

VP-1231-CE7 Series User Manual

Version 1.0.0 January 2016

Service and usage information for

VP-1231-CE7



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1. Introduction

This chapter provides an overview of the VP-1231-CE7 and its components, and introduces the fundamental concepts for user familiar with the VP-1231-CE7.

The VP-1231-CE7 is the new generation Windows CE 7.0 based PAC (Programmable Automation Controller) of ICP DAS. Each VP-1231-CE7 is equipped with a Cortex-A8 (1.0 GHz) CPU running a Windows CE 7.0 operating system, a variant of input/output ports (VGA, USB, Ethernet, RS-232/485), and 3 expansion I/O slots that can be used to integrate high performance I-8K (parallel-type) and I-87K (serial-type) series I/O modules.

Its operating system, Windows CE 7.0, has many advantages, including hard real-time capability, small core size, fast boot speed, and interrupt handling at a deeper level, achievable deterministic control and low cost. Using Windows CE 7.0 in the VP-1231-CE7 gives it the ability to run PC-based Control software such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, Soft PLC ...etc.

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1.1. Features

The VP-1231-CE7 offers the most comprehensive configuration to meet specific application requirements. The following list shows the hardware and software features designed to simplify installation, configuration and application.

Hardware Features

- Powerful CPU module
- Cortex-A8 1.0 GHz CPU
- Memory Size:
 - SDRAM (512 MB)
 - MRAM (128 KB)
 - Flash (256 MB)
 - FRAM (64 KB)
 - microSD card (support up to 32 GB)
- VGA Port x 1, USB 2.0 port x 1, Series port (RS-232/RS-485) x 2
- 64-bit Hardware Serial Number
- Dual Watchdog Timers
- Operating Temperature: -25 ~ +75 °C

Software Features

- Windows Embedded Compact 7.0
- JavaScript and VBScript
- SQL Compact Edition 3.5
- .NET Compact Framework 3.5
- Remote Display
- Rich Software Solution SDK for Microsoft Studio 2008

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1.2. Specifications

The table below summarizes the specifications of the VP-1231-CE7.

Models	VP-1231-CE7
System Software	
OS	Windows CE 7.0
.Net Compact Framework	3.5
Embedded Service	FTP Server, Web Server (Supports VB script, JAVA script), Embedded SQL Server
SDK Provided	DII for
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese
CPU Module	
СРО	Cortex-A8 (1.0 GHz)
SDRAM	512 MB (DDR3)
MRAM	128 KB
Flash	256 MB
EEPROM	16 KB
microSD	microSD socket with one microSD 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 (0.8 second)
LED Indicator	3 Dual-Color LEDs (PWR, RUN, LAN1, L1, L2, L3; L1 to L3 for user programmable)
Rotary Switch	Yes (0 to 9)
VGA & Communication Ports	
VGA Resolution	640 x 480
Ethernet	RJ-45 x 1, 10/100/1000 Base-TX
USB	USB 2.0 x 2
COM 0	For I-87K series modules in slots
COM 2	RS-485 (D+, D-; self-tuner ASIC inside); 2500 V _{DC} isolated
COM 3	RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); Non-isolated

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Models	VP-1231-CE7
I/O Expansion Slots	
Number of I/O slots	3
Supported types of I/O modules	I-8K and I-87K series I/O Modules
Mechanical	
Dimensions (W x H x D)	182 mm x 158 mm x 125 mm
Ingress Protection	Front panel: IP65
Installation	Wall mounting
Environmental	
Operating Temperature	-20 °C to +70 °C
Storage Temperature	-30 °C to + 80 °C
Ambient Relative Humidity	10 % to 90 % RH (non-condensing)
Power	
Input Range	+10 V _{DC} to +30 V _{DC}
Redundant Power Inputs	Yes
Isolation	1 kV
Capacity	2.5 A, 5 V supply to I/O expansion slots
Consumption	7.2 W (0.3 A @ 24 V _{DC})

1.3. Overview

The VP-1231-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.

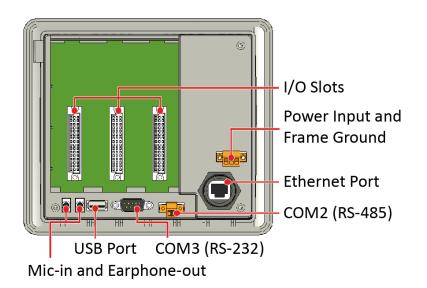
Side View

Rotary Switch

ED Indicators Touch Screen

Programmable Function Keys

Back View



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• LED Indicators

The VP-1231-CE7 has 3 Dual-Color LED indicators. The details of these LED indicators are as follows:



LED Indicator	Color	Status	Description		
11/12/12	Red	On	LED indicators controlled by user Drogrom		
L1/L2/L3	Red	Off	LED indicators controlled by user Program.		
	Green	On	System booted and ready.		
RUN	Green	Off	BIOS failure.		
KON	Green	Blinking	System memory mapped out, formatted or		
	Green		defragmented.		
PWR	Green	On	System has power applied to it.		
PVVK	Green	Off	System is not powered on.		
	Green	On	Link between system and network.		
LAN1	Green	Off	Network disconnected.		
	Green	Blinking	Network Access.		

• Touch Panel

The VP-1231-CE7 is equipped with a touch panel to the display panel.

• Programmable Function Keys

The VP-1231-CE7 provides support for keyboard input. The F1 to F6 function keys can be programmed by the user.

• Rotary Switch



Rotary Switch is an operating mode selector. The VP-1231-CE7 has several operating modes, for more detailed information about these operating modes. Please refer to "2.3 Configuring the Boot Mode"

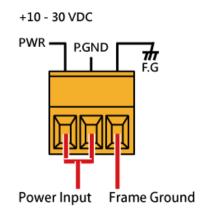
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• I/O Slots

The VP-1231-CE7 has 3 I/O slots that can be used to integrate high performance parallel I/O modules (high profile I-8K Series) or serial I/O modules (high profile I-87K series).

• Power Input and Frame Ground

The VP-1231-CE7 has a terminal with 3pins, there are 2 pins for power input and a pin for frame ground as follows:



• Ethernet Port

The VP-1231-CE7 has an Ethernet port that can be used to connect that can be used to connect the router to the Internet or to other devices.

• Mic-in and Earphone-out

The VP-1231-CE7 has a microphone and an earphone jack to the input and output of sound system.

• USB Port

The VP-1231-CE7 has a USB 2.0 port that can be used to connect the USB devices such as mouse, keyboard or an external USB hard drive.

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• COM2

COM2 port provides a connection to external RS-485 devices. The COM2 has 2 pins, as follows:

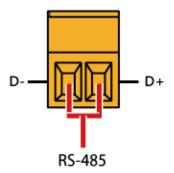
Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

Data Bits: 7, 8

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

Stop Bits: 1, 2

FIFO: 16 bytes



• COM3

The VP-1231-CE7 has one standard RS-232 serial communication interface port, COM3 (9-pin Sub-D plug connector). The details of this Pin assignment are as follows:

Port Type: Male

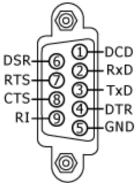
Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

Data Bits: 5, 6, 7, 8

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

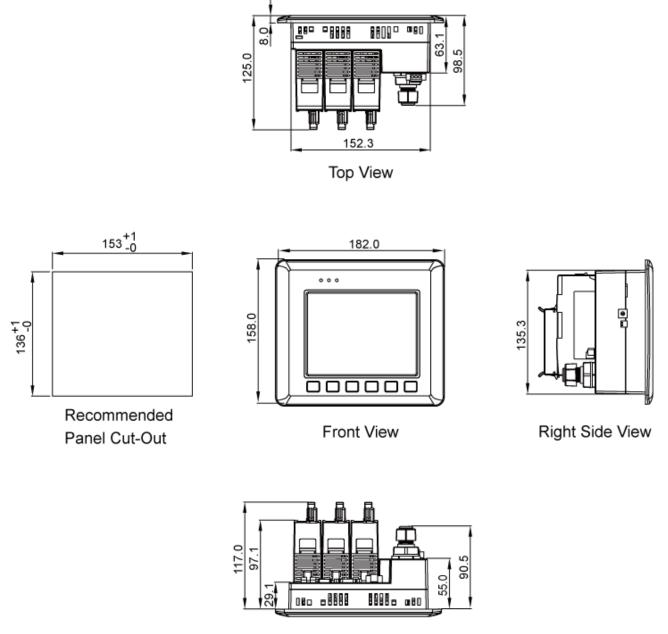
Stop Bits: 1, 2

FIFO: 16 bytes



1.4. Dimensions

The diagrams below provide the dimensions of the VP-1231-CE7 to use in defining your enclosure specifications. Remember to leave room for potential expansion if you are using other components in your system.

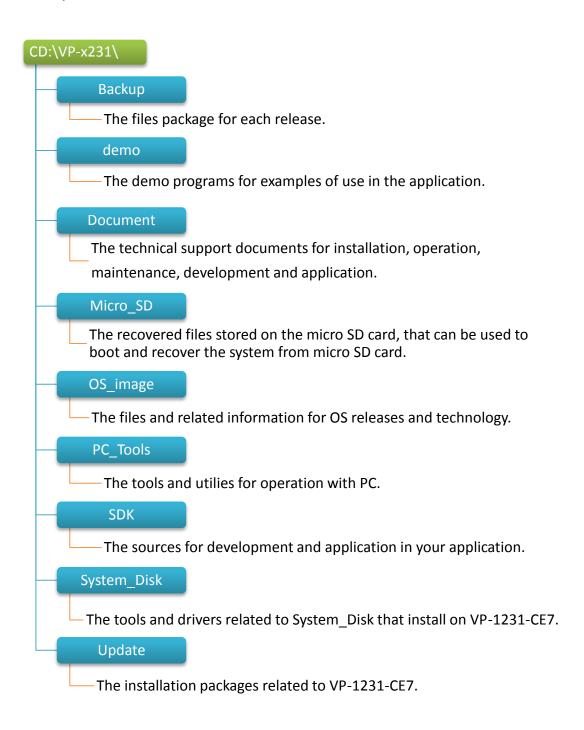


Bottom View

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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 \VP-x231 directory. All of them are listed below.

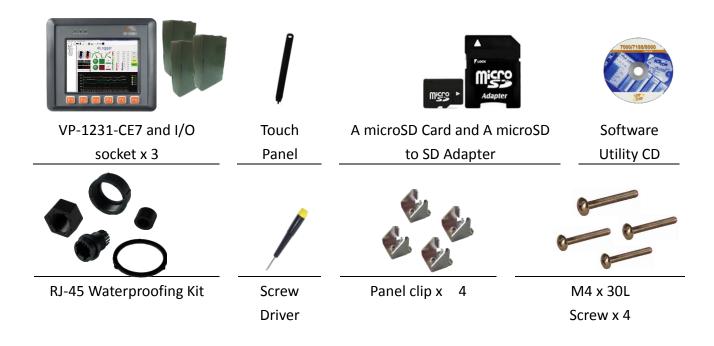


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2. Getting Started

This chapter provides a guided tour of the VP-1231-CE7 installation and configuration that describes the steps needed to download, install, configure, and run the basic procedures for user working with the VP-1231-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.



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2.1. Mounting the VP-1231-CE7

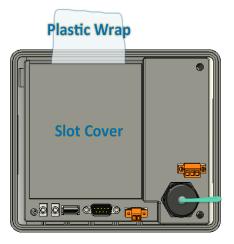
Before you work with the VP-1231-CE7, you should have a basic understanding of hardware specification, such as the dimensions, the usable input-voltage range of the power supply, and the type of communication interfaces.

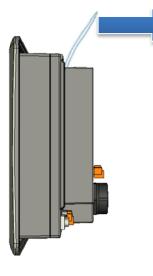
For more information about the hardware details, see section 1.2., "Specifications." For more information about the hardware dimensions, see section 1.4., "Dimensions."

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2.1.1. Removing the Slot Cover

The VP-1231-CE7 has a slot cover to protect the internal components from damage during shipping. Before starting any installation, please first remove the slot cover.





Step 1: Hold the top of VP-1231-CE7

Step 2: Pull the plastic wrap



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2.1.2. Installing Expansion I/O Sockets

The case (a socket and a top case) is included in the package. Before inserting the I/O modules you first need to install the expansion I/O socket.

Step 1: Take the I/O socket out from the case

Step 2: Padlock the bottom of the I/O socket into the VP-1231-CE7

Step 3: Slide the socket into the VP-1231-CE7 until it clicks

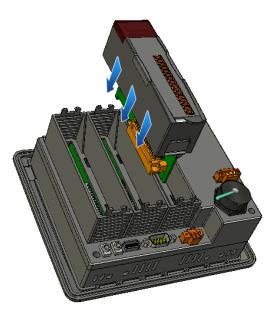
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2.1.3. Inserting and Wiring the I/O Modules

VP-1231-CE7 supports various types of I/O expansion modules for interfacing many different field devices. For more information about I/O expansion modules, please refer to: <u>http://www.icpdas.com/products/PAC/winpac/io_support_list.htm</u>

Step 1: Hold the I/O module vertically and align the socket

Step 2: Carefully press the I/O module onto the socket



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2.1.4. Mounting the Waterproof

The VP-1231-CE7 is equipped with an IP67 waterproof connector to withstand contaminant in dusty environment and immersion in water and corrosive elements.



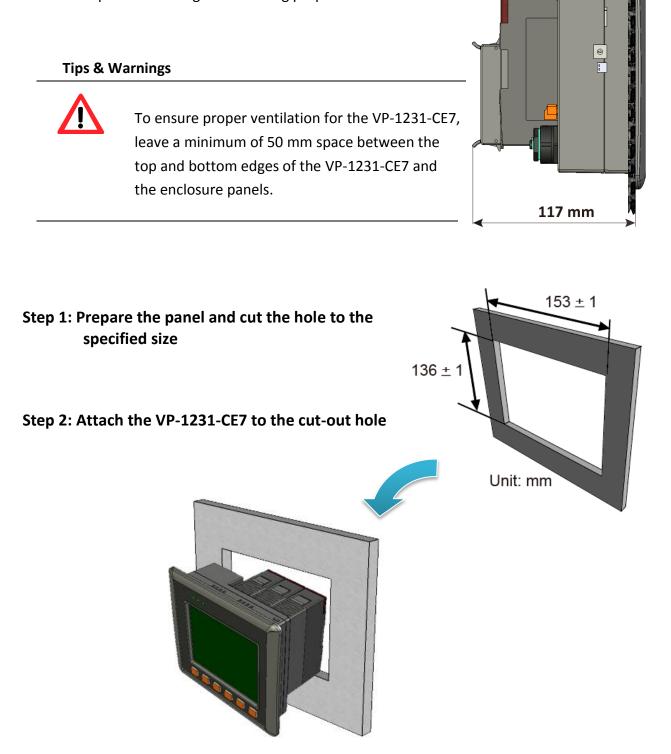
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2.1.5. Mounting the VP-1231-CE7

The VP-1231-CE7 can be mounted on a panel of maximum thickness 12 mm. Adequate access space can be available at the rear of the instrument panel for wiring and servicing purposes.



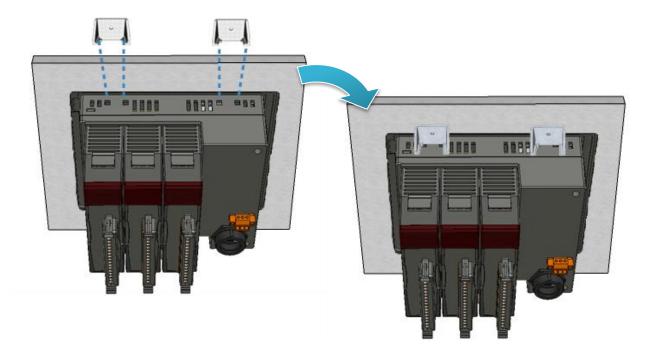
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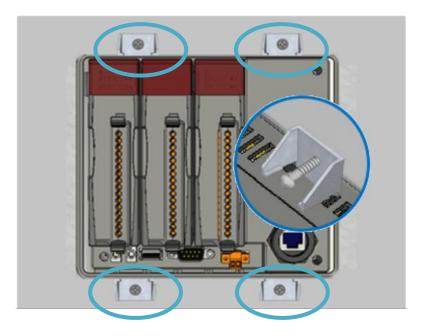
Panel thickness

up to 12 mm

Step 3: Insert the panel mounting clips into the upper and lower ventilation holes



Step 4: Screw the panel mounting clips to the panel.



Tips & Warnings



Recommended Screw Torque: 3.4 ~ 4.5 kgf-cm.

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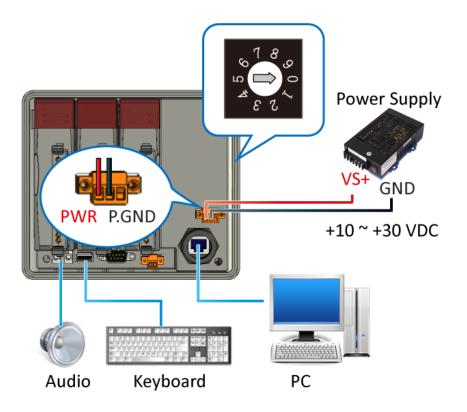
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2.2. Deploying a Basic VP-1231-CE7 System

The VP-1231-CE7 provides a variety of communication interface to suit a range of application. Here is a simple application for using the VP-1231-CE7.

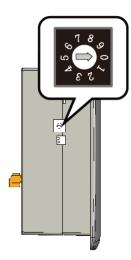
- Step 1: Connect the positive terminal (+) of the power supply to the terminal <u>PWR1/2</u> and the negative terminal (-) of the power supply to the <u>P.GND</u>
- Step 2: Connect the USB mouse or the USB keyboard to the USB port
- Step 3: Connect the monitor to the VGA port
- Step 4: Connect to PC or the laptop to the LAN port via an Ethernet switch



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2.3. Configuring the Boot Mode

The VP-1231-CE7 has several operating modes, which can be selected by a rotary switch.



The table below lists the operation modes available with the VP-1231-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.

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Safe mode is a trouble shooting. The mode loads the minimum required device drivers and system services to boot the VP-1231-CE7.

If you have malicious software or a program caused the VP-1231-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 VP-1231-CE7 OS image, please refer to section 6.1. OS updates

Reserve \rightarrow 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.

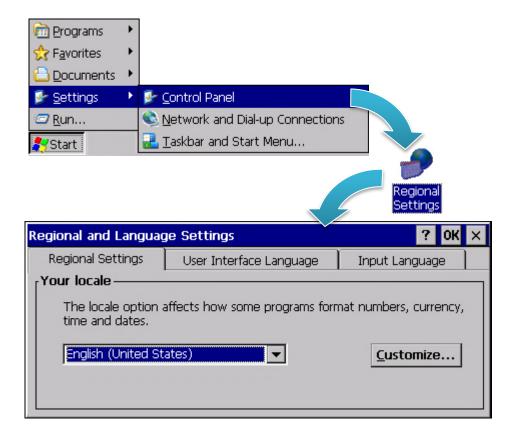
When VP-1231-CE7 is boot with one of these positions, it is boot at normal mode. User's application can check the position of the rotary switch position to run at different mode.

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2.4. Changing the User Interface Language

The **Regional and Language Settings** is a Windows CE functionality that allows users to change the VP-1231-CE7 user interface with your native language.

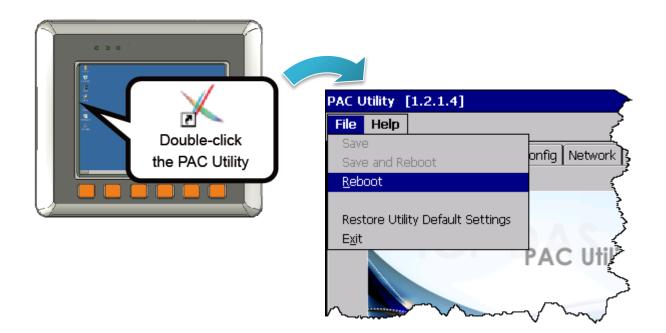
Step 1: Click <u>Start</u> menu, point to <u>Settings</u>, click <u>Control Panel</u>, and then click Regional Settings



Step 2: Click <u>User Interface Language</u> tab, choose to your local language, and then click <u>OK</u> button

Regional and Langua	ge Settings	? OK ×		
Regional Settings	User Interface Language Input Language			
User Interface Lan	ſUser Interface Language			
The option wil and alerts.	l determine the language used fo	or the menus, dialogs		
	English (United Sta	tes) 💌		
	English (United Star French (France) German (Germany) Italian (Italy)	tes)		
	Portuguese (Brazil) Spanish (Spain - Int	ernational Sort)		

Step 3: Double-click the <u>PAC Utility</u> on the desktop, and then reboot the VP-1231-CE7 for changes to take effect



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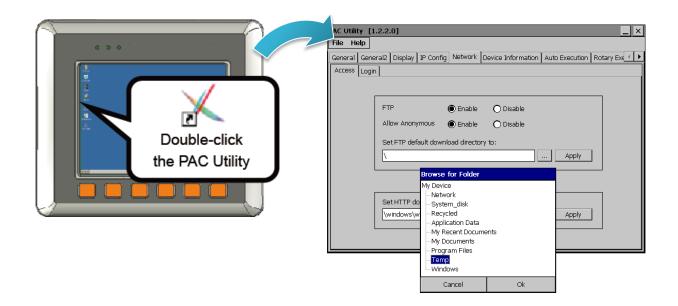
2.5. Using PAC Utility to Manage the VP-1231-CE7

The PAC Utility is a collection of the VP-1231-CE7 system tool that allows users to manage and configure the VP-1231-CE7 quickly and easily.

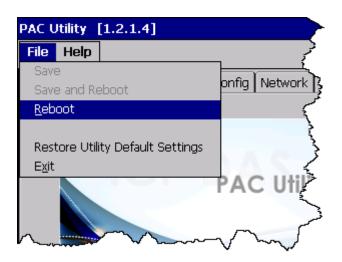
For more detailed information on PAC Utility applications, please refer to "3.1. PAC Utility"

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

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



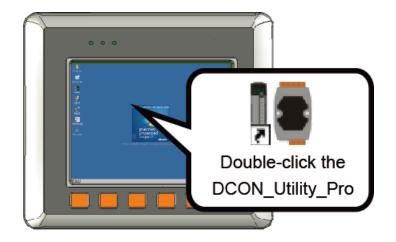
Step 3: Reboot the VP-1231-CE7



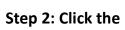
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2.6. Using DCON Utility Pro Configure I/O Modules

DCON Utility Pro allows users 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





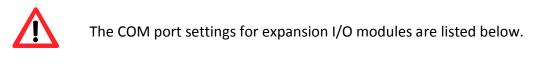
DCON	Utility Pro CE	V 2.0.0.5					×
Ę		II 🛠		1] ?	
Start	Address	0 Enc	l Address	255			
ID	Addr	Baud Rate	Checks	Format	Status	Description	
•							

VP-1231-CE7 User Manual, v1.0.0

Step 3: Configure the communication settings

COM Port Option	×
COM Port	Timeout
COM0[Backplane]	300 ms
COM0[Backplane]	
COM1 COM2 COM3	ecksum Format
COM4	8,2
OK Cancel	

Tips & Warnings



COM0 [Backplane]	
	▋▋▋▓▁▕▓▁▏▓▁
сом2/3	

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

VP-1231-CE7 User Manual, v1.0.0



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

DCON Utility Pro (CE V 2.0.0.5
Start Address	0 End Address 4
10 Addr. 97015 5	15200 Disable N,8,1 [DCON]8*AI (Universal RTI
	97015 /rmware[B209] ×
	Configuration AI About
	Protocol(INIT*) DCON
	Baud Rate(INIT*) 115200
	Parity(INIT*) N,8,1-None Parity
	Checksum(INIT*) Disable Analog Format Ohms
	60/50 Hz 50Hz
COM:0[N,8,1]	Save Configurations to the File
	Write Configurations to I/O Module
	Response Delay 0 ms
	Exit

VP-1231-CE7 User Manual, v1.0.0

3. Tools and Tasks

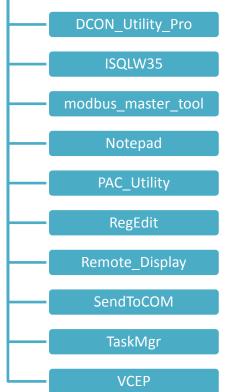
This chapter provides a brief introduction of the VP-1231-CE7 service tools and its benefits.

There are several tools and utilities built-in and designed for use with VP-1231-CE7. Some of these are pre-installed on VP-1231-CE7 and can work directly on VP-1231-CE7, and some of these are supporting tools and can help you to manage the VP-1231-CE7 remotely on a PC.

The following tools are pre-installed on VP-1231-CE7 and can work directly on VP-1231-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:\vp-x231\System_Disk\Tools\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/system_disk/tools/

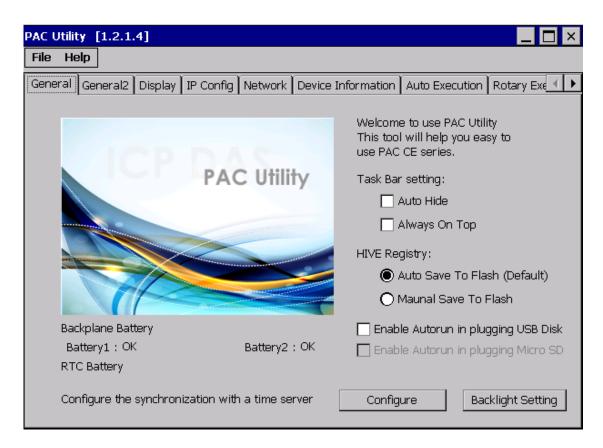


VP-1231-CE7 User Manual, v1.0.0

3.1. PAC Utility

PAC Utility is a collection of software applications that enable management and configuration of VP-1231-CE7 system and features.

PAC Utility is subject to change



The PAC Utility includes the following menu bars and property tabs.

All of these functions will be explained later.

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

VP-1231-CE7 User Manual, v1.0.0

3.1.1. Menu Bar – File

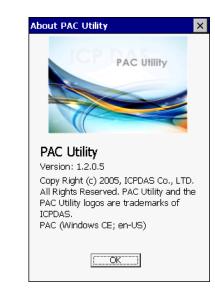
File Help Save Save and Reboot Reboot Restore Utility Default Settings Exit

The menus use to	How to use
Reboot	Restarts the VP-1231-CE7
Restore Default Settings	Restore the VP-1231-CE7 settings to its default.
Exit	Exits the PAC Utility.

VP-1231-CE7 User Manual, v1.0.0

3.1.2. Menu Bar – Help



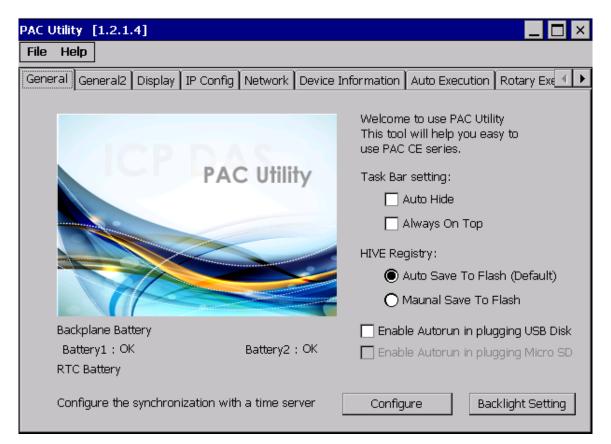


The menus use to	How to use
About	Displays a dialog box with information about PAC Utility,
	including the current version and copyright information.

VP-1231-CE7 User Manual, v1.0.0

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	Auto-Hide the taskbar:	
the taskbar	Select the Auto Hide check box.	
	Lock the taskbar:	
	Select the Always On Top check box.	
Auto save or	Auto save to flash:	
manual save to	Select the Auto Save To Flash (Default) check box.	
flash	Any changes made to the VP-1231-CE7 will be saved and only take effect	
	after the VP-1231-CE7 reboots. PAC Utility [1.2.1.4]	
	Manual save to flash:	
	Select the Manual Save to Flash	
	check box. Save and Reboot	
	Any changes made to the	
	VP-1231-CE7 will be saved by Restore Utility Default Settings	
	clicking the Save and Reboot from	
	File menu.	

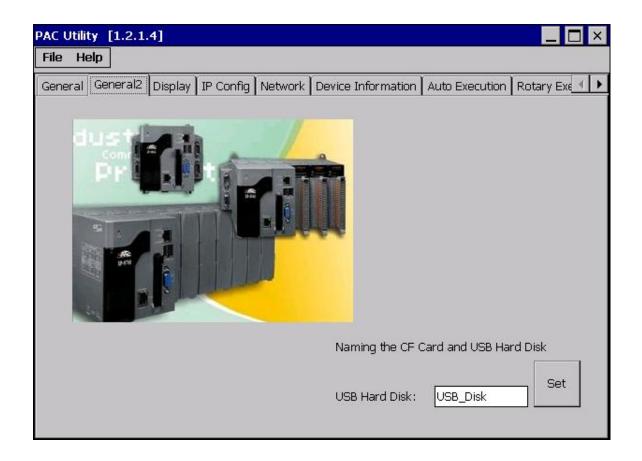
VP-1231-CE7 User Manual, v1.0.0

The tab use to	How to use
Enable USB autorun	Select the Enable Autorun in plugging USB Disk check box.
Enable microSD auotrun	This item is temporarily unavailable.
Automatic synchronization	Refer to the Appendix A.2. How to configure the service for
of system time	automatically synchronizing with the internet time server.
Adjust the backlight	Move the slider to the left to decrease the brightness or move the slider to the right to increase the brightness, and then click the Save the settings button.
	Backlight_Brightness_Setting Image: Comparison of the settings Fightness value: O Save the settings

VP-1231-CE7 User Manual, v1.0.0

3.1.4. Property Tab – General2

The **General2** tab provides functions to specify the name of the USB disk.



The tab use to	How to use
Specify the name of the USB disk	Enter a name in the USB Hard Disk: field

VP-1231-CE7 User Manual, v1.0.0

3.1.5. Property Tab – Display

The **Display** tab provides functions to configure the monitor settings.

PAC Ut	tility	[1.2.1	.4]							X
File	Help	•								
Genera	al 🛛 G	ieneral2	Display	IP Config	Network	Devi	ce Information	Auto Execution	Rotary Exe	
		Screen Less		1: 480 pixels	More		Screen refre	sh rate:	T	
									Apply	

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.

VP-1231-CE7 User Manual, v1.0.0

3.1.6. 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.

PAC Util	ity [1.2.	0.6]					. 🗆 ×
File H	lelp						
General	Display	IP Config	Network	Device Information	Auto Execution	Rotary Execution	
I	LAN 1:						
1	MAC Addr	ess: 78-C5	-E5-88-96-	-8C			
	🖲 Use DH	ICP to get II	° address				
(🔿 Assign	IP address					
1	IP Address	s: 10.1.0).86				
1	Mask:	255.2	55.0.0				
	Gateway:	10.1.0).254				
1	DNS Server: 10.0.0.3						
	Reboot for changes to take effective						
			Арр	ly			

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.

VP-1231-CE7 User Manual, v1.0.0

3.1.7. 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.

PAC Utility [1.	2.1.4]
File Help	
General Gener	al2 Display IP Config Network Device Information Auto Execution Rotary Exe 💶 💽
Access Login	File Server Settings
Γ	FTP
	Allow Anonymous Enable Disable
	Set FTP default download directory to:
	\Apply
Γ	Set HTTP document root directory to:
	\windows\www\wwwpub\ Apply

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

VP-1231-CE7 User Manual, v1.0.0

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

Login

The Login tab provides functions to maintain the FTP accounts.

PAC Utility [1.2.1.4]
File Help
General General2 Display IP Config Network Device Information Auto Execution Rotary Exe 💶 🕨
Access Login File Server Settings
User Name Password
Admin Add Delete
User name Password
Admin ****

The tab use to	How to use
Maintain the FTP	Refer to the Appendix C.1 How to add a user account to remote
accounts	login the VP-1231-CE7 from PC.

VP-1231-CE7 User Manual, v1.0.0

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

PAC Utility [1.2.0.6]	
File Help	
General Display IP Config Network Devi	ce Information Auto Execution Rotary Execution
Access Login File Server Settings	
You can create a networked file server an retrieve files, and makes use of the Intern client devices and other shared equipment	et for communication between
Settings	Share Files System Settings 📃 🗙
	Device Name (Each device need setting a different device name)
	Compact
-	The path to the folder to be shared
	Configure the file server to use LANx as he network adapter
	PCIVFETCE5B2
	Enable all authentication on the file server. The file server will not be accessible to all users on the network and the "admin" as the user to be allowed access to the file server
	Set
	Help

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

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3.1.8. Property Tab – Device Information

The **Device Information** tab provides functions to monitor necessary system information of the VP-1231-CE7. The information is the most important note of version control for upgrading system.

PAC Utility [1.2.1	.4]					X
File Help						
General General2	Display IP Config Netwo	ork Device In	formation	Auto Execution	Rotary Exe_	∢ ≯
Slot 1:	Module(CPU) Type:				
Slot 2:	Serial N	umber:	01-82-40)-06-18-00-00-D/		
Slot 3:	Backplar	ne Version:				
	CPU Ver	sion:	1.0.0.0			
	OS Vers	ion:	1.0.1.1 ,	2015/10/30 09:3	36:5	
	Eboot V	ersion:	1.2.1.0 ,	2015/10/22 16:2	26:0	
	.NET CF	Version:	3.5.7338	.00		
	SQL CE	Version:	3.5.8154	.0		
	PACSDK	Version:	4.3.3.4			
	CPU Te	mperature:				

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3.1.9. Property Tab – Auto Execution

The **Auto Execution** tab provides functions to configure programs running at VP-1231-CE7 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.

PAC Utility [1.2.1.4]			_ 🗖 ×
File Help			
General General2 Displa	ay IP Config	Network Device Information Auto Execution	Rotary Exe 🔳 🕨
	Program 1:	V_REMOTE.exe	Browse
	Program 2:		Browse
	Program 3:		Browse
	Program 4:		Browse
At most 10 programs	Program 5:		Browse
can be specified to execute automatically	Program 6:		Browse
at system startup.	Program 7:		Browse
	Program 8:		Browse
	Program 9:		Browse
	Program10:		Browse
		Clean Ap	ply

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

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3.1.10. Property Tab – Rotary Execution

The **Rotary Execution** tab provides functions to configure programs running at VP-1231-CE7 startup in one of the user defined mode, it allows users to configure ten execute files at most.

PAC Utility [1.2.1.4]		_ 🗆 ×
File Help		
General2 Display IP Config Network De	vice Information Auto Execution Rotary Ex	ecution 🕅 🔸 🕨
Rotary Switch 0	Normal Mode	Browse
Rotary Switch 1	Safe Mode	Browse
Rotary Switch 2	:	Browse
そて Rotary Switch 3	:	Browse
Rotary Switch 4	:	Browse
Rotary Switch 5	:	Browse
Rotary Switch 6	:	Browse
Rotary Switch 7	:	Browse
Rotary Switch 8	:	Browse
Rotary Switch 9	:	Browse
	Ар	ply

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

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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 information on how to use DCON Utility Pro to configure I/O modules, please refer to 2.5. Using DCON Utility Pro to Configure I/O Modules

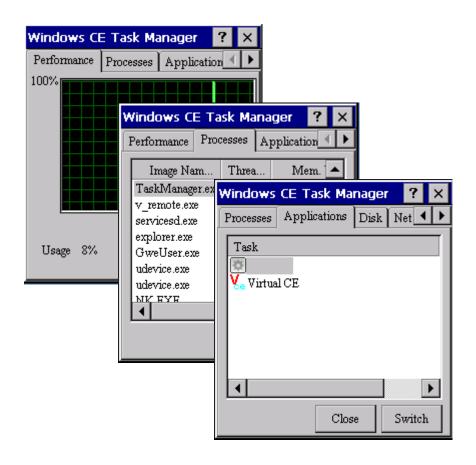
For more detailed information on DCON Utility application, please refer to: http://www.icpdas.com/root/product/solutions/software/utilities/dcon_utility_pro.html

DCON Utility Pro CE V 2.0.0.4	
Start Address 0 End Address 4	
ID Addr Baud Rate Checks Format Status Description	
Terminal Command Line Tool	×
	end
Checksum Disable Slot Slot I III IIII	
Command \$00M	
Response	
Tool for Command Data Logger ×	
Edit Command Data Logger About	
COM Port COMO Load	
Start Search Baud Rate 115200 Remove	
Data Format N,8,1 Add >>	
Checksum Disable	
Slot Modify rt	
Timeout (ms) 200(ms) Save	
Delay for Next (ms) 200(ms)	
Send Command \$01M	
Compared Response Input Compared Data	
Compare Mode Full Match	

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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.



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3.4. VCEP

ICP DAS VCEP is designed for managing your VP-1231-CE7 anywhere. No matter where you are, ICP DAS VCEP provides a convenient environment on the Desktop PC and lets you control your VP-1231-CE7 remotely.

Virtual CE	_
File Help	×
Virtual CE 5	
Connected	
Ready	
Primary IP = 10.1.0.96 License Free Version	
Video=GDI	
www.icpdas.com	

ICP DAS VCEP is composed of two main components: The **Server** which runs on VP-1231-CE7 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_am335x/VP-1231-CE7/pc_tools/vcep/

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3.5. Remote_Display

The **Remote Display** allows VP-1231-CE7 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 VP-1231-CE7. The client is a PC-based program named cerhost.exe running on the 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.

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

ICPDAS Send to COM V1.0.4 2011/2/23	×
Connection Status COM Port Baudrate Data Bit Parity Stop Bit	Slot
COMPORT Dadalate Data bit Parky Ditto Ditt	Close
	string +CRC
Commands Responses	O Binary O String Send Polling
Current Packet Size (bytes)	Auto send Internal (ms) 500
Total Packet Bytes 0 Total Packet Bytes 0	Start Stop Set
Packet Quantity send 0 Packet Quantity received 0	Start Time Start Time
Clear	Stop Time Stop Time
<u>ــــــــــــــــــــــــــــــــــــ</u>	A
v	—
	Clear

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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.

Registry Editor Version 1.2.2				_ 🗗 ×
File Help				
HKEY_CLASSES_ROOT	Name	Туре	Data	
HKEY_CURRENT_USER			•	
HKEY_USERS				

3.8. ISQLW35

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

🚰 Objects 🗮 SQL 📖 Grid 📳 Notes	
Databases	
rools SQL 🚯 🖯 🙌	×

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3.9. INotepad

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

INote	pad			
File	Edit	Format	Help	
I				A
				Input Panel
				[ssc]1]2]3]4[5]6]7[8]9]0]- = ● Tab[q]w]e]r]t]y]u]i]0]p[[]]
				CAP a s d f g h j k l ; '
				Shift Z × [c v] b] n]m] ,] , [/] ← J Cti]áü] `] \]

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4. Your First VP-1231-CE7 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 VP-1231-CE7 modules.

4.1. Setting up the Development Environment

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

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4.1.1. Preparing the Development Tools and Programming Languages

VP-1231-CE7 is a Windows CE-based device that supports three programming languages for developing Windows CE applications.

- Visual Basic.NET
- Visual C#
- Visual C++

Development Tools

VP-1231-CE7 supports the application development with the Professional Edition application of Visual Studio 2008.



Tips & Warnings



There are some updates for Visual Studio 2008 to provide support for Windows Embedded Compact 7.

If you have Professional Edition of Visual Studio 2008 are installed, make sure all of the following package are installed

1. Visual Studio 2008 Service Pack 1

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

2. Visual Studio 2008 update for Windows Embedded Compact 7

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

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

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

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4.1.2. Installing the VP-1231-CE7 SDK

The VP-1231-CE7 SDK offers several APIs for customizing the standard features and integrating with other applications, devices and services.

Step 1: Get the latest version of the VP-1231-CE7 SDK, AM335x_WINCE7_SDKV100B03

The VP-1231-CE7 SDK can be found from the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\VP-x231\SDK\PlatformSDK\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/sdk/platformsdk/

Step 2: Execute the AM335x_WINCE7_SDK_YYYYMMDD.msi

Follow the prompts until the installation process is complete.

Step 3: Execute the VisualStudioDeviceWindowsEmbeddedCompact7

Follow the prompts until the installation process is complete.

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4.2. First VP-1231-CE7 Program in VB.NET

The best way to learn programming with VP-1231-CE7 is to actually create a VP-1231-CE7 program.

The example below demonstrates how to create a demo program running on VP-1231-CE7 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 VP-1231-CE7
- 6. Execute the application on VP-1231-CE7

All main steps will be described in the following subsection.

In this tutorial, we will assume that you have installed VP-1231-CE7 SDK on PC and used the Visual Studio 2008 for application development.

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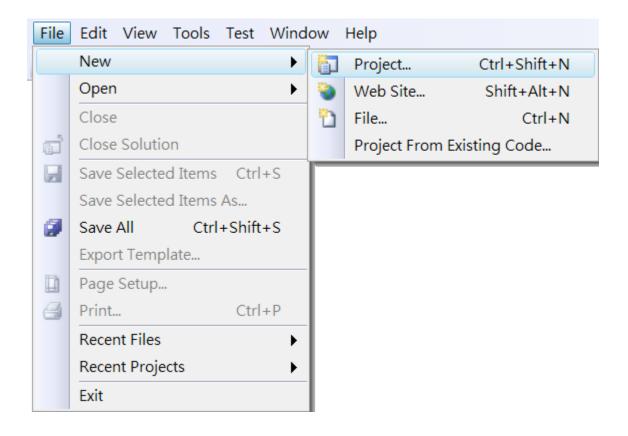
4.2.1. Create a new project

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: Start 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 node and select Smart Device

Step 4: In the list of <u>Templates</u>, select <u>Smart Device Project</u>

Step 5: Specify a name and a location for the application and then click <u>OK</u>

New Project			? ×
Project types:		Templates:	.NET Framework 3.5 ▼ 🖽 🔚
General MFC Smart Device Test Win32 Other Language Visual Basic Windows Web Smart Dev Office Database Reporting Test WCF Workflow Visual C#	es rice	Visual Studio installed templates	
	Device applications. Ch	oose target platform, Framework version, and template in t	he next dialog box.
Name: Location:		or\Documents\Visual Studio 2008\Projects	▼ Browse
Solution Name:	SDK_Info	Create directory for	or solution
			OK Cancel

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Step 6: In the Target platform, select Windows CE

Step 7: In the <u>.NET Compact Framework version</u>, select <u>.NET Compact Framework</u> <u>Version 3.5.</u>

Tips & Warnings



Windows CE7 only supports .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 8: In the list of templates, select Device Application. Click OK

Add New Smart Device Project - SDK_Ir	nfo	? ×			
Target platform: .NET Compact Framework version: Templates:	Windows CE .NET Compact Framework Version 3.5	▼ ▼			
Device Class Console Application Library Application	Control Empty Library Project	Description: A project for creating a .NET Compact Framework 3.5 forms application for Windows CE Platform			
Download additonal emulator images and smart device SDKs OK Cancel					

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4.2.2. Specify the path of the PAC reference

The PAC SDK provides a complete solution to integrate with VP-1231-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



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

CD:\VP-x231\SDK\PACNET\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/sdk/pacnet/

Step 2: On the Project menu, and then click Add Reference...

😤 SDK_Info - Microsoft Visual Studio (Administrator)												
File	Edit	View	Proj	ect	Build	Debug	Data	Format	Tools	Test	Window	Help
				Ad	d Wind	dows Forr	n					
				Ad	d User	Control						
			1	Ad	d Com	ponent						
			1	Ad	d Mod	ule						
			₽\$	Ad	d Class	i						
			.	Ad	d New	Item	Ctrl+	Shift+A				
			:::	Ad	d Existi	ing Item	Shif	t+Alt+A				
				Exc	lude Fi	rom Proje	ct					
				Sh	ow All I	Files						
				Ad	d Refe	rence						
				Ad	d Web	Reference	e					
				Se	t as Sta	rtUp Proj	ect					
			47	Re	fresh P	roject Too	box It	ems				
				Ch	ange T	arget Plat	form					
			æ	SD	K_Info	Propertie	s	Alt+F7	_			

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Step 3: On the <u>Browse</u> tab and browse to where the PACNET.dll are installed, and then click <u>OK</u>

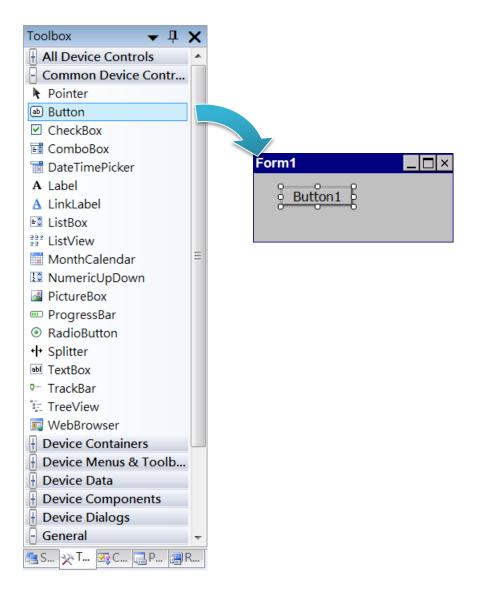
Add Reference						
.NET Projects Browse Recent						
Look in: 📜 PACNET 👻	G 🏂 📂 🖽 -					
Name	Date modified					
ACNET.dll	2014/5/30					
<	4					
File name: : PACNET	•					
Files of type: : Component Files (*.dll;*.tlb;*.olb;*.ocx;*.exe)	•					
	OK Cancel					

4.2.3. 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.

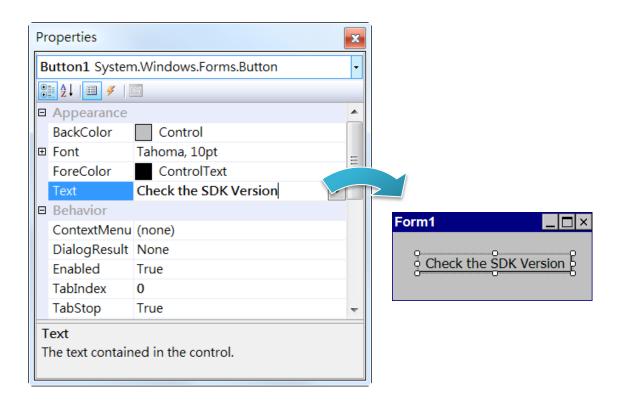
After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

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



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Step 2: On the Properties panel, type Check the SDK version in the Text field



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4.2.4. 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

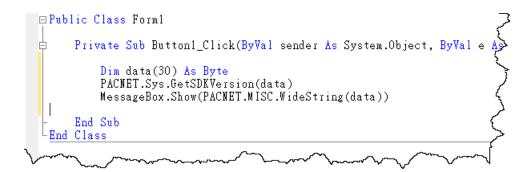
Form1	
Check the S	DK Version

Step 2: Inserting the following code

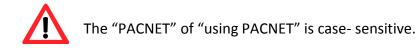
Dim data(30) As Byte

PACNET.Sys.GetSDKVersion(data)

MessageBox.Show(PACNET.MISC.WideString(data))



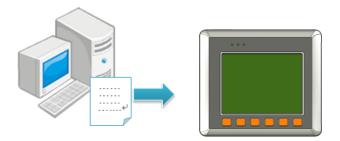
Tips & Warnings



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4.2.5. Upload the application to VP-1231-CE7

VP-1231-CE7 supports FTP server service. You can upload files to VP-1231-CE7 or download files from a public FTP server.



Step 1: On the <u>Build</u> menu, and then click <u>Build [Project Name]</u>

File	Edit	View	Project	Build	Debug	Data	Format	Tools	Test	Window	Help
					Build Solu	ition		F7			
				1	Rebuild S	olution	Ctrl+A	lt+F7			
				1	Deploy So	olution					
				(Clean Solu	ution					
					Build SDK	_Info					
					Rebuild S	DK_Info)				
				1	Deploy SE	OK_Info					
				(Clean SDk	(_Info					
				(Configura	ition Ma	anager				

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Step 2: Open the browser and type the IP address of VP-1231-CE7

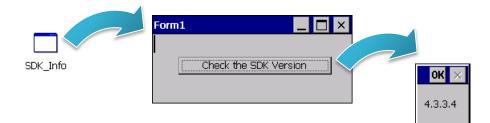
Step 3: Upload the application and the corresponding PACNET.dll files to VP-1231-CE7

Tips & Warnings							
	For applications programming in C# and VB.net with .net compact framework, when executing these application on VP-1231-CE7, the corresponding PACNET.dll must be in the same directory as the .exe file.						
	Eile Edit Yiew Go Favorites Address \Temp Address \Temp PACNET SDK_Info						

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4.2.6. Execute the application on VP-1231-CE7

After uploading the application to VP-1231-CE7, you can just double-click it on VP-1231-CE7 to execute it.



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4.3. First VP-1231-CE7 Program in Visual C#

The best way to learn programming with VP-1231-CE7 is to actually create a VP-1231-CE7 program.

The example below demonstrates how to create a demo program running on VP-1231-CE7 with Visual C#.

To create a demo program with Visual 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 VP-1231-CE7
- 6. Execute the application on VP-1231-CE7

All main steps will be described in the following subsection.

In this tutorial, we will assume that you have installed VP-1231-CE7 SDK on PC and used the Visual Studio 2008 for application development.

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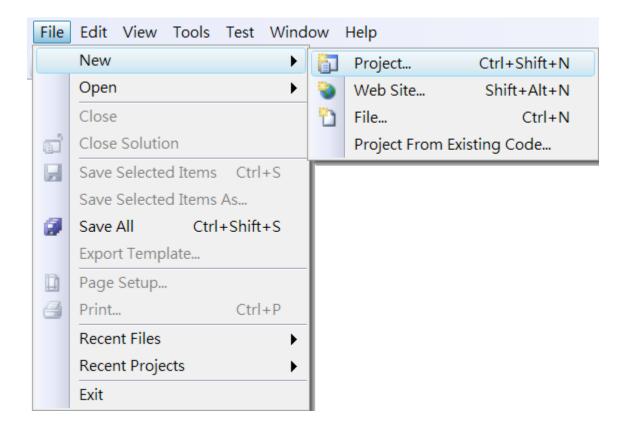
4.3.1. Create a new project

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: Start 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# node and select Smart Device

Step 4: In the list of <u>Templates</u>, select <u>Smart Device Project</u>

Step 5: Specify a name and a location for the application and then click <u>OK</u>

New Project				2 X
Project types:		Templates:		.NET Framework 3.5 🔻 🖽 🔚
Visual C++ Other Languag Visual Basic Visual C# Windows Web Smart Dev MySQL Office Database Reporting Test WCF Workflow Other Project Ty Test Projects	vice	Visual Studio installed templates – Smart Device Project My Templates Search Online Templates		
		oose target platform, Framework ver	sion, and template in the next di	alog box.
Name: Location:		or\Documents\Visual Studio 2008\Pr	ojects	▼ Browse
Solution: Solution Name:	Create new Solution SDK_Info		Create directory for solution	1
				OK Cancel

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Step 6: In the Target platform, select Windows CE

Step 7: In the <u>.NET Compact Framework version</u>, select <u>.NET Compact Framework</u> <u>Version 3.5.</u>

Tips & Warnings



Windows CE7 only supports .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 8: In the list of templates, select Device Application. Click OK

Add New Smart Device Project - SDK_Ir	nfo	? X
Target platform: .NET Compact Framework version:	Windows CE .NET Compact Framework Version 3.5	▼
Templates:		_
Device Class Console Application Library Application	Control Empty Library Project	Description: A project for creating a .NET Compact Framework 3.5 forms application for Windows CE Platform
Download additonal emulator imag	es and smart device SDKs	
		OK Cancel

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4.3.2. Specify the path of the PAC reference

The PAC SDK provides a complete solution to integrate with VP-1231-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



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

CD:\VP-x231\SDK\PACNET\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/sdk/pacnet/

Step 2: On the Project menu, and then click Add Reference...

😤 SDK_Info - Microsoft Visual Studio (Administrator)												
File	Edit	View	Proj	ect	Build	Debug	Data	Format	Tools	Test	Window	Help
				Ad	d Wind	dows Forr	n					
				Ad	d User	Control						
			1	Ad	d Com	ponent						
			1	Ad	d Mod	ule						
			₽\$	Ad	d Class	i						
			-	Ad	d New	Item	Ctrl+	Shift+A				
			:::	Ad	d Existi	ing Item	Shif	t+Alt+A				
				Exc	lude Fi	rom Proje	ct					
				Sh	ow All I	Files						
				Ad	d Refe	rence						
				Ad	d Web	Reference	e					
				Set	t as Sta	rtUp Proj	ect					
			f	Re	fresh P	roject Too	box It	ems				
				Ch	ange T	arget Plat	form					
			æ	SD	K_Info	Propertie	s	Alt+F7	_			

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Step 3: On the <u>Browse</u> tab and browse to where the PACNET.dll are installed, and then click <u>OK</u>

Add Reference	? ×
.NET Projects Browse Recent	
Look in: 📜 PACNET 👻	G 🏂 📂 🎞 -
Name	Date modified
ACNET.dll	2014/5/30
<	4
File name: : PACNET	•
Files of type: : Component Files (*.dll;*.tlb;*.olb;*.ocx;*.exe)	•
	OK Cancel

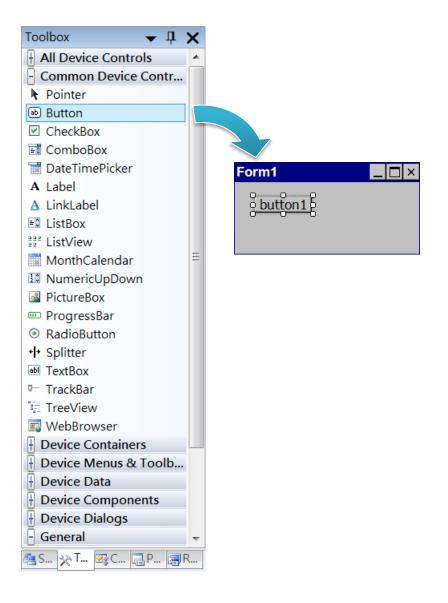
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4.3.3. Add the control to the form

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.

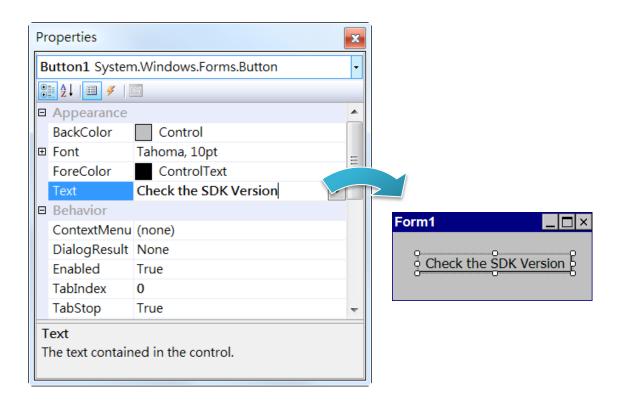
After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

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



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Step 2: On the Properties panel, type Check the SDK version in the Text field



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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

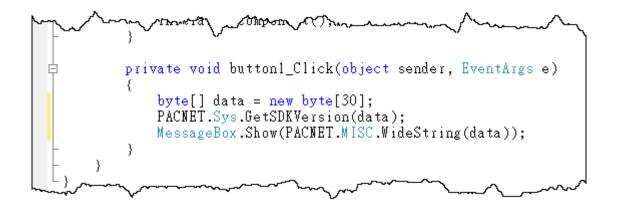


Step 2: Inserting the following code

byte[] data = new byte[30];

PACNET.Sys.GetSDKVersion(data);

MessageBox.Show(PACNET.MISC.WideString(data));



Tips & Warnings

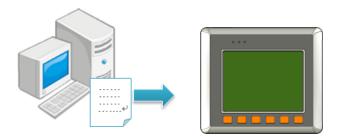


The "PACNET" of "using PACNET" is case- sensitive.

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4.3.5. Upload the application to VP-1231-CE7

VP-1231-CE7 supports FTP server service. You can upload files to VP-1231-CE7 or download files from a public FTP server.



Step 1: On the <u>Build</u> menu, and then click <u>Build [Project Name]</u>

File	Edit	View	Project	Build	Debug	Data	Format	Tools	Test	Window	Help
				***	Build Solu	ition		F7			
					Rebuild S	olution	Ctrl+A	lt+F7			
					Deploy So	olution					
				(Clean Solu	ution					
					Build SDK	_Info					
					Rebuild S	DK_Info)				
					Deploy SE)K_Info					
					Clean SDk	(_Info					
					Configura	tion Ma	anager				

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Step 2: Open the browser and type the IP address of VP-1231-CE7

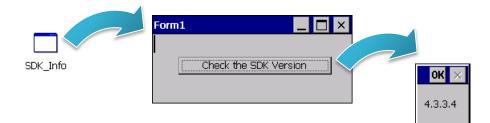
Step 3: Upload the application and the corresponding PACNET.dll files to VP-1231-CE7

Tips & V	Warnings
	For applications programming in C# and VB.net with .net compact framework, when executing these application on VP-1231-CE7, the corresponding PACNET.dll must be in the same directory as the .exe file.
	Eile Edit View Go Favorites Address ITemp Image: Address Image: Addres

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4.3.6. Execute the application on VP-1231-CE7

After uploading the application to VP-1231-CE7, you can just double-click it on VP-1231-CE7 to execute it.



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4.4. First VP-1231-CE7 Program in Visual C++

The best way to learn programming with VP-1231-CE7 is to actually create a VP-1231-CE7 program.

The example below demonstrates how to create a demo program running on VP-1231-CE7 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 VP-1231-CE7
- 7. Execute the application on VP-1231-CE7

All main steps will be described in the following subsection.

In this tutorial, we will assume that you have installed VP-1231-CE7 SDK on PC and used the Visual Studio 2008 for application development.

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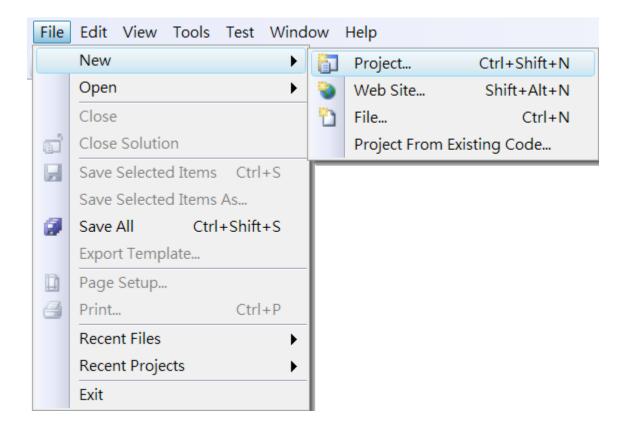
4.4.1. Create a new project

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: Start 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++ node and select Smart Device

Step 4: In the list of <u>Templates</u>, select <u>MFC Smart Device Application</u>

Step 5: Specify a name and a location for the application and then click <u>OK</u>

New Project	\$100A	impative addition and in the second s	anament suit a field and the meng timuriphin, main and	2 X
Project types:		Templates:		.NET Framework 3.5 🔻 🔛 🔚
Visual C++ ATL CLR General MFC Smart Device Test Win32 Other Language Other Project Ty Test Projects	es	Visual Studio installed templates ATL Smart Device Project MFC Smart Device Application Win32 Smart Device Project My Templates Search Online Templates	📲 MFC Smart Device	e ActiveX Control
An application for \ Name:	Windows Mobile and ot	her Windows CE-based devices that	t uses the Microsoft Foundation C	Class Library
Location:	C:\Users\Administrat	or\Documents\Visual Studio 2008\	Projects	▼ Browse
Solution Name:	SDK_Info		Create directory for solution	n
				OK Cancel

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

Welcome to the MFC Smart Device Application Wizard	MFC Smart Device Applic	ation Wizard - SDK_Info
	Welcon	me to the MFC Smart Device Application Wizard
Overview These are the current project settings: Platforms • Windows Mobile 5.0 Pocket PC SDK Platform Application Type • Single document interface Document Template Strings Click Finish from any window to accept the current settings. User Interface Features After you create the project, see the project's readme.bt file for information about the project features and files that are generated. Generated Classes Image: Classes Output Image: Classes Image: Classes Image:	Platforms Application Type Document Template Strin User Interface Features Advanced Features	 Windows Mobile 5.0 Pocket PC SDK Platform Single document interface Click Finish from any window to accept the current settings. After you create the project, see the project's readme.bt file for information about the project features and files that are generated.

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

MFC Smart Device Applic	ation Wizard - SDK_Info	? ×
Platfor	ms	
Overview Platforms Application Type Document Template Strin User Interface Features Advanced Features Generated Classes	Select platform SDKs to be added to the current project.	
	AM335x_WINCE7_SDK Instruction sets: ARMv4I, ARMv4I < Previous Next > Finish	Cancel

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

MFC Smart Device Appli	cation Wizard - SDK_Info		? X
Applic	ation Type		
Overview	Application type:	Use of MFC:	
Platforms	\bigcirc <u>S</u> ingle document	O Use MFC in a shared DLL	
Application Type	Dialog based	Use MFC in a static library	
Document Template Str	$^{ m ings}$ \bigcirc Single document with DocList		
User Interface Features	☑ Document/View architecture support		
Advanced Features			
Generated Classes	Resource <u>l</u> anguage: 英文 (美國)		
		< Previous Next > Finish	Cancel

Step 9: On the next page of the wizard, click <u>next</u>

MFC Smart Device Applic	ation Wizard - SDK_Info	? ×
User I	nterface Features	
Overview	Command bar:	
Platforms	Menus only	
Application Type	○ Menus and bu <u>t</u> tons	
Document Template Stri	ngs	
User Interface Features	Status ba <u>r</u>	
Advanced Features	Dialog title:	
Generated Classes	SDK_Info	
		vious Next > Finish Cancel

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Step 10: On the next page of the wizard, click <u>next</u>

MFC Smart Device Applie	ation Wizard - SDK_Info	? ×
Advan	ced Features	
Overview	Advanced features:	
Platforms	□ Windows H <u>e</u> lp	
Application Type	□ Printing and print preview	
Document Template Stri	ngs ActiveX controls	
User Interface Features	□ <u>W</u> indows sockets	
Advanced Features	Number of files on recent file list:	
Generated Classes	4 🗸	
	< Previous Next > Finish	Cancel

Step 11: On the next page of the wizard, click <u>Finish</u>

Gener	ated Classes	
Overview Platforms	Generated classes: CSDK_InfoApp CSDK_InfoDlg	
Application Type Document Template Str	ings	
User Interface Features) C <u>l</u> ass name:	.h fil <u>e</u> :
Advanced Features Generated Classes	CSDK_InfoApp	SDK_Info.h
	Base class; ⊂WinApp	.cpp file: SDK_Info.cpp

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4.4.2. 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 select AM335x_WINCE7_SDK(ARMv4I) as shown in the following illustration.



4.4.3. Specify the Path of PACSDK library and header files

The PAC SDK provides the PACSDK library and header files with VP-1231-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: On the <u>View</u> menu, and then click <u>Property Pages</u>

File	Edit	View	Project	Build	Debug	Tools	Test	Wir	ndow	Help
		-2	Solution E	xplorer		Ctrl	+Alt+L			
		-2	Bookmark	Windo	w (Ctrl+K, C	Ctrl+W			
		<u> </u>	Class View	v		Ctrl+S	hift+C			
			Code Defi	nition V	Vindow	Ctrl+S	hift+V	,		
		2	Object Bro	owser		Ctrl	+Alt+J			
			Output				Alt+2			
			Property I	Manage	er					
		2	Resource	View		Ctrl+S	Shift+E			
		X	Toolbox			Ctrl+	+Alt+X			
			Find Resu	lts				►		
			Other Wir	ndows				►		
			Toolbars					►		
			Full Scree	n	S	hift+Alt	+Enter			
		P	Navigate	Backwa	rd		Ctrl+-			
		E,	Navigate	Forward	d	Ctrl+S	Shift+-			
			Next Task							
			Previous	Fask						
		e	Property I	Pages						

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Step 2: In left pane, expand <u>Configuration Properties</u>, and then click <u>C/C++</u>

Step 3: In the right pane, choose the following path in the <u>Additional Include</u> <u>Dependencies</u> item

C:\Program Files\Windows CE Tools\SDKs\N2000_WINCE7_SDK\Include\Armv4i

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

SDK_Info Property Pages	ALC PROPERTY OF THE OWNER.				
Configuration: Active(Relea	ase) Platform:	Active(AM335x_WINCE7_SDK (, 🔻 Configuration Manager			
Common Properties	Additional Include Directories	"C:\Program Files (x86)\Windows CE Tools\SDKs\AM			
Configuration Properti	Resolve #using References				
General	Debug Information Format	Program Database (/Zi)			
Debugging	Suppress Startup Banner	Yes (/nologo)			
Deployment	Warning Level	Level 3 (/W3)			
C/C++	Detect 64-bit Portability Issues	No			
General	Treat Warnings As Errors	No			
Optimization					
Preprocessor					
Code Generation					
Language					
Precompiled Hea					
Output Files					
Browse Informati					
Advanced					
Command Line					
Linker					
Resources					
XML Document Gen					
Browse Information Build Events					
Custom Build Step Authenticode Signir					
Authenticode signir					
	Additional Include Directories				
	Specifies one or more directories to add to the include path; use semi-colon delimited list if more				
		OK Cancel Apply			

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Step 4: In left pane, click Linker

Step 5: In the right pane, choose the following path in the <u>Additional Library</u> <u>Dependencies</u> item

C:\Program Files\Windows CE Tools\SDKs\N2000_WINCE7_SDK\Include\Armv4i

onfiguration: Active(Rele	ease)	Active(AM335x_WINCE7_SDK (, Configuration Manager
Common Properties Configuration Properti General Debugging Deployment C/C++ Linker General Input Manifest File Debugging System Optimization Embedded IDL Advanced Command Line Resources XML Document Gen Browse Information Build Events	Output File Show Progress Version Enable Incremental Linking Suppress Startup Banner Ignore Import Library Register Output Per-user Redirection Additional Library Directories Link Library Dependencies Use Library Dependency Inputs Use UNICODE Response Files	\$(OutDir)\\$(ProjectName).exe Not Set No (/INCREMENTAL:NO) Yes (/NOLOGO) No No No Yes No Yes No Yes
Custom Build Step Authenticode Signir	Additional Library Directories Specifies one or more additional p	baths to search for libraries; configuration specific; use semi-col

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4.4.4. 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.

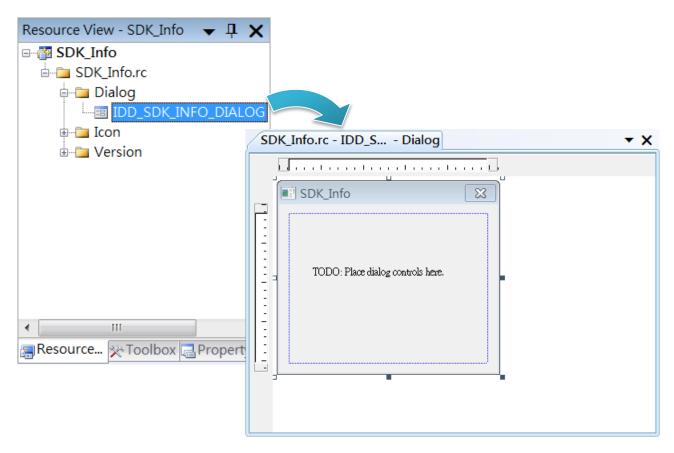
After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

Step 1: On the <u>View</u> menu, and then click <u>Resource View</u>

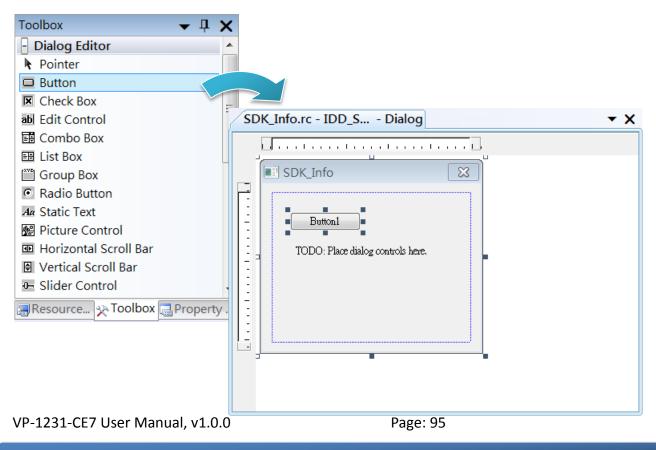
File	Edit	View	Project	Build	Debug	Tools	Test	Wir	ndow	Help
		¥	Code			Ctrl+	+Alt+0			
		-2	Solution E	Explorer		Ctrl	+Alt+L			
			Bookmarl	k Windo	w	Ctrl+K, C	Ctrl+W	'		
		23	Class Viev	N		Ctrl+S	hift+C	:		
			Code Def	inition V	Vindow	Ctrl+S	hift+V	'		
		<u> 1</u>	Object Bro	owser		Ctrl	+Alt+J			
			Output				Alt+2			
			Property	Manage	er					
		2	Resource	View		Ctrl+S	Shift+E	:		
		R	Toolbox			Ctrl+	Alt+X	[
			Find Resu	ılts				•		
			Other Wir	ndows				•		
			Toolbars					•		
			Full Scree	n	S	hift+Alt	+Enter			
		P	Navigate	Backwa	rd		Ctrl+-			
		E,	Navigate	Forward	d	Ctrl+9	Shift+-			
			Next Task	:						
			Previous 7	Task						
		c	Property	Pages						

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Step 2: In the <u>Resource View</u> Panel, Expand the <u>[Project name].rc</u> file and then expand the <u>Dialog</u> item to click the plug-in dialog



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



Step 4: On the <u>Properties</u> panel, type Check the SDK version in the <u>Caption</u> field

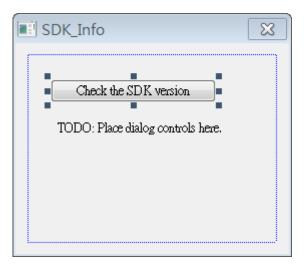
P	roperties	→ ₽ X				
IC	IDC_BUTTON1 (Button Control) ICeButtonEc -					
•	2↓ 🔲 🖋 🖾					
Ξ	Appearance					
	Caption	Check the SDK version				
	Client Edge	False				
	Horizontal Alignmer	Default				
	Modal Frame	False				
	Multiline	False				
	Notify	False				
	Static Edge	False				
	Vertical Alignment	Default				
Ξ	Behavior					
	Default Button	False				
	Disabled	False				
	Owner Draw	False				
	Visible	True				
Ξ	Misc					
	(Name)	IDC_BUTTON1 (Button C				
~	Group	m				

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4.4.5. 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);



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Step 2: Inserting the following code into the header area

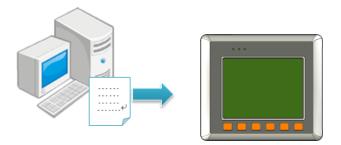
#include "PACSDK.h"

```
#include "stdafx.h"
#include "SDK_InfoDlg.cpp : implementation file
#include "SDK_Info.h"
#include "SDK_InfoDlg.h"
#include "PACSDK.h"
```

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4.4.6. Upload the application to VP-1231-CE7

VP-1231-CE7 supports FTP server service. You can upload files to VP-1231-CE7 or download files from a public FTP server.



Step 1: On the <u>Build</u> menu, and then click <u>Build [Project Name]</u>

File	Edit	View	Project	Build	Debug	Tools	Test	Window	Help
				## E	Build Solu	ition		F7	
				F	Rebuild S	olution	Ctrl-	+Alt+F7	
				(Deploy So	lution			
				(Clean Solu	ution			
					Build SDK	_Info			Ĩ
				F	Rebuild S	DK_Info			
				(Deploy SE)K_Info			
				(Clean SDK	(_Info			
				F	Project Or	nly		+	
				E	Batch Buil	d			-
				(Configura	ition Ma	nager		
				۵	Compile			Ctrl+F7	_

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Step 2: Open the browser and type the IP address of VP-1231-CE7

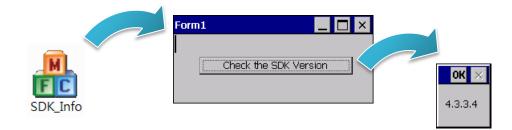
Step 3: Upload the application to VP-1231-CE7

Eile	Edit	⊻iew	<u>G</u> o	F <u>a</u> vorites	
Addr	ess Te	mp			7
	1				Ę
SDK_I	nfo				<u>ک</u>
					<
~	~~~~	\sim	~	\sim	\checkmark

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4.4.7. Execute the application on VP-1231-CE7

After uploading the application to VP-1231-CE7, you can just double-click it on VP-1231-CE7 to execute it.

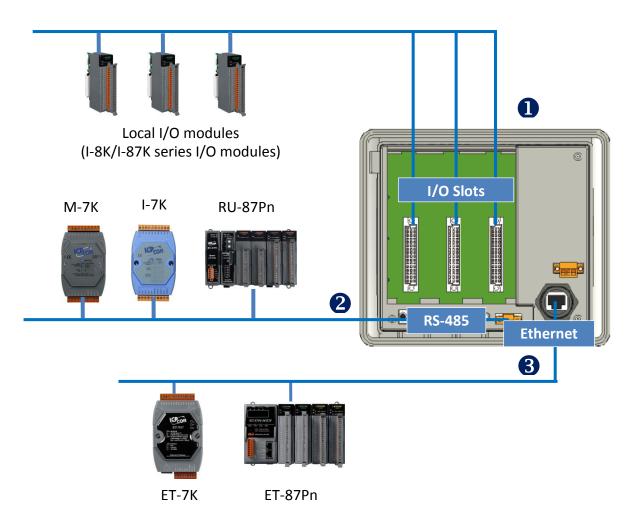


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5. I/O Expansion Modules and SDKs Selection

This chapter describes how to select a suitable expansion I/O module and the corresponding SDK library to be used for developing programs on VP-1231-CE7.

VP-1231-CE7 provides the following I/O expansion buses:



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1. Local I/O Modules (I-8K series and I-87K series)

VP-1231-CE7 has three expansion slots that can be used to add expansion I/O modules. The expansion I/O modules can be divided into two categories: High Profile I-8K series I/O modules and High profile I-87K series I/O modules. The following indicates the appropriate SDK library to be used for I/O modules.

> General I-8K/I-87K series I/O modules

Module	Native SDK	.NET CF SDK
I-8K series	PACSDK.dll	PACNET.dll
I-87K series	PACSDK.dll	PACNET.dll
I-8K series with PWM	PACSDK_PWM.dll	PACNET.dll
I-87K series with PWM	PACSDK_PWM.dll	PACNET.dll

For full details regarding I-87K series I/O modules and its demos, please refer to: <u>http://ftp.icpdas.com/pub/cd/winpac_am335x/demo/vp-x231/pac/applicabled_demo_for_87k_m</u> <u>odule.pdf</u>

> Specified I-8K series I/O modules

Module	Native SDK	.NET CF SDK
I-8014W	pac_i8014W.dll	pac_i8014WNET.dll
I-8017HW	pac_i8017HW.dll	pac_i8017HWNET.dll
I-8024W	pac_i8024W.dll	pac_i8024WNET.dll
I-8026W	pac_i8026W.dll	pac_i8026WNET.dll
I-8048W	pac_i8048W.dll	pac_i8048WNET.dll
I-8050W	pac_i8050W.dll	pac_i8050WNET.dll
I-8084W	pac_i8084W.dll	pac_i8084WNET.dll
I-8088W	pac_i8088W.dll	pac_i8088WNET.dll
I-8093W	pac_i8093W.dll	pac_i8093WNET.dll
I-87088W	PACSDK_PWM.dll	PACNET.dll

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2. RS-485 (I-7000 series and M-7000 series)

I-7000, M-7000, RU-87Pn and high profile I-87K series modules connect to VP-1231-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: <u>http://ftp.icpdas.com/pub/cd/winpac_am335x/demo/vp-x231/pac/applicabled_demo_for_7k_mo_dule.pdf</u>

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:

CD:\vp-x231\demo\nModbus\

> RU-87Pn + I-87K series I/O modules

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

> Other Specified I/O

Module	Native SDK	.NET CF SDK
Others	PACSDK.dll	PACNET.dll

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

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

Module	Native SDK	.NET CF SDK
M-7000 series	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/vp-x231/demo/nmodbus/

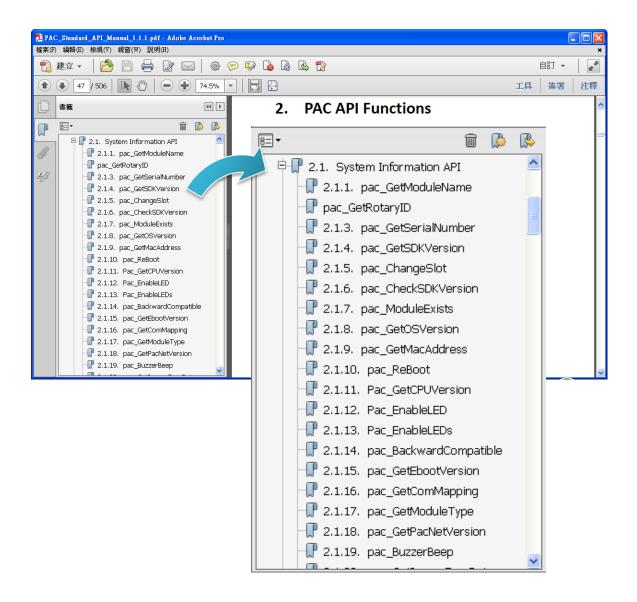
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6. API Resources and Demo References

This chapter provides a brief overview of PAC standard APIs and demos that have been designed for VP-1231-CE7 from the PAC SDK package.

ICP DAS provides a set of demos in different programming languages. You can examine the demo 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.

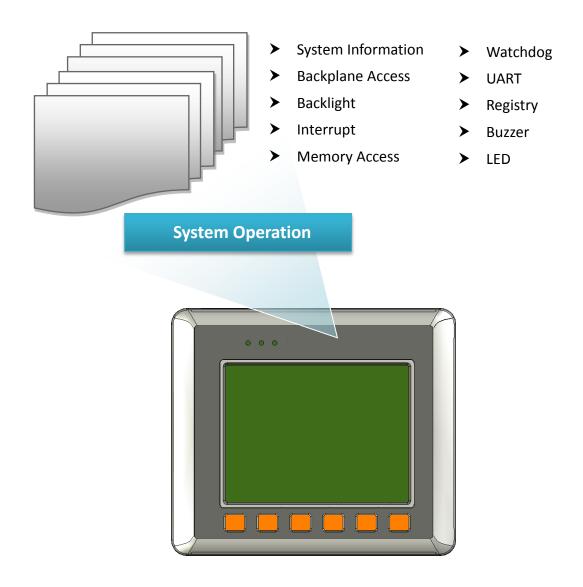
For full usage information regarding the description, prototype and the arguments of the functions, please refer to the "PAC Standard API Manual"



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6.1. PAC Standard APIs for System Operation

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



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6.1.1. VB.NET Demos for PAC Standard APIs

The PAC SDK includes the following demos that demonstrate the use of the PAC Standard APIs in a VB.NET language environment.

The following 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:\vp-x231\Demo\PAC\Vb.net\Standard\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/demo/pac/vb.net/standard/

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

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6.1.2. C# Demos for PAC Standard APIs

The PAC SDK includes the following demos that demonstrate the use of the PAC Standard APIs in a C# language environment.

The following 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:\vp-x231\Demo\PAC\C#\Standard\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/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	
GetRotaryID	GetRotaryID	version, SDK version, etc. 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	

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6.1.3. Visual C++ Demos for PAC Standard APIs

The PAC SDK includes the following demos that demonstrate the use of the PAC Standard APIs in a Visual C++ language environment.

The following 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:\vp-x231\Demo\PAC\Vc2008\Standard\

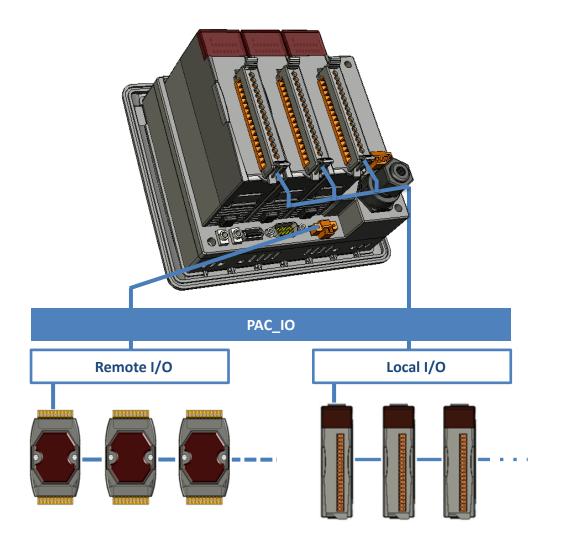
http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/demo/pac/vc2008/standard/

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

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6.2. PAC Standard APIs for I/O Expansion

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



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6.2.1. 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:\vp-x231\Demo\PAC\Vb.net\IO\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/demo/pac/vb.net/io/

Folder	Demo	Explanation		
	find_io	Shows how to retrieve the module names and types which		
		plugged in the VP-1231-CE7.		
		Shows how to read the DI values of DI module.		
	8k_di	This demo program is used by 8K series DI modules.		
		Shows how to write the DO values to DO module.		
	8k_do	This demo program is used by 8K series DO modules.		
		Shows how to read the DI and the DO values of the DIO module.		
	8k_dio	This demo program is used by 8K series DIO modules.		
	07k hasis	Shows how to send/receive a command/response application.		
	87k_basic	This demo program is used by 87K series modules.		
		Shows how use UART API and the IO modules located as slots.		
Local	87K_demo	This demo program is used by 87K series modules.		
	074 6	Shows how to read the AI values of AI module.		
	87k_ai	This demo program is used by 87K series AI modules.		
	87k_ao	Shows how to write the AO values to AO module.		
		This demo program is used by 87K series AO modules.		
	071	Shows how to read the DI values of DI module.		
	87k_di	This demo program is used by 87K series DI modules.		
	074 40	Shows how to write the DO values to DO module.		
	87k_do	This demo program is used by 87K series DO modules.		
	97k dia	Shows how to read the DI and the DO values of the DIO module.		
	87k_dio	This demo program is used by 87K series DIO modules.		
		Shows how to send/receive a command/response application.		
	7k87k_basic	This demo program is used by 7K or 87K series		
Remote		AI modules which connected through a COM port.		
		Shows how to read the AI values of AI module.		
	7k87k_ai	This demo program is used by 7K or 87K series		

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Folder	Demo	Explanation
		AI modules which connected through a COM port.
		Shows how to write the AO values to AO module.
	7k87k_ao	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI values of DI module.
	7k87k_di	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the DO values to DO module.
	7k87k_do	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI and the DO values of the DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

6.2.2. 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:\vp-x231\Demo\PAC\C#\IO\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/demo/pac/c%23/io/

Folder	Demo	Explanation		
	6 I ·	Shows how to retrieve the module names and types which		
	find_io	plugged in the VP-1231-CE7.		
		Shows how to read the DI values of DI module.		
	8k_di	This demo program is used by 8K series DI modules.		
		Shows how to write the DO values to DO module.		
	8k_do	This demo program is used by 8K series DO modules.		
		Shows how to read the DI and the DO values of the DIO module.		
	8k_dio	This demo program is used by 8K series DIO modules.		
	07k hasia	Shows how to send/receive a command/response application.		
	87k_basic	This demo program is used by 87K series modules.		
	Q7K damaa	Shows how use UART API and the IO modules located as slots.		
Local	87K_demo	This demo program is used by 87K series modules.		
	074 6	Shows how to read the AI values of AI module.		
	87k_ai	This demo program is used by 87K series AI modules.		
	87k_ao	Shows how to write the AO values to AO module.		
		This demo program is used by 87K series AO modules.		
	071	Shows how to read the DI values of DI module.		
	87k_di	This demo program is used by 87K series DI modules.		
	97k do	Shows how to write the DO values to DO module.		
	87k_do	This demo program is used by 87K series DO modules.		
	97k dia	Shows how to read the DI and the DO values of the DIO module.		
	87k_dio	This demo program is used by 87K series DIO modules.		
		Shows how to send/receive a command/response application.		
	7k87k_basic	This demo program is used by 7K or 87K series		
Remote		AI modules which connected through a COM port.		
	76976 -	Shows how to read the AI values of AI module.		
	7k87k_ai	This demo program is used by 7K or 87K series		

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Folder	Demo	Explanation
		AI modules which connected through a COM port.
		Shows how to write the AO values to AO module.
	7k87k_ao	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI values of DI module.
	7k87k_di	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the DO values to DO module.
	7k87k_do	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI and the DO values of the DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

6.2.3. Visual C++ Samples for PAC Standard APIs

The PAC SDK includes the following samples that demonstrate the use of the PAC IO 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:\vp-x231\Demo\PAC\Vc2008\IO\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/demo/pac/vc2008/io/

Folder	Demo	Explanation		
	final to	Shows how to retrieve the module names and types which		
	find_io	plugged in the VP-1231-CE7.		
		Shows how to read the DI values of DI module.		
	8k_di	This demo program is used by 8K series DI modules.		
		Shows how to write the DO values to DO module.		
	8k_do	This demo program is used by 8K series DO modules.		
		Shows how to read the DI and the DO values of the DIO module.		
	8k_dio	This demo program is used by 8K series DIO modules.		
	07k hasis	Shows how to send/receive a command/response application.		
	87k_basic	This demo program is used by 87K series modules.		
Local		Shows how use UART API and the IO modules located as slots.		
LUCAI	87K_demo	This demo program is used by 87K series modules.		
	074 6	Shows how to read the AI values of AI module.		
	87k_ai	This demo program is used by 87K series AI modules.		
	87k_ao	Shows how to write the AO values to AO module.		
		This demo program is used by 87K series AO modules.		
	87k_di	Shows how to read the DI values of DI module.		
		This demo program is used by 87K series DI modules.		
	071	Shows how to write the DO values to DO module.		
	87k_do	This demo program is used by 87K series DO modules.		
	97k dia	Shows how to read the DI and the DO values of the DIO module.		
	87k_dio	This demo program is used by 87K series DIO modules.		
		Shows how to send/receive a command/response application.		
	7k87k_basic	This demo program is used by 7K or 87K series		
Remote		AI modules which connected through a COM port.		
		Shows how to read the AI values of AI module.		
	7k87k_ai	This demo program is used by 7K or 87K series		

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Folder	Demo	Explanation
		AI modules which connected through a COM port.
		Shows how to write the AO values to AO module.
	7k87k_ao	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI values of DI module.
	7k87k_di	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the DO values to DO module.
	7k87k_do	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI and the DO values of the DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

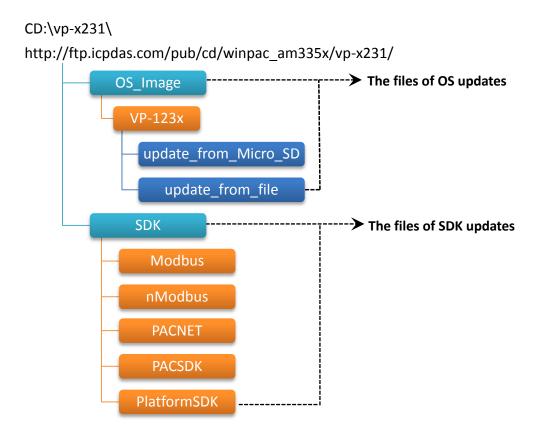
7. VP-1231-CE7 Updates

This chapter provides a guided tour that demonstrates the steps needed to update the VP-1231-CE7 OS and SDKs.

ICP DAS will continue to add additional features to VP-1231-CE7 SDK and OS in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

The file location of the OS and SDK

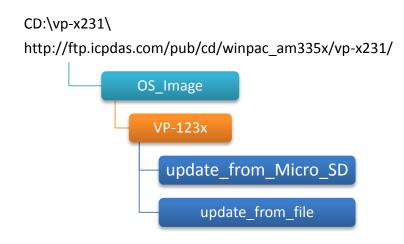
Both the files of OS updates and SDK updates can be found on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.



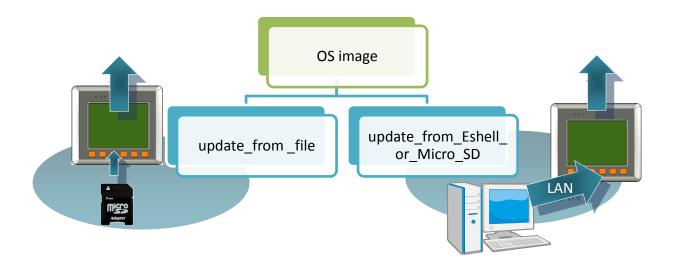
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7.1. OS Updates

The latest version of the VP-1231-CE7 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.



There are two ways to update the OS:

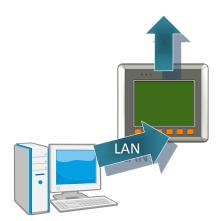


- OS updates from eshell (Please refer to section 7.1.1) (We recommend that you use this one for more quicker and easier to update)
- 2. OS updates from micro_SD (Please refer to section 7.1.2)

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7.1.1. OS Updates from Eshell

By default, the OS update is updated via a LAN. Before updating the OS, make sure the LAN is connected to 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.

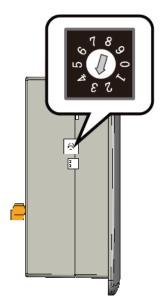
http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/os_image/vp-123x/update_f rom_eshell_or_micro_sd\

Step 2: Run the <u>registry clear.exe</u>

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:\VP-x231\PC_Tools\Eshell http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/pc_tools/eshell/

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



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Step 4: Run the ESHELL.exe, and then restart the VP-1231-CE7-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:\VP-x231\PC_Tools\Eshell

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/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.

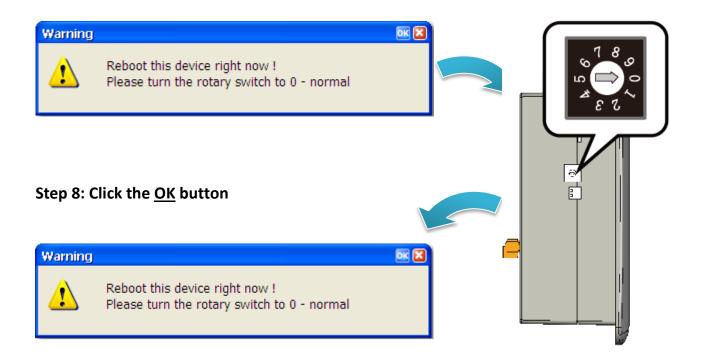
Select Device	
Enter Device Name:	OK
WINPAC	Cancel
Or Select From the List WINPAC	Reset devices to
~	automatically put names on the list.
,	

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

Open					? 🛛		
Look in:	D WP50.bx_5	0140821_Fex10.0		🗢 🗈 💣 (# •		
My Recent Documents	NK.bin						
			Be Bit Josh Option Yo		0 (/R41/ed_2/WinPACharph	olwy-2000_cr50105_imagr/wy-	23+1% 🔽 🗖 🔀
Desktop			UP_WAN98; Bootloader		2: 10.1.0.50, MAC: 00	081F 81A002	
My Documents			Downloading '\\Rdfs\ Jumping to image on Connecting to UP_6440	UP_44498		mage\up-23w1\update_fro	in_Eshell\en\W
My Computer			<				
My Network	File name:	NK.BIN					3
	Files of type:	NK Images (*					
			C. Really				8

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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 9: Check the OS version

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

PAC_Utility			
	PAC Utility [1.2.1.4]		
	File Help		
	General General2 Display]	IP Config Network Device In	formation 🛛 Auto Execution 🗍 Rotary Exe 💽 🕨
	Slot 1:	Module(CPU) Type:	
	Slot 2:	 Serial Number:	01-82-4D-06-18-00-00-DA
	Slot 3:	Backplane Version:	
	Slot 4:	CPU Version:	1.0.0.0
	Slot 5:	OS Version:	1.0.1.1 , 2015/10/30 09:36:5
	Slot 6:	Eboot Version:	1.2.1.0 , 2015/10/22 16:26:0
	Slot 7:	.NET CF Version:	3.5.7338.00
		SQL CE Version:	3.5.8154.0
		PACSDK Version:	4.3.3.4
		CPU Temperature:	

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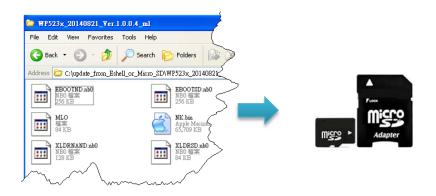
7.1.2. OS updates using micro_SD

The microSD card can be used to reinstall the VP-1231-CE7 OS image to factory default settings in the event of the VP-1231-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.

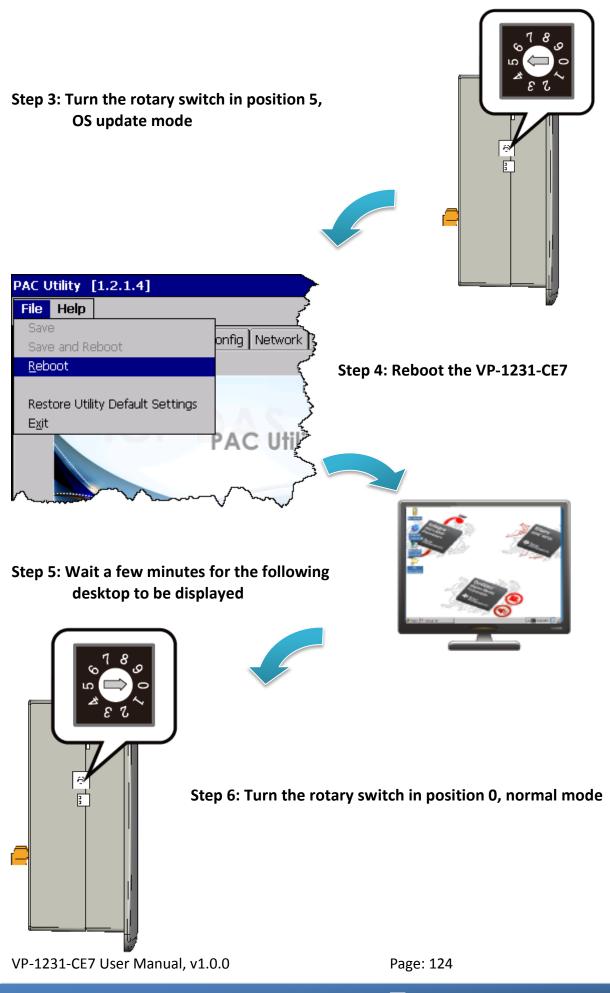
http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/os_image/vp-123x/update_f rom_eshell_or_micro_sd\



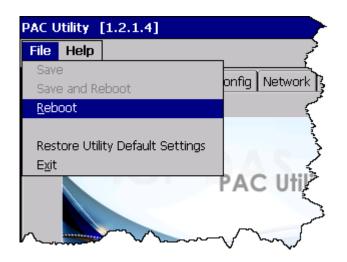
Step 2: Plug the microSD card into microSD slot



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Step 7: Reboot the VP-1231-CE7



Step 8: Check the OS version

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

PAC_Utility			
-	PAC Utility [1.2.1.4]		
	File Help		
	General General2 Dis	splay IP Config Network Device In	formation Auto Execution Rotary Exe া 🕨
	Slot 1:	Module(CPU) Type:	
	Slot 2:	Serial Number:	01-82-4D-06-18-00-00-DA
	Slot 3:	Backplane Version:	
	Slot 4:	CPU Version:	1.0.0.0
	Slot 5:	OS Version:	1.0.1.1 , 2015/10/30 09:36:5
	Slot 6:	Eboot Version:	1.2.1.0 , 2015/10/22 16:26:0
	Slot 7:	.NET CF Version:	3.5.7338.00
		SQL CE Version:	3.5.8154.0
		PACSDK Version:	4.3.3.4
		CPU Temperature:	

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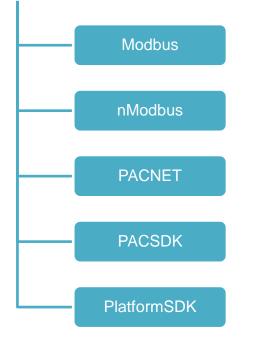
7.2. SDK Updates

SDK update is a part of the VP-1231-CE7 update services to provide additional and more efficient features and functionality for VP-1231-CE7 operating system.

The SDK update 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:\vp-x231\SDK\

http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/sdk/



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7.2.1. SDK Updates for VB.NET or C#

The SDK can be updated by changing the SDK file.

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

The latest version of the PACNET.dll file can be obtained from ICP DAS web site. http://ftp.icpdas.com/pub/cd/winpac_am335x/vp-x231/sdk/pacnet/

Step 2: Copy the latest version of PACNet.dll file to PC and VP-1231-CE7

The PACNET.dll file on PC can be placed anywhere only the solution can reference it. The PACNET.dll file on VP-1231-CE7 is located at the same directory as the .exe file.

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7.2.2. SDK Updates for VB.NET or Visual C++

The SDK can be updated by changing the SDK file.

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/vp-x231/sdk/pacsdk/

Step 2: Copy the latest version of header files and libraries to 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 VP-1231-CE7

The DLL files are located at:

\System_Disk\ICPDAS\System

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8. ViewPAC Download Center

This chapter provides a brief introduction of the ViewPAC download center.

ViewPAC has a download center where you can access the latest version of the software, tools, demo programs, and related information.

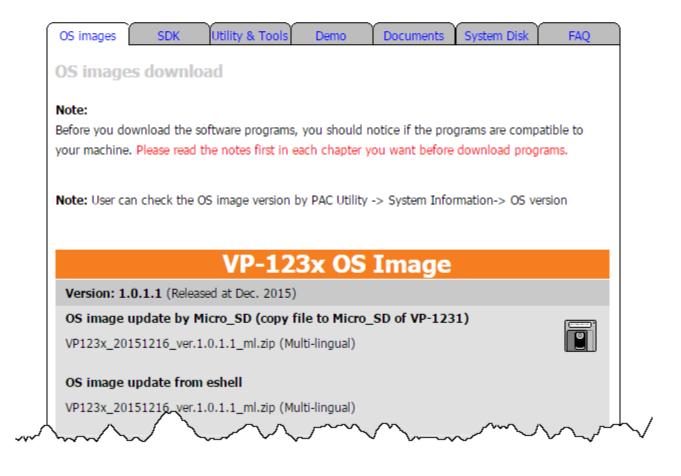
The ViewPAC Download Center can be found at:

http://www.icpdas.com/root/support/download/pac/vp-x23x-ce7/vp-x23x-ce7 download os ima ges.html

VP-x23x Download Center

Note:

When you download the software programs, you should notice if the programs conform to your machine. Before you download any program, please read the notes of each online program first to avoid the confused situation.



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Tips & How to

This chapter provides tips and a guided tour on using and maintaining the VP-1231-CE7.

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A. I-8K and I-87K I/O Modules

There are 3 slots to expand local I/O. And the I/O modules can be parallel bus type (high profile I-8K series) and serial bus type (high profile I-87K series).

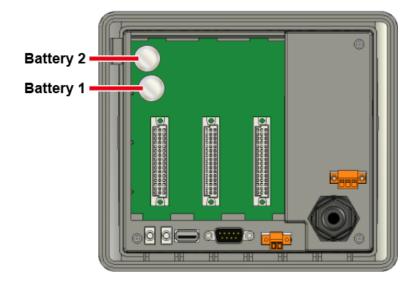
The difference between them is as follows:

Functions	I-8K Series	I-87K Series
Communication interface	Parallel bus	Serial bus
Protocol	-	DCON
Communication speed	Fast	Slow
DI latched function	-	Yes
Counter input (for digital input module)	-	Yes (100 Hz)
Power on value	-	Yes
Safe value	-	Yes
Programmable slew-rate for AO module	-	Yes

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B. How to Change the Battery

RTC and SRAM data is retained by two Li batteries, which can supply continuous power to the 512 KB SRAM to ensure that the data is retained for 5 years. The dual-battery design has the added function of preventing data from being lost while replacing the battery.



The following figures show the location of the two batteries installed in the ViewPAC.

To checking the current battery power:

- Run the PAC utility and check the Battery1 and Battery2 fields that display the current status of each battery. Refer to Section 3.1.3. PAC Utility - Property Tab - General for more details. If the power level for either of the batteries is low, both 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 for either of the batteries is low, it's recommended that the battery is replaced immediately, otherwise the data on the SRAM may be lost or RTC time will be reset.

Tips & Warnings

The battery initial voltage should be around 2.8 V to 3.0 V. When lower than 2.1 V, the PAC Utility will show the low power warning. When lower than 1.5 V, the data in the RTC (real time clock) and 512 KB SDRAM will be lost.

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To replace the battery without losing data:

- 1. Power off the ViewPAC.
- 2. Remove the slot cover and I/O socket inserted into the slot.
- 3. First, remove the battery that is running low on power from the battery holder.
- 4. Insert a new battery.
- 5. Remove the other battery.
- 6. Insert a new battery.

Tips & Warnings



1. If the battery power for only one of the two batteries is low, you can use this method to replace the battery so as to prevent data from being lost. (In the circuit design for the ViewPAC series, when the power for one of the batteries is low, it will automatically switch to the other one to ensure continued battery power)

2. If both batteries have run out of power, the data will be lost, even if this method is used to replace the batteries.

To replace the battery 1/2:

To back up the SRAM data using the backup utility before replacing the battery. Refer to Section "Using the Backup Utility to back up the settings and files" to back up and restore the SRAM data.

- 1. Run the backup utility to back up the SRAM data.
- 2. Power off the ViewPAC.
- 3. Remove the slot cover and I/O socket inserted into the slot.
- 4. Remove both batteries from their respective holders.
- 5. Insert a new battery.
- 6. Power on the ViewPAC.
- 7. Run the backup utility to restore the SRAM data.
- 8. Set the RTC time.

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C. How to Online Debug the VP-1231-CE7 Program

Here are step by step instructions on how to online debug the VP-1231-CE7 program.

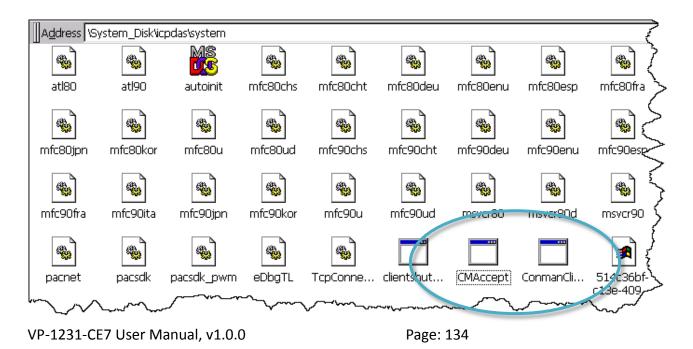
Tips & W	/arnings
	Before starting online debug the VP-1231-CE7 program, make sure that the VP-1231-CE7 SDK has been installed correctly.
	For more information on how to install the VP-1231-CE7 SDK, please refer to 4.1.2. Installing the VP-1231-CE7 SDK.

Step 1: Copy the following files to the \System_Disk\icpdas\system on the VP-1231-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 VP-1231-CE7



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Step 3: On the Tools menu, click the Options

File Edit View Project Build Debug	Tool	s Test	Window	Help	
🛅 🕶 🖽 🕶 🚅 🛃 🎒 👗 🗈 🛍 🔊 🕶		Attach	to Process		Ctrl+Alt+P
AM335x_WINCE7_SDK AF 🕶 🗐 🚛 🚛	3	Device	Security Ma	anager	
	9,	Connec	t to Device.		
And the former and the second	<u>j</u>	<u> Device</u>	Emutator	lanager	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sqrt{CF}$	a~~	gtina	nom
		Externa	l Tools		
		Import	and Export	Settings	
		Custon	ize		
		Option	s		

Step 4: In the left pane, expand <u>Device Tools</u> node and select <u>Devices</u>

# Step 5: In the <u>Show devices for platform</u>:, select <u>AM335x_WINCE7_SDK</u> and then click <u>Properties</u>

Environment	Snow devices for platform:	
Projects and Solutions		
Source Control	AM335x_WINCE7_SDK	
Text Editor	Devices;	
Database Tools		
Debugging	AM335x_WINCE7_SDK ARMV7 Device	ş
Device Tools		
General	Rena	
Devices		
Form Factors	Delete	2
HTML Designer		
Office Tools	Propertie	es
Test Tools		
Text Templating		
Windows Forms Designer		
Workflow Designer		
	Default device:	
	AM335x_WINCE7_SDK ARMV7 Device	
	ОКСС	ancel

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#### Step 6: Click the Configure...

AM335x_WINCE7_SDK ARMV7 Device Properties	2 X
Default output location on device:	
	-
Transport:	
TCP Connect Transport	Configure
Bootstrapper:	
ActiveSync Startup Provider 🔹	Configure
Detect when device is disconnected	
	OK Cancel

### Step 7: Select the Use specific IP address:, and then type the IP address of VP-1231-CE7

Configure TCP/IP Transport	
Use fixed port number:	5655
Device IP address	
Obtain an IP address automa	atically using ActiveSync
Ouse specific IP address:	
10.1.0.96	-
	OK Cancel

## VP-1231-CE7 User Manual, v1.0.0

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

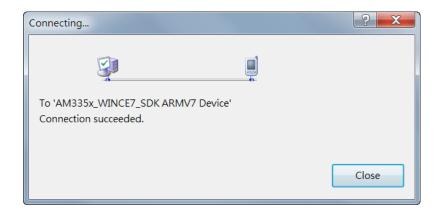
AM335x_WINCE7_SDK ARMV7 Device Propertie	s ? X	
Default output location on device:		
Transport:		
TCP Connect Transport	Configure	
Bootstrapper:		
ActiveSync Startup Provider	Configure	
Detect when device is disconnected		
	OK Cancel	
Options	~	? ×
<ul> <li>&gt; Environment</li> <li>&gt; Projects and Solutions</li> <li>&gt; Source Control</li> <li>&gt; Text Editor</li> <li>&gt; Database Tools</li> </ul>	Show devices for platform: AM335x_WINCE7_SDK Devices: AM335x_WINCE7_SDK ARMV7 Device	Save As
<ul> <li>&gt; Debugging</li> <li>a Device Tools</li> </ul>		
General Devices		Rename
Form Factors THTML Designer		Delete
> Office Tools		Properties
> Test Tools > Text Templating		
> Windows Forms Designer > Workflow Designer		
	Default device:	
	AM335x_WINCE7_SDK ARMV7 Device	
		K Cancel

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

File	Edit	View	Project	Build	Debug	Tools Test Window Help
						Attach to Process Ctrl+Alt+P
						Device Security Manager
					C	🗐 Connect to Device
						Device Emulator Manager
						🖏 Connect to Database
						Connect to Server
						Code Snippets Manager Ctrl+K, Ctrl+B
						man have have a second more thank where the second

#### 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.



VP-1231-CE7 User Manual, v1.0.0

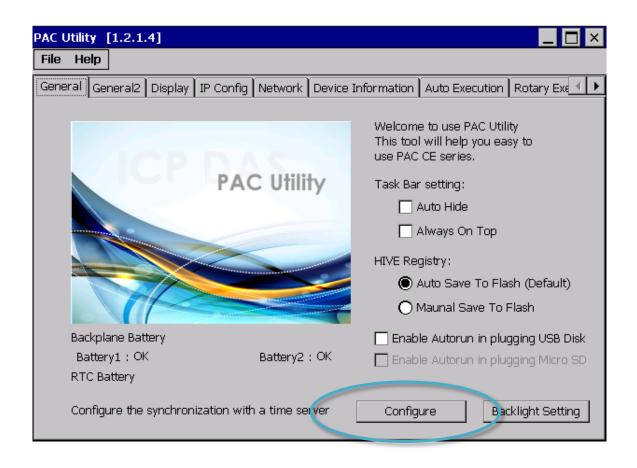
## D. How to Automatically Synchronize VP-1231-CE7 Clock with an Internet Time Server

The clock on the VP-1231-CE7 can be synchronized with an internet time server. This means that the clock is updated to match the clock on the time server, which can help ensure that the time on the VP-1231-CE7 is accurate. Here are step by step instructions on how to synchronize the clock on the VP-1231-CE7 with an Internet time server.

#### Step 1: Run the PAC Utility

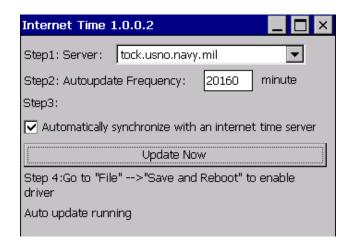


#### Step 2: On the General tab, press Configure button

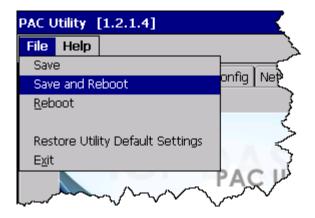


#### VP-1231-CE7 User Manual, v1.0.0

- 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 VP-1231-CE7 will automatically synchronize with an internet time server regularly

	Internet Time 1.0.0.2
Step 7: Click the Update Now button to synchronize VP-1231-CE7 clock immediately	Step1: Server:       tock.usno.navy.mil         Step2: Autoupdate Frequency:       20160         minute       Step3:         Automatically synchronize with an internet time serve;         Update Now         Step 4: Co to "File"> "Save and Reboot" to enable         driver         Auto update running
VP-1231-CE7 User Manual, v1.0.0	Page: 140

# E. How to Control the User Account Control in VP-1231-CE7

User Account Control is a security feature that helps prevent unauthorized system changes to the VP-1231-CE7.

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#### E.1. How to Create a User Account

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

#### Step 1: Run the PAC Utility



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

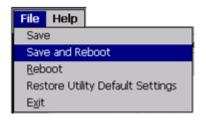
PAC Utilii	ty [1.2.2.	.0]					_ ×
File He	elp						
General	General2	Display	IP Config	Network	Device Information	Auto Execution	Rotary Exe 🔳 🕨
Access	Login						
User N		Passwo					
ICPD4	45		<u>* </u>	Add	Delete		
User	name Pa	assword					

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

PAC Utility [1.2.2.0]
File Help
General General2 Display IP Config Network Device Information Auto Execution Rotary Exe 🚺
Access Login
User Name Password ICP DAS **** Add Delete
User name Password ICP DAS ****

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



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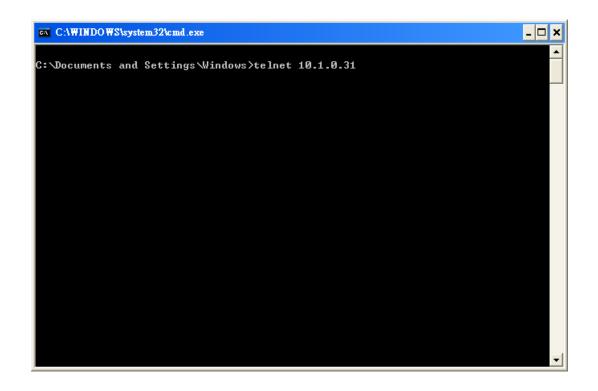
#### E.2. How to Use Telnet to Remote Login the ViewPAC from PC

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

- Marine Ma Marine Marine Mari	Run	×
	Type the 2. Type "cmd"	, you.
☐ Programs ☆ Favorites	Open: cmd	<b>_</b>
	OK Cancel	Browse
Settings		Diowsein
Start 1	and the second sec	

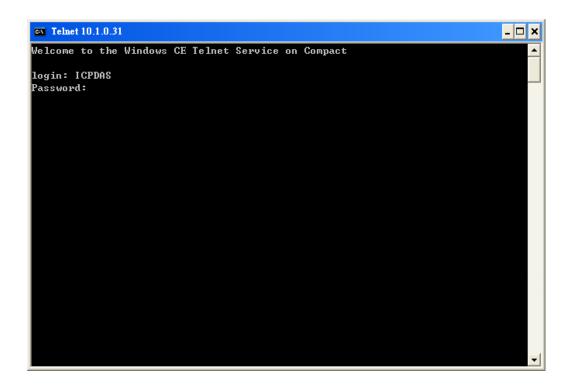
#### Step 1: On the PC, open a MS-DOS command prompt

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

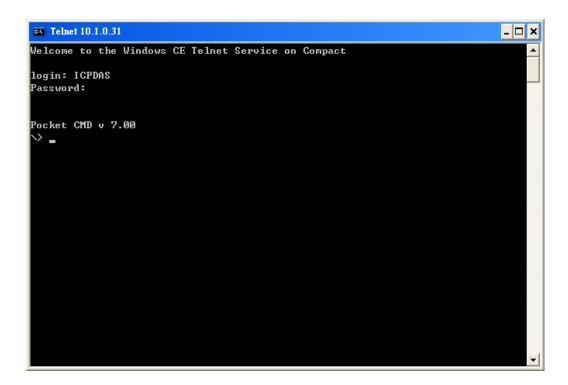


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Step 3: The connection has been set up, and then type the name and password



#### Step 4: The remote login has been completed



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#### E.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

PAC Utility [1.2.2.0]				_ ×
File Help				
General General2 Display IP Config	Network	Device Information	Auto Execution	Rotary Exe 🔳 🕨
Access Login				
User Name Password	Add	Delete		
User name Password				

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

File	Help		
Save	e		
Save and Reboot			
<u>R</u> eboot			
Restore Utility Default Settings			
E <u>x</u> it			

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## F. How to Use the Services Tool

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

phone and the second se	Run	×
	Type the <b>2. Type "cmd"</b>	, you.
Image: Programs ☆ Favorites	Open: cmd	•
Documents     Documents     Settings	OK Cancel	Browse
Start 1	and the second sec	

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

#### Step 2: List all services

[Syntax] services list

File	Edit	Help	]		
Pocket	t CMD	v 5.0			
> ser	vices	list			
FYO:	0x0	003011	0 1	NOTIFY.D11	Running
ITPO:	0x0	003157	0 1	HTTPD.DLL	Running
RDO:	0x0	003207	0 (	credsvc.dll	Running
MQ1:	0x0	003679	0 1	MSMQD.D11	Off
BX0:	0x0	0036Ъ2	0 (	OBEXSrVr.dll	Off
TPO:	0x0	003777	0 )	FTPD.D11	Running
ELO:	0x0	0037ac	0 3	TELNETD.D11	Running
MB0:	0x0	003c3e	0 :	smbserver.dl]	l Running
ITPO:	$0 \times 0$	003fff	0 1	timesvc.dll	Running
>					

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#### Step 3: Type the commands to configure service

[Syntax] services stop <services name>

For example, turn on the "FTP" service:

services stop FTP0:

File	Edit	Help		
Pocket	t CMD	v 5.0		
<pre>&gt;&gt; ser</pre>	vices	stop FTPO:		
<pre>\&gt; ser</pre>	vices	list		
NFYO:	0x00	030110	NOTIFY.D11	Running
HTPO:	0x00	031570	HTTPD.DLL	Running
CRD0:	0x00	032070	credsvc.dll	Running
MMQ1:	0x00	036790	MSMQD.D11	Off
OBX0:	0x00	036b20	OBEXSrVr.dll	Off
FTPO:	0x00	037770	FTPD.D11	Off
TELO:	0x00	037ac0	TELNETD.D11	Running
SMB0:	0x00	03c3e0	smbserver.dll	Running
NTPO:	0x00	03fff0	timesvc.dll	Running
1>				

#### **Tips & Warnings**



For more information about using services tool, just type "services help"

```
File Edit
           Help
Pocket CMD v 5.0
> services help
Commands:
       help - print this text
        list - lists loaded services
        load <service name> - activates a service that is inactive
        stop <service instance> stops/pauses a service (does not un
        start <service instance> - starts/resumes a service
        refresh <service instance> - causes service to refresh its
        unload <service instance> - causes service to be unloaded and
        register <service name> - service will be automatically los
eboot
        unregister <service name> - service will not be automatical
next reboot
        command <service name> [argl arg2 ...] - send service-spe
o service
       help <service name> - get information on what service-spect
are supported
        <service name> - service's name in the registry (i.e. HTTPD
        <service instance> - particular instantiation (i.e. HTPO:)
Flags:
        -f <file name>
        -s silent
        -d output to debugger
\>
```

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# 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	December 2015	Initial issue

VP-1231-CE7 User Manual, v1.0.0