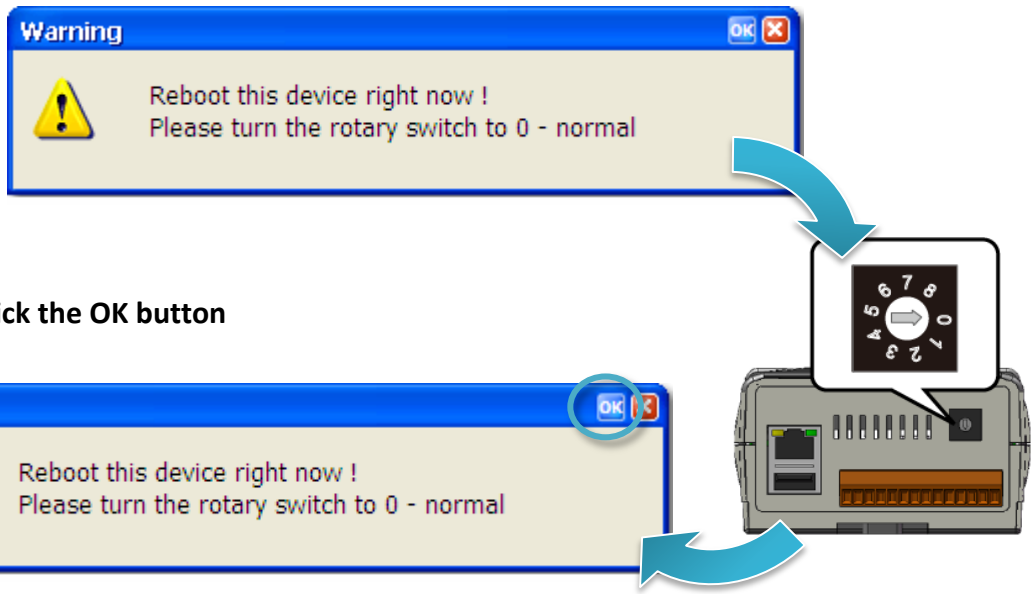
Select the device name which you want to update the OS image from the list.



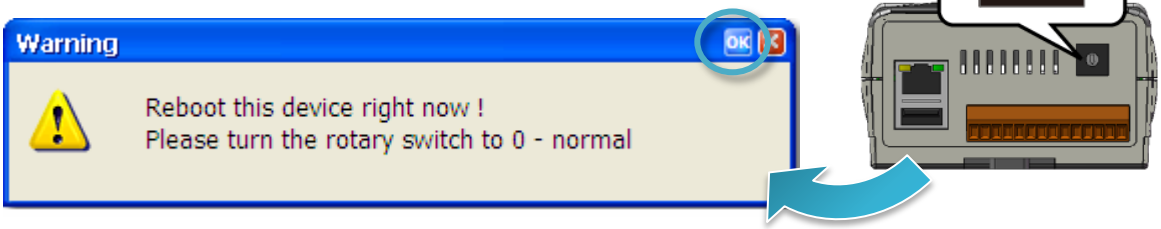
Step 6: Select the latest version of the OS image file



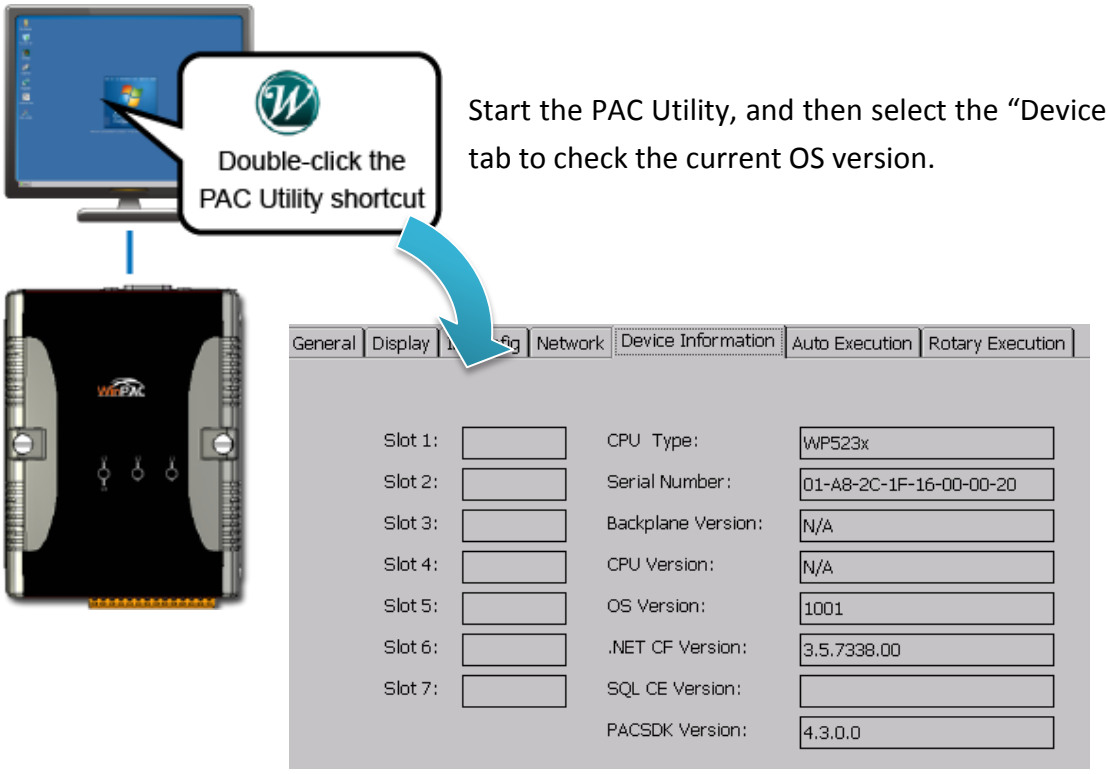
Step 7: Once the procedure is completed, the "Warning !" dialog box will appear as below shown, then turn the rotary switch in position 0, normal mode



Step 8: Click the OK button



Step 9: Check the OS version



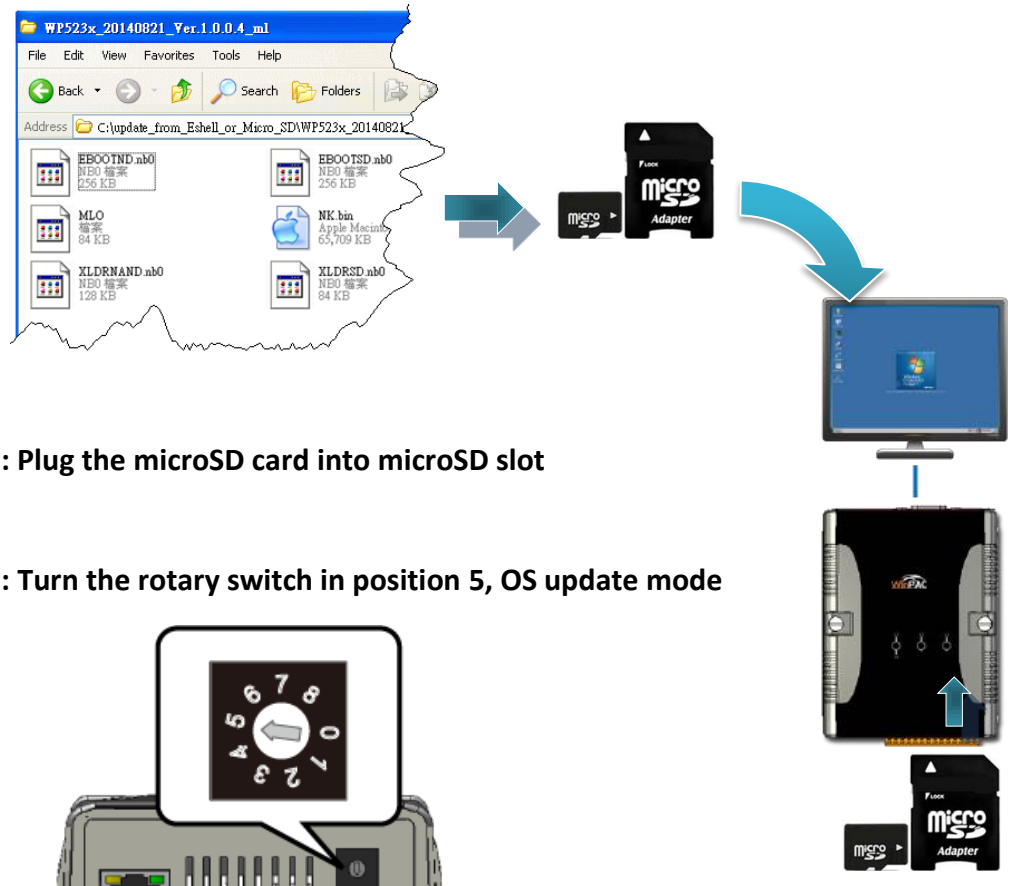
Start the PAC Utility, and then select the "Device Information" tab to check the current OS version.

7.1.2. OS Updates using micro_SD

The microSD card can be used to reinstall the WP-5000-CE7 OS image to factory default settings in the event of the WP-5000-CE7 failure.

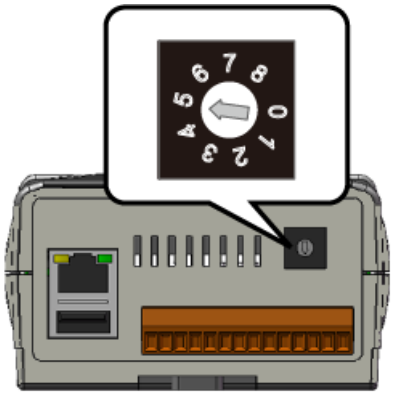
Step 1: Get the latest version of the installation package file, then unzip the file, and then copy them to microSD card

The latest version of the installation package file can be found from ICP DAS web site.
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/os_image/update_from_eshell_or_micro_sd\



Step 2: Plug the microSD card into microSD slot

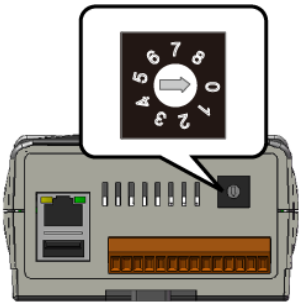
Step 3: Turn the rotary switch in position 5, OS update mode



Step 4: Reboot the WP-5000-CE7

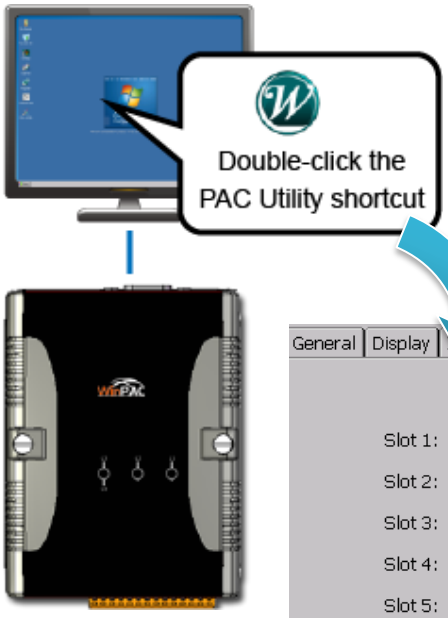
Step 5: Wait a few minutes for the following desktop to be displayed

Step 6: Turn the rotary switch in position 0, normal mode

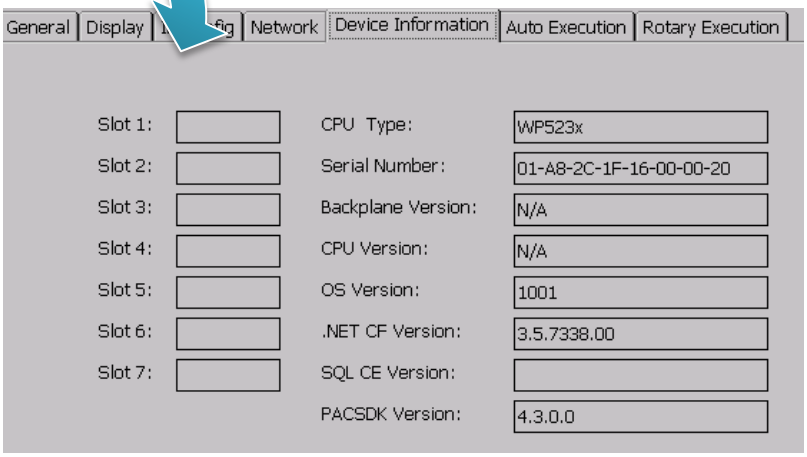


Step 7: Reboot the WP-5000-CE7

Step 8: Check the OS version



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

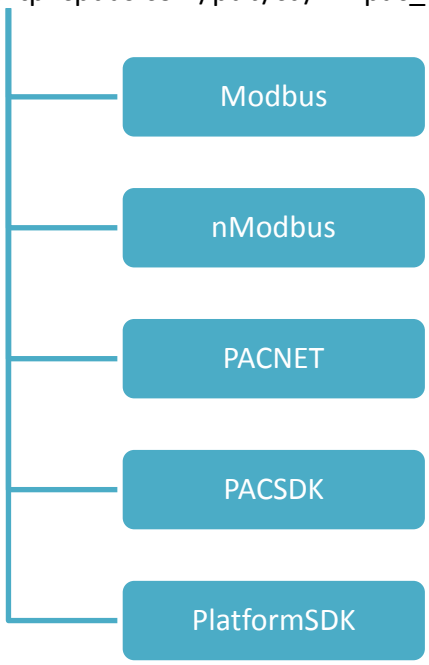


7.2. SDK Updates

SDK updates are part of the WP-5000-CE7 updates services to provide additional and more efficient features and functionality for WP-5000-CE7 operating system.

The updates files of SDK files can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\wp-5231\SDK\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/



7.2.1. SDK Updates for VB.NET or C#

You can just change the old one with a new one.

Step 1: Get the latest version of the PACNET.dll

The latest version of the PACNET. dll can be obtained from ICP DAS web site.
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/pacnet/

Step 2: Copy the PACNET.dll file to PC and WP-5000-CE7

The DLL files on PC are located at anywhere only the solution can reference it.
The DLL files on WP-5000-CE7 are located at the same directory as the .exe file.

7.2.2. SDK Updates for Visual C++

You can just change the old one with a new one.

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

The latest version of the VC++ components can be obtained from:
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/sdk/pacsdk/

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\SDKs\AM335x_WINCE7_SDK\Include\Armv4i
The libraries are located at:
C:\Program Files\Windows CE Tools\SDKs\AM335x_WINCE7_SDK\Lib\ARMv4I

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

The DLL files are located at:
\System_Disk\ICPDAS\System

Tips – How to

This chapter provides tips and a guided tour on using and maintaining the WinPAC.

A. How to Online Debug the WP-5000-CE7 Program

Here are step by step instructions on how to online debug the WP-5000-CE7 program.

Tips & Warnings

Before starting online debug the WP-5000-CE7 program, make sure that the WP-5000-CE7 SDK has been installed correctly.

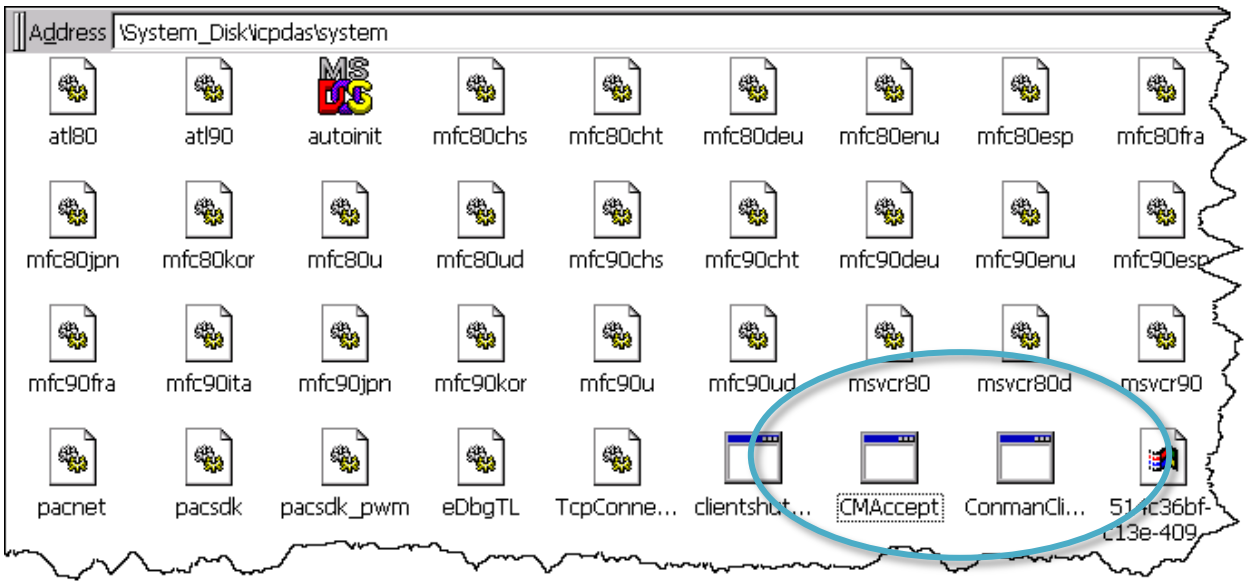
For more information on how to install the WP-5000-CE7 SDK, please refer to 4.2. Installing WP-5000-CE7 SDK.

Step 1: Copy the following files to the \System_Disk\icpdas\system on the WP-5000-CE7

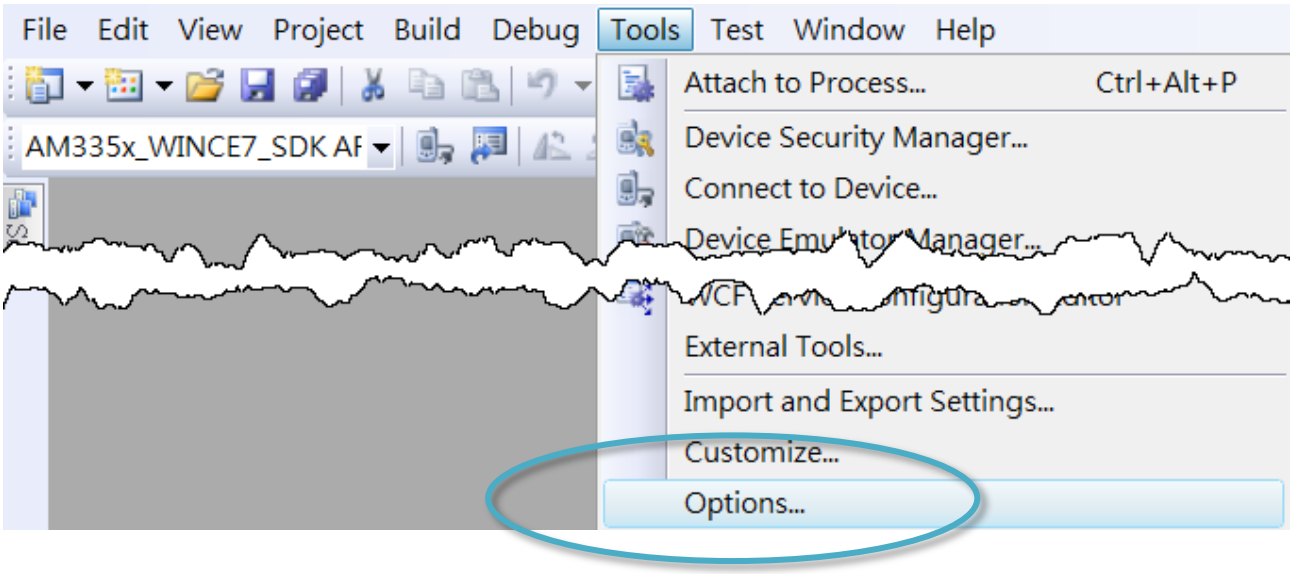
By default, these files are located on the development computer at C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Target\wce400\<CPU>.

- clientshutdown.exe
- CMAccept.exe
- ConmanClient2.exe
- eDbgTL.dll
- TcpConnectionA.dll

Step 2: Run the ConmanClient2.exe and then CMAccept.exe on the WP-5000-CE7

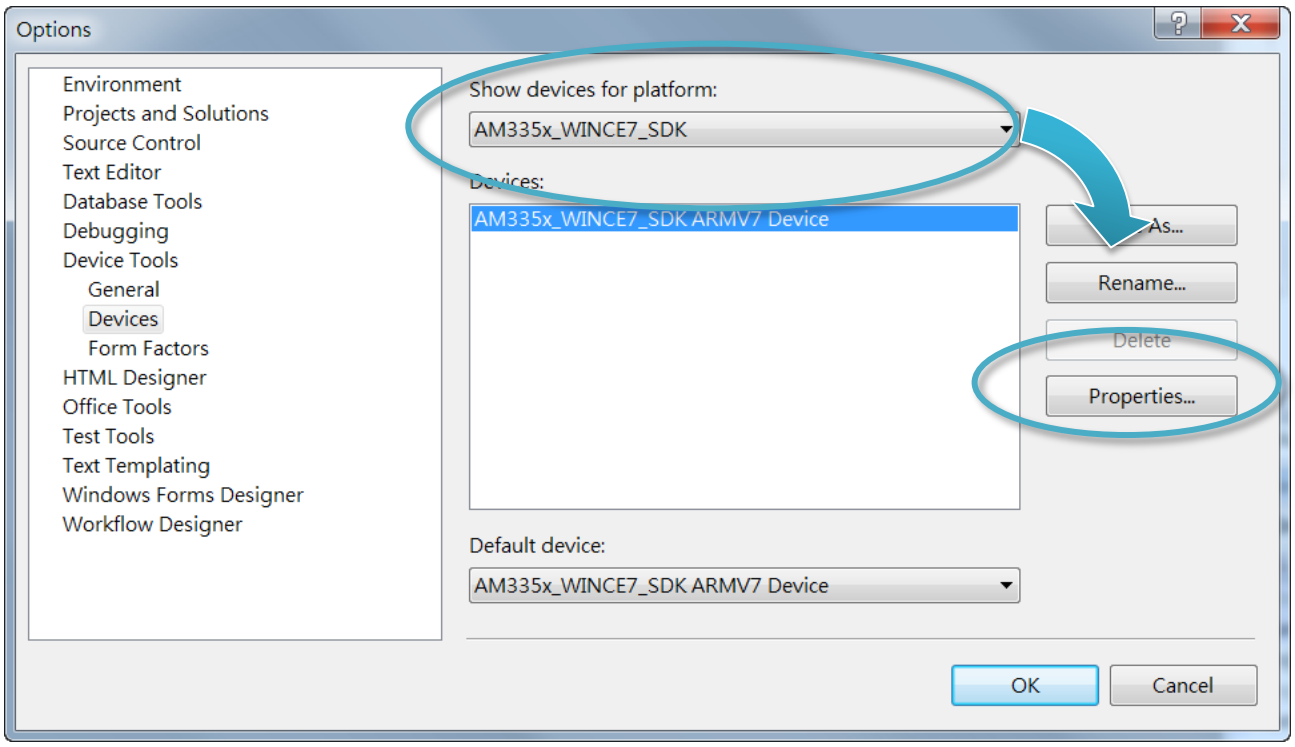


Step 3: On the Tools menu, click the Options…

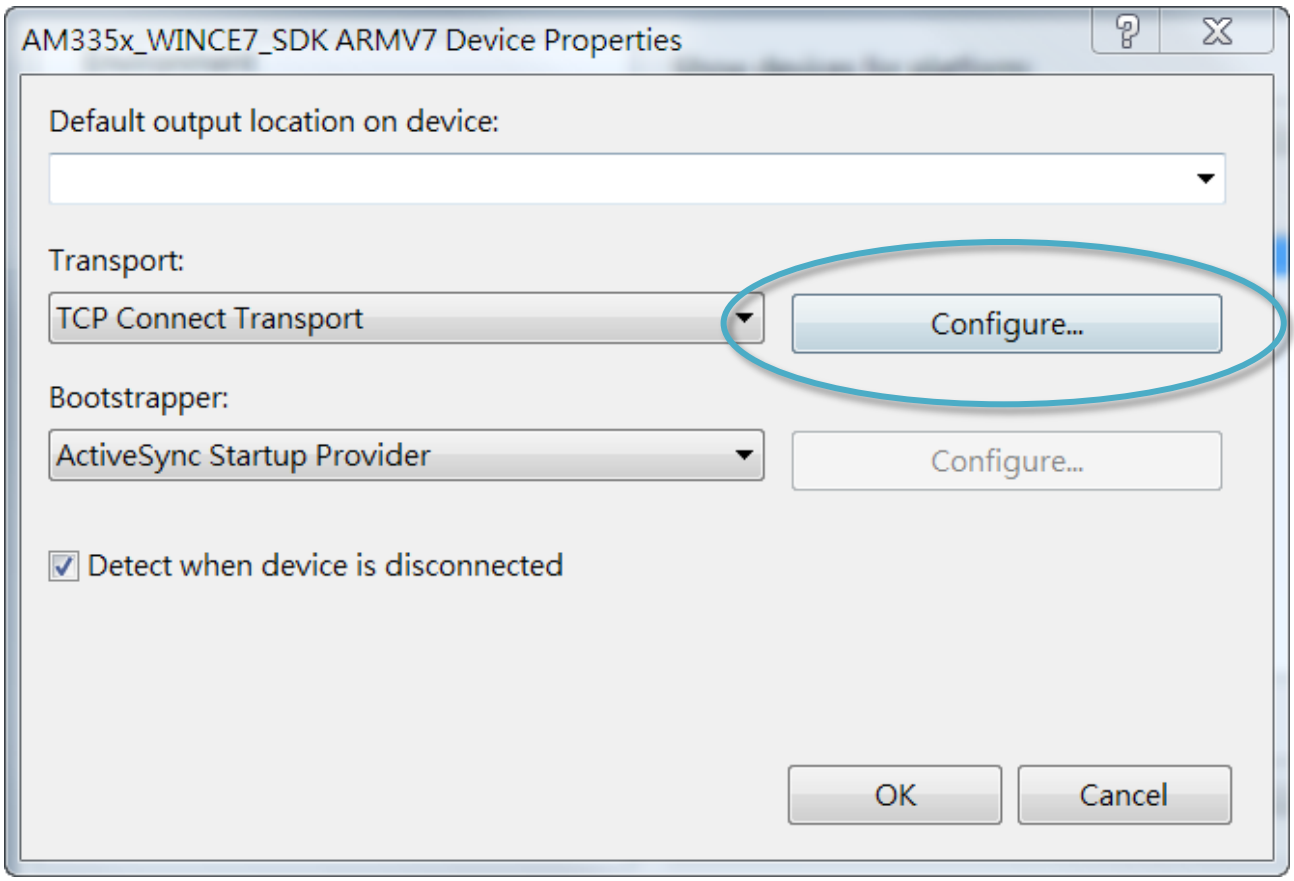


Step 4: In the left pane, expand Device Tools node and select Devices

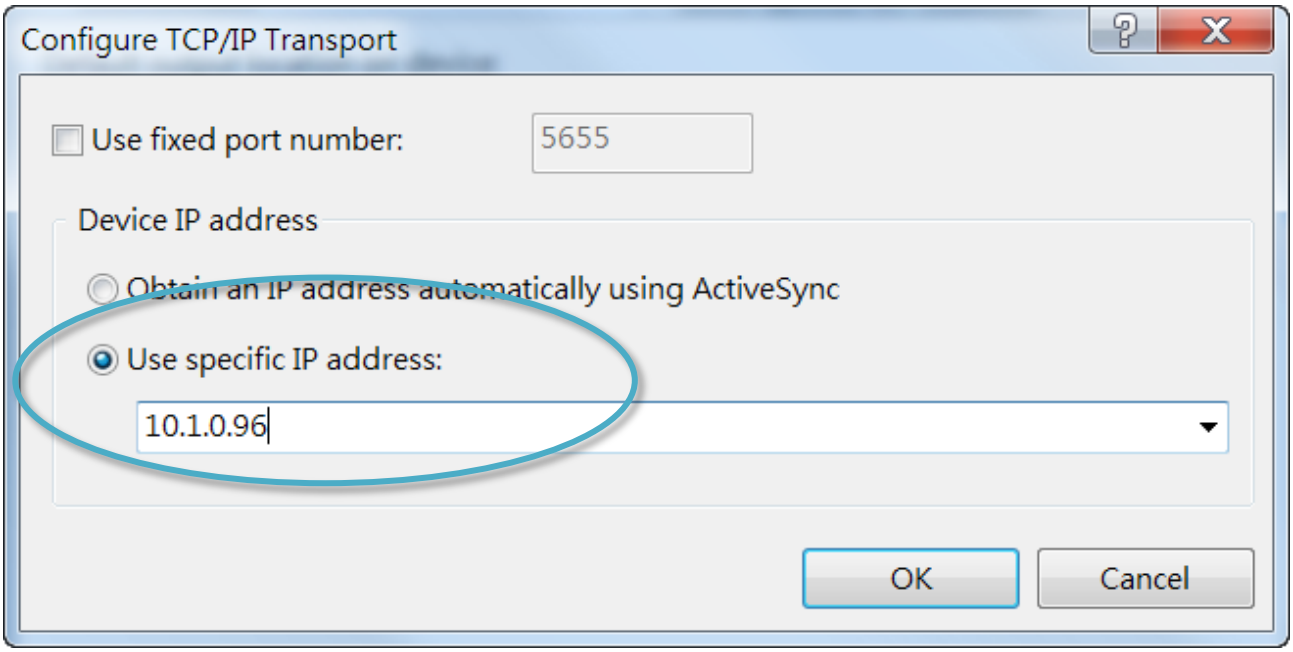
Step 5: In the Show devices for platform:, select AM335x_WINCE7_SDK and then click Properties



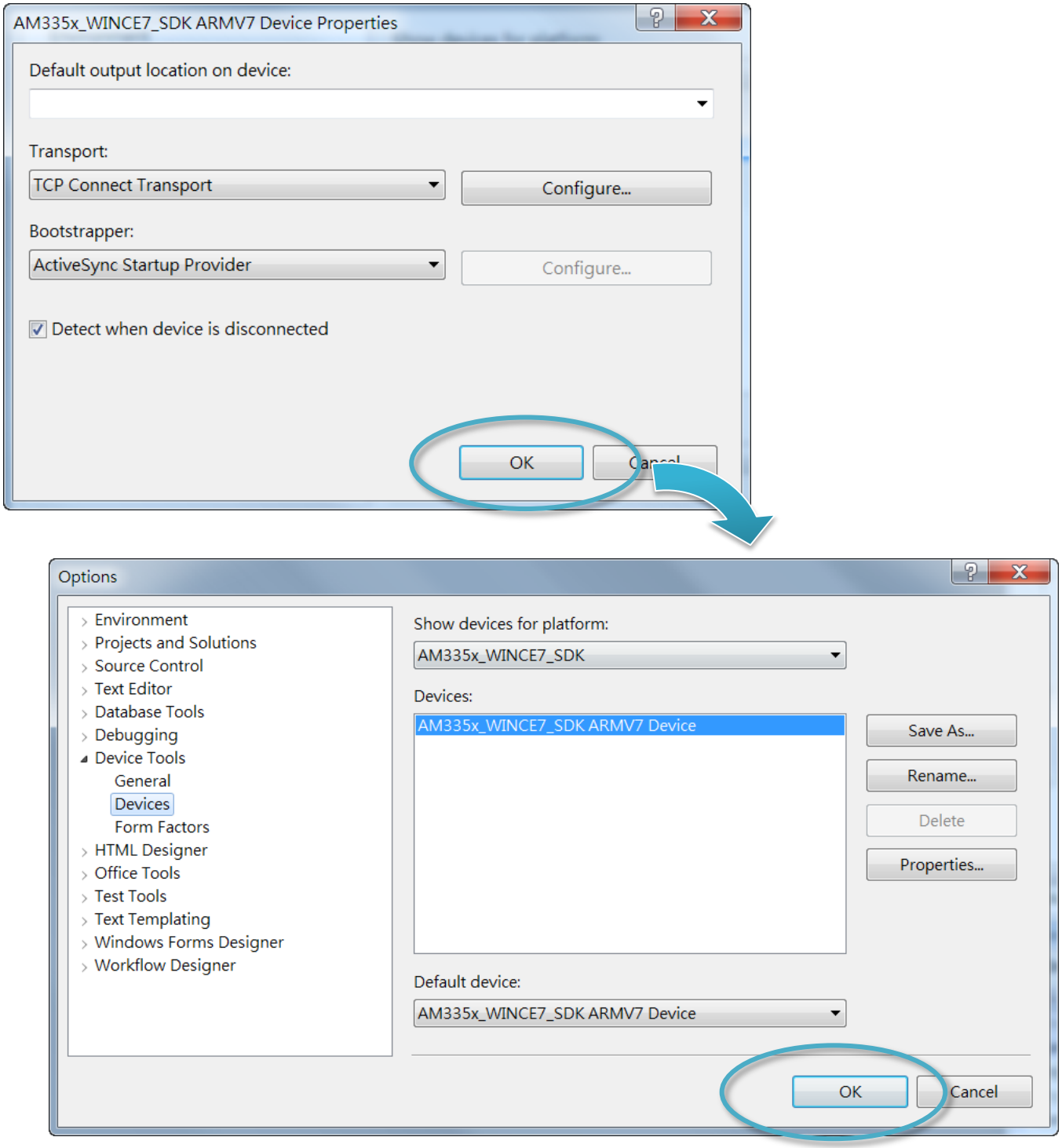
Step 6: Click the Configure…



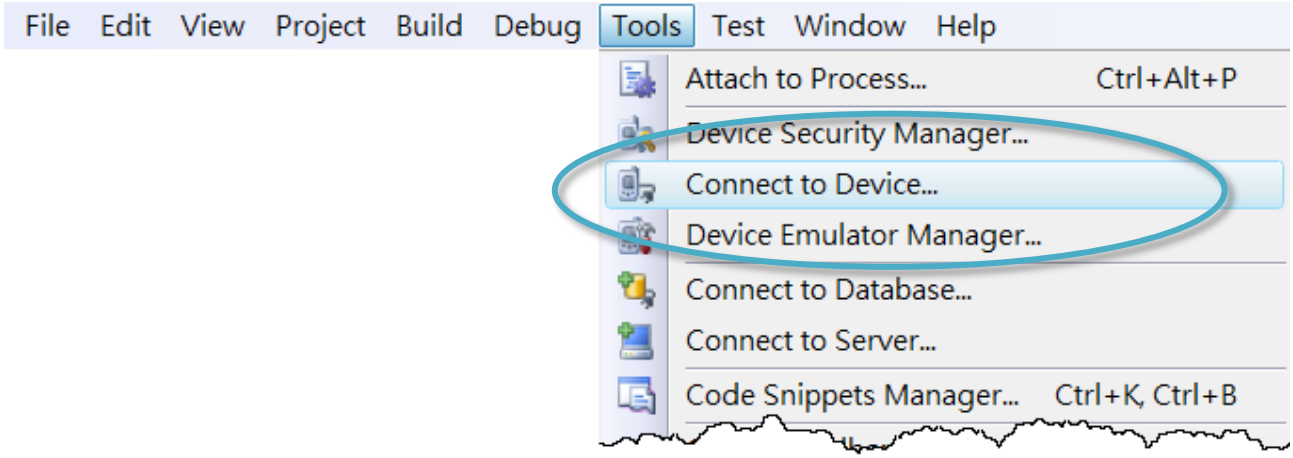
Step 7: Select the Use specific IP address:, and then type the IP address of WP-5000-CE7



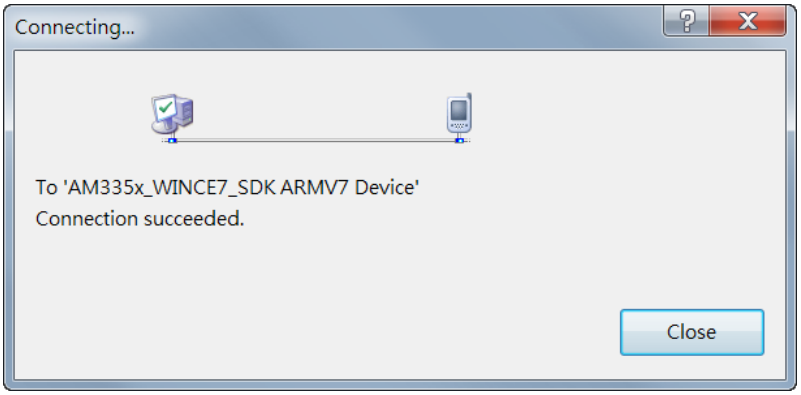
Step 8: Click the OK, and then click OK to end the dialog



Step 9: On the Tools menu, click the Connect to Device…

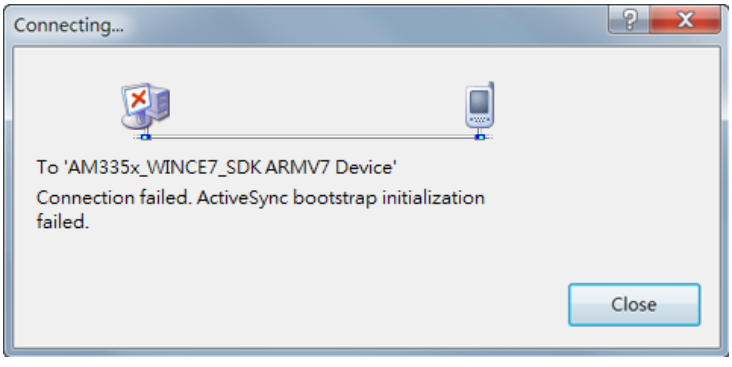


Step 10: Wait for the connection to be established



Tips & Warnings

If the connection fails, as shown below, please repeat the step 2 to step 9 to try it again.

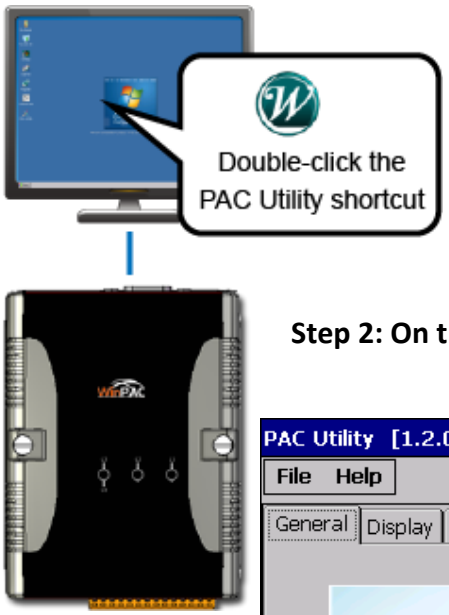


B. How to Automatically Synchronize WinPAC Clock with an Internet Time Server

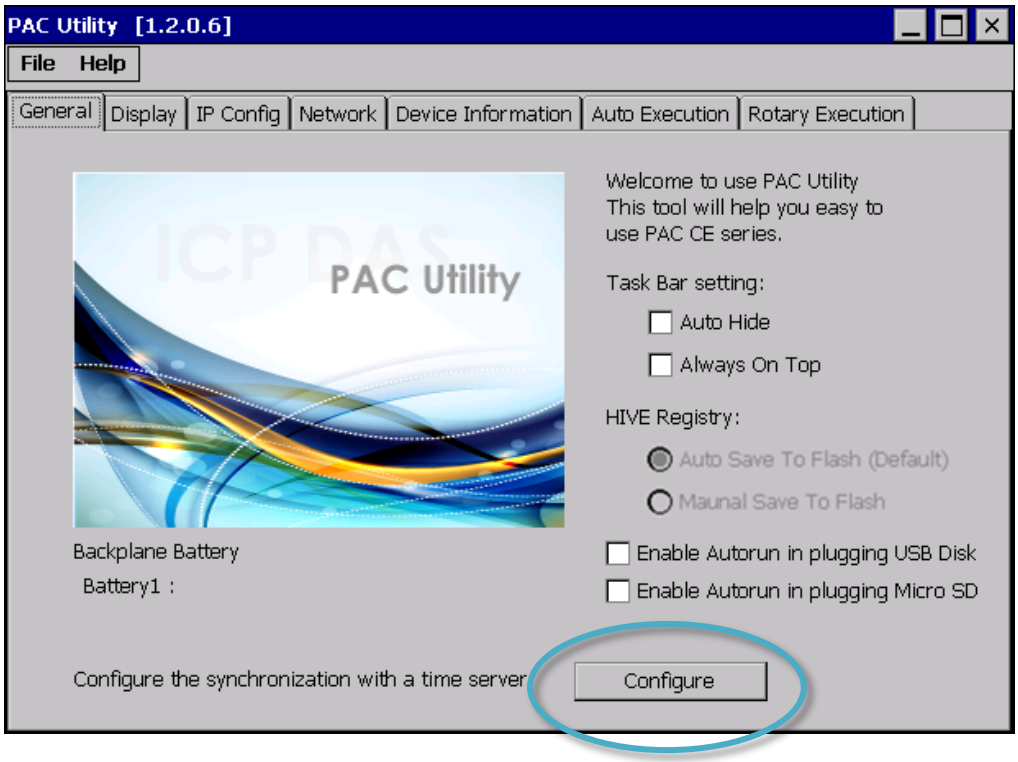
You can synchronize your WinPAC clock with an Internet time server.

If synchronization is enabled, the WinPAC clock is synchronized with an Internet time server.

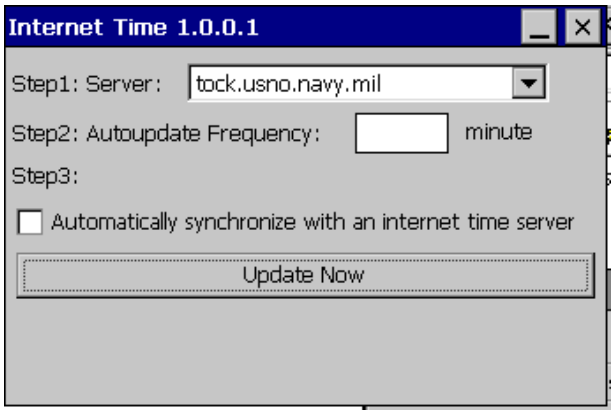
Step 1: Double-click the PAC Utility on the desktop



Step 2: On the General tab, press Configure button

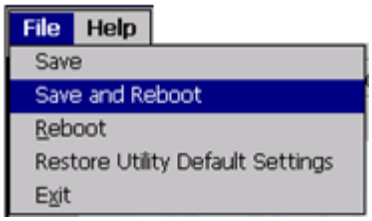


Step 3: Select the domain name from the Server drop-down list, and then enter a value in the Autoupdate Frequency field



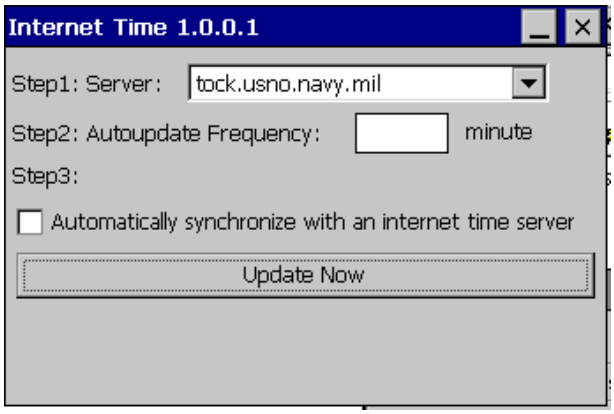
Step 4: Check the Automatically synchronize with an internet time server check box

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



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

Step 7: Click the Update Now button to synchronize WinPAC clock immediately



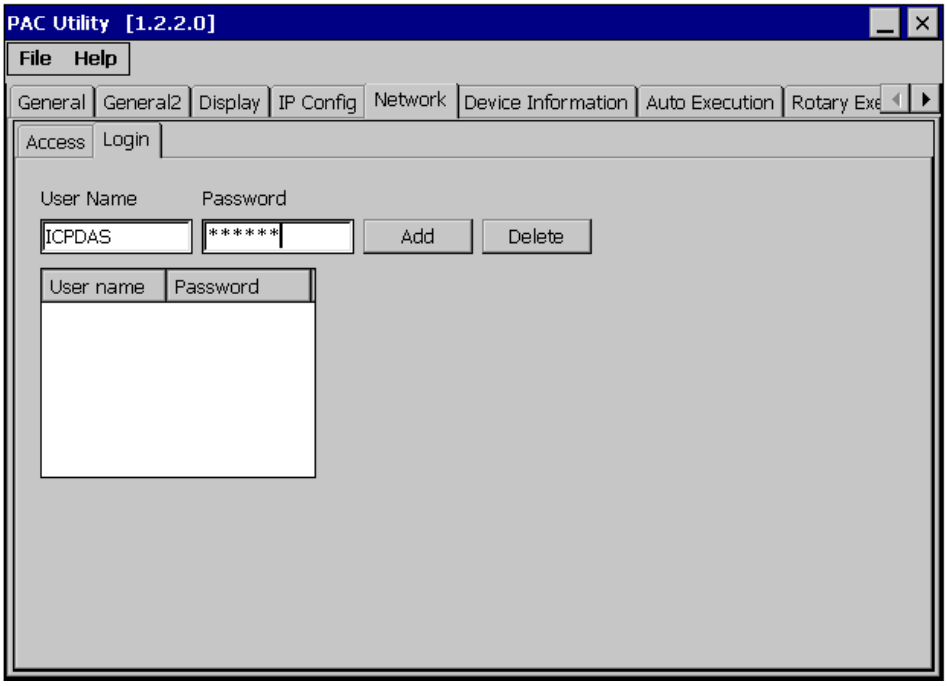
C. How to use User Account Control in WinPAC

C.1. How to Create an User Account

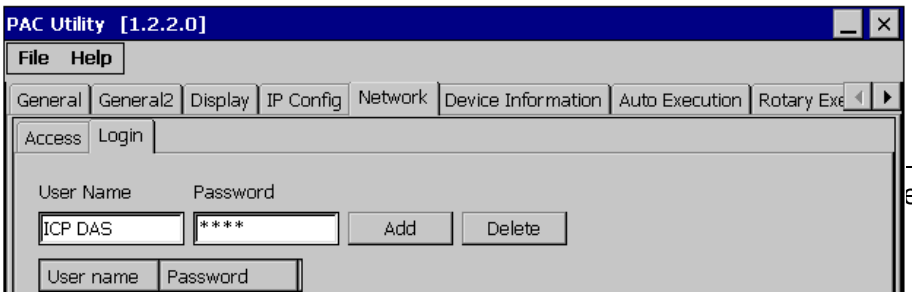
Here are step by step instructions on how to add a user account.

Step 1: Double-click the PAC Utility on the desktop

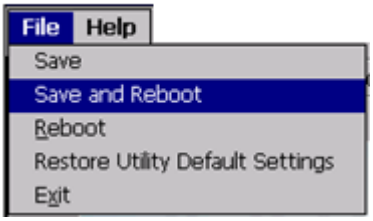
Step 2: On the Login tab of the Network tab, click Login tab, type the User Name and Password, and then click Add button



Step 3: The user has been added to the allowed under the remote login and included in the following list



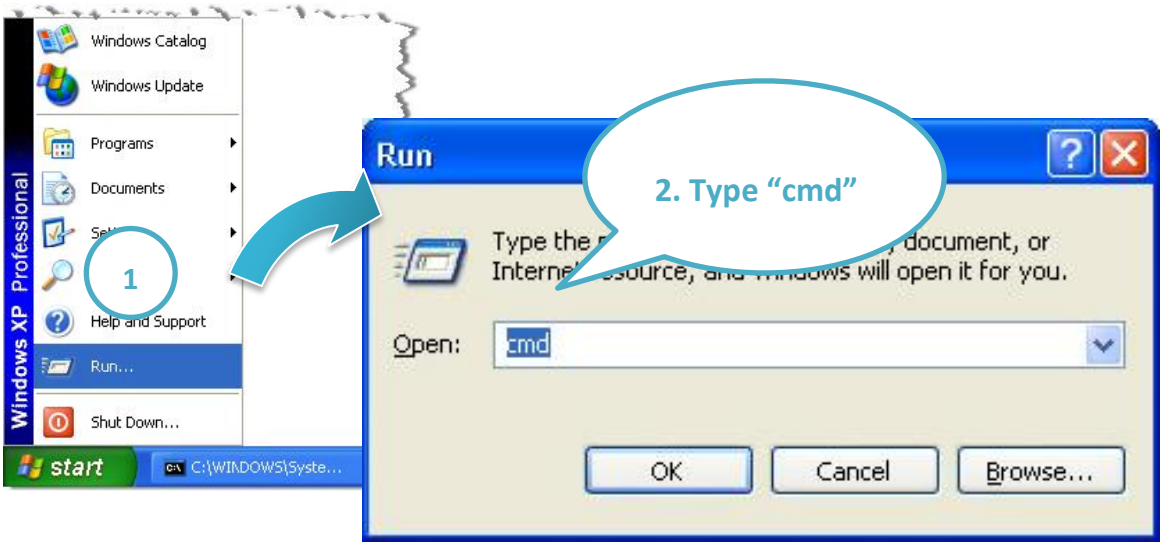
Step 4: On the File menu, click Save and Reboot for changes to take effect



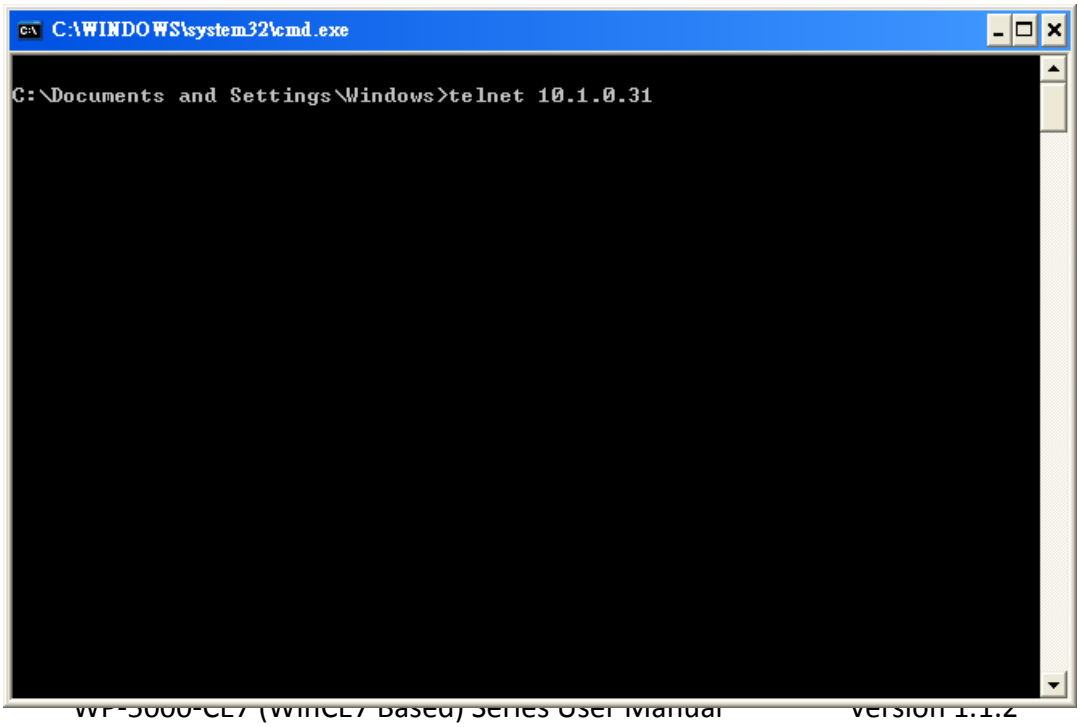
C.2. How to Use Telnet to remote login the WinPAC from PC

Here are step by step instructions on how to use telnet to remote login the WinPAC from PC.

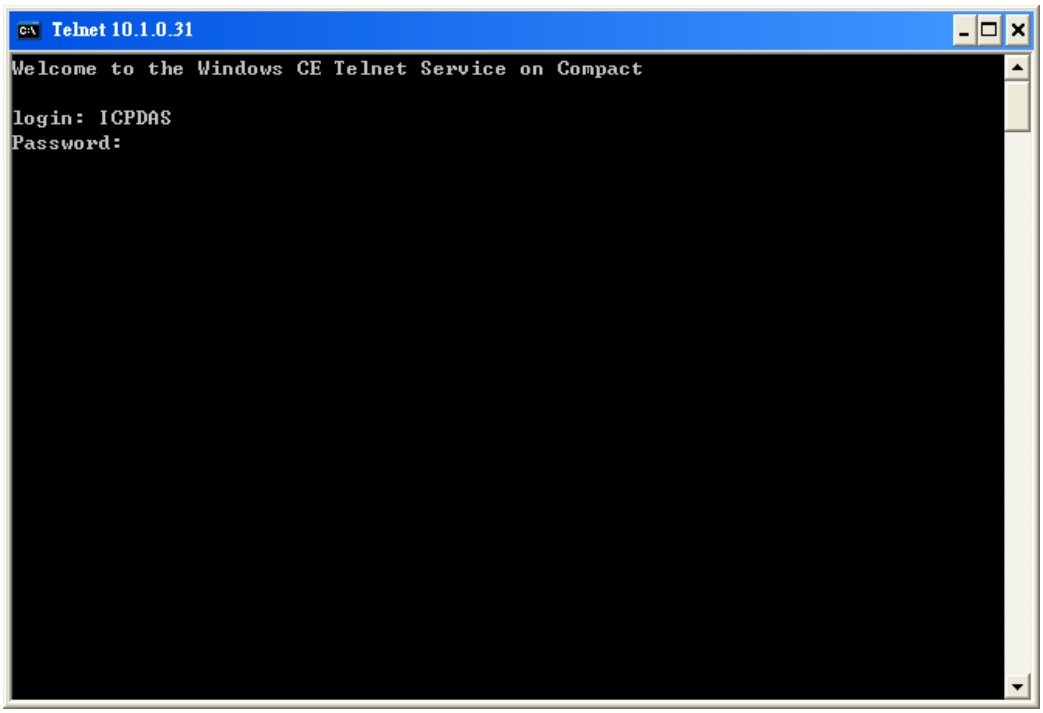
Step 1: On the PC, open a MS-DOS command prompt



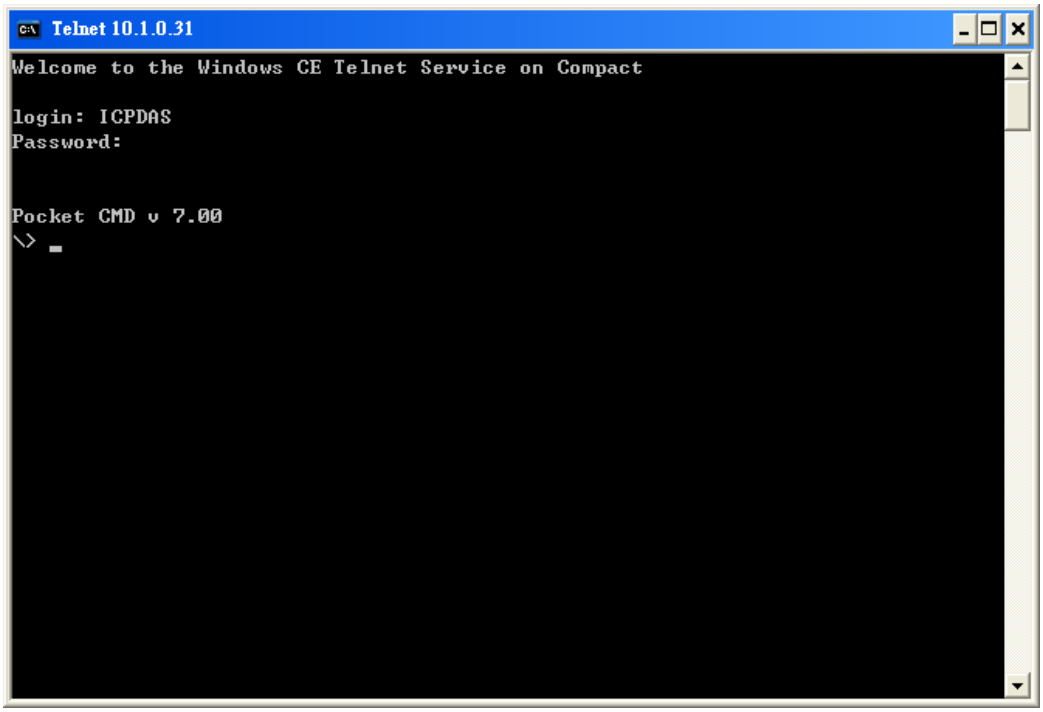
Step 2: At the command prompt, type "telnet (IP address)"



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



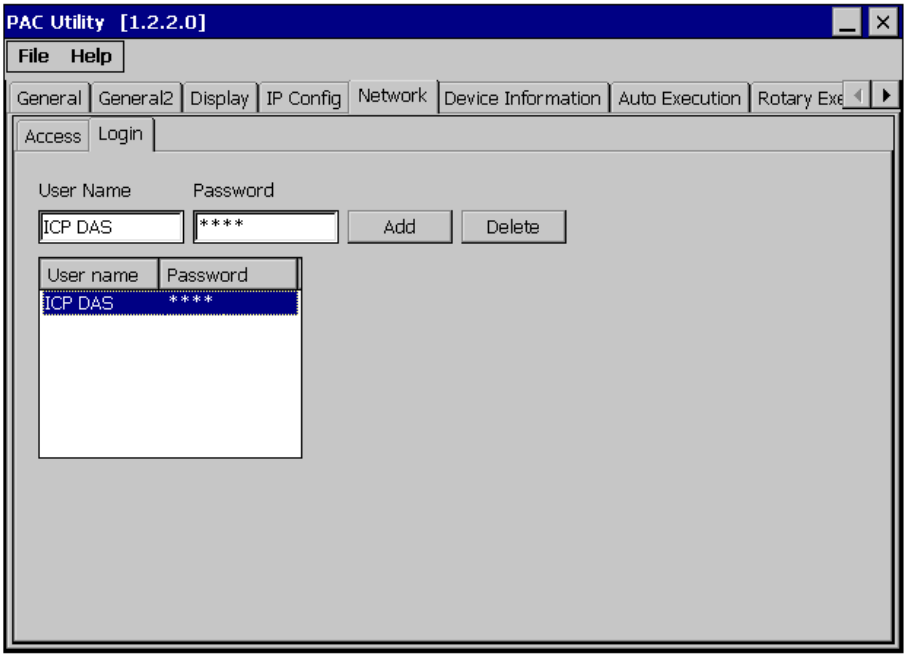
Step 4: The remote login has been completed



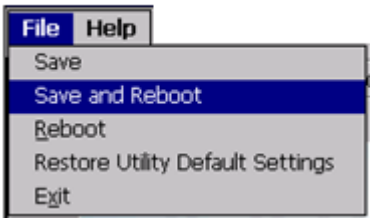
C.3. How to Remove a User Account from the Login List

Here are step by step instructions on how to remote the user from the login list.

Step 1: Click a user from the list which you want to remove, and the user will display in the field, and then press Delete to delete the user from the login list

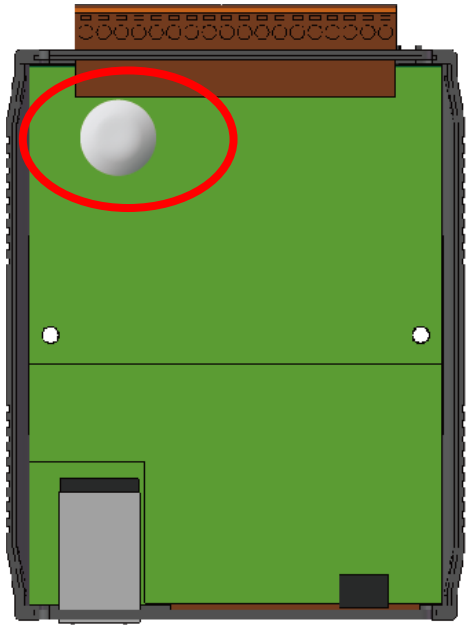
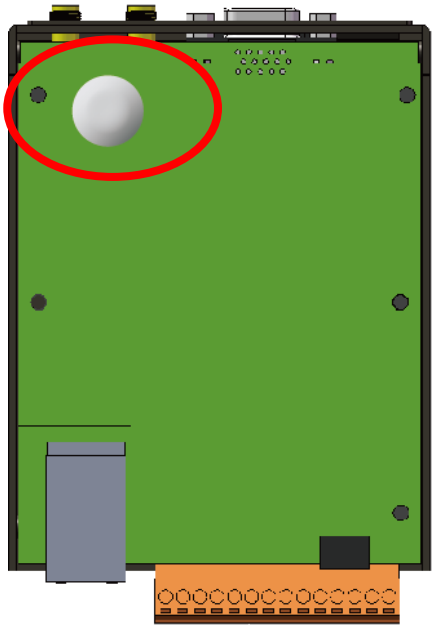


Step 2: On the File menu, click Save and Reboot for changes to take effect



D. How to change the battery

RTC is retained by a Li-ion battery, which can supply continuous power for 10 years. The battery design has the added function of preventing data from being lost while replacing the battery. The following figures show the location of the battery installed in the WinPAC CPU board.

WP-5231-CE7	WP-5231M-CE7/WP-5231PM-3GWA-CE7 WP-5231PM-4GC-CE7/WP-5231PM-4GE-CE7
	

Checking the current battery power

1. Run the PAC utility and check the Battery 1 fields that display the current status. Refer to Section 3.1 PAC utility “General” for more details. If the power level is low that the battery should be replaced.
2. When programming this, call the pac_GetBatteryLevel() API function in the PACSDK.dll to check whether the battery power is low. When the power of the battery is low, it’s recommended that the battery is replaced immediately, otherwise the RTC time will be reset.

Replacing the battery

1. Power off the WinPAC device.
2. Remove the CPU board.
3. Remove the battery that is running low on power from the battery holder in CPU board.
4. Insert a new battery.
5. Set the RTC time.

Tips & Warnings

Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions."

Ordering information

Battery type: BR1632 (Part number is 2LB010 for ICP DAS)

For more detailed information, contact your local sales office or distributor.

E. How to Using the Practical Functions of the 3G/4G I/O Module

The WP-5231PM-3GWA, WP-5213PM-4GE-CE-CE7/WP-5231PM-4GC-CE7 built-in Mobile network modem that utilize the 3G/4G network to implement SMS and GPRS connection to send and receive functions.

E.1. How to Auto Dial 3G/4G GPRS network and redial when the network disconnected

The AutoDialer allows user to automatically dial GRPS network after boot.

When the GRPS network disconnect the AutoDialer will automatically re-dial Internet access.

Tips & Warnings

Before installing the SIM card, please cancel the PIN lock function of SIM card; otherwise you will not be able to dial the Internet

The demos can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\WinPAC_AM335x\wp-5231\demo\3g_modem\autodialer\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/3g_modem/autodialer/

The description of the demo can be found by downloading the latest version from ICP DAS web site.

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/document/faq/development/

W5-13_How_to_use_Auto_dial_GPRS_network_and_redial_when_the_network_disconnected_en

E.2. How to Use the SMS Function and Get the GPS Data

The 3G/4G modem allows the user to use the SMS function and get the GPS data.

The API manual can be found by downloading the latest version from ICP DAS web site.
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/3g_modem/3g_modem_sms_demo/gsm_lib_manual_v1.0.1.pdf

The demos can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.
CD:\WinPAC_AM335x\Wp-5231\demo\3g_modem \3G_modem_SMS_Demo\
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/3g_modem/3g_modem_sms_demo

The description of the demo can be found by downloading the latest version from ICP DAS web site.
http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/document/faq/development/
W5-14_How_to_use_the_SMS_function_and_get_the_GPS_data_en

E.3. How to Synchronize the System Time by GPS Data

The demos can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\WinPAC_AM335x\Wp-5231\demo\3g_modem\gpstimesynchronization\

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/demo/3g_modem/gpstimesynchronization

The description of the demo can be found by downloading the latest version from ICP DAS web site.

http://ftp.icpdas.com/pub/cd/winpac_am335x/wp-5231/document/faq/development/

W5-15_How_to_Synchronize_the_system_time_by_GPS_data_en

F. XV-Board Modules

The XV-board series are for LP-5000, WP-5000-CE7. One PAC can only plug only one XV-board. The XV-board series have following common specification:

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

DIO Expansion

Model	DI			DO	
	Channel	Type	Sink/Source	Channel	Sink/Source
XV107	8	Wet	Source	8	Sink
XV107A			Sink		Source
XV110	16	Dry/Wet	Sink/Source	-	-
XV111	-			16	Sink
XV111A					Source

Relay Output Expansion

Model	DI			Relay Output	
	Channel	Type	Sink/Source	Channel	Type
XV116	5	Wet	Sink/Source	2	Signal Relay
				4	Power Relay

Multi-Function Expansion

Model	AI	AO	DI			DO	
	Channel			Type	Sink/Source	Channel	Sink/Source
XV308	8	-	DI+DO=8	Dry/Wet	Source	DI+DO=8	Sink
XV310	4	5	4		Sink		Source

For more detailed information about these support modules, please refer to http://www.icpdas.com/root/product/solutions/hmi_touch_monitor/touchpad/xv-board_selection.html

G. Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
1.0.0	January 2015	Initial issue
1.0.1	September 2015	Modified the information about the XV-board installation in section 2.2. Installing the XV-Board.
1.0.2	December 2015	1. Modified the product name from WP-5231 to WP-5231-CE7. 2. Modified the CPU specification from AM3354 to Cortex-A8 3. Deleted the product information of WP-5231M-3GWA.
1.0.3	March 2016	1. Deleted the information about the printer application in Appendix A.1. 2. Added the information on how to online debug the WP-5231-CE7 program in Appendix A.1.
1.0.4	September 2016	1. Added the information about the WP-5231PM-3GWA-CE7 specification in section 1.2. Specifications. 2. Added the information about the WP-5231PM-3GWA-CE7 overview, dimension and installation in section 1.3. Overview. 3. Added the information about the WP-5231PM-3GWA-CE7 dimension in section 1.4. Dimensions 4. Added the information about the WP-5231PM-3GWA-CE7 installation in section 2.1.2. WP-5231PM-3GWA-CE7 Installation.
1.1.0	March 2017	1. Added the information about the WP-5231M-CE7 specification in section 1.2. Specifications.
1.1.1	October 2017	1. Added the information about the WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 specification in section 1.2. Specifications. 2. Added the information about the WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 overview in section 1.3. Overview. 3. Added the information about the WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 dimension in section 1.4. Dimensions 4. Added the information about the WP-5231PM-4GC-CE7 and WP-5231PM-4GE-CE7 installation in section 2.1.2. WP-5231M-CE7/WP-5231PM-3GWA-CE7/ WP-5231PM-4GC-CE7 /WP-5231PM-4GE-CE7 Installation.

Revision	Date	Description
1.1.2	April 2018	1. Added the information about how to change the battery in Appendix D. 2. Added the information about the 3G/4G applications in Appendix E.