WinPAC-8000 User Manual (Standard series solution)

Version 2.0.3, July 2010

Service and usage information for











Model: WP-8131

Model: WP-8431

Model: WP-8831



Model: WP-8141



Model: WP-8441



Model: WP-8841

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1. Introduction



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

Its operating system, Windows CE 5.0, has many advantages, including hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level, achievable deterministic control and low cost. Using Windows CE.Net 5.0 in the WinPAC-8000 gives it the ability to run PC-based Control software such as Visual Basic.NET, Visual C#, Embedded Visual C++, SCADA software, Soft PLC ...etc.

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

1.1. Features



Windows CE .Net 5.0 Inside

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

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

Remote Maintenance via FTP Server and VCEP Software

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

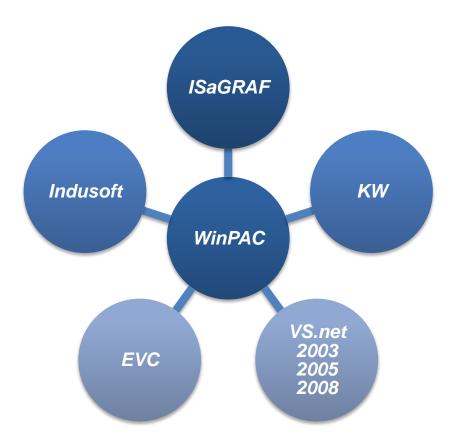
Built-In OPC Server

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

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

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

Rich Software Solutions



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

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

Indusoft provides simple "drag and drop", "point and click" developing environment for HMI and SCADA applications.

Upgrading applications from WinCon to WinPAC just copy and play



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



Power CPU Module

The most important features of the CPU module are

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

Built-in VGA Port

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

64-bit Hardware Serial Number

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

I/O Module Hot Swap Ability

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



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

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

Built-In Flash Disk (31/63 MB)

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

Dual Watchdog Timer

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

Dual Battery-Backup SRAM (512 KB)

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

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

Dual Ethernet Ports

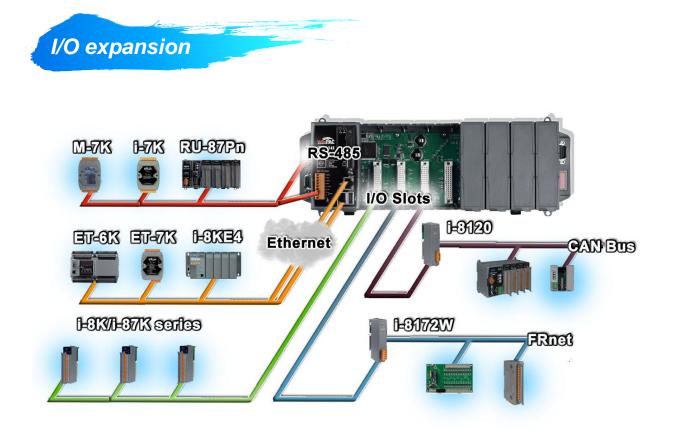
WinPAC-8000 provides two Ethernet ports. The two Ethernet ports can be used to implement redundant Ethernet communication and separate Ethernet communication (one for global Internet, one for private Ethernet).

Redundant Power Input

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

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

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



WinPAC-8000 provides the following I/O expansion bus

Local I/O Slot

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

The difference between them is

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

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Ethernet

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

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

<u>RS-485</u>

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

FRnet

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

CAN Bus

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

1.2. Specifications

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

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

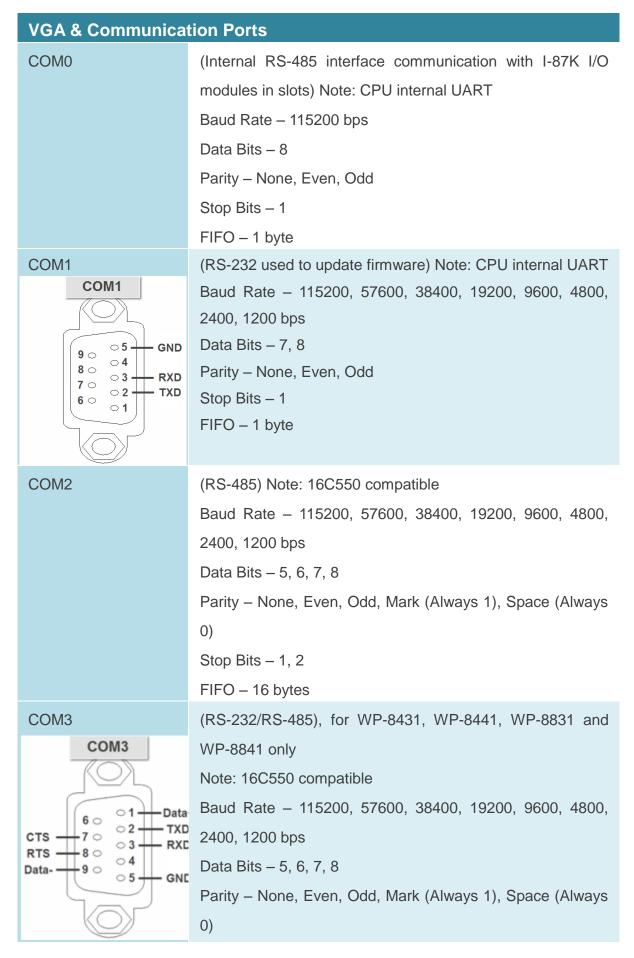
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Rotary Switch	Yes (0 ~ 9)
DIP Switch	Yes (8 bits); for WP-8431, WP-8441, WP-8831 and
	WP-8841 only

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

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

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VGA & Communica	tion Ports
	Stop Bits – 1, 2
	FIFO – 16 bytes
	Tips & Warnings
	COM3 can be configured as either RS-232 or
	RS-485, that only can select one at a time and
	Its configuration depends on the pin connections
	as follows:
	RS-232 (RXD, TXD, CTS, RTS and GND)
	RS-485 (Data+ and Data-)
	There is no software configuration or hardware
	jumper needed.
COM4	(RS-232), for WP-8431, WP-8441, WP-8831 and WP-8841
00114	
COM4 DSR 6 0 1 CD RTS 7 0 2 RXD	only, Note: 16C550 compatible
	Baud Rate - 115200, 57600, 38400, 19200, 9600, 4800,
	2400, 1200 bps
	Derity None Even Odd Mark (Always 1) Space (Always

- GND 0) Stop Bits – 1, 2

RI

90

o 5 -

FIFO - 16 bytes

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

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

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

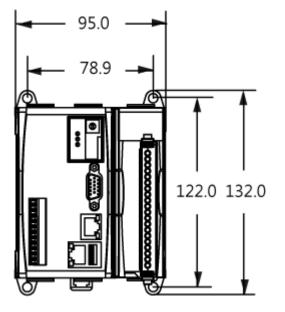
1.3. Dimensions

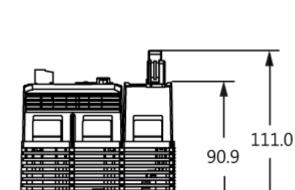
There are several series of WinPAC modules whose overviews depended on the quantity of the slot.

All dimensions in millimeter.

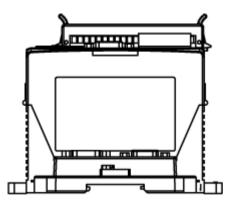




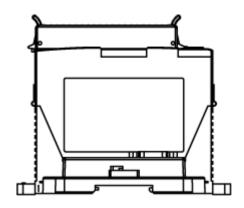




Right Side View



Left Side View

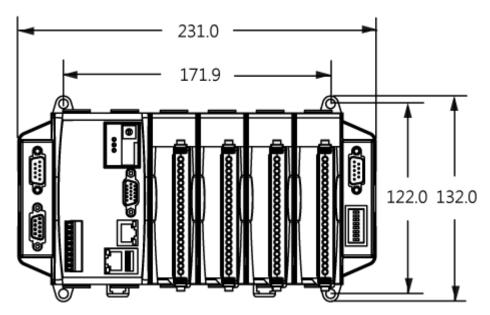


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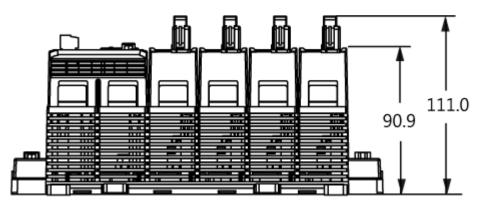
Front View



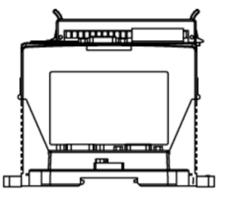
Top View



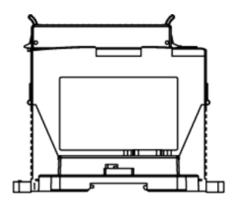
Front View



Right Side View



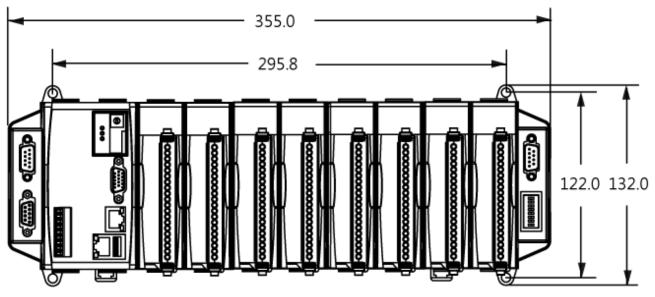
Left Side View



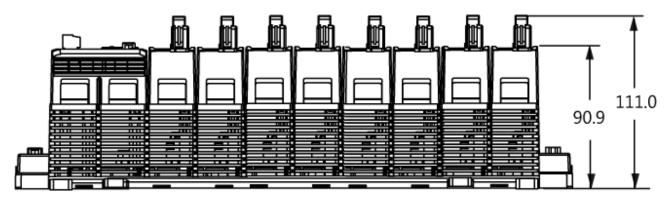
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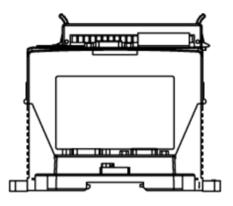
Top View



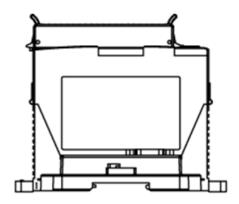
Front View



Right Side View



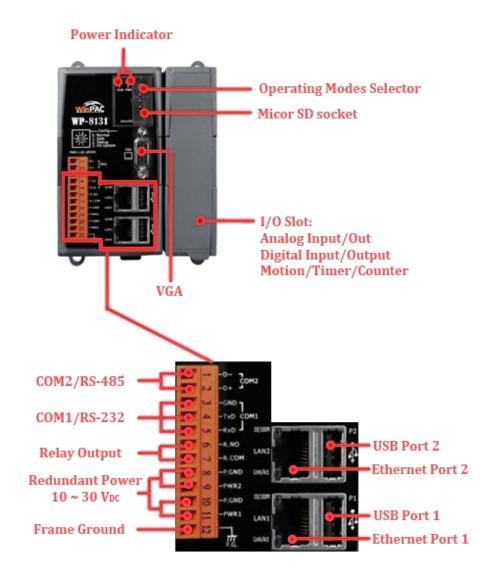
Left Side View



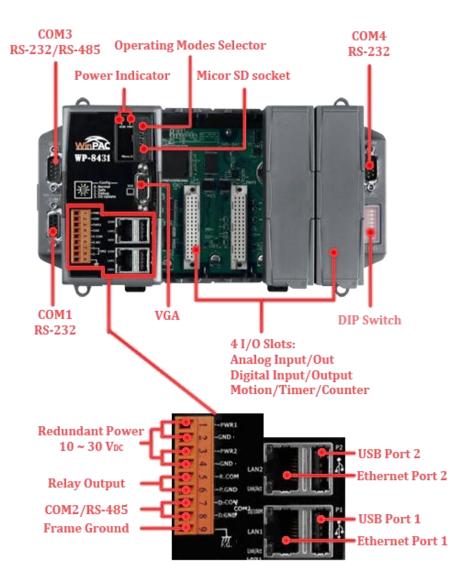
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1.4. Overview

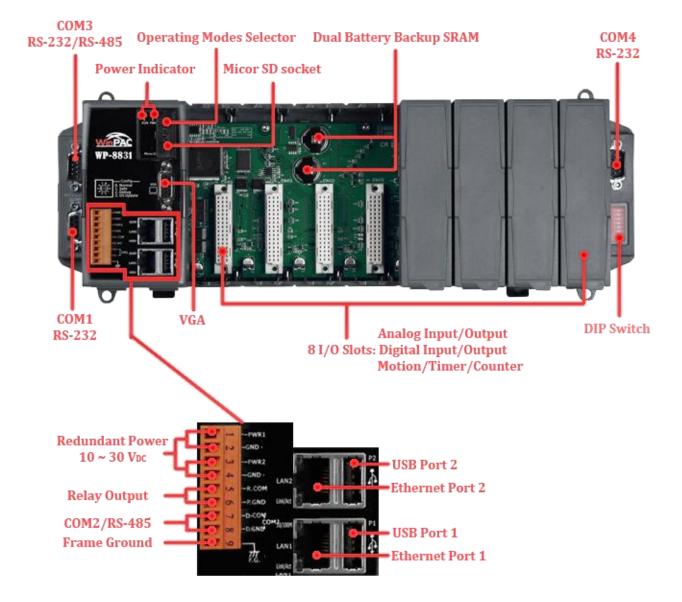


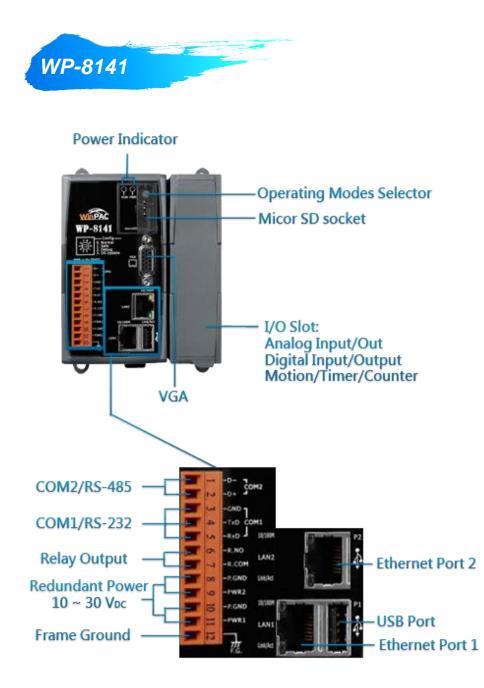








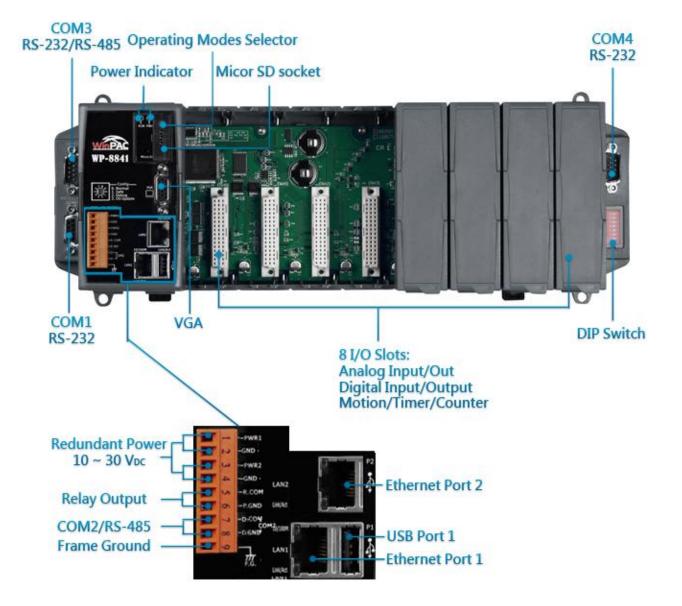






COM3 RS-232/RS-485 Operating Modes Selector Micor SD socket **Power Indicator** P-8441 COM4 **RS-232 DIP Switch** COM1 VGA **RS-232** 4 I/O Slots: Analog Input/Out Digital Input/Output Motion/Timer/Counter PWRI **Redundant Power** GND 10 ~ 30 Vpc PWR2 GND Ethernet Port 2 LAN2 R.COM **Relay Output** POND tielle COM2/RS-485 USB Port 1 Frame Ground 应 Ethernet Port 1





1.5. Companion CD

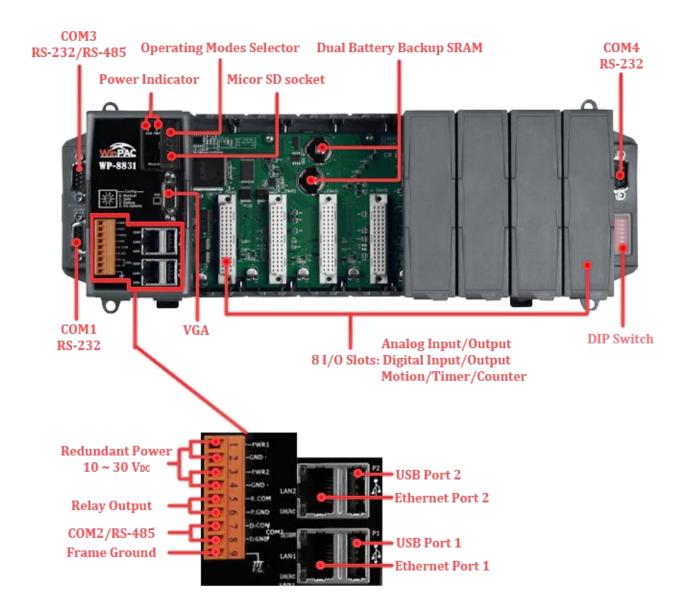
This package comes with a CD that provides drivers, software utility, all of the required documentations..., etc. All of them are listed below.

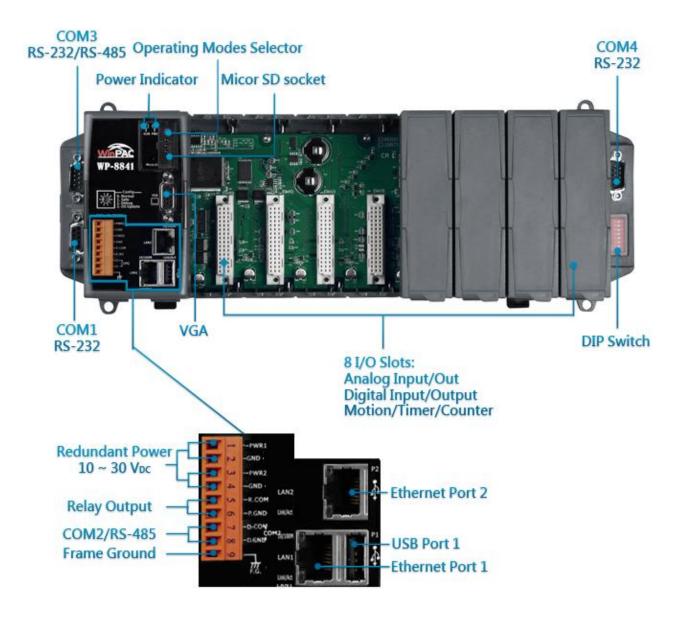
CD:\napdos	
wp-8x3x_c	e50/wp-8x4x_ce50
Bac	ckup
	Backup files related to the documents, OS images, SDKs, etc.
De	emo
	Demos related to WP-8x3x/WP-8x4x
Docu	ument
	Document related to WP-8x3x/WP-8x4x
eLo	gger
	Demos and drivers related to eLogger
Micr	o_SD
	Tools and drivers related to manage the microSD
m	isc
	Files related to miscellaneous
OS_I	Image
	OS_Image related to WP-8x3x/WP-8x4x
PC_	Tools
	Tools related to management WP-8x3x/WP-8x4x that install on PC
S	ОК
	SDKs related to WP-8x3x/WP-8x4x
Syster	m_Disk
	Tools and drivers related to System_Disk that install on WP-8x3x/WP-8x4x
Up	date
	Installation packages related to WP-8x3x/WP-8x4x updates

1.6. Comparison of WinPAC and WinCon

WP-8x3x/WP-8x4x

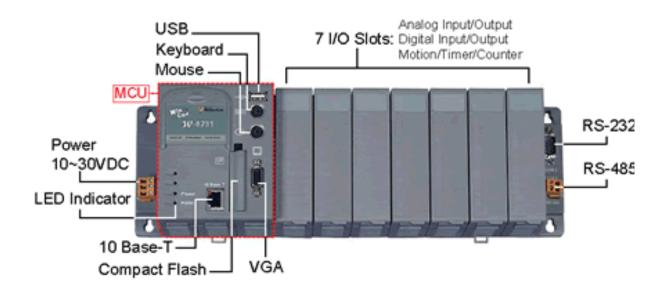
WP-8x3x/WP-8x4x is the second generation of PAC. It is equipped with various connections (VGA, USB, Ethernet, RS-232/485) and 1/4/8 slots for high performance parallel I/O modules (high profile I-8K series) and serial-type I/O modules (high profile I-87K I/O modules). Comparing to the first generation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





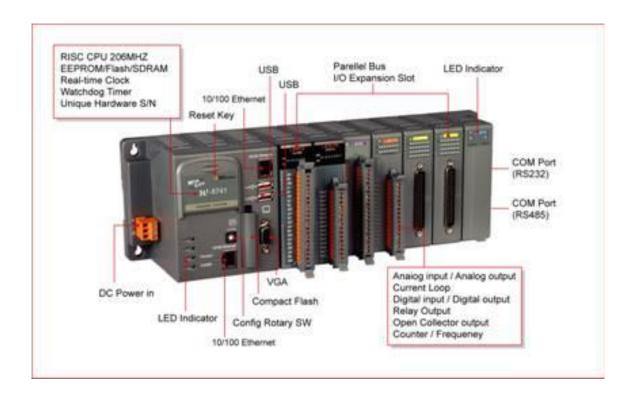
W-8x3x (Phased Out Since 2008)

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



W-8x4x

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



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

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

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

2. Getting Started

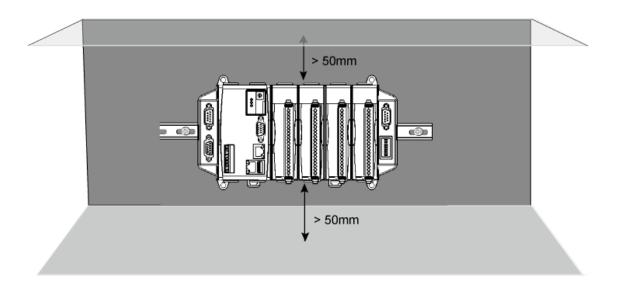
This chapter describes installation, basic configuration and fundamental operating principle needed to install and set up the WinPAC.

2.1. Mounting the Hardware

Step 1: Mounting the WinPAC

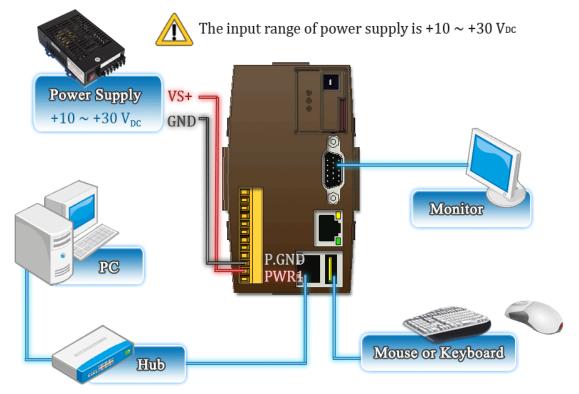
The WinPAC installation must provide proper ventilation, spacing, and grounding to ensure the equipment will operate as specified.

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



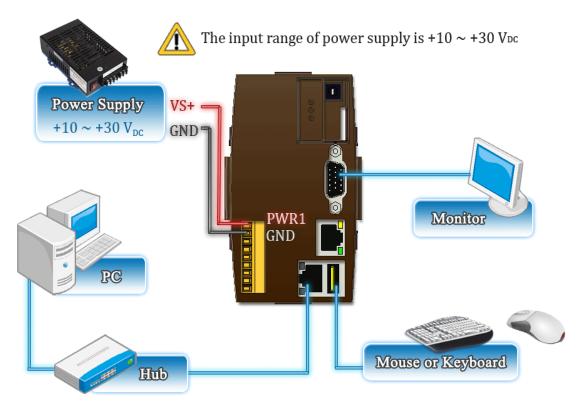
There is a minimum of 50mm clearance between the top and bottom edges of the WinPAC and the enclosure panels.

Step 2: Connecting power and I/O device



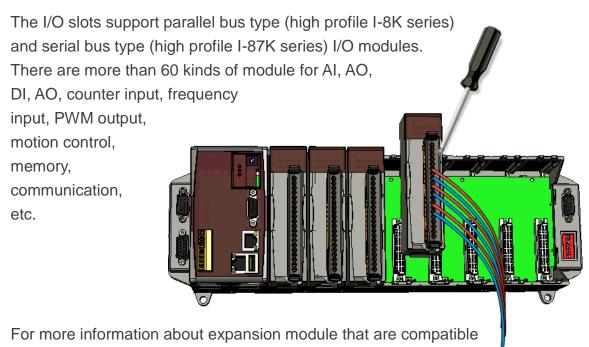
The diagram below shows the connections of the 1 slot of the WinPAC.

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



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2.2. Inserting I/O Modules



with the WinPAC, please refer to

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

Tips & Warnings



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

Step 1: Read the relevant documentation



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

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

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

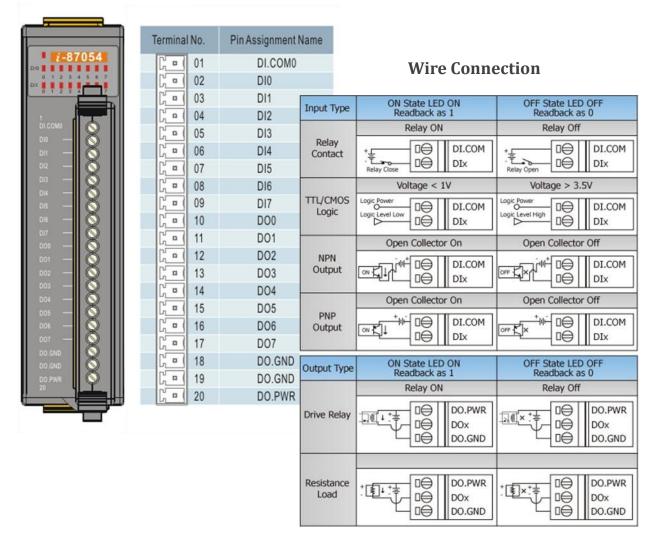
CD:\Napdos\io_module http://www.icpdas.com/products/PAC/winpac/io_support_list.htm

Step 2: Wiring Connections

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

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

Pin Assignments



2.3. Configuring the Boot Mode

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

	Rotary switch position	Modes of operation
	0	Normal mode (Default)
,18,	1	Safe mode
Lu Co	2	Debug mode
53	3	OS update mode
	4	Development mode
	5	DCON_CE
	6	VCEP
	7~9	(For user)

The table below lists the operation mode selection.

Normal mode (Default)

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

Safe mode

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

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

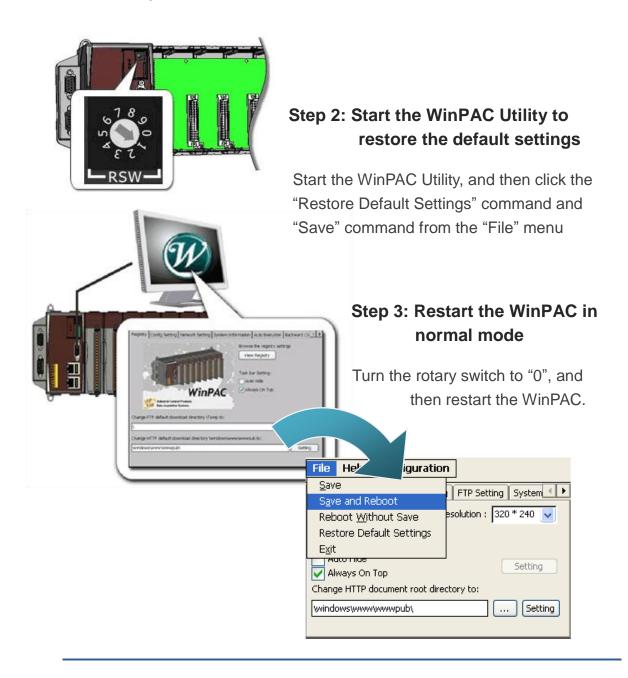
Tips & Warnings



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

Step 1: Restart the WinPAC in safe mode

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



Debug mode

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

OS Update mode

OS update mode is a way used to update OS. To update the WinPAC OS image, please refer to "6.1. OS updates"

DCON_CE mode

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

Tips & Warnings



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

VCEP mode

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

Tips & Warnings



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

User mode

Rotary switch position 7, 8, 9 are reserved for user's applications.

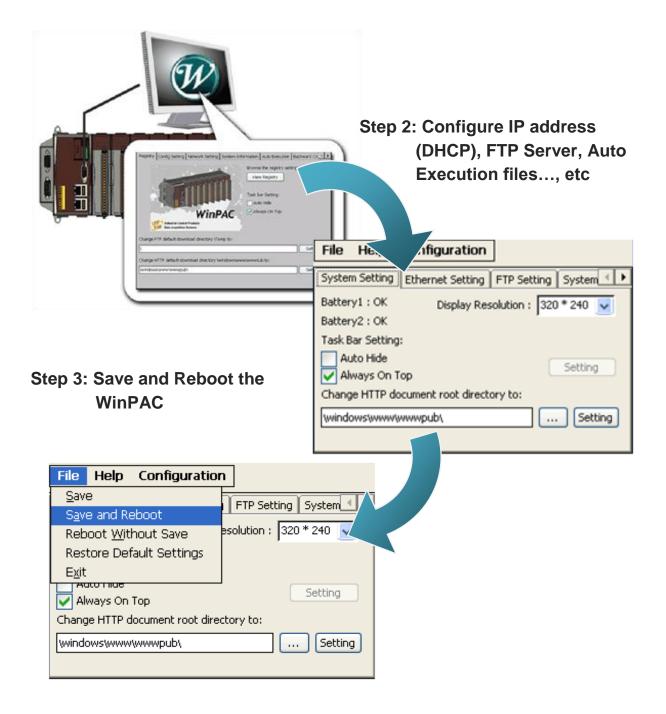
When WinPAC is boot with one of these rotary switch positions, it is boot at normal mode. User's application can check the rotary switch position to run at different mode.

2.4. Using WinPAC Utility to manage the WinPAC

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

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





2.5. Using DCON Utility to Configure I/O Modules

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

Step 1: Run the DCON firmware on the WinPAC

The DCON firmware is located at: \System_Disk\tools\DCON_CE\ Step 2: Run the DCON Utility on Run the DCON firmware the host PC The DCON Utility can be obtained from: ► For WP-8x3x series CD:\Napdos\wp-8x3x_ce50\PC_Tools\DCON_Utility\ http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/pc_tools/dcon_utility/ ➤ For WP-8x4x series CD:\Napdos\wp-8x4x_ce50\PC_Tools\DCON_Utility\ http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/pc_tools/dcon_utility/ Step 3: Click the WIN CE button n 📾 🖻 💷 🕎 🛛 🛛 👮 Start 0 End 255 (Address 0"255) Run the DCON Utility

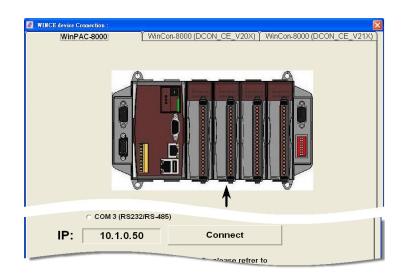
Run the WINCE button

Address 00 [dec] 0 [hex] Baudrate: 9600 Party: None Data Bit: 8 Stop Bit 1

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erching 1 COM Port

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

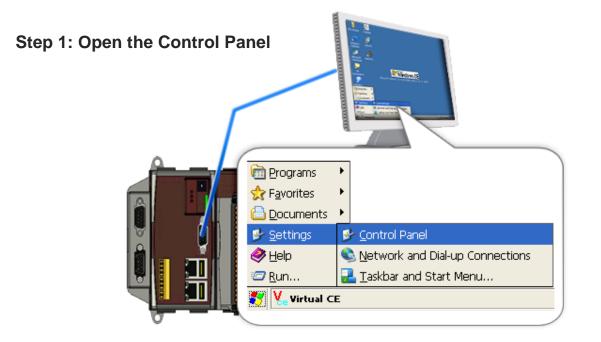


Step 5: Select the module name that you want to configure

DCON_UTILITY_VER[506] The Fou File COM Port Search Run Terminal L	
	Start 0 End 255 (Address 0~255)
module Ad. WinCon8000 1[1] xxxxx S0 115200	m format Status Description N.8.1 WinPAC8000 Sustem(DCDN) onfiguration for 87055 Module Version: A108
87055 S1 115200 xxxxx S2 115200 xxxxxx S3 115200 xxxxxx S4 115200 xxxxxx S4 115200 xxxxxx S4 115200 xxxxxx S5 115200 xxxxxx S5 115200 xxxxxx S6 115200 xxxxxx S7 115200	87055 9 Digital Output 14 0xE MSB (CH-7)
- Searching Status:	Configuration Setting: Modbus Response Delay Time Setting Protocol: DCON Image: Delay Time: Address: 1 Image: Delay Time: Image: Delay Time: Baudrate: 115200 Image: Delay Time: Image: Delay Time: Checksum Disable Image: Delay Time: Image: Delay Time: Image: Delay Time: Power On Value of DO Safe Value of DO Safe Value Set Value Parity Option: None Parity Setting Read Value Read Value Enable WDT First
	Digital Input 0 0x00 LSB (CH:0) MSB (CH:7)
	Host Watchdog Setting Image: Constraint of the set of

2.6. Changing the User Interface Language

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



Step 2: Run the Regional Settings

Step	3: Choose the display language	e, and then click OK
Regional Settings	Regional and Language Se OK X Region Language Input User Interface Language: The option will determine the language used for the menus, dialogs and alerts. English (United States) V English (United States) V Region (Germany) Russian	

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Step 4: Run the WinPAC Utility located on desktop



Step 5: Save and Reboot

File Help Configuratio	n	
<u>S</u> ave	FTP Setting System	
S <u>a</u> ve and Reboot		
Reboot <u>W</u> ithout Save	esolution : 320 * 240 🔽	
Restore Default Settings		
E <u>x</u> it		
Setting		
Always On Top		
Change HTTP document root directory to:		
windows/www/wwwpub/		

2.7. Installing the Touch Panel Driver

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

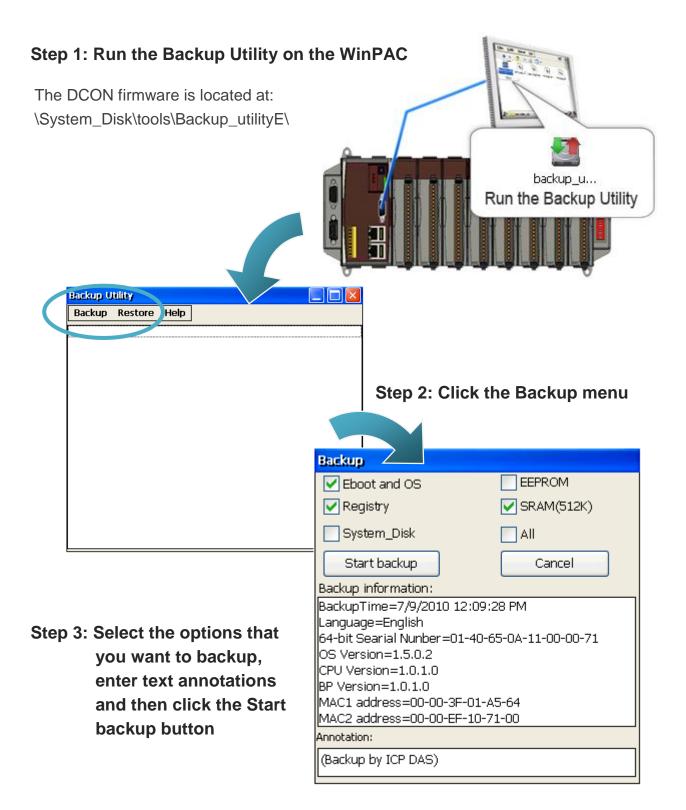
The table below provides a list of supported models and respective device driver names.

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

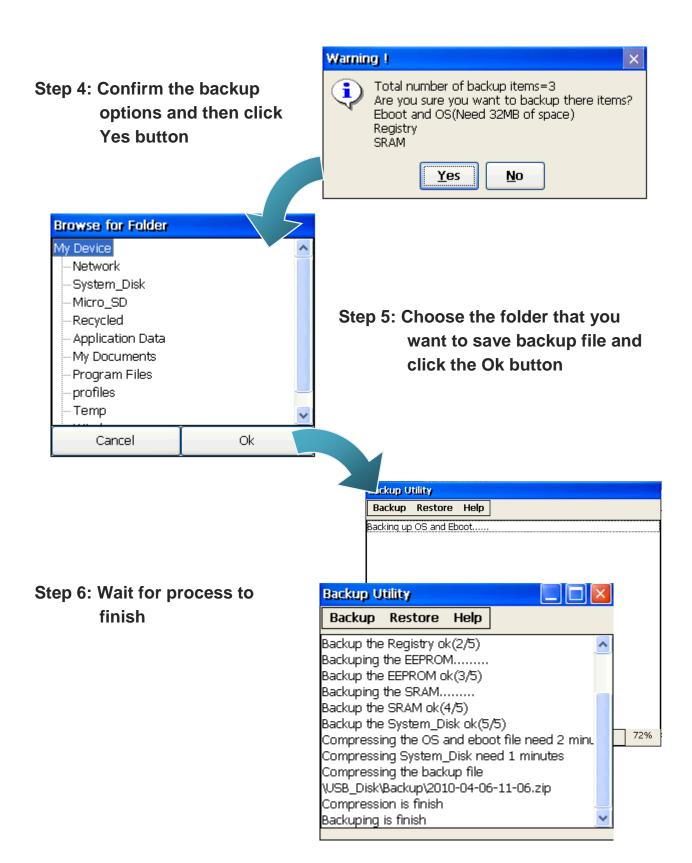
For more information on how to make setting of touch panel driver, please refer to: <u>http://www.icpdas.com/products/PAC/winpac/download/winpac_8000/download_os_im</u><u>ages.htm</u>

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

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



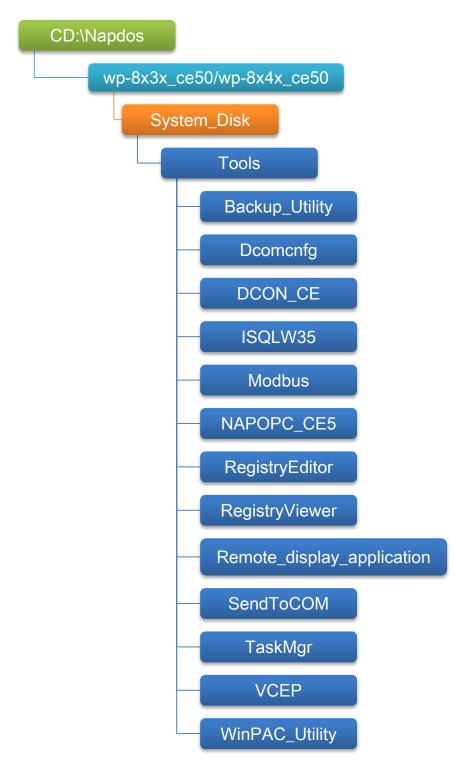
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3. Tools and Tasks

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

Following tools has been installed on the WinPAC.



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• Backup_Utility

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

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

•Dcomcnfg

dcomcnfg.exe for Windows CE to configure your DCOM settings. **NTLMUser.exe** for Windows CE to create local NTLM accounts on the Windows CE Device.

• DCON_CE

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

• ISQLW35

The ISQLW35 implements SQL server compact 3.5 Query Analyzer.

Modbus

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

• NAPOPC_CE5

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

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

RegistryEditor

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

RegistryViewer

The Registry Viewer allows user to view the registry value of Windows CE Operating System.

Remote display application

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

SendToCOM

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

• TaskMgr

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

• VCEP

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

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

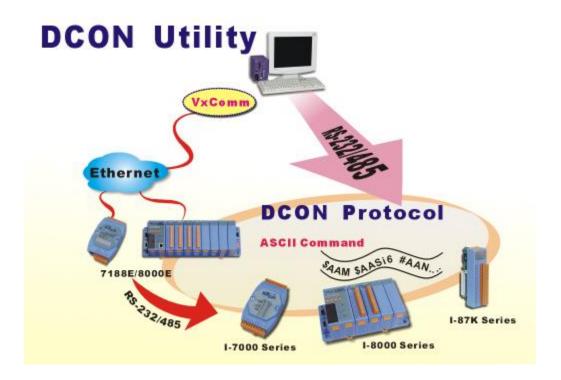
• WinPAC Utility

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

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

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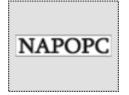
3.1. DCON Utility



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

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

3.2. NAPOPC_CE5



NAPOPC_CE5 DA Server is a free OPC DA Server (The "OPC" stands for "OLE for Process Control" and the "DA" stands for " Data Access") working on WinPAC, ViewPAC & WinCon controllers provided by ICP DAS Ltd. The first standard (originally called simply the OPC Specification and now called the Data Access Specification)

resulted from the collaboration of a number of leading worldwide automation suppliers working in cooperation with Microsoft. Originally based on Microsoft's OLE COM (component object model) and DCOM (distributed component object model) technologies, the specification defined a standard set of objects, interfaces and methods for use in process control and manufacturing automation applications to facilitate interoperability. NAPOPC_CE5 DA Server integrates OPC, Modbus TCP Slave and Modbus RTU Slave three kind Slave services, as well as integrates Modbus TCP Master, Modbus RTU Master and DCON three kind Master communication protocols. It also provides one advanced function "Rule Script" for use in the I/O integration and transformation, and some conditional Logic operation.

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

3.3. SendToCOM

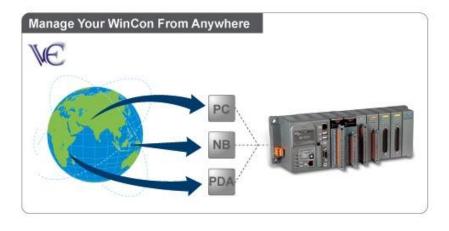
The SendToCOM uses the serial port to communicate with expansion module. To use the SendToCOM, you can send data to expansion module through the serial port, and receive data from other device through the serial port.

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

CD:\Napdos\io_module\87k_high_profile_modules.htm

ICPDAS Send to COM v2.00 Connection Status COM Port Baudrate Data Bit Parity Stop Bit COM Port Baudrate Data Bit Parity Stop Bit COM1 Interval Stop Bit Parity Stop Bit COM1 Interval Interval X	Slot Close
End string with Image: None LF_CR CR CR_LF LF Commands Responses Current Packet Size (bytes) Image: Current Packet Size (bytes) Image: Current Packet Size (bytes) Image: Current Packet Size (bytes) Total Packet Bytes Image: Current Packet Size (bytes) Image: Current Packet Bytes Image: Current Packet Size (bytes) Image: Current Packet Bytes Image: Current Packet Bytes Image: Current Packet Quantity received Image: Current Packet Quantity received Image: Current Packet Quantity received Image: Current Packet Quantity Packet Quantity Packet Quantity Packet Quantity Packet Quantity Image: Current Packet Quantity Packet Quantity Image: Current	string V +CRC Binary String Send Polling Auto send Internal (ms) 500 Start Stop Set Start Time Stop Time Stop Time
	Clear

3.4. VCEP



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

ICPDAS VCEP is composed of two main components: The "Server" which runs on WinPAC. The "Client" which runs on a Desktop PC.

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

For more detailed information on VCEP application, please refer to http://www.icpdas.com/products/PAC/wincon-8000/wincon_VirtualCE.htm

3.5. WinPAC Utility

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

ViewPAC Utility [2.0.0.8]			
File Help Configuration			
System Setting Ethernet Setting FTP	Setting System Information Auto Execution Multi-serial por 💶 🕨		
ViewPAC Notestial Control Products Data Acquisition System	Welcome to use ViewPAC Utility This tool will help you to set ViewPAC. Display Resolution : 640 * 480		
Battery1 : OK	Task Bar Setting:		
Battery2 : OK	🗌 Auto Hide 🛛 V Always On Top		
Change HTTP document root directory \windows\www\wwwsub to:			
\windows\www\wwwpub\	Setting		

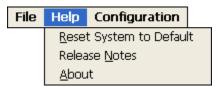
3.5.1. Menu Bar

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

✓ File Menu



✓ Help Menu



✓ Configuration Menu

File	Help	Configuration
		Import Registry Key
		Export Regsitry Key
		Store All Registry Setting
		Dump All Registry Setting

File	Help	Configuration
<u>S</u> ave		
S <u>a</u> vi	e and Re	eboot
Reboot <u>W</u> ithout Save		
Res	tore Def	fault Settings
E <u>x</u> it		

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

Help Menu

File Help Configuration

<u>R</u>eset System to Default Release <u>N</u>otes <u>A</u>bout

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

Configuration Menu

File	Help	Configuration
		Import Registry Key
		Export Regsitry Key
		Store All Registry Setting
		Dump All Registry Setting

The menu commands	Use to
Import Registry Key	Backs up a sub-key of registry by using a registration entry (.reg) file.
	How to use:
	Step 1: Select the "Import Registry Key", then the
	"Open" dialog box will appear Step 2: On the "Open" dialog box, select a
	specific .reg file to import
	Warning:
	 The .reg file which should be saved by "Export Registry Key".
	2. It will not save automatically after import a .reg file.
Export Registry Key	Makes a back up of a registry sub-key
	How to use:
	Step 1: Select the "Export Registry Key", then the
	"Export Registry" box will appear
	Step 2: Select a specific root key
	Step 3: Input a specific path of sub-key
	Step 4: Push the "OK" button, then the "Save As"
	dialog box will appear prompting you to select a
	location where you want to save this exported file
	Warning:
	The export operation will export all the sub-keys of
	the specific key which you input.
Store All Registry	Stores all registry setting to flash from .das file which
Setting	is saved by "Dump All Registry Setting".
	How to use:

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The menu commands	Use to			
	 Step 1: Select the "Store All Registry Setting", then the "Open" dialog box will appear Step 2: On the "Open" dialog box, select a specific .das file to store Warning: 1. The .das file which should be saved by "Dump All Registry Setting". 			
	2. It will save automatically after store .das file.			
Dump All Registry Settings	Dump all registries setting to .das file. How to use: Select the "Dump All Registry Setting", then the "Save As" dialog box will appear prompting you to select a location where you want to save this exported file.			

3.5.2. Property Tabs

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

WinPAC Utility [2.0.1.1]					
File Help Configuration					
System Setting Ethernet Setting FTP	Setting 🛛 System Information 🗍 Auto Execution 🗍 Multi-serial port 🗸 💶 🕨				
Welcome to use WinPAC Utility This tool will help you to set WinPAC - 8000. Display Resolution : 800 * 600					
Data Acquisition System	Setting				
Battery1 : OK	Task Bar Setting:				
Battery2 : OK	🗌 Auto Hide 🛛 🗹 Always On Top				
Change HTTP document root directory \	windows\www\wwwsub to:				
\windows\www\wwwpub\	Setting				

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

System Setting Tab

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

WinPAC Utility [2.0.1.1]				
File Help Configuration				
System Setting Ethernet Setting FTP	Setting System	Information	Auto Execution	Multi-serial port 🗸 🕨
WinPAC	This tool will he		NPAC Utility WINPAC - 8000.	
Data Acquisition System			Setting	
Battery1 : OK	Task Bar Settin	g:		
Battery2 : OK	Auto Hide	Always C	On Top	
Change HTTP document root directory \	windows\www\	www.pub.to:		
\windows\www\wwwpub\			Settir	ng

path.

The tab use to	How to use		
Adjust the size of the desktop	Select a display resolution from the		
	Resolution list.		
Lock or Auto-Hide the taskbar	Auto-Hide:		
	Select the Auto Hide check box		
	Lock:		
	Select the Always On Top check box.		
Check the status of the battery	See the Battery1 and Battery2 field that		
	displays the battery status.		
Change the HTTP directory path	Enter a new path in the Change HTTP		
	document root directory		
	\windows\www\wwwpub to field, and then		
	press the Setting button.		

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Ethernet Setting Tab

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

WinPAC Utility [2.0.1.1]					
File Help Config	uration				
System Setting Ethe	rnet Setting	FTP Setting	System Information	Auto Execution	Multi-serial port 🗸 🕨
LAN1 LAN2					
MAC Address 1:		D-01-6C			
LAN 1 IP Address	-	_			
 Use DHCP to Assign IP add 	-	5			
IP Address:	10.1.0.91				
Mask:	255.255.0.0				
Gateway:	10.1.0.254				
DNS Server:	10.0.0.33		Setting		

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

FTP Setting Tab

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

WinPAC Utili	ity [2.0.1.1]
File Help	Configuration
System Setti	ing Ethernet Setting FTP Setting System Information Auto Execution Multi-serial port 🗤 💶 🕨
	FTP
	Allow Anonymous 💿 Enable 🔵 Disable
	Allow Anonymous 💿 Enable 🔘 Disable Upload
	Change FTP default download directory \Temp to:
	\Temp\
	Setting

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

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

System Information Tab

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

WinPAC Utility [2.0.1.1]								
File Help Configuration								
System Setting Ethernet	System Setting Ethernet Setting FTP Setting System Information Auto Execution Multi-serial port 💶							
Slot 0:	Module Type: Serial Number:	WP-844x (96MB) 01-CA-89-81-12-00-00-06						
Slot 2:	OS Version: Eboot Version:	1.4.1.2 , 2009/07/23 18:33:54 1.0.5.6 , 2009/01/22 15:59:42						
Slot 3:	Backplane Version:	1.0.2.0						
Slot 4:	CPU Version:	1.0.8.0						
Slot 5:	WinPacSDK Version:	1, 0, 9, 0						
Slot 6:	WinPacNet Version:	1.2.0.6						
Slot 7:	.NET Framework Version:	2.0.7045.00						
0.0007.	SQL CE Version:	3.5.5386.0						
	Last Save Date:	Tuesday, May 05, 2009						

Auto Execution Tab

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



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

WinPAC Utility [2.0.1.1]						
File Help Config	uration					
System Setting Ethe	ernet Setting	FTP Setting	System Information	Auto Execution	Multi-serial po	rt v 🔹 🕨
	Program 1:				Browse	
	Program 2:				Browse	
	Program 3:				Browse	
	Program 4:				Browse	
	Program 5:				Browse	
At most 10 programs can be	Program 6:				Browse	
specified to execute automatically at system startup.	Program 7:				Browse	
	Program 8:				Browse	
	Program 9:				Browse	
	Program 10:				Browse	
			Settir	ng		

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

Multi-Serial Port Wizard Tab



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



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

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

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

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

WinPAC Utility [2.0.1.1]				
File Help Configuration				
Ethernet Setting FTP Setting Syste	m Information Auto	Execution Multi-	-serial port wizard	System 4 🕨
Slot 0: Slot 1: Slot 2: 8144 Slot 3: Slot 4:	■-棘 Slot2 - m MSA1 - m MSA2 - m MSA3 - m MSA4			river enabled river disabled
Slot 5:	Install driver			
Slot 7:		et >"Save and Re	aboot" to enable dri	ver

System Memory Setting Tab

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

WinPAC Utility [2.0	.1.1]			×
File Help Config	uration			
Auto Execution Mult	ti-serial port wizard System M	lemory Setting Backplane	e Compatibility	•
	Move slider to the left for mo programs. Move slider to the room. Only unused RAM can	right for more storage		
Storage Memory			Program Memory	
Allocated	: 49128KB	Allocated:	49128KB	
In Use:	6916KB	In Use:	14248KB	
			Setting	

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

Backplane Compatibility Tab

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

WinPAC Ut	ility <u>(</u> 2.0.1	.1]						×
File Help) Configu	ration						
Auto Execu	tion Multi-	serial po	ort wizard	System N	lemory Setting	Backplane	Compatibility	•
			tting may le un on the fo		support old pro evice.	grams		
		() W	'inPAC 8000	I				
		Oc	OM Port Bad	kward Co	mpatible for W	inCon		
		Support	Devices:				7	
		W-8x	3x Series:		W-8x4x Series	:		
		W-83	31 / 8039-0 31 / 8339-0 31 / 8739-0	3	W-8041 / 8047 W-8341 / 8347 W-8741 / 8747	/ 8349-G		
						Setting		

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

4. Your First WinPAC Program

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

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

4.1. Preparing the Development Tools

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

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

4.2. Installing WinPAC SDKs

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

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

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

- Step 2: Execute the "PAC270_SDK_YYYYMMDD.msi" which is located in
- For WP-8x3x series
 CD:\Napdos\wp-8x3x_ce50\SDK\
- For WP-8x4x series
 CD:\Napdos\wp-8x4x_ce50\SDK\

Step 3: Follow the prompts until the installation is complete

4.3. Understanding the WinPAC SDK

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

Requirements

The WinPAC SDK only supports NET Framework 2.0 or above.

Installation Path

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

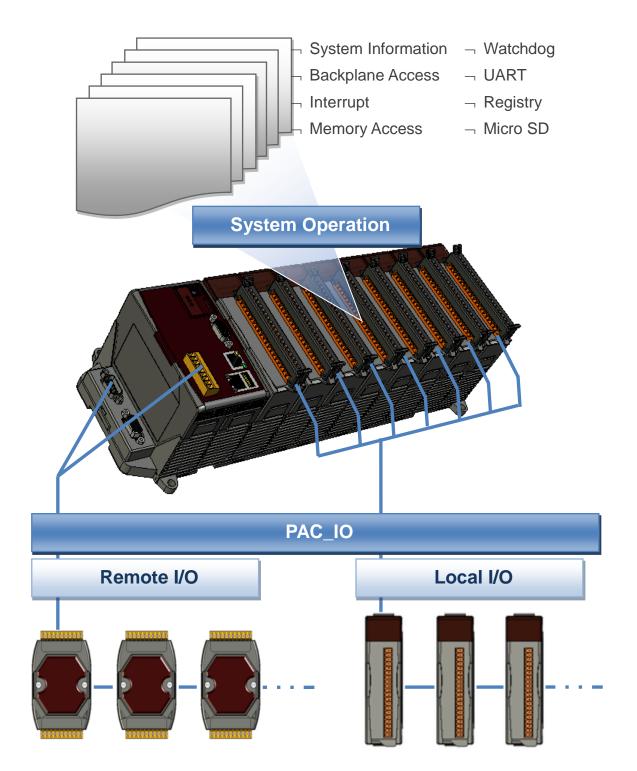
Header files:

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

Libraries:

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

4.3.1. WinPAC SDK Overview



• SystemInformation Functions

Provides reference information for the system status.

• Backplane Access API

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

Interrupt API

Provides reference information for the Interrupt APIs

• Memory Access API

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

• Watchdog Functions

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

• Uart API

Provides reference information for the Uart APIs.

• Registry API

Provides reference information for the registry.

MicroSD Management API

Provides reference information for the MicroSD Manager.

• PAC_IO API

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

• Error Handling API

Provides reference information for error handling.

4.3.2. WinPAC SDK Reference

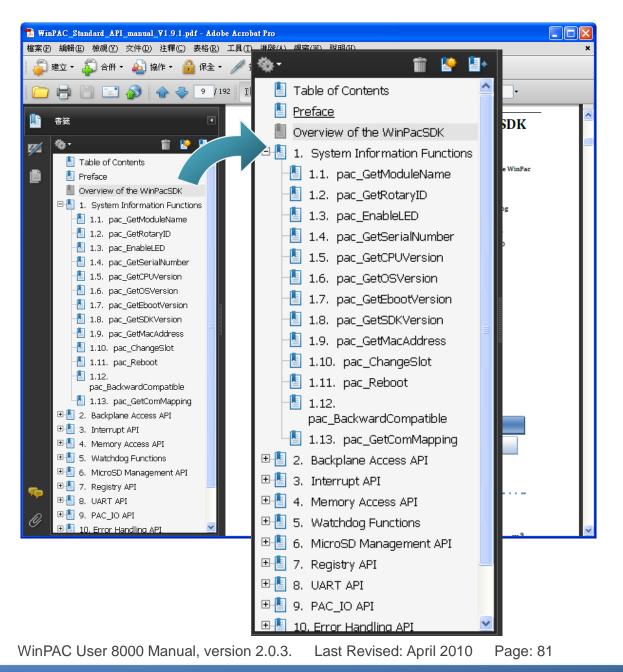
For full usage information regarding the description, prototype and the arguments of the functions, please refer to the "WinPAC Standard API Manual" located at:

► For WP-8x3x series

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

► For WP-8x4x series

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



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4.4. Your First Program in C#

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

Depending on the version of

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

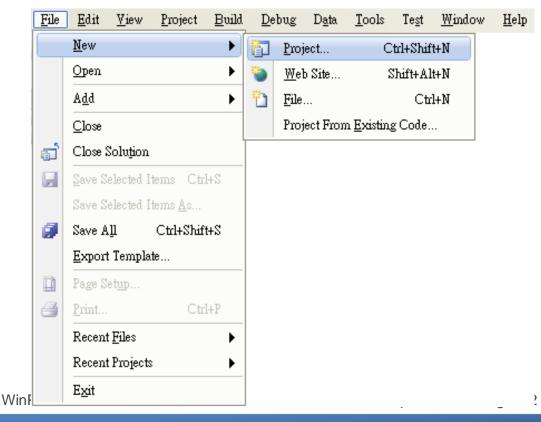
- 1. Create a new project
- 2. Add project reference for an application
- 3. Design and Build an application program
- 4. Execute the application on the WinPAC

All main steps will be described in the following subsection.

4.4.1. Create a new project

Step 1: Start the Visual Studio 2005

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



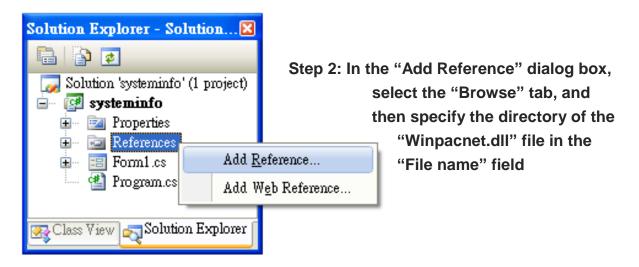
New Project				? 🛛
		Templates: Visual Studio installed templates Device Application Console Application Empty Project My Templates Search Online Templates		2m
A project for creating	ng a .NET Comnact Fr	amework 2.0 forms application for 7	Windows CE 5.0 and later	
<u>N</u> ame:	systeminfo			
Location:	C:\Windows CE Too	ls\C#		✓ <u>B</u> rowse
Solution:	Create new Solution	~	Create directory for solution	
	Solution Na <u>m</u> e:	systeminfo		
				OK Cancel

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

Step 4: Click OK to start creating a "systeminfo" project

4.4.2. Add project reference for an application

Step 1: On the "Solution Explorer" window, right-click the "Reference" and then click the "Add Reference..." command



The "winpacnet.dll" file can be obtained from:

► For WP-8x3x series:

CD:\Napdos\wp-8x3x_ce50\SDK\WinPacNet\

http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/sdk/winpacnet/

► For WP-8x3x series:

CD:\Napdos\wp-8x4x_ce50\SDK\WinPacNet\

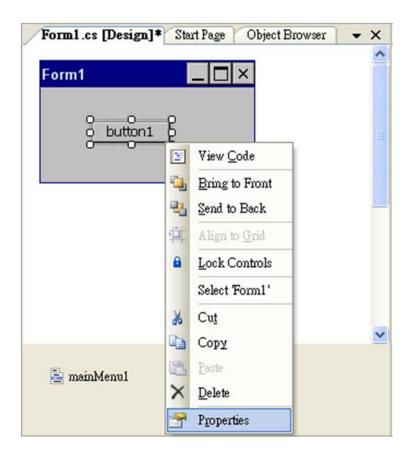
http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/sdk/winpacnet/

Add Reference		? 🔀
NET COM Location:	Projects Browse Recent	
File Name: File Types:	WinPacNet.dll Component Files (*.dll;*.tlb;*.olb;*.ocx;*.exe;*.manifest) OK Ca	▼ ▼

4.4.3. Design and Build an application program

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

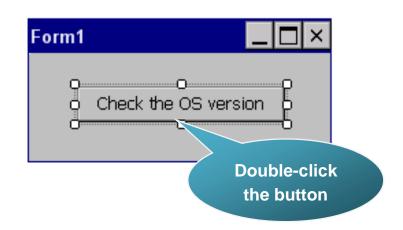
Step 2: Right-click the "button" object and click the "Properties" command



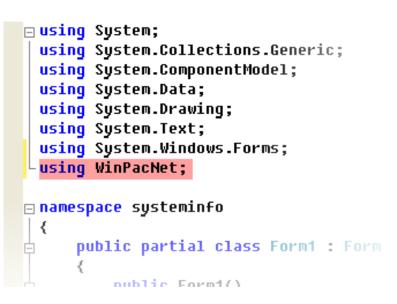
Step 3: On the "Properties" window, type "Check the OS version" in the "Text" edit box

Pro	operties		×		
button1 System.Windows.Forms.Button					
	2↓ 💷 🖋 ⊨ 📼				
	ImageKey	(none)	^		
	ImageList	(none)			
	RightToLeft	No	-		
	Text	Check the OS version 🗸			
	TextAlign	MiddleCenter			
	TextImageRelation	Overlay			
	11 V/ ·	Ψ			
Text The text associated with the control.					
	Class View 💦 Solu	ation Explorer 🕋 Properties			

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



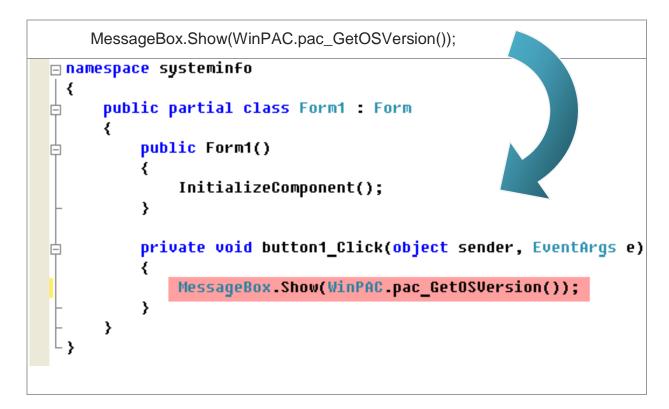
Step 5: Insert the "using WinPACNet;" into the header area after "using System.Windows.Forms;"



Tips & Warnings

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

Step 6: Insert the following code in the Editor Window



4.4.4. Execute the application on the WinPAC

Step 1: On the "Build" menu, click the "Build Solution" command

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>P</u> roject	<u>B</u> uild	Debug	D <u>a</u> ta	F <u>o</u> rmat	<u>T</u> ools	Te <u>s</u> t	<u>W</u> indow	<u>H</u> elp
				*	<u>B</u> uild Solu	tion Ci	trl+Shift+B				
					<u>R</u> ebuild So	lution					
					<u>D</u> eploy Sol	lution					
					<u>C</u> lean Solu	tion					
					B <u>u</u> ild syste	minfo					
					R <u>e</u> build sy	steminfo					
					De <u>p</u> loy sys	teminfo					
					Clea <u>n</u> syste	minfo					
					Ba <u>t</u> ch Buil	d					
					C <u>o</u> nfigurat	ion Man	ager				

- Step 2: Open the web browser and type the IP address to connect the FTP server of WinPAC
- Step 3: Upload the "systeminfo.exe" application and the corresponding "Winpacnet.dll" file to the WinPAC via the WinPAC FTP server

Tips & Warnings



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



Step 4: On the WinPAC, execute the uploaded file



4.5. Your First Program in VB.net

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

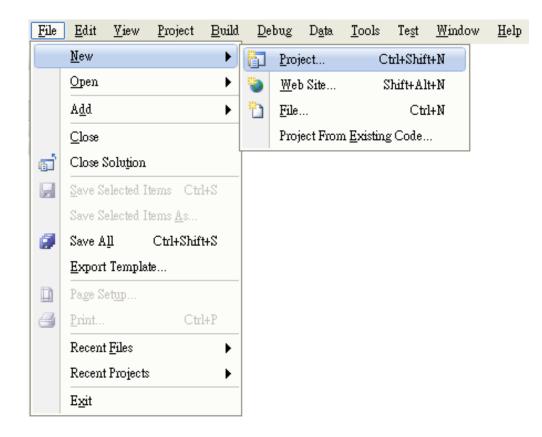
- 1. Create a new project
- 2. Add project reference for an application
- 3. Design and Build an application program
- 4. Execute the application on the WinPAC

All main steps will be described in the following subsection.

4.5.1. Create a new project

Step 1: Start the Visual Studio 2005

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



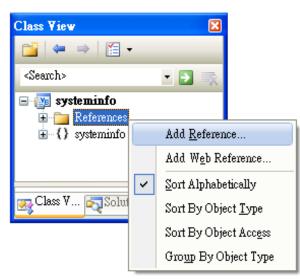
New Project				? 🔀
<u>P</u> roject types:]	[emplates:		
 Visual C# Windows Smart Devi Database Starter Kits Other Language Visual Basi Windo Smart I 	es c WS	Visual Studio installed ten Device Application Control Library Empty Project My Templates	aplates Class Library Console Application	
Poo	ket PC 2003 artphone 2003 ndows CE 5.0 se Kits	🛐 Search Online Templates		
		nework 2.0 forms application for 1	Windows CE 5.0 and later	
<u>N</u> ame: Location:	systeminfo C:\Windows CE Tool:	s\VB.net		✓ <u>B</u> rowse
Solution:	Create new Solution	•	Create directory for solution	
	Solution Na <u>m</u> e:	systeminfo		
			OK	Cancel

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

Step 4: Click OK to start creating a "systeminfo" project

4.5.2. Add project reference for an application

Step 1: On the "Class View" window, right-click the "Reference" and then click the "Add Reference..." command



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

The "winpacnet.dll" file can be obtained from:

► For WP-8x3x series:

CD:\Napdos\wp-8x3x_ce50\SDK\WinPacNet\

http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/sdk/winpacnet/

► For WP-8x3x series:

CD:\Napdos\wp-8x4x_ce50\SDK\WinPacNet\

http://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/sdk/winpacnet/

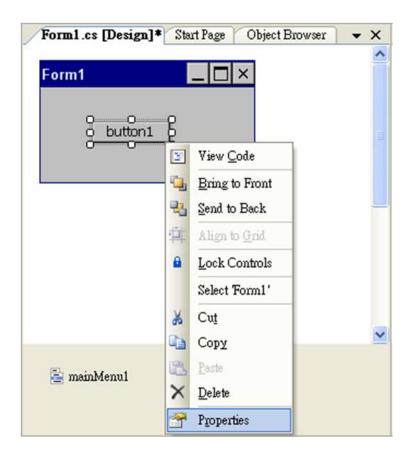
	Add Reference	? 🗙
	NET COM Projects Browse Recent	
	Location: 🗁 WinPacNet <table-cell> 🔇 🌮 🖽 -</table-cell>	
	File Name: WinPacNet.dll	~
	File Types: Component Files (*.dll;*.tlb;*.olb;*.ocx;*.exe;*.manifest)	
WinPAC 8		age: 92

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4.5.3. Design and Build an application program

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

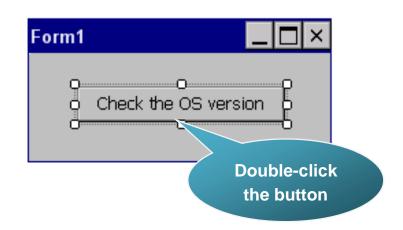
Step 2: Right-click the "button" object and click the "Properties" command



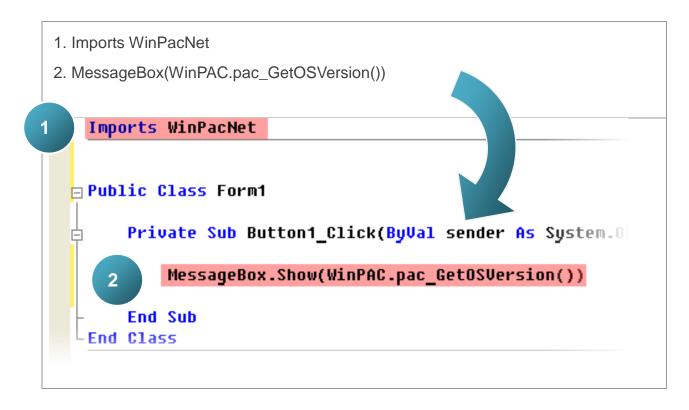
Step 3: On the "Properties" window, type "Check the OS version" in the "Text" edit box

Pro	operties		×						
bı	<pre>button1 System.Windows.Forms.Button</pre>								
0	2↓ 💷 🖋 🖆								
	ImageKey	(none)	^						
	ImageList	(none)							
	RightToLeft	No	-						
	Text	Check the OS version 🗸							
	TextAlign	MiddleCenter							
	TextImageRelation	Overlay	-						
	TT 1.7	Ψ							
T	ext								
The text associated with the control.									
<u></u>	Class View 🛃 Solu	ttion Explorer Properties							

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



Step 5: Insert the following code in the Editor Window



Tips & Warnings



The "WinPacNet" of "Imports WinPacNet" is case- sensitive

4.5.4. Execute the application on the WinPAC

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

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>P</u> roject	Build	<u>D</u> ebug	D <u>a</u> ta	F <u>o</u> rmat	<u>T</u> ools	Te <u>s</u> t	<u>W</u> indow	<u>H</u> elp
					<u>B</u> uild Solu	tion C	trl+Shift+E	;			
					<u>R</u> ebuild So	lution					
					<u>D</u> eploy Sol	lution					
					<u>C</u> lean Solu	tion					
					B <u>u</u> ild syste	minfo					
					R <u>e</u> build sy	steminfo)				
					De <u>p</u> loy sys	teminfo					
					Clea <u>n</u> syste	minfo					
					Batch Buil	d					
					C <u>o</u> nfigurat	ion Man	ager				

- Step 2: Open the web browser and type the IP address to connect the FTP server of WinPAC
- Step 3: Upload the "systeminfo.exe" application and the corresponding "Winpacnet.dll" file to the WinPAC via the WinPAC FTP server

Tips & Warnings



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



Step 4: On the WinPAC, execute the uploaded file



4.6. Your First Program in eMbedded Visual C++

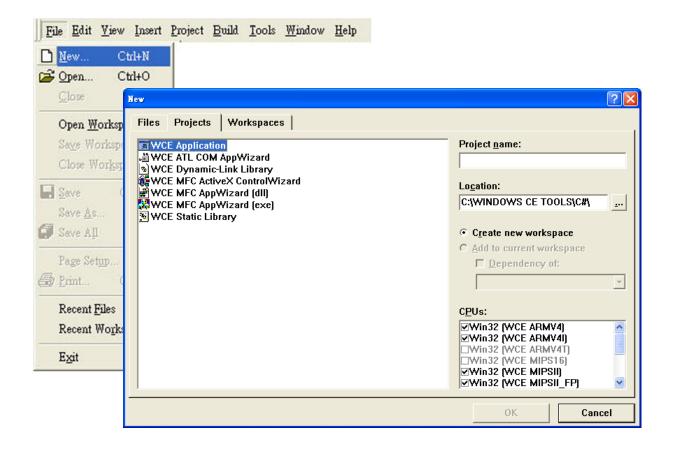
To create a demo program with eMbedded Visual C++ development tool includes the following main steps:

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

All main steps will be described in the following subsection.

4.6.1. Create a new Forms-Based project

Step 1: Start the Microsoft Embedded Visual C++



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

New	? 🛛
Files Projects Workspaces WCE Application WCE ATL COM AppWizard WCE Dynamic-Link Library WCE Dynamic-Link Library WCE MFC ActiveX ControlWizard WCE MFC AppWizard [dn] WCE MFC AppWizard [exe] WCE Studie Library WCE Studie Library WCE Studie Library	Project genne: systeminfo Logation: C:\WINDOWS CE TOOLS\C++\sy C Create new workspace Add to current workspace Dependency of: Hello CPUs: Win32 (WCE ARMV4) Win32 (WCE ARMV4) Win32 (WCE ARMV4) Win32 (WCE ARMV4) Win32 (WCE ARMV4) Win32 (WCE ARMV4) Win32 (WCE MIPS16) Win32 (WCE MIPS16) Win32 (WCE MIPS11) Win32 (WCE MIPS11_FP)
	OK Cancel

Tips & Warnings

The selected CPU type must have "Win32 [WCE ARMV4I]"

Step 4: Click the "OK" button to start the wizard

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

WCE MFC AppWizard (exe) - Step 1 of 4	· · · · · · · · · · · · · · · · · · ·
Applicatios On X	What type of application would you like to create? Single document Dialog based Document/View architecture support? What language would you like your resources in?
< <u>B</u> ack	<u>N</u> ext > <u>F</u> inish Cancel

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

WCE MFC AppWizard (exe) - Step 2 of 4	? 🗙
Application (M)	What features would you like to include? Windows Sockets Windows Help ActiveX Controls
< Back	Help contents file: SDKinfo.htp Next > Einish Cancel

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

WCE MFC AppWizard (exe) - Step 3 of 4	2 🛛
File Edit Yiew Jacett Build Help Froject Cpp Froject Cpp	Would you like to generate source file comments
< <u>B</u> ack	<u>N</u> ext > <u>F</u> inish Cancel

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

WCE MFC AppWizard (exe) -	Step 4 of 4		? 🛛	
		AppWizard creates the you: <u>CSDKinfoApp</u> CSDKinfoDIg	following <u>c</u> lasses for	
		C <u>l</u> ass name:	Header file:	
		CSDKinfoApp	SDKinfoApp.h	
		Base class:	Implementation file:	
		CWinApp	SDKinfoApp.cpp	
	< <u>B</u> ack	Next > Ei	nish Cancel	

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

Application type of SDKinfo: Dialog-Based Application	arastina'
Win32 (WCE ARMV4I)	aryeuny.
Win32 (WCE MIPSII)	
Win32 (WCE MIPSII FP	
Win32 (WCE MIPSIV)	
Win32 (WCE MIPSIV FI	7
Win32 (WCE SH4)	·
Win32 (WCE emulator)	
Win32 (WCE x86)	
	n SDKinfo.h and SDKinfo.cpp KinfoDlg.h and SDKinfoDlg.cpp iew.h and ChildView.cpp
Features:	
+ Uses shared DLL implem	entation
+ Localizable text in:	
英文 [美國]	
Project Directory:	
,	

4.6.2. Configure compiler options

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

👷 SDKinfo - Microsoft eMbedded Visual C++	
Eile Edit Yiew Insert Project Build Tools Window Help	
12 🚅 🖬 🕼 🙏 🖻 🖻 🗠 × 🗠 × 🚾 🔉 😤 🐂	
CSDKinfoApp (All class members) - CSDKinfoApp	
SDKinfo STANDARDSDK Vin32 (WCE ARMV41) Release STANDARDSDK_500 Emulator	💽 🖉 🕮 (
Image: Win32 [WCE ARMV4I] Debug Win32 [WCE emulator] Debug Win32 [WCE emulator] Debug Win32 [WCE emulator] Release Win32 [WCE MIPSII] Debug Win32 [WCE MIPSII] Debug Win32 [WCE MIPSII] Release Win32 [WCE MIPSII] Release Win32 [WCE MIPSII] PDebug Win32 [WCE MIPSIV] Debug Win32 [WCE MIPSIV] Debug Win32 [WCE MIPSIV] PDebug Win32 [WCE MIPSIV] PDebug Win32 [WCE MIPSIV] FP] Release Win32 [WCE SH4] Debug Win32 [WCE SH4] Debug Win32 [WCE SH4] Release Win32 [WCE ×86] Debug Win32 [WCE ×86] Release	
Ready	

4.6.3. Specify the path for project reference

Step 1: Click the "Options..." command from the "Tools" menu

🖺 File	<u>E</u> dit	<u>V</u> iew	Insert	<u>P</u> roject	<u>B</u> uild	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp	
						So	urce Bro <u>w</u>	ser	Alt+F12
						Ch	os <u>e</u> Source	Browser File	
						💦 En	ror Loo <u>k</u> uj	p	
						🎤 Re	mote C <u>a</u> ll	Profiler (WCE	(500)
						💦 Re	mote <u>F</u> ile '	Viewer (WCE	500)
						🅕 Re	mote <u>H</u> eap) Walker (WC	E500)
								iel <u>T</u> racker (W	
						_			tor (WCE500)
							_	ess Viewer (W	
						_	_	stry Editor (W	CE500)
						_		+ (WCE500)	
						_	-	m Information	
						∕îi Re	mote <u>Z</u> oor	nin (WCE500)
						S <u>e</u>)	lect Remot	e Tools	•
						<u>C</u> u	istomize		
						Op	tions		
						<u>M</u> a	acro		
						<u>R</u> e	cord Quicl	k Macro	Ctrl+Shift+R
						Pla	y Quick M	facro	Ctrl+Shift+P
						Co	onfi <u>gu</u> re Pl	atform Manag	er

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

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

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

Options					? 🗙
Download Build	Directories	Workspace	Macros	Format	◄►
<u>P</u> latform:	<u>C</u> PUs:		Show	directories	
PAC270 – STANI 🔻	Win32 (WCE /	ARMV4I)	Inclu	de files	·
Directories:				<u>"</u> ×≁	+
C:\Program Files\ C:\Program Files\ C:\Program Files\	Windows CE To	ools\wce500\S1	FANDARDSDI	K 500\mfc\i	nclu
			k this butt specify th		
1		ł	neader file		
		in	clude path	h Canc	el

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

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

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

Options					? ×
Download Build	Directories	Workspace	Macros	Format	◄►
<u>P</u> latform:	<u>C</u> PUs:		Show	directories	
PAC270 - STANI -	Win32 (WCE /	ARMV4I)	Libra	ary files	-
Directories:				🖱 🗙 🕈	+
C:\Program Files\ C:\Program Files\ C:\Program Files\	Windows CE To	ools\wce500\S1	ANDARDSD	K 500\mfc\l	ibyAF
Click this button					
		to	specify th	ne	
		libr	ary file pa	ath Cano	el

🖹 File	<u>E</u> dit	<u>V</u> iew	Insert	<u>P</u> roject	<u>B</u> uild	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp
				Set	Acti <u>v</u> e I	Project		•
				<u>A</u> dd	l To Pro	oject		- •
				Dep	endenc	ies		
				Settings Alt+F7 Export <u>M</u> akefile		7		
				Insert Project into Workspace				

Step 4: Click the "Settings..." command from the "Project" menu

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

Project Settings	? 🛛
Settings For: Win32 (WCE ARMV4I) Release The systeminfo	General Debug C//++ Link Resources M Category: General Category: General Output file name: ARMV4IRel/systeminfo.exe Object/librery modules: winpacsdk.lib Generate debug info Generate debug info Generate mapfile Project Options: /nologo /base:"0x00010000" /stack:0x10000,0x1000 /entry:'wWinMainCRTStartup" /incremental:no /pdb:"ARMV4IRel/systeminfo.pdb"
	OK Cancel

4.6.4. Design and Build an application program

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



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

E SDK	🔄 SDKinfo.rc - IDD_SDKINFO_DIALOG [German (Germany)] (Dial 🔲 🗖 🔀				
	SDKinfo	Controls			
	Button1				
	ZU ERLED.: Dialogfeld-Steuerelem. hier				
3					

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

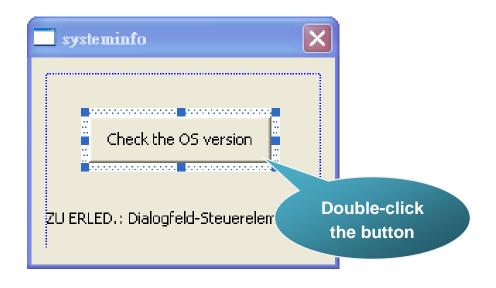
in s	DKinfo.rc - IDD_SDKINFO_DI	ALOG [German (Germany)] (Dial 🔳 🗖 🗙
	.	
	SDKinfo Button1 ZU ERLED.: Dialogfeld-Steuen hier	a a Cut Bet Conv
		Size to Content Size to Content Sign Left Edges P Align Top Edges Check Mnemonics ClassWizard Events Events Properties

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

Push But	ton Propertie:		×	
-¤ ?	General	Styles Extended Styles		
ĮD:	IDC_BUTT(N1 <u>Caption:</u> Check the OS version	•	
	✓ Visible □ Group □ Disabled ▼ Tab stop			

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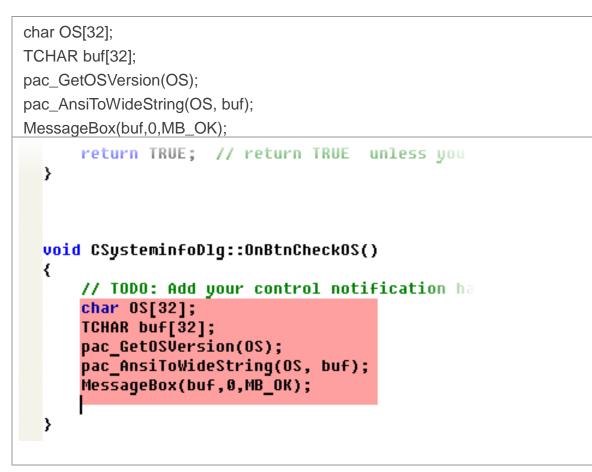
Step 5: In the "systeminfo" dialog box, double-Click the button object



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

Add Member Function	? 🛛
Member function <u>n</u> ame:	ОК
OnBtnCheckOS	Cancel
Message: BN_CLICKED Object ID: IDC_BUTTON1	

Step 7: Insert the following code into the Editor Window



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

4.6.5. Execute the application program on WinPAC

Eile Edit <u>V</u> iew Insert Project	<u>Build</u> <u>T</u> ools <u>W</u> indow <u>H</u> elp
12 🚅 🖬 🕼 🐰 🛍 🛍	🕸 Compile SDKinfoDlg.cpp 🛛 Ctrl+F7 👘
	Build SDKinfo.exe F7
	🛗 <u>R</u> ebuild All
	Batch B <u>u</u> ild
	Cl <u>e</u> an
	Start Debug
	Update Re <u>m</u> ote Output File(s)
	opaab Ro <u>m</u> ole Oalpar Helloy
	Execute SDKinfo.exe Ctrl+F5
	Set Active Configuration
	Con <u>f</u> igurations
	Set Active Platform

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

- Step 2: Open the web browser and type the IP address to connect the FTP server of WinPAC
- Step 3: Upload the "systeminfo.exe" application to the WinPAC via the WinPAC FTP server



5. APIs and Demo References

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

5.1. Demo programs with C#

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

5.1.1. C# Demo programs for WinPAC Standard API

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



WinPAC Standard API:

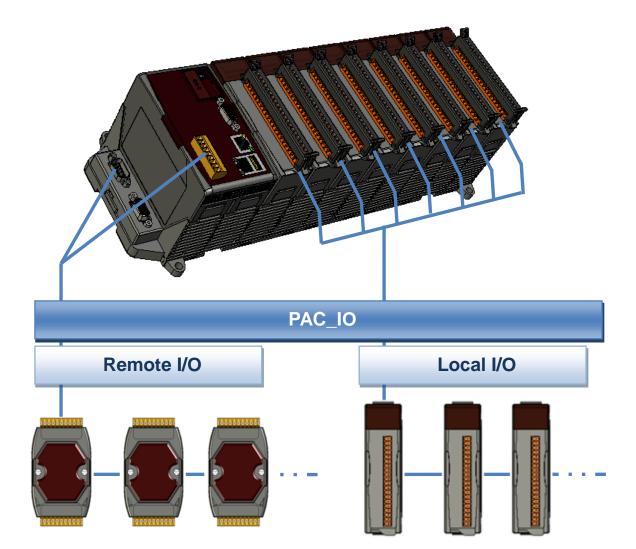
Folder	Demo	Explanation
system	systeminfo	Retrieves information about the OS version, CPU version, SDK version, etc.
backplane	backplaneinfo	Retrieves information about the DIP switch, backplane ID and slot count.
	memory	Shows how to read/write date values from/to EEPROM
memoryaccess	battery_backup_sram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

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

- For WP-8x3x series CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\DotNET\C#.NET\Standard\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/dotnet/</u> <u>c%23.net/standard/</u>
- For WP-8x4x series CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\DotNET\C#.NET\Standard\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/dotnet/</u> <u>c%23.net/standard/</u>

5.1.2. C# Demo programs for PAC IO API

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



PAC IO API:

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

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

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Folder	Demo	Explanation
		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
	7k07k dia	DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

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

- For WP-8x3x series CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\DotNET\C#.NET\PAC_IO\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/dotnet/</u> <u>c%23.net/pac_io/</u>
- For WP-8x4x series CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\DotNET\C#.NET\PAC_IO\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/dotnet/</u> <u>c%23.net/pac_io/</u>

5.2. Demo Programs with eMbedded Visual C++

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

5.2.1. eVC Demo programs for WinPAC Standard API

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



WinPAC Standard API:

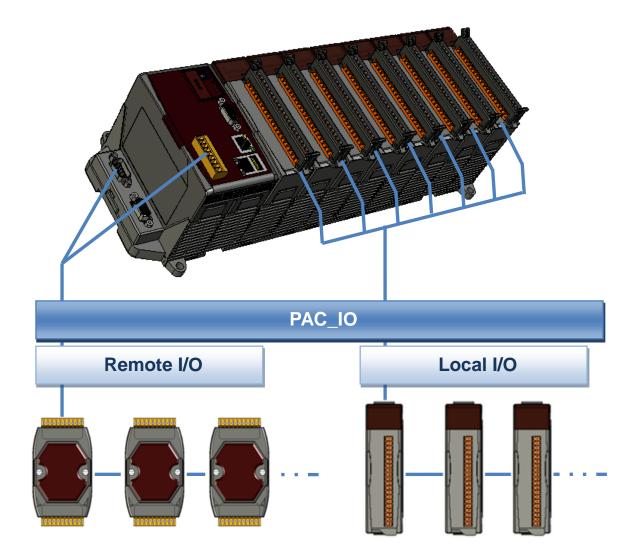
Folder	Demo	Explanation
system	Systeminfo	Retrieves information about the OS version, CPU version, SDK version, etc.
backplane	Backplaneinfo	Retrieves information about the DIP switch, backplane ID and slot count.
	Memory	Shows how to read/write date values from/to EEPROM
memoryaccess	battery_backup_sram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

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

- For WP-8x3x series CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\eVCT\Standard\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/evc/sta</u> <u>ndard/</u>
- For WP-8x4x series CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\eVC\Standard\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/evc/sta</u> ndard/

5.2.2. eVC Demo programs for PAC IO API

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



PAC IO API:

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

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

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Folder	Demo	Explanation
		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
	7k87k_dio	DIO module.
		This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

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

- For WP-8x3x series CD:\Napdos\wp-8x3x_ce50\Demo\WinPAC\eVC\PAC_IO\ <u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x3x_ce50/demo/winpac/evc/pa</u> <u>c_io/</u>
- ► For WP-8x4x series

CD:\Napdos\wp-8x4x_ce50\Demo\WinPAC\eVC\PAC_IO\

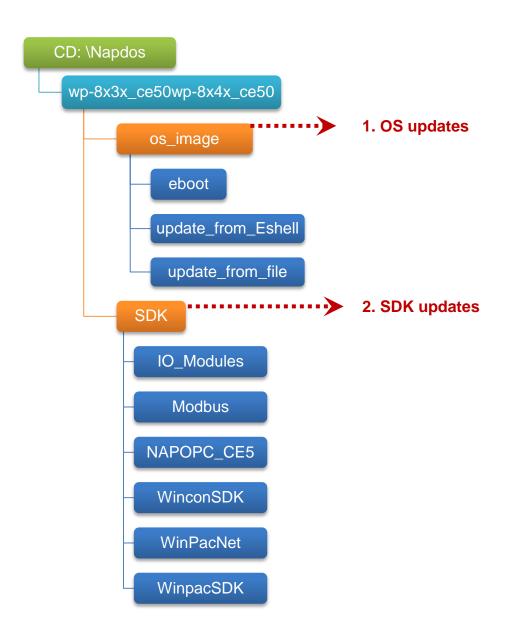
<u>ftp://ftp.icpdas.com/pub/cd/winpac/napdos/wp-8x4x_ce50/demo/winpac/evc/pa</u> <u>c_io/</u>

6. WinPAC Updates

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

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

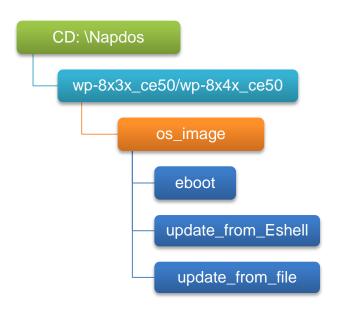
WinPAC updates services can be divided into the following two main categories:



6.1. OS updates

The updates files of OS image are located on:

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

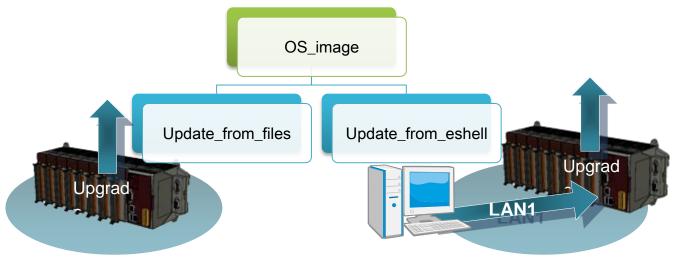


There are two ways to update the OS:

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

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

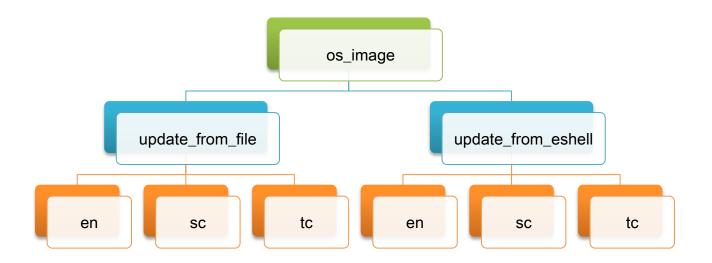
2. Update from Eshell (Please refer to section 6.1.2)



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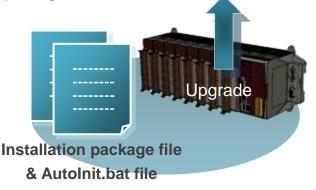
The WinPAC OS supports multi-language:

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



6.1.1. WinPAC OS updates using installation package file on WinPAC

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



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

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

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

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

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



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

- i. On the WinPAC, you can download these files via Ethernet connection.
- ii. On the PC, you can download these files via .a USB storage device, the removable Micro SD card or FTP server

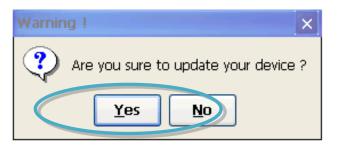
Step 2: Run the installation package file and then click "OK" to make sure you receive the important notice of this procedure will ease flash memory



Step 3: Click "Update Now" to start the process

W	WP-8x4x Ver. 1.4.1.0 OK				
	WinPAC - 8000 Update				
	Step 1: Install Boot Loader file !				
	Step 2: Erase flash disk !				
	Step 3: Install OS image !				
	Step 4: Set and save registry !				
	Update Now QUIT				

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



This installation procedure will perform the following tasks:

i. Install boot loader file

Important Warnings



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

ii. Erase flash disk

- iii. Install OS image
- iv. Set and save registry

Tips & Warnings

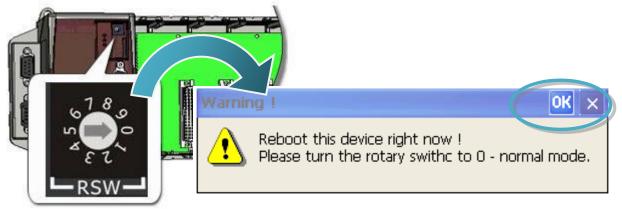


This procedure will reset the registry settings to their default settings, and all of your settings will be lost.

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

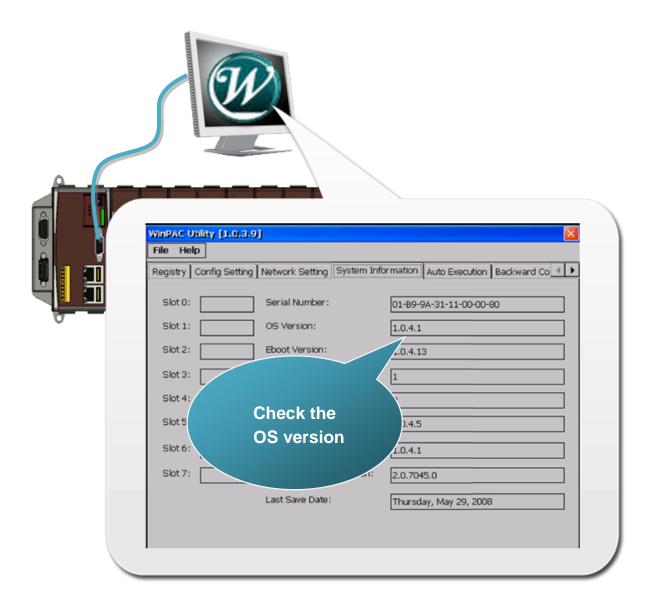
Besides, we recommend that you turn off all other applications before starting to upgrade the OS.

Step 5: After completing the above-mentioned tasks, the "Warning !" dialog box will appear as follow, before clicking the "OK" button, you must first turn the rotary switch to the "0" position

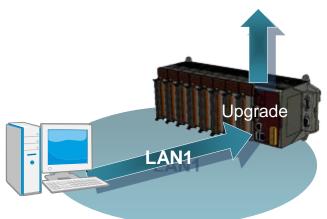


Step 6: Check the WinPAC OS version

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



6.1.2. WinPAC OS updates using Eshell via Ethernet



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

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

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

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

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



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Step 2: Run the ESHELL on the PC



ESHELL you can be obtained at:

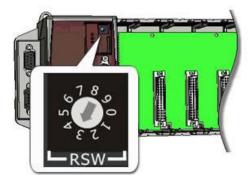
ESHELL

► For WP-8x3x series

CD:\Napdos\wp-8x3x_ce50\PC_Tools\Eshell\ ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x3x_ce50/pc_tools/eshell/

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

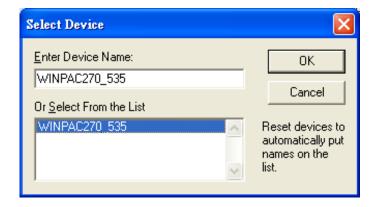
Step 3: Configure the reboot in OS update mode



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

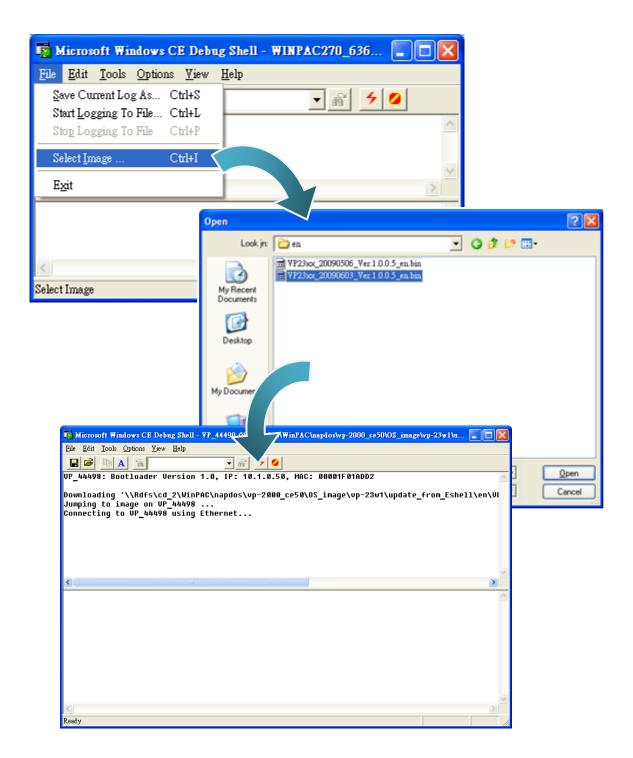
Step 4: Select the device which you want to update the OS image

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

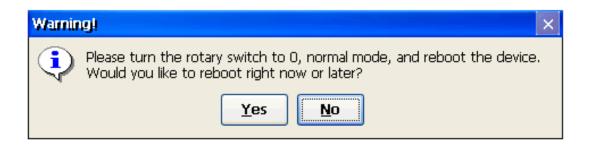


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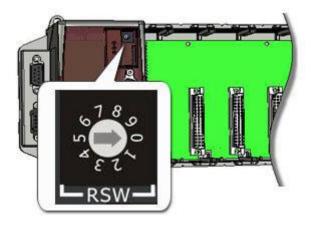
Step 5: Select the latest version of the OS image file



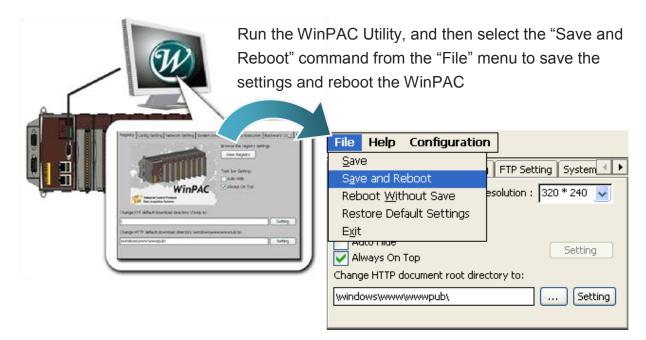
Step 6: Once the procedure is completed, the "Warning !" dialog box will Appear on WinPAC screen as below shown, click "No" to finish the process



Step 7: Configure the WinPAC to boot in normal mode



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



Step 9: Click "Yes" to reboot the WinPAC



Step 10: Check the WinPAC OS version

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

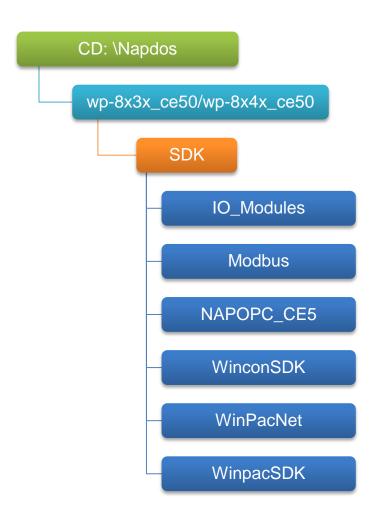
WinPAC Utility [1.0.3.9] File Help Reaistry Config Setting Network Setting	ng System Information Auto Execution Backward Co < 🕨	
Slot 0: Serial Number:	er: 01-89-9A-31-11-00-00-80	
Slot 2: Ehnot Version: Slot 3		
Check the OS version	1.0.4.5 1.0.4.1	
Last Save Date		
		Ϊ

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6.2. SDKs Updates

The updates files of SDK are located on:

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



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

- i. WinPAC SDK updates for dotnet
- ii. WinPAC SDK updates for eMbedded Visual C++

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

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

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

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

- For WP-8x3x series <u>ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x3x_ce50/sdk/WinPACNet/</u>
- For WP-8x4x series <u>ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x4x_ce50/sdk/WinPACNet/</u>

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

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

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

6.2.2. WinPAC SDK updates for eMbedded Visual C++

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

Step 1: Get the latest version of the eMbedded Visual C++ components

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

- For WP-8x3x series <u>ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x3x_ce50/sdk/WinPACSDK /</u>
- ➤ For WP-8x4x series <u>ftp://ftp.icpdas.com/pub/cd/WinPAC/napdos/wp-8x4x_ce50/sdk/WinPACSDK /</u>

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

The header files are located at:

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

The libraries are located at:

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

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

The DLL files are located at:

\System_Disk\ICPDAS\System

7. WinPAC Download Center

This chapter introduces the WinPAC Download Center.

Visit the WinPAC Download Center:

http://www.icpdas.com/products/PAC/winpac/download/winpac_8000/download_os_images.htm

WinPAC-8000 Download Center

Note:

When you download the software programs, you should notice if the programs conform to your machine. The published date and indicated requirement of a program can help user to determine the compatibility for your WinPAC-8000. Before you download any program, please read the notes of each online program first to avoid the confused situation.

OS images	WinPAC SDK	Utility & Tools	<u>Demo</u>	Documents	System Disk				
WinPAC-8000 Utility and Tools									
Note: User should consider the suitability over his application. If you get any problems caused by updating the WinPAC Utility software, please feedback to your local seller and ask essential help & sevices.									
WinPAC Utility HTTP FTP									
Version	Last update	Co	mpatibility						
2.0.1.1	Jul. 2009	WP-8:	x4x / WP-8x3x						
Tools to save / view the system information registry and setup the HTTP / FTP path and update non-volatile internal memory within WinPAC-8000									

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

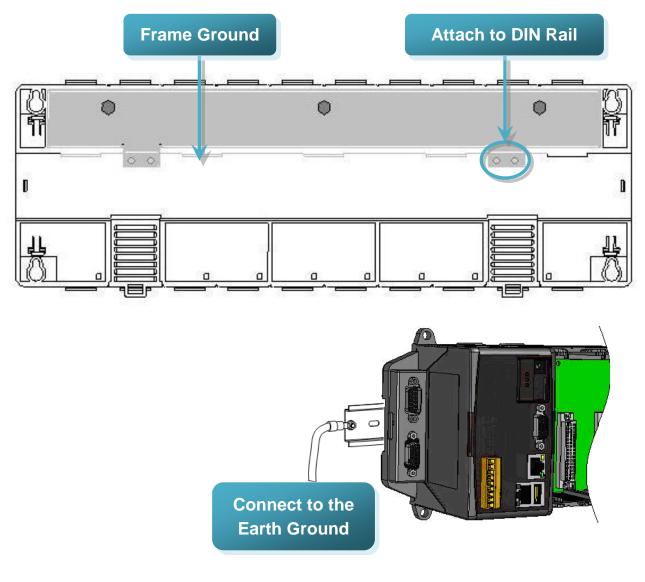
- ✓ OS images Includes updates and the latest version of WinPAC OS.
- ✓ WinPAC SDK Includes updates and the latest version of each WinPAC component SDK, such as WinPAC SDK, NAPOPC_CE5 SDK, Modbus SDK, etc.
- ✓ Utility & Tools Includes updates and the latest version for WinPAC toolkits
- ✓ **Demo** Includes all related WinPAC demos.
- ✓ **Documents** Includes updates and the latest version for related WinPAC documents.
- ✓ System Disk Includes updates and the latest version for WinPAC toolkits

Appendix A. Frame Ground

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

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

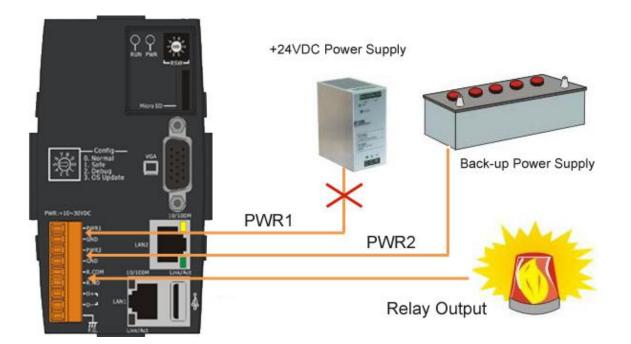
The I-8000 controller has a metallic board attached to the back of the plastic basket as shown in the Figure 2-1 below. When mounted to the DIN rail, connect the DIN rail to the earth ground because the DIN rail is in contact with the upper frame ground as shown in the Figure 2-2 below.



Appendix B. Redundant Power

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

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



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

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

The difference between them is

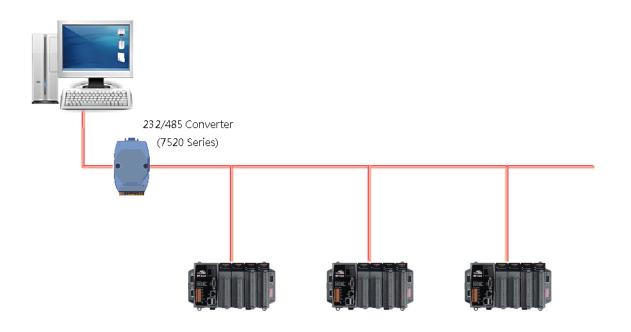
Item	I-8K Series	I-87K Series
Microprocessor	No	Yes (8051)
Communication interface	Parallel bus	Serial bus
Communication speed	Fast	Slow
DI latched function	No	Yes
Counter input (for digital input module)	No	Yes (100 Hz)
Power on value	No	Yes
Safe value	No	Yes
Programmable slew-rate for AO module	No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

Appendix D. Application of RS-485 Network

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

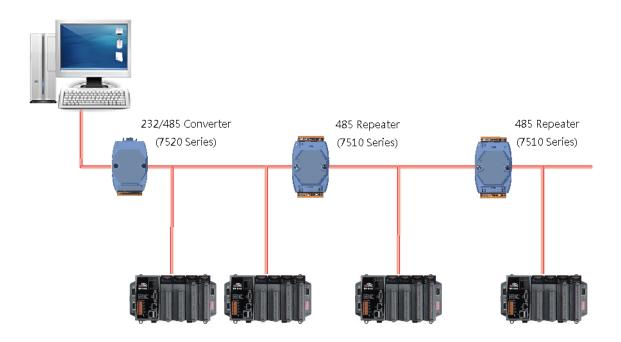
D.1. Basic RS-485 Network

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



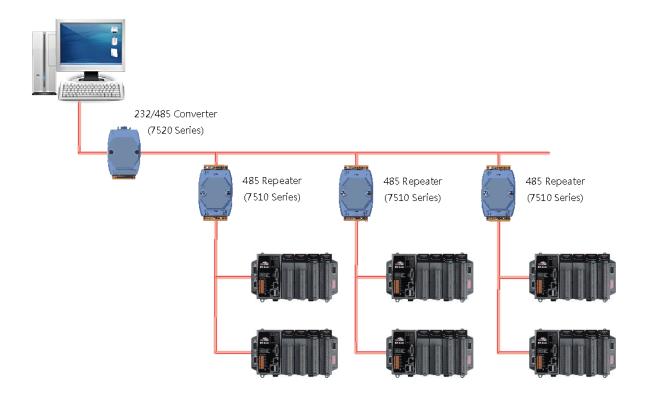
D.2. Daisy Chain RS-485 Network

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

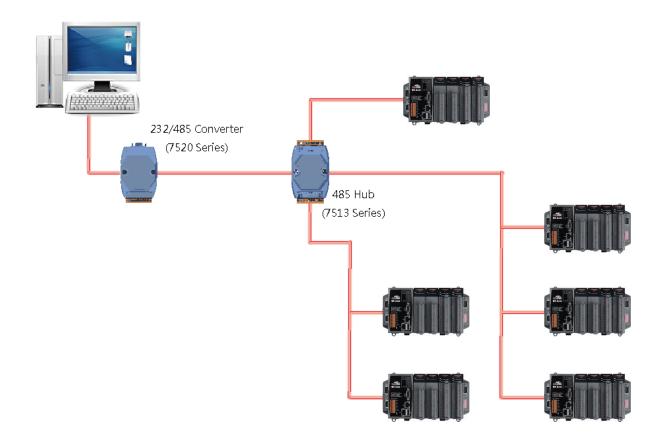


D.3. Star Type RS-485 Network

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

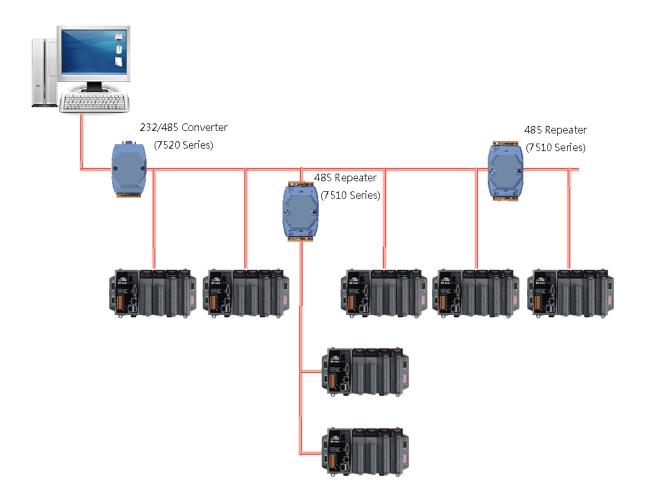


There is a better choice to use 7513 as a RS-485 hub on start type network.



D.4. Random RS-485 Network

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

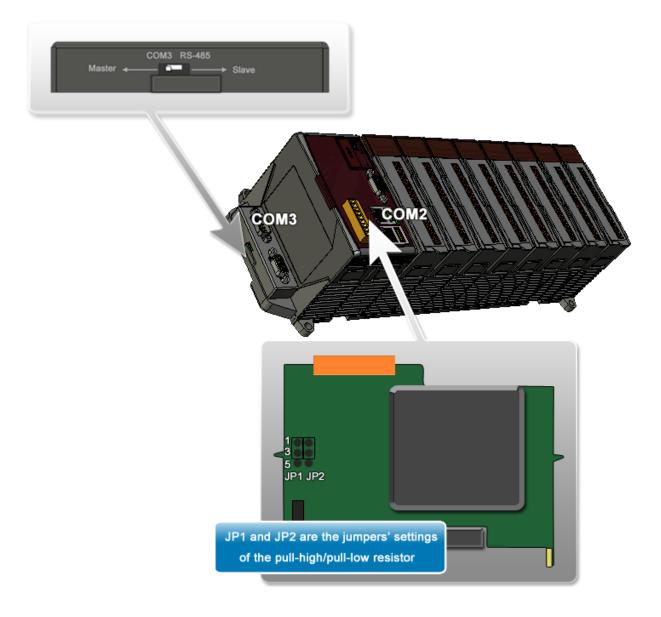


D.5. Master/Slaves Settings

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

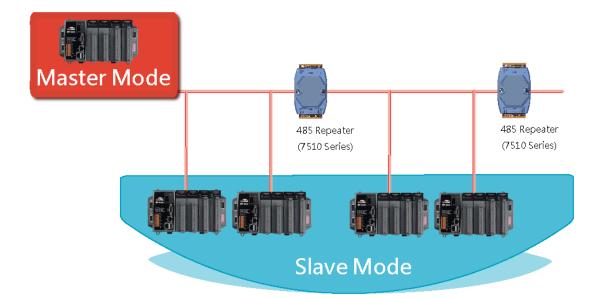
The WinPAC provides two RS-485 communication interfaces based on the master-slave system architecture, all of which have a pull-high/pull-low resistor, user can set it to master or slave for implementing an RS-485 multi-drop network.

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

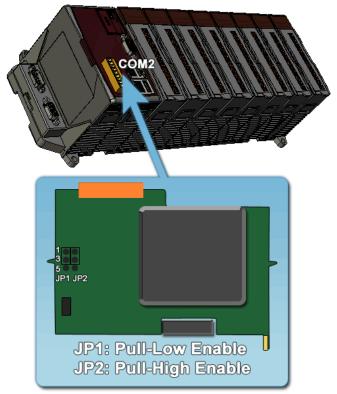


D.5.1. WinPAC as a Master (default):

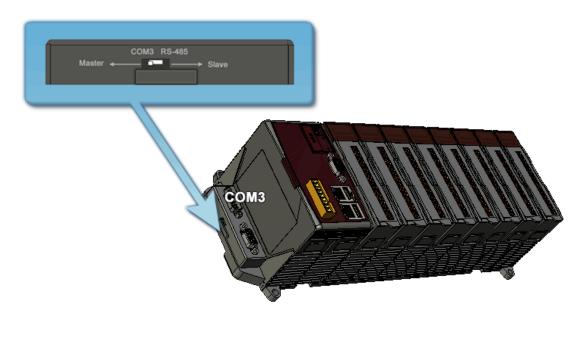
When one of WinPAC is set to master, then all the other devices on the same network must be slave mode. If the network is up to 1.2 KM, it will need a repeater (7510 series) to extend the network length.



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



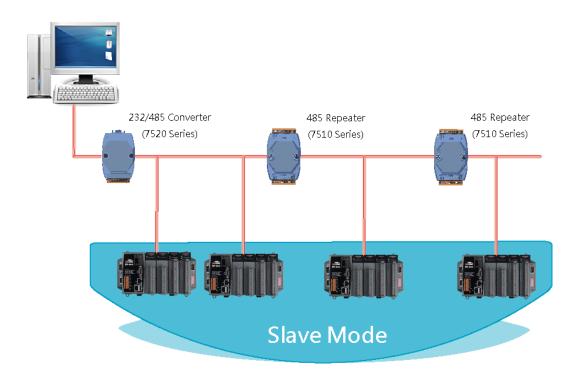
When WinPAC as a master using COM3 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.



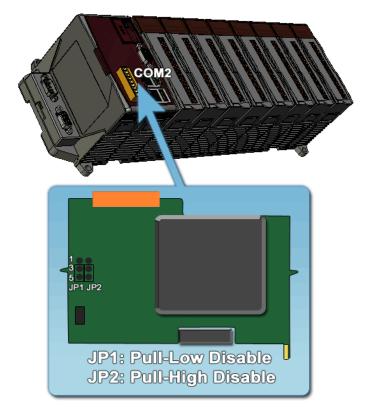
D.5.2. WinPAC as a Slave

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

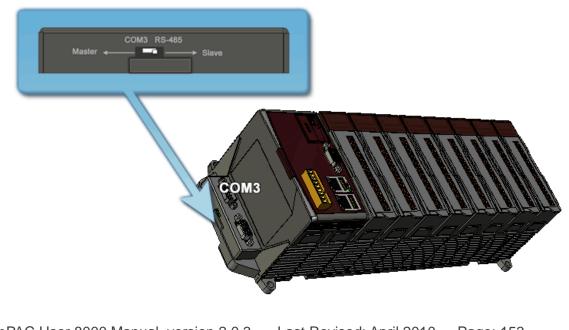
If there are repeaters on the RS-485 network, there will be pull-high/pull-low resistors on both sides of the repeaters (I-7510)



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



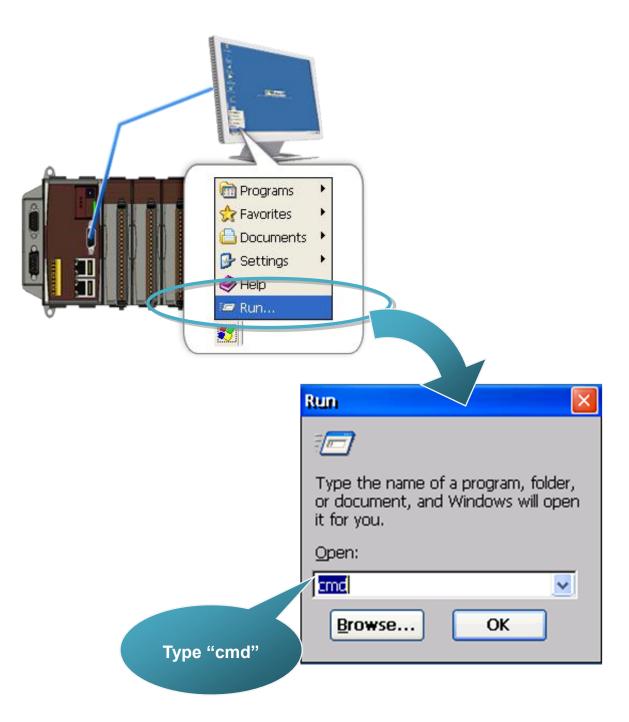
When WinPAC as a slave using COM3 communication interface, the pull-high /pull-low resistor located on the power board must set to "Slave" as shown below.



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

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



Step 1: Open a MS-DOS command prompt

Step 2: Establish a new account

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

<u>File E</u> dit <u>H</u> elp
Pocket CMD v 5.0
> usrmgr -a guest 1234

Tips & Warnings



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

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

```
<u>File Edit Help</u>
Pocket CMD v 5.0
> usrmgr
Usage: usrmgr [-a|-d|-1] [<user name> [<password>]]
     -a <user name> <password> : Add or update a user
      -d <user name>
                               : Remove a user
     -1
                               : List all users
     -gm
                                : Create a new group
      -gd
                               : Delete a group
      -gl
                               : List all groups
      -qm
                               : List members in a group
      -gat
                               : Add a user to a group
                                : Remove a user from a group
      -grf
```

E.2. How to online debug WinPAC

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

E.2.1. Debug WinPAC programs in EVC++

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

Eile Edit View Insert Project Build	l <u>T</u> ools <u>W</u> indow <u>H</u> elp		
	 Fror Lookup Remote Call Profiler (WCE500) Remote File Viewer (WCE500) Remote Heap Walker (WCE500) Remote Kernel Tracker (WCE500) Remote Performance Monitor (WCE500) Remote Process Viewer (WCE500) Remote Registry Editor (WCE500) Remote System Information (WCE500) Remote Zoomin (WCE500) 		
	Select Remote Tools <u>C</u> ustomize <u>O</u> ptions <u>Macro</u> <u>Record Quick Macro Ctrl+Shift+R</u> Play Quick Macro Ctrl+Shift+P <u>Configure Platform Manager</u>		

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

Windows CE Platform Manager Configuration	
Select a platform or device to configure PAC270 PAC270 Device SA_IA STANDARDSDK_420 Windows CE Default Platform	Add Device Delete Properties About
Ōĸ	

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

Device Properties
Device Name: PAC270 Device
Select a transport and a startup server. Choose Test to verify that you can establish a connection to your target device with the selected transport and startup server
Transport:
TCP/IP Transport for Windows CE
Startup Server:
Manual Server Configure
<u>O</u> K <u>C</u> ancel <u>I</u> est

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

TCP/IP Transport Configuration					
Configuration for device: PAC270 Device					
Check connection <u>s</u> tatus	Interval (msec):	60000			
Fixed port	Port number:	5000			
Host IP					
• Use fixed address:	10.0.9.52	•			
Configure <u>a</u> utomatically over serial					
<u>0</u> K	<u>C</u> ancel				

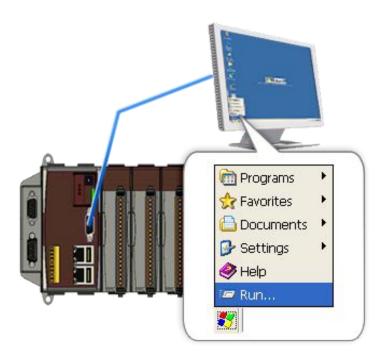
Step 5: On the "Windows CE Platform Manager Configuration" dialog, click the "Test" button

Device Properties	
Device Name: PAC270 Device	
Select a transport and a startup server. Choose Test to verify the establish a connection to your target device with the selected tra startup server	
Transport: TCP/IP Transport for Windows CE	Configure
Startup Server:	
Manual Server 🗨	Configure
<u>O</u> K <u>C</u> ancel <u>T</u> est	

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

Manual Server - Action	×
Please make sure the following files are on the device	
\WINDOWS\tcpipc.dll \WINDOWS\cemgrc.exe \WINDOWS\cetIstub.dll	
And launch CEMGRC.EXE with the following cmd line CEMGRC.EXE /S /T:TCPIPC.DLL /Q /D:10.0.9.52:5000	_
OK Cancel	

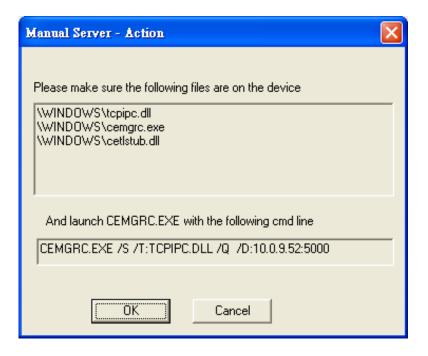
Step 7: On the WinPAC, select the "Start" menu, and then click the "Run..." command



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

My Documents		WINPAC Microsoft WordPad Micr	Run Image: Constraint of the second seco
	(Alternet	Microsoft	Type the name of a program, folder, or document, and Windows will open it for you. Open: (cos itcpipc.dll /q /d:10.0.9.52:5000)

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



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

Testing Device Connection
Device Name: PAC270 Device
Connection to device established
TCP/IP Transport for Windows CE
OK

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

Device Properties
Device Name: PAC270 Device
FAC270 Device
Select a transport and a startup server. Choose Test to verify that you can establish a connection to your target device with the selected transport and startup server
Transport:
TCP/IP Transport for Windows CE Configure
Startup Server:
Manual Server Configure
OK <u>C</u> ancel <u>T</u> est

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

Windows CE Platform Manager Configuration	
Windows CE Platform Manager Configuration Select a platform or device to configure PAC270 PAC270 Device PAC270 Device SA_IA STANDARDSDK_420 Windows CE Default Platform	<u>A</u> dd Device <u>D</u> elete <u>Properties</u> <u>Ah</u> out

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

E File Edit View Ins	sert <u>P</u> roject <u>B</u> uild <u>T</u> ools	<u>W</u> indow <u>H</u> elp			
			Ctrl+F7 F7		
	Start <u>D</u> ebu Update Re	g <u>m</u> ote Output File(s)		<mark>≣↓ G</mark> o {*} Step Into	F5 F11
	Execute Sy	ystemInfo.exe	Ctrl+F5	*{} Run to <u>C</u> ursor	Ctrl+F10
	Set Active Configura <u>S</u> et Active		1	Attach to <u>W</u> CE I	Process

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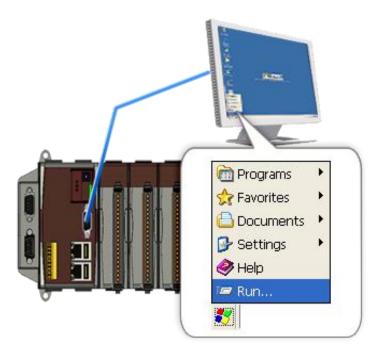
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Step 14: The "Manual Server - Action" dialog will appear displaying a command line, before click the "OK" button to close dialog, turn to the WinPAC controller side to do the next two-steps

Manual Server - Action	×
Please make sure the following files are on the device	
\WINDOWS\tcpipc.dll \WINDOWS\cemgrc.exe \WINDOWS\cetIstub.dll	
And launch CEMGRC.EXE with the following cmd line CEMGRC.EXE /T:TCPIPC.DLL /Q /D:10.0.9.52:2008	_
Cancel	

Step 15: On the WinPAC, select the "Start" menu, "Run..." command

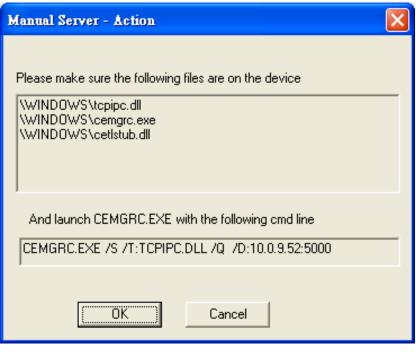
and then click the



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

Vince Vince </th
--

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



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

Microsoft eMbedded Visual C++	?×				
'C:\\ARMV4IRel\Memory.exe' does not contain debugging information. Press OK to continue.					
Do not prompt in the future.					
OK Cancel					

Step 19: Connection established. Then you can debug on line.

Tips & Warnings



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

<u>File E</u> dit <u>V</u> iew	Insert Project	Debug Layout Tools	<u>W</u> indow <u>H</u> elp
		EL Go	F5
		🗊 <u>R</u> estart	Ctrl+Shift+F5
		式 Stop <u>D</u> ebugging	Shift+F5
		'≣ <mark>n</mark> <u>B</u> reak	
		🔁 Step Into	F11
		{} ↓ Step <u>O</u> ver	F10
		{₱ Step O <u>u</u> t	Shift+F11
		*{ } Run to <u>C</u> ursor	Ctrl+F10
		🛃 Exceptions	
		J. Ihreads	
		<u>M</u> odules	
		➡ Show <u>N</u> ext Statemen	t Alt+Num *
		66° QuickWatch	

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

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

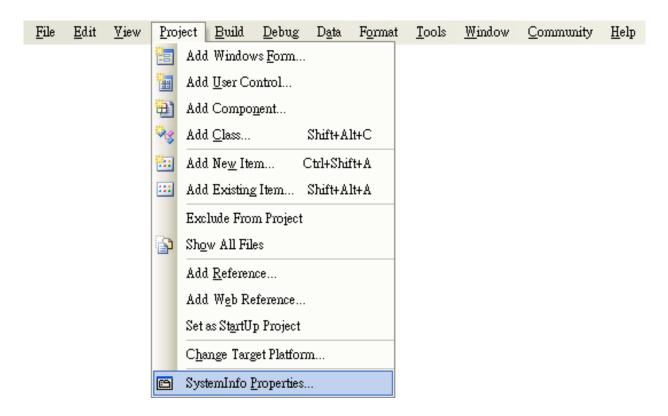
Step 1: Make sure the following file are listed with the matching version numbers

Path	File
C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Bin	1. ActiveSyncBootstrap.dll 2. ConMan2.dll
	 ConManPS.dll DesktopDMA.dll
	5. eDbgTL.dll 6. TcpConnectionC.dll
C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Bin\1033	conmanui.dll
C:\Program Files\Common Files\Microsoft	1. DeviceDMA.dll
Shared\CoreCon\1.0\Target\wce400\armv4i	2. eDbgTL.dll 3. TcpConnectionA.dll
	4. clientshutdown.exe
	 5. CMAccept.exe 6. ConmanClient2.exe

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

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

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



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

Application	Configuration: N/A V Platform: N/A V
Build	
Build Events	>ployment Options
Debug	PAC50-ARMV4: ARMV4I_Release
Resources	Qutput file folder: %CSIDL_PROGRAM_FILES%create_database
Reference Paths	Deploy the latest version of the .NET Compact Framework (including Service Packs)
Signing	thenticode Signing
Devices*	Sign the project output with this certificate
Devices	Select Cer

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Fil	le <u>E</u> dit <u>V</u> iew <u>P</u> roj	ect <u>B</u> uild <u>D</u> ebug D <u>a</u> ta	<u>T</u> ool	ls Te <u>s</u> t <u>W</u> indow <u>H</u> elp	
18] • 🛅 • 💕 📕 🗿	1 X 🖻 🛍 🔊 - (*		Attach to Process Ctrl+Alt+P	•
PA	PAC50-ARMV4: ARMV4I_Release 💌 💼 📰 🗥		BR	Device Sec <u>u</u> rity Manager	
*	create_database*	Form1.cs Form1.cs [Desig	9,	Connect to De <u>v</u> ice	
Toolbox		[Device Emulator Manager	
lbox	Application	Configuration: N/A	۳.,	Connect to <u>D</u> atabase	~
	Build		1	Connect to Server	
		ployment Options		Code Snippets Manager Ctrl+K, Ctrl+B	
	Build Events	<u>T</u> arget device:		Choose Toolbo <u>x</u> Items	
	Debug	PAC50-ARMV4: ARMV4I		<u>A</u> dd-in Manager	
	Resources	<u>Output file folder:</u>		Macros	
		%CSIDL_PROGRAM_FILE		Partner Products Catalog	
	Reference Paths	Deploy the latest version		Create <u>G</u> UID	cks)
	Signing	thenticode Signing		Dotfuscator Community Edition	
	Devices*	Sign the project output w	.	WCF Service Configuration Editor	
				External Tools	Select <u>C</u> er
				Import and Export Settings	
				<u>C</u> ustomize	
		<		Options	>
				, in the second s	•

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

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

Options		? 🔀
Documents Find and Replace Fonts and Colors Import and Export Settings International Settings Keyboard Startup Task List Web Browser Projects and Solutions Source Control Text Editor Database Tools Debugging		Show devices for platform: PAC270 Devices: PAC50-ARMV4: ARMV4I_Release Save As Rename Delete Properties
 Device Tools General Devices Form Factors 	*	Default device: PAC50-ARMV4: ARMV4I_Release
· · · · · · · · · · ·		OK Cancel

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

PAC50-ARMV4: ARMV4I_Release Properti	es ? 🔀
Default output location on device:	
Program Files Folder	▼
Transport:	
TCP Connect Transport	Configure
<u>B</u> ootstrapper:	
ActiveSync Startup Provider	Configure
Detect when device is disconnected	
	OK Cancel

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

Options	?⊻
— Fin — Fo ⊕ He	Configure ICP/IP Transport Use fixed port number: 5655 Device IP address Obtain an IP address automatically using ActiveSync Use specific IP address:
	OK Cancel

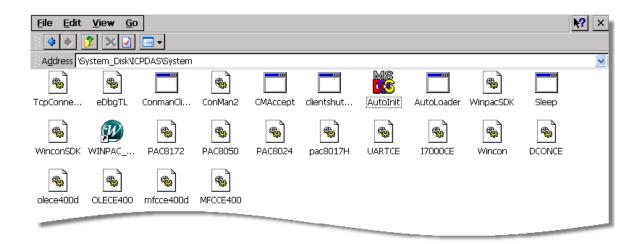
Step 9: On the "PAC50- ARMV4:ARMV4I_Release Properties" dialog, click the "OK" button

PAC50-ARMV4: ARMV4I_Release Properties	? 🔀
Default output location on device:	
Program Files Folder	~
T <u>r</u> ansport:	
TCP Connect Transport 💽	onfigure
Bootstrapper:	
ActiveSync Startup Provider 🛛 🔽 📿	onfigure
Detect when device is disconnected	
OK	Cancel

Step 10: On the "Options" dialog, click the "OK" button

Options	? 🗙
 Documents Find and Replace Fonts and Colors Help Import and Export Settings International Settings Keyboard Startup Task List Web Browser Projects and Solutions Source Control Text Editor Database Tools Debugging Device Tools General Devices Form Factors 	Show devices for platform: PAC270 Devices: Save As Rename Default device: PAC50-ARMV4: ARMV4I_Release PAC50-ARMV4: ARMV4I_Release
	OK Cancel

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



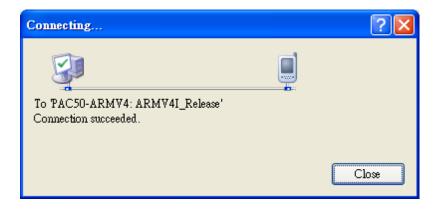
Step 12: On the "Tools" menu, click "Connect to Device..." command

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>P</u> roject	<u>B</u> uild	Debug	D <u>a</u> ta	Too	ls <u>W</u> indow <u>C</u> ommunit	ty <u>H</u> elp
							5	Attach to <u>P</u> rocess	Ctrl+Alt+P
							J,	Connect to De <u>v</u> ice	
							۳.,	Connect to <u>D</u> atabase	
							2	Connect to <u>S</u> erver	
							G	Code Snippe <u>t</u> s Manager	Ctrl+K, Ctrl+B
								Choose Toolbo <u>x</u> Items	
								<u>A</u> dd-in Manager	
								<u>M</u> acros	•
								Create <u>G</u> UID	
								Dotfuscator Community E	dition
								<u>E</u> xternal Tools	
							<u>.</u>	Device Emulator Manager.	
								Import and Export Setting	3
								<u>C</u> ustomize	
								Options	

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

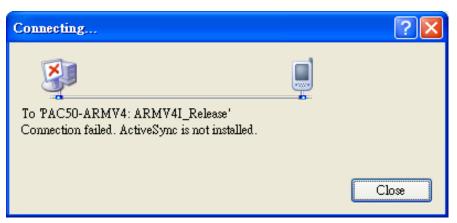
Connect to Device	? 🔀
To connect to a physical device or launch an emulator image, select a platform: PAC270 Devices: PAC50-ARMV4: ARMV4I_Release	Cancel

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



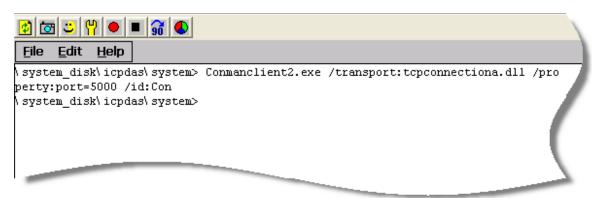
Step 15: Connection established. Then you can debug on line.

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



Open the command prompt, run the

"CommanClient2.exe/transport:tcpconnectiona.dll/property:port=5000/id:Con" at: \System_Disk\ICPDAS\System, and then run the "CMAccept.exe"



Configure TCP/IP Transport	? 🔀
☑ Use fixed port number: 5000 Device IP address	
○ <u>O</u> btain an IP address automatically using ActiveSy	ync
⊙ Use specific IP address:	
10.0.9.10	~
	OK Cancel

E.3. How to recompile WinCon programs

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

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

Tips & Warnings



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

- E.3.1. Compiler old programs which ran on Wincon 8x3x and 8x4x
 - Step 1: Open project which programmed in WinCon using eMbedded Visual C++
 - Step 2: On the "Build" menu, click "Configurations" command

🚞 <u>F</u> ile	<u>E</u> dit	<u>V</u> iew	Insert	<u>P</u> roject	<u>B</u> uild	<u>L</u> ayout	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp
					\$	ompile		Ctrl+F	7
					B	uild HELI	LO.exe	F	7
					🛗 <u>R</u> e	ebuild All	l		
					B	atch B <u>u</u> ild	l		
					C	l <u>e</u> an			
					St	art <u>D</u> ebug	ç		•
					Uj	pdate Re <u>r</u>	<u>n</u> ote Ou	tput File(s)	I
					! E2	gecute HE	LLO.ex	œ Ctrl+H	75
					Se	et Active (C <u>o</u> nfigu	ration	
					C	onfigurati	ions		
					<u>S</u> e	t Active I	latform	L	

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

🛃 Demo - Microsoft eMbedded ¥isual C+	+ - [DemoDlg.cpp]	
]] 🔁 File Edit View Insert Project Build Id	ols <u>W</u> indow <u>H</u> elp	_ & ×
) 🎦 😂 🖬 🕼 🖁 🖁 🗳 🖄		- ² 84
CDemoDlg 📃 (All class me	embers] 📕 💊 OnButtonAO	- 🖹 -
Demo V STANDARDSDK V	Win32 (WCE ARMV4) Release 🖃 STANDA	RDSDK_420 Emulator 💽
Demo resources	TCHAR temp[20],*stopstring; float AO[4]; int i;	-
	<pre>m_AO0.GetWindowText(temp, 20); </pre>	ing);

Step 4: On the "Configurations" dialog, click the "Add..." button

Configurations	? 🗙
Projects and	Close
□ Demo Win32 (WCE emulator) Release Win32 (WCE emulator) Debug Win32 (WCE ARMV4) Release	<u>A</u> dd <u>R</u> emove
Win32 (WCE ARMV4) Debug Win32 (WCE x86) Release Win32 (WCE x86) Debug	

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

Add Project Configuration	? 🔀
C <u>P</u> U: Win32 (WCE ARMV4I) Copy settings from:	OK Cancel
*Default Debug Configuration	
<u>C</u> onfiguration:	
Release	
The new configuration will be called: Demo - Win32 (WCE ARMV4I) Release	

 File
 Edit
 View
 Insert
 Project
 Build
 Tools
 Window
 Help

 Set
 Active
 Project
 •

 Add
 To
 Project
 •

 Dgpendencies...
 •
 •
 •

 Settings...
 Alt+F7
 •
 •

 Insert
 Project into Workspace...
 •

Step 6: On the "Project" menu, click "Settings..." command

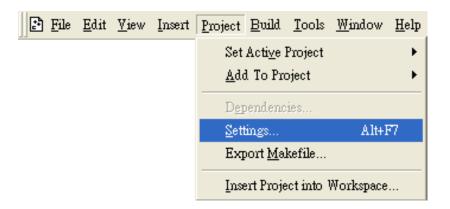
Step 7: On the "Project Settings" dialog, select the "Link" tab and change the value of the "Entry-point symbol" field, "WinMainCRTStarup" to "wWinMainCRTStartup",

Project Settings		? 🛛
Settings For: Win32 (WCE ARMV4) Release ▼ ⊕ @ Demo	General Debug C/C++ Category: Output	Link Resources M +
	<u>B</u> ase address:	<u>E</u> ntry-point symbol:
	0×00010000	wWinMainCRTStartup
	Stack allocations	
	Reserve:	<u>C</u> ommit:
	0×10000	0×1000
	Version information <u>M</u> ajor:	Minor:
	Project <u>O</u> ptions:	
	UARTCE.lib 17000CE.lib /nolo /stack:0×10000,0×1000 /entr /incremental:no /pdb:"ARMV/	y:"wWinMainCRTStartup" 💻
		OK Cancel

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

<pre>int slotD1; bool timerOn=false; int D0_number=0;D1_number=0;</pre>	
ClassView ResourceView FileView	•
Linking UARTCE.lib (UARTCE.dll) : fatal error LNK1112: module machine type ' THUMB ' conflicts with target machine type ' / Error executing link.exe.	ARM '
Demo.exe 1 error (s), 0 warning (s)	_
Build / Debug / Find in Files 1 / Find in Files 2 /	<u>۲</u>
Ln 11, Col 17	REC COL OVR READ

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



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

Project Settings	?⊠
<u>S</u> ettings For:	General Debug C/C++ Link Resources M 🕞
Win32 (WCE ARMV4I) Release	Category: General 💌 Reset
	Project Options:
	/nodefaultlib:"\$(CENoDefaultLiv) /out:"ARMV4IRel/Damo.exe" /subsystem:\$(CESubsystem) /MACHINE:THUMB
	OK Cancel

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

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

- Step 2: In the .vcp file, replace "0xa301" with "0xa501"
- Step 3: In the .vcp file, replace "ARMV4" with "ARMV4I"
- Step 4: In the .vcp file, replace "MACHINE:ARM" with "MACHINE:THUMB"
- Step 5: Save the .vcp file just edited
- Step 6: Open the old WinCon project and recompile it

E.4. How to use the printer

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

Tips & Warnings



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

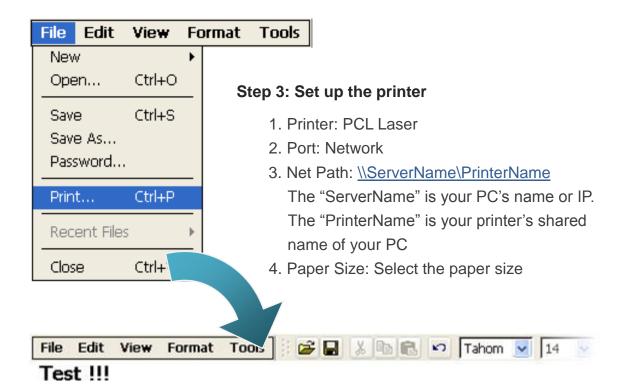
E.4.1. How to use network printer

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

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

System Properties ?
System Restore Automatic Updates Remote
General Computer Name Hardware Advanced
Windows uses the following information to identify your computer on the network.
Computer description:
For example: "Kitchen Computer" or "Mary's Computer"
Full computer name: ServerName.
Workgroup: ICPDAS.COM
To use the Net 📚 Auto HP LaserJet 2200 (RD1) on KEVIN_WINPAC Properties
ID. General Sharing Ports Advanced Color Management
To rename this You can share this printer with other users on your network. To enable sharing for this printer, click Share this printer.
O Do not share this printer
Share this primer
Share name: PrinterName
Changes
Drivers
If this printer is shared with users running different versions of Windows, you may want to install additional drivers, so that the users do not have to find the print driver when they connect to the shared printer.
Additional Drivers
OK Cancel Apply Help

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

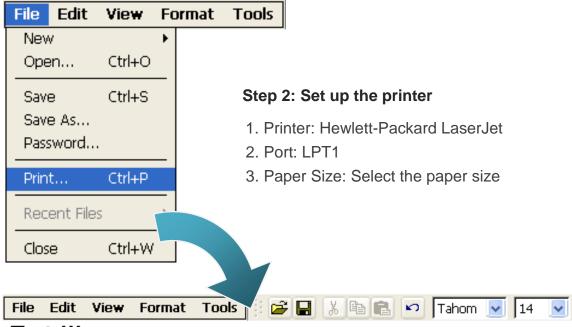


Printer:	PCL Laser 🔽	Print Range	Orientation
Port:	Network 🔽	 All 	Portrait
Net Path:	NRD1-User2\Anna	O Selection	O Landscape
Paper Size:	A4 🔽	Margins (inches) Top: 1"

E.4.2. How to use printer via USB

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

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



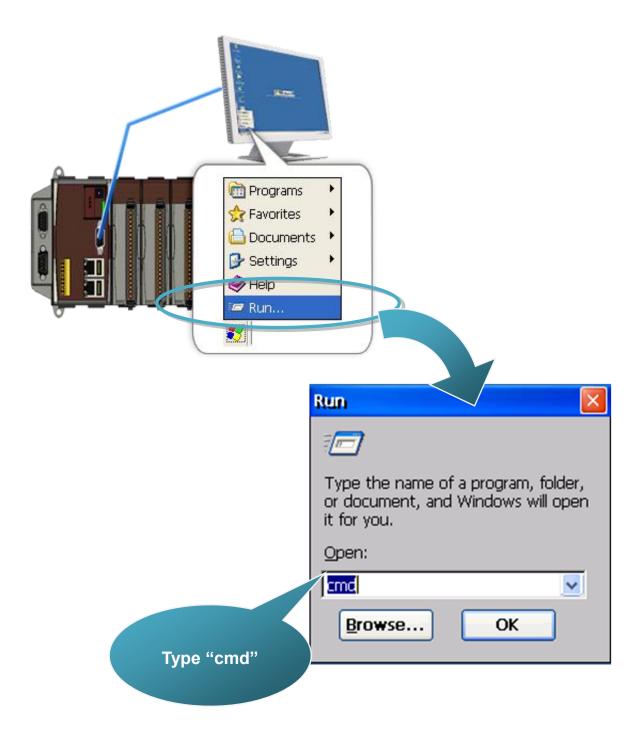
Test !!!

Print			? OK 🔀
Printer:	Hewlett-Packard LaserJ	Print Range	Orientation
Port:	LTP1 🔽		Portrait
Net Path:		O Selection	O Landscape
Paper Size:	Α4 🔽	Margins (inches)	
Advance	ed Draft Mode		Top: 1" Bottom: 1"

E.5. How to use services tool

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





Step 2: List all services

[Syntax] services list

File	Edit Help		
Pocket	5 CMD v 5.0		
> serv	vices list		
FYO:	0x00030110	NOTIFY.D11	Running
ITPO:	0x00031570	HTTPD.DLL	Running
CRD0:	0x00032070	credsvc.dll	Running
MMQ1:	0x00036790	MSMQD.D11	Off
DBX0:	0x00036b20	OBEXSrVr.dll	Off
FTPO:	0x00037770	FTPD.D11	Running
TELO:	0x00037ac0	TELNETD.D11	Running
SMB0:	0x0003c3e0	smbserver.dll	Running
NTPO:	0x0003fff0	timesvc.dll	Running
\ >			

Step 3: Type the commands to configure service

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

File	Edit Help		
Pocke	t CMD v 5.0		
\≻ ser	vices stop FTPO	:	
\≻ ser	vices list		
NFYO:	0x00030110	NOTIFY.D11	Running
HTPO:	0x00031570	HTTPD.DLL	Running
CRDO:	0x00032070	credsvc.dll	Running
MMQ1:	0x00036790	MSMQD.D11	Off
OBX0:	0x00036b20	OBEXSrVr.dll	Off
FTPO:	0x00037770	FTPD.D11	Off
TELO:	0x00037ac0	TELNETD.D11	Running
SMB0:	0x0003c3e0	smbserver.dll	Running
NTPO:	0x0003fff0	timesvc.dll	Running
\ >			
· ·			

Tips & Warnings



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

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

Appendix F. Revision History

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

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