

# XP-8000 Series User Manual (for WES 2009/7 Based XPAC)

V1.0.2, March 2017



XP-8x31-WES7/XP-8x41/XP-8x41-Atom

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## 1. Introduction

This chapter provides an overview of the XP-8000 series and its components, and introduces the fundamental concepts for user familiar with the XP-8000.

XP-8000 series PACs, the new generation Windows Embedded Standard 2009/7 based XPACs, consists of the following models:

- XP-8x31-WES7: XP-8131-WES7, XP-8331-WES7, and XP-8731-WES7
- XP-8x41-Atom: XP-8141-Atom, XP-8341-Atom, and XP-8741-Atom
- XP-8x41: XP-8041, XP-8341, and XP-8741



#### Windows Embedded Standard 2009/7



XP-8000 Series is the new generation Windows Embedded Standard based PACs of ICP DAS. It is equipped with a variety of CPU options (AMD LX800, 500 MHz/Intel Atom Z510, 1.1 GHz/R3600), various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/1/3/7 I/O slot(s) for high performance parallel I/O modules (high profile I-8K Series) and serial I/O modules (high profile I-87K series). The benefits of running Windows Embedded Standard on XPAC include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. XPAC is also capable of running PC-based control software such as Visual Basic .NET, Visual C#,.... etc. It has all of the best features of both traditional PLCs and Windows capable PCs.

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#### 1.1. Features

The XP-8000 offers the most comprehensive configuration to meet specific application requirements. The following list shows the hardware and software features designed to simplify installation, configuration and application.

#### **Hardware Features**

• Powerful CPU module:

XP-8x31-WES7	XP-8x41	XP-8x41-Atom
x86 CPU, 1 GHz,	AMD LX800 CPU, 32-bit	Intel Atom Z510 CPU,
dual-core	and 500 MHz	1.33 GHz

• Rich Memories:

	XP-8x31-WES7	XP-8x41	XP-8x41-Atom
System Memory	2GB DDR3	1 GB DDR	1 GB DDR2
Built-in Flash Disk	32 GB	4 GB	16 GB
EEPROM		16 KB	
SRAM/MRAM	Non-volatile MRAM A with no battery Dual Battery-Backup SRAM (512 KB)		up SRAM(512 KB)
CF card	one CF card (support up to 32 GB)		32 GB)

- VGA Port x 1, USB 2.0 port x 2/4, Series port (RS-232/RS-485) x 4/5
- 64-bit Hardware Serial Number
- Dual Watchdog Timers
- Dual Ethernet Ports (10 M/100 M/1000 M)
- Redundant Power Input
- Operating Temperature: -25 to +75 °C

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#### **Software Features**

- Windows Embedded Standard 2009/7
- Internet Information Services, FTP server and web server
- ASP.NET
- SQL Server 2005 Express Edition
- .NET Framework 3.5/4.5
- Remote Desktop Connection
- Built-in OPC Server
- Rich Software Solutions -

SDK for Microsoft Visual Studio.NET and Visual Studio 6.0 Borland C++ Builder and Delphi

### 1.2. Specifications

The table below summarizes the specifications of the XP-8000.

#### 1.2.1. XP-8x31-WES7

Models	XP-8131-WES7	XP-8331-WES7	XP-8731-WES7
OS	Wir	ndows Embedded Standa	rd 7
.Net Framework		4.5	
Embedded Service	IE11, FTP Ser	ver, IIS 7.0, ASP (Java Scr	ipt, VB Script)
SDK Provided	DII fo	or VC, DII for Visual Studio	o.Net
Multilanguage Support	English, German, Frer Korean, Sin	nch, Spanish, Russian, Ita nplified Chinese, Traditio	lian, Czech, Japanese, nal Chinese
CPU Module			
CPU	>	(86 CPU, 1 GHz, dual-cor	e
SDRAM	2 GB DDR3		
MRAM, Non-volatile Memory	512 KB (retain memory without battery support)		
Flash	32 GB		
EEPROM	16 KB; Data Retention: 40 years; 1,000,000 erase/write cycles		
CF Card	CF slot with one CF card (support up to 32 GB)		
RTC (Real Time Clock)	Provide second, m	inute, hour, date, day of	week, month, year
64-bit Hardware Serial Number	Yes,	for software copy protect	ction
Dual Watchdog Timers		Yes (0.8 second)	
Rotary Switch		Yes (0 to 9)	
DIP Switch		Yes (8 bits)	
Programmable LED Indicator	2 (L1 and L2)		
VGA & Communication Ports			
VGA Resolution	1600 x 1200, 1024 x 768, 800 x 600, 640 x 480		
Dual Ethernet Port	RJ-45 x 2, 10/100/1000 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators)		
USB 2.0		4	

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COM 1	Internal communication with high profile I-87K series modules in slots			
COM 2	RS-232 (RxD, TxD and GND); non-isolated			
COM 3	RS-485 (Data+, Data-)	with internal self-tuner A	ASIC; 3000 V <sub>DC</sub> isolated	
COM 4	RS-232/RS-485 (RxD, Dat	TxD, CTS, RTS and GND f a- for RS-485); non-isola	or RS-232, Data+ and ted	
COM 5	RS-232 (RxD, TxD, CTS	, RTS, DSR, DTR, CD, RI aı	nd GND); non-isolated	
Audio	Micr	ophone-in and Earphone	e-out	
I/O Expansion Slots				
Number of I/O slots	1	3	7	
Supported I/O modules	I-8K	and I-87K series I/O Moc	lules	
Mechanical				
Dimensions (W x L x H), unit: mm	169 x 132 x 125	231 x 132 x 125	355 x 132 x 125	
Installation	DIN-Rail or Wall Mounting			
Environmental				
Operating Temperature	-25 °C to +75 °C			
Storage Temperature	-30 °C to + 80 °C			
Ambient Relative Humidity	10 %	to 90 % RH (non-conder	nsing)	
Power				
Input Range		+10 $V_{DC}$ to +30 $V_{DC}$		
Redundant Power Inputs	Yes, with one	e power relay (1 A @ 24 \	V <sub>DC</sub> ) for alarm	
Isolation	1 kV			
	3.7 A, 5 V supply to	3.8 A, 5 V supply to	4.0 A, 5 V supply to	
	CPU and backplane,	CPU and backplane,	CPU and backplane,	
Capacity	1.3 A, 5 V supply to	3.2 A, 5 V supply to	3.0 A, 5 V supply to	
	I/O expansion slots,	I/O expansion slots,	I/O expansion slots,	
	25 W in total	30 W in total	35 W in total	
Consumption	16.6 W	16.8 W	18 W	
	(0.69 A @ 24 VDC)	(0.7 A @ 24 VDC)	(0.75 A @ 24 VDC)	

#### 1.2.2. XP-8x41

Models	XP-8041 XP-8341 XP-8741		XP-8741	
OS	Windows Embedded Standard 2009			
.Net Compact Framework		3.5		
Embedded Service	FTP Server, Internet	Information Service 5.1,	ASP (Java Script, VB	
SDK Provided		or VC DIL for Visual Studi	o Net	
	English German Free	ach Spanish Russian Ita	lian Crech Jananese	
Multilanguage Support	Korean, Sin	nplified Chinese, Traditio	nal Chinese	
CPU Module				
CPU	AMD L	X800 CPU, 32-bit and 50	00 MHz	
SDRAM		1 GB DDR		
Dual Battery Backup SRAM	512	KB; data valid up to 5 ye	ears	
Flash		4 GB		
EEPROM	16 KB			
CF Card	CF slot with one CF card (support up to 32 GB)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
64-bit Hardware Serial Number	Yes,	for software copy protect	ction	
Dual Watchdog Timers		Yes (0.8 second)		
Programmable LED Indicator		2 (L1 and L2)		
Rotary Switch		Yes (0 to 9)		
DIP Switch	-	Yes (8	3 bits)	
VGA & Communication Ports				
VGA Resolution	1600 x 120	0, 1024 x 768, 800 x 600	), 640 x 480	
Dual Ethernet Port	RJ-45 x 2, 10/100 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators)			
USB 2.0	2			
COM 1	RS-232 (RxD, TxD and Internal communication with the high profile GND); non-isolated I-87K series modules in slots			
COM 2	RS-232 (	RxD, TxD and GND); non	-isolated	
COM 3	RS-485 (Data+, Data-) with internal self-tuner ASIC; 3000 $V_{DC}$ isolated			

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COM 4	RS-232/RS-485 (RxD, Dat	TxD, CTS, RTS and GND f a- for RS-485); non-isola	or RS-232, Data+ and ted
COM 5	RS-232 (RxD, TxD, CTS	, RTS, DSR, DTR, CD, RI ai	nd GND); non-isolated
I/O Expansion Slots			
Number of I/O slots	0 3 7		
Supported I/O modules	I-8K	and I-87K series I/O Mod	lules
Mechanical			
Dimensions (W x L x H), unit: mm	137 x 132 x 125	231 x 132 x 125	355 x 132 x 125
Installation	C	DIN-Rail or Wall Mountin	g
Environmental			
Operating Temperature	-25 °C to +75 °C		
Storage Temperature	-30 °C to + 80 °C		
Ambient Relative Humidity 10 % to 9		to 90 % RH (non-conden	ising)
Power			
Input Range		+10 $V_{DC}$ to +30 $V_{DC}$	
Redundant Power Inputs	Yes, with one	power relay (1 A @ 24 \	/ <sub>DC</sub> ) for alarm
Isolation		1 kV	
Capacity	1.8 A, 5 V supply to1.8 A, 5 V supply toCPU and backplane,CPU and backplane,15 W in total5.2 A, 5 V supply toI/O expansion slots,35 W in total		<ul> <li>2.0 A, 5 V supply to</li> <li>CPU and backplane,</li> <li>5.0 A, 5 V supply to</li> <li>I/O expansion slots,</li> <li>35 W in total</li> </ul>
Consumption	14.4 W (0.6	A @ 24 V <sub>DC</sub> )	16.8 W (0.7 A @ 24 V <sub>DC</sub> )

#### 1.2.3. XP-8x41-Atom

Models	XP-8141-Atom	XP-8341-Atom	XP-8741-Atom	
OS	Windows Embedded Standard 2009			
.Net Compact Framework		3.5		
Embedded Service	FTP Server, Internet	Information Service 5.1,	ASP (Java Script, VB	
	Scri	pt), SQL Server 2005 Exp	bress	
SDK Provided	DII fo	or VC, DII for Visual Studio	o.Net	
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Czech, Japanese, Korean, Simplified Chinese, Traditional Chinese			
CPU Module				
CPU	Int	el Atom Z510 CPU, 1.33 (	GHz	
SDRAM		1 GB DDR2		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years			
Flash	16 GB			
EEPROM	16 KB			
CF Card	CF slot with one CF card (support up to 32 GB)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
64-bit Hardware Serial Number	Yes,	for software copy protect	ction	
Dual Watchdog Timers		Yes (0.8 second)		
Rotary Switch		Yes (0 to 9)		
DIP Switch		Yes (8 bits)		
Programmable LED Indicator		2 (L1 and L2)		
VGA & Communication Ports				
VGA Resolution	1600 x 1200, 1024 x 768, 800 x 600, 640 x 480			
Dual Ethernet Port	RJ-45 x 2, 10/100/1000 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators)			
USB 2.0		4		
COM 1	Internal communication with high profile I-87K series modules in slots			
COM 2	RS-232	(RxD, TxD and GND); non	-isolated	
COM 3	RS-485 (Data+, Data-) with internal self-tuner ASIC; 3000 $V_{DC}$ isolated			

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COM 4	RS-232/RS-485 (RxD, TxD, CTS, RTS and GND for RS-232, Data+ and Data- for RS-485); non-isolated			
COM 5	RS-232 (RxD, TxD, CTS)	, RTS, DSR, DTR, CD, RI ar	nd GND); non-isolated	
Audio	Micr	ophone-in and Earphone	e-out	
I/O Expansion Slots				
Number of I/O slots	1	3	7	
Supported I/O modules	I-8K	and I-87K series I/O Mod	lules	
Mechanical				
Dimensions (W x L x H), unit: mm	169 x 132 x 125	231 x 132 x 125	355 x 132 x 125	
Installation	DIN-Rail or Wall Mounting			
Environmental				
Operating Temperature	-25 °C to +75 °C			
Storage Temperature	-30 °C to + 80 °C			
Ambient Relative Humidity	10 %	to 90 % RH (non-conden	ising)	
Power				
Input Range		+10 $V_{DC}$ to +30 $V_{DC}$		
Redundant Power Inputs	Yes, with one	e power relay (1 A @ 24 \	/ <sub>DC</sub> ) for alarm	
Isolation	1 kV			
Capacity	3.7 A, 5 V supply to3.8 A, 5 V supply to4.0 A, 5 V supply toCPU and backplane,CPU and backplane,CPU and backplane,1.3 A, 5 V supply to3.2 A, 5 V supply to3.0 A, 5 V supply toI/O expansion slots,I/O expansion slots,I/O expansion slots,25 W in total30 W in total35 W in total		<ul> <li>4.0 A, 5 V supply to</li> <li>CPU and backplane,</li> <li>3.0 A, 5 V supply to</li> <li>I/O expansion slots,</li> <li>35 W in total</li> </ul>	
Consumption	16.6 W (0.69 A @ 24       16.8 W (0.7 A @ 24       18 W (0.75 A @ 24         V <sub>DC</sub> )       V <sub>DC</sub> )       V <sub>DC</sub> )			

#### 1.3. Overview

The XP-8000 is equipped with several interfaces and peripherals that can be integrated with external systems. Here is an overview of the components and its descriptions.



#### XP-8041

#### XP-8131-WES7/XP-8141-Atom



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#### XP-8731-WES7/ XP-8741/XP-8741-Atom



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The details of these items are as follows:

#### **LED Indicators**

The XP-8000 has 4 LED indicators. The first is labeled PWR, located near the power switch and shows the power status. The three other are located next the rotary switch, the left one is labeled RUN and shows the operation status, the two other are denoted L1 and L2 and used for user defined.



LED Indicator	Label	State (Color)	Meaning
Programmable LED Indicators	L1 and L2	-	Programmable LED indicators
System LED indicator	RUN	Orange	OS is running
Power LED Indicator	PWR	Green	Power 1 is on

#### **Operating mode Selector**



Rotary Switch is an operating mode selector that provides functions to configure with the selection of operating mode and authorization control.

#### **Power Switch**

The power switch is a small switch that enables or disables power to electric circuits and loads in the XP-8000.

Power Switch -



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The XP-8000 has a 2-row 10-wire terminal block; there has 4-wire for redundant power inputs and 2-wire for relay output. The details of the redundant power are shown to the side.



#### Redundant Power

The XP-8000 provides redundant power that can keep the device running if a problem occurs in the power supply.

#### • Relay Output

The XP-8000 has a relay output that can be used to control a light, siren, or other low voltage device when an alarm occurs.

# d Power Supply 1

Relay Output

Power Supply 2

#### **Communication Ports**

The XP-8000 is equipped with several interfaces and peripherals that can be integrated with external systems.

#### • VGA Port

The VGA connector is a 3-row 15-pin connector that can be used to connect a monitor at a variety of supported VGA resolutions. and the output resolution covers,  $1600 \times 1200$ ,  $1024 \times 768$ ,  $800 \times 600$ ,  $640 \times 480$ .



#### • CF slot

The CF slot comes with a free CF card that can be used to restore the system, and expand the memory up to 32 GB.

#### • Ethernet Ports (LAN1 and LAN2)

The XP-8000 has 2 Ethernet ports that can be used to connect the router to the Internet or to other devices.

Each Ethernet port has 2 LED indicators, which are used to indicate the network speed and Link/Acting, as described below.

LED Indicator	State (Color)	Meaning	
10/100M	ON (Yellow)	Network Speed: 100 MB GB	
	OFF	Network Speed: 10 MB	
1G	ON (Yellow)	Network Speed: 1000 MB GB	
	OFF	Network Speed: 10/100 MB	
Link/Act	ON (Green)	The Link is active	
	OFF	The Link is inactive	
	Blinking(Green)	Network activity	



## For XP-8x31-WES7, and XP-8x41-Atom:



#### • USB Ports (P1, P2, P3 and P4

#### (P3 and P4 are for XP-8x31-WES7 and XP-8x41-Atom only)

The XP-8000 has 2/4 USB 2.0 ports that can be used to connect the USB devices such as mouse, keyboard or an external USB hard drive.

#### • Microphone-in and Earphone-out (for XP-8x31-WES7 and XP-8x41-Atom only)

The XP-8000 has a microphone-in and an earphone-out that can be used to process the input and the output of sound.

#### • COM1, Expansion I/O Slot (Except XP-8041)

The XP-8000 has 1/3/7 I/O slot(s) that can be used to integrate high performance parallel I/O modules (high profile I-8K Series) or serial I/O modules (high profile I-87K series).

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#### • COM1 (RS-232) (for XP-8041 only)

The COM1 port is a 9-pins RS-232 connector. The details of the COM1 port specifications are shown to the side.

Note: 16C550 compatible Port Type: Male Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits: 5, 6, 7, 8 Parity: None, Even, Odd, Mark (Always 1), Space (Always 0) Stop Bits: 1, 2 FIFO: 128 bytes



#### • COM2 (RS-232)

The COM2 port is a 9-pins RS-232 connector. The details of the COM2 port specifications are shown to the side.

Note: 16C550 compatible Port Type: Female Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits: 7, 8 Parity: None, Even, Odd Stop Bits: 1 FIFO: 1 byte





Note: 16C550 compatible Port Type: Terminals Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits: 5, 6, 7, 8 Parity: None, Even, Odd, Mark (Always 1), Space (Always 0) Stop Bits: 1, 2 FIFO: 128 bytes

#### • COM4 (RS-232/RS-485)

The COM4 port is a 9-pins RS-232/RS-485 connector. The details of the COM4 port specifications are shown to the side.

Note: 16C550 compatible Port Type: Male Baud Rate: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps Data Bits: 5, 6, 7, 8 Parity: None, Even, Odd, Mark (Always 1), Space (Always 0) GND 5 9 Data-RxD 3 7 CTS Data+ 1 6

COM4 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.

#### • COM5 (RS-232)

The COM5 port is a 9-pins RS-232 connector. The details of the COM5 port specifications are shown to the side.

 Note: 16C550 compatible

 Port Type: Male

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

 Data Bits: 5, 6, 7, 8

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

 Stop Bits: 1, 2

 FIFO: 16 bytes



#### **Tips & Warnings**



The table below shows the data bit and their corresponding stop bit for COM2, COM3 COM4, and COM5

Word Length	Number of Stop Bits		
5, 6, 7, 8	1		
5	1.5		
6, 7, 8	2		

#### 1.4. Dimensions

The diagrams below provide the dimensions of the XP-8000 to use in defining your enclosure specifications. Remember to leave room for potential expansion if you are using other components in your system.

The height dimension is the same for all XP-8000. The width depending on your choose of I/O expansion slots. All dimensions are in millimeters.







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#### 1.5. Companion CD

This package comes with a CD that provides a collection of the software utility, documentation, drivers, demo program and application.

For XP-8x31-WES7: CD:\ippc-wes7\ ftp://ftp.icpdas.com/pub/cd/ippc-wes7/ • For XP-8x41: CD:\XP-8000\ http://ftp.icpdas.com/pub/cd/xp-8000/ • For XP-8x41-Atom: CD:\XPAC-Atom\ http://ftp.icpdas.com/pub/cd/xpac-atom/ Demo The demo programs for examples of use in the application. Document The technical support documents for installation, operation, maintenance, development and application. OS\_image The files and related information for OS releases and technology.

Rescue\_Disk
The files for storage on CF card. These files can be used to boot and
recover the system from CF card.
SDK
The sources for development and application in your application.
Tools

- The tools and utilities for operation on PC.

Update

The installation packages related to XP-8000.

## 2. Getting Started

This chapter provides a guided tour of the XP-8000 installation and configuration that describes the steps needed to download, install, configure, and run the basic procedures for user working with the XP-8000 for the first time.

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



XP-8x31-WES7/XP-8x41/XP-8x41-Atom



**Quick Start Guide** 







CF Slot with one CF card

Screw Driver 2.4 mm

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#### 2.1. Mounting the XP-8000

The XP-8000 can be mounted either directly to a wall/panel, or onto a standard 35mm DIN rail.

#### Wall/Panel mounting



## Step 2: Fasten the screws securely

**Step 1: Install the four mounting** 

mounting holes

screws into the 4 keyhole

#### **Tips & Warnings**



There must be a minimum clearance of 50mm between the XP-8000 and the top and bottom side of the enclosure panel.



Step 1: Hook upper tab over upper flange of DIN rail

Step 2: Tilt the module toward DIN rail until it snaps securely to DIN rail



Gently push up retaining clips

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A good common ground reference (earth ground) is essential for proper operation of the XP-8000. One side of all control circuits, power circuits and the ground lead must be properly connected to earth ground by either installing a ground rod in close proximity to the enclosure or by connecting to the incoming power system ground. There must be a single-point ground (i.e. copper bus bar) for all devices in the enclosure that require an earth ground.



Connect the ground lead to the ground screw

#### 2.2. Deploying a Basic XP-8000 System

The XP-8000 provides a variety of communication interface to suit a range of application. Here is a simple application for using the XP-8000.

#### Step 1: Connect the positive terminal (+) of the power supply to the terminal <u>PWR1/2</u> and the negative terminal (-) of the power supply to the <u>P.GND</u>

#### **Tips & Warnings**



- 1. The input range of power supply is +10 to +30  $V_{DC}$ .
- 2. The XP-8000 have two power inputs that can be connected simultaneously to the two independent power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help assure non-stop operation of the XP-8000.



Step 2: Connect the USB mouse or the USB keyboard to the USB port

Step 3: Connect the monitor to the VGA port

Step 4: Connect to PC or the laptop to the LAN port via an Ethernet switch



#### 2.3. Inserting the I/O Modules

XP-8000 has 0/1/3/7 I/O expansion slot(s) and only supports I-8K and I-87K series I/O modules.

Before choosing the right I/O modules, you first need to know the I/O expansion capacities in order to choose the best expansion module for achieving maximal efficiency.

For more information about the I/O expansion modules that are compatible with the XP-8000, please refer to:

http://www.icpdas.com/root/product/solutions/remote\_io/rs-485/i-8k\_i-87k/i-8k\_i-87k selection. html



#### **Tips & Warnings**



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

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# Step 2: Pull top and bottom locking tabs toward module face. Click indicates lock is engaged



#### Step 3: Attach field wiring using the terminal block, and then insert the terminal block

All I/O Web Page 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:

http://www.icpdas.com/root/product/solutions/remote\_io/rs-485/i-8k\_i-87k/i-8705 4w.html



#### 2.4. Committing EWF to Allow Settings to Be Saved

The EWF is a safety mechanism that provides the ability to control write protection of the XP-8000 system built in C: drive. Any changes made to the system are lost when the start restarts while EWF is enabled, unless they are committed to the system.

For more details about the EWF, please refer to section 3.4. Configuring the EWF Manager.

Step 1: Double-click the <u>PAC Utility</u> on the desktop



Step 2: Click the <u>EWF Operation</u> tab, select the <u>Commit</u> option, and then click <u>Apply</u> button

Eile Help	ACU	tility	
System Information Auto Exect	tion EWF Operation	Mi ti-serial Port Module	Language Setting
Automatically run EWF Status with EWF Control	hen I log on Windows		
⊖ Enable	○ Disable	⊙ Commit	Apply
Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2 0 Volume 20	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	0-00	

#### Step 3: Click <u>OK/Yes</u> button to save changes to the disk

For XP-8x41 and XP-8x41-Atom:



For XP-8x31-WES7:

Commit	8
?	Are you sure to save the change of the disk [C:]?
	<u>Y</u> es <u>N</u> o
### Step 4: Log off the XP-8000, and then login again for changes to take effect



For XP-8x41 and XP-8x41-Atom:

For XP-8x31-WES7:

	Control Paner Devices and Printers Default Prograt
All Programs	Help and Suppo
Search programs and files	Shut down D

#### **Tips & Warnings**



The Enhanced Write Filter (EWF) is a Windows embedded utility for protecting the C:\ drive of the XP-8000. If you need to change any of the settings you have configured, you must manage the EWF to commit the changes on the next login or next reboot. These changes will take effect on the login or next reboot.

# 2.5. Changing the User Interface Language

The **Regional and Language Settings** is a WES 2009/7 functionality that allows users to change the XP-8000 user interface with your native language.



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

Step 2: Click the <u>Language Setting</u> tab, choose your preferred language that you want to use for XP-8000 menus and dialogs, and then click <u>Apply</u> button

File Help	
PAC Uti	lity
System Information Auto Execution EWF Operation Multi-se	erial Port Modu 🕴 Language Setting
Change the Windows UI languages.	
Language used in menus and dialogs: English	Apply
English italiano français Русский Español	
Deutsch 日本語 čeština	

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Step 3: Click the <u>EWF Operation</u> tab, select the <u>Commit</u> option, and then click <u>Apply</u> button

File	e Help	0000	tility	
Syst	em Information Auto Exec	ution EWF Operation	Mul -serial Port Mod	ule Language Setting
Cha	nge the EWF status	to enable or disal	the system p	rotection.
	EWF Control O Enable	⊖ Disable	⊙ Commit	Apply
~	Protected Volume Configuratio Type RAM (REG) State ENABLED Boot Command Param1	n 227 - ap		

#### Step 4: Click <u>OK/Yes</u> button to save changes to the disk

For XP-8x41 and XP-8x41-Atom:



For XP-8x31-WES7:



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### Step 5: Log off the XP-8000, and then login again for changes to take effect



For XP-8x41 and XP-8x41-Atom:



	Control Paner Devices and Printers Default P gram	Switch user Log off
All Programs	Help and Suppo	<u>R</u> estart
Search programs and files	Shut down 🕨	<u>S</u> leep
📀 🥖 📜 💽		

# 2.6. Using DCON Utility Pro Configure I/O Modules

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

#### Step 1: Double-click the <u>DCON\_Utility\_Pro</u> on the desktop



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#### Step 3: Configure the communication settings

Comport Option			×
COM	1 Port	Timeout	
COM1 [Backp	lane] -	300	ms
Baud Rate	Protocol Check	sum Format	
☑ 115200	57600	☑ 38400	☑ 19200
☑ 9600	☑ 4800	☑ 2400	☑ 1200
ОК	Cancel		

#### **Tips & Warnings**



### COM2/3/4/5

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



Step 5: Click the module name to enter the I/O configure form, and then configure the I/O module

	Ţ			*	5				?			3
	Stort Ar	Idress	1	End Ac	ldress	4						5
(	ID 87055 87024 8088	Adu Slot: Slot s'(3	Paud F	ate C C C -	Thecksum Disable Disable	Format N,8,1 N,8,1 -	Status Remote Remote Remote	e I/O e I/O e I/O		Description [DCON]8*DI [DCON]4*AO [8KIO]8*PWI	+ 8*DO (mA,V) 4 + 8*DI	$\geq$
			18 87061 Fm	A20	2]							شر 💌
			Configuration	DO	Host WDT	About						
	1 m	$\sim$	DO Sta	itus								
	~~~	0000000000	0	<b>1</b>	2	3	<b>4</b>	5	<b>6</b>	7		
			8	9	<b>1</b> 0	11	12	13	14	15		
			Set F	ower On afe Value	)  Read D Read P Read S	O ower ON Valu afe Value	e					
			Exit									í

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# 3. Security and Risk

This chapter provides information of technological security risks and solutions associated with the XP-8000 services.

Security is important for XP-8000. Based on WES 2009/7, XP-8000 can avoid many security vulnerabilities. The following provides some security policy that you should consider before you develop your XP-8000.

- Administrator and User Accounts
- Windows Firewall
- IIS (Internet Information Service)
- EWF (Enhanced Write Filter)

The following table provides the default settings of the XP-8000 security policy.

Security Item	Default Settings	User Name	Password
Firewall	Enable	N/A	N/A
IIS	Enable	anonymous	Blank
EWF	Enable	N/A	N/A

# 3.1. Administrator and User Accounts

Based on WES, XP-8000 includes several components for managing user account names, groups, and passwords.

#### Account Types

Before you start creating new users on your XP-8000, you should understand the difference between the two main account types.

- Administrators have full control over the system. They can install software programs and hardware drivers, and they can create and modify new users and groups. Additionally, they can reset passwords, set policies, and edit the Registry. The OS identifies tasks that require administrator permissions with a Windows security icon.
- Standard users are permitted to log on to the computer, run programs, customize their accounts, and save files in their user folders. Users are restricted from making systemwide changes.

#### The First User

When XP-8000 OS reinstalls, it asks you for a user name and password, which it then uses to create your first account. This account joins the Administrators group, which has the highest set of privileges. From this account you can create and manage all other user accounts.

### 3.1.1. Creating and Managing User Accounts in WES 7

The Windows Control Panel provides utilities that enable you to create and manage user accounts quickly and easily. To access the relevant settings, you need to have Administrator permissions on XP-8000.

1) Open Control Panel, and then choose User Accounts and Family Safety



2) Under User Accounts, click Add or remove user accounts



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3) Click Create A New Account to start the process of adding a new account

🚱 🗢 🎕 « User Accounts → Manage Accounts 🗸 🔸 Search Control Panel	٩
Choose the account you would like to change	
User1 Administrator Password protected Guest account is off	
Create a new account	
What is a user account?	
Additional things you can do	
🛞 Set up Parental Controls	
Go to the main User Accounts page	

4) Type in the new account name, select either the Administrators or Standard Users user type, and then click **Create Account** 

By default, Windows assigns no password; you can make one by clicking on that user's icon and selecting Create a password. Alternatively, you can leave it blank to allow the user to set a password when they first log on.

				<u> </u>
<b>@</b>	See User Accounts  Manage Accounts  Create New Account	• 4• Sea	rch Control Panel	0
	Name the account and choose an account type This name will appear on the Welcome screen and on the Start menu. General User Standard user Standard account users can use most softy name system settings that do the security of the computer. Administrator Administrators have complete access to the computer and can make any desired on notification settings, administrators may be asked to provide their password or com- making changes that affect other users. We recommend that you protect every account with a strong password. Why is a standard account recommended? Create Account Complete Access (Create Access)	o not affect of changes. Base firmation be	ther users or ed on fore	
00-8	« User Accounts + Manage Accounts	<b>- - - €</b>	Search Control Par	el P
	Choose the account you would like to change         User1         Administrator         Password protected         Image: Change of the state o	Gener Standar	al User d user	
	Create a new account What is a user account? Additional things you can do Set up Parental Controls Go to the main User Accounts page			

#### 5) Manage the user account

There are several different operations that are commonly performed when managing user accounts. You can access these by clicking the name or icon of an account in the Manage Accounts window.



The options include the following:

- Change The Account Name
- Change The Password (or Create A Password if the account does not currently have one)
- Remove The Password (if one is currently configured)
- Change The Picture
- Set Up Parental Controls
- Change The Account Type
- Delete The Account

### 3.1.2. Creating and Managing User Accounts in WES 2009

The Windows Control Panel provides utilities that enable you to create and manage user accounts quickly and easily. To access the relevant settings, you need to have Administrator permissions on XP-8000.

1) Open Control Panel, and then choose User Accounts



2) Click Create an account



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3) Type in the new account name, and then click Next >

😫 User Accounts	
🌀 Back 💿 🕵 Home	
	Type a name for the new accunt:         Impose         Impose

4) Select the desired account type, and then click Create Account



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#### 5) Manage the user account

There are several different operations that are commonly performed when managing user accounts. You can access these by clicking the name or icon of an account in the Manage Accounts window.



The options include the following:

- Change the name
- Change the password
- Remove the password
- Change the picture
- Change the account type
- Delete the account

# 3.2. Windows Firewall

Based on WES, XP-8000 Firewall with Advanced Security and the related firewall technologies documented here enable user to share Internet connections, protect connections using a firewall, and provide Network Address Translation (NAT).

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### 3.2.1. Enabling and disabling firewall in WES 7

You shouldn't turn off Windows Firewall unless you have another firewall turned on. Turning off Windows Firewall might make your XP-8000 (and your network, if you have one) more vulnerable to unauthorized access to your network.

1) Open Control Panel, and then choose System and Security



2) Click Windows Firewall



3) Click Turn Windows Firewall On or Off in the left pane of the window



- 4) As Customize Settings page, enable/disable the Windows Firewall, and then click OK
  - Click Turn on Windows Firewall to enable Windows Firewall.
  - Click Turn off Windows Firewall (not recommended) to disable Windows Firewall.



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### 3.2.2. Enabling and disabling firewall in WES 2009

You shouldn't turn off Windows Firewall unless you have another firewall turned on. Turning off Windows Firewall might make your XP-8000 (and your network, if you have one) more vulnerable to unauthorized access to your network.

1) Open Control Panel, and then choose Security Center



2) Click Windows Firewall



- 3) Enable/disable the Windows Firewall, and then click OK
  - Click **On (recommended)** to enable Windows Firewall.
  - Click **Off (not recommended)** to disable Windows Firewall.

🖗 Windows Firewall 🛛 🔀
General Exceptions Advanced
Windows Firewall is helping to protect your PC
Windows Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.
💿 On (recommended)
This setting blocks all outside sources from connecting to this computer, with the exception of those selected on the Exceptions tab.
Don't allow exceptions
Select this when you connect to public networks in less secure locations, such as airports. You will not be notified when Windows Firewall blocks programs. Selections on the Exceptions tab will be ignored.
🔞 🔿 Off (not recommended)
Avoid using this setting. Turning off Windows Firewall may make this computer more vulnerable to viruses and intruders.
What else should I know about Windows Firewall?
OK Cancel

## 3.3. IIS

IIS creates a default Web site configuration on your hard disk at the time of installation. You can use the \Inetpub\Wwwroot directory to publish your Web content, or create any directory or virtual directory you choose. The File Transfer Protocol (FTP) service must be installed and started in order to create an FTP site. It is not installed by default.

#### **Tips & Warnings**



You must be a member of the Administrators group on the local computer to configure the IIS.

### 3.3.1. Starting IIS Manager in WES 7

IIS Manager is a graphical interface for configuring your application pools or your Web, FTP, SMTP, or NNTP sites. With IIS Manager, you can configure IIS security, performance, and reliability features. You can add or delete sites; start, stop, and pause sites; backup and restore server configurations; and create virtual directories for better content management, to name only a few of the administrative capabilities. In previous releases of IIS, this tool was called the Internet Service Manager.

#### 1) Open Control Panel, and then choose System and Security



2) Click Internet Information Services (IIS) Manager



### 3.3.2. Creating a new FTP site in WES 7

IIS Manager creates a default FTP site during the FTP services installation. You can use the \Inetpub\Ftproot directory to publish your content, or you can create another directory.

- 1) Open IIS Manager
- 2) In the **Connections** pane, right-click the **Sites** node in the tree and click **Add FTP Site**, or click **Add FTP Site** in the **Actions** pane



3) Type the name, and then select the Physical path (The default path is c:\inetpub\ftproot)

Add FTP Site		- ? <b>- X-</b>
Site Information		
ETP site name:		
FTP Default Site		
Content Directory		
Physical path:		
c:\inetpub\ftproot		
	Previous Next Einish	Cancel

4) Click on the drop down arrow and choose the IP address of your XP-8000, and then click the **Next** 

d FTP Site	
Binding and SSL Settings	
Binding	
IP <u>A</u> ddress: 10.1.0.31	Port: 21
<u>Enable Virtual Host Names:</u> <u>V</u> irtual Host (example: ftp.contoso.com):	
Start FTP site automatically	
<u>Start FTP site automatically</u> SSL     No SSL	
<ul> <li>✓ <u>Start FTP site automatically</u></li> <li>SSL</li> <li>○ No <u>SSL</u></li> <li>○ All<u>o</u>w SSL</li> </ul>	
<ul> <li>✓ <u>Start FTP site automatically</u></li> <li>SSL</li> <li>○ No <u>SSL</u></li> <li>○ All<u>ow</u> SSL</li> <li>○ <u>R</u>equire SSL SSL <u>C</u>ertificate:</li> </ul>	

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5) Click on the drop down arrow and choose the All users, and then select the **Read and Write**, and then click the **Finish** 

Add FTP Site	? 💌
Authentication and Authorization Information	
Authentication         ✓ Anonymous         ✓ Basic         Authorization         Allow access to:         All users         ✓         Permissions         ✓ Read         ✓ Write	
Previous Next	<u><u>F</u>inish Cancel</u>

6) Open Control Panel, and then choose System and Security



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7) Select the FTP Server, and then click the OK

			• X
🕥 🗢 🕍 « Windows Firewall 🕨 Allowed Programs 🔹 👻	← Search Control Pa	inel	\$
Allow programs to communicate through Windows F To add, change, or remove allowed programs and ports, click Change What are the risks of allowing a program to communicate?	irewall settings. මি Char	nge settings	
Allowed programs and features:			
Name	Home/Work (Private)	Public ^	
Connect to a Network Projector			
Core Networking	$\checkmark$		
Distributed scare in components			
ustributed Transaction Coordinator			
☑ File and Printer Sharing			
FTP Server			
			ļ
I LPD Service			
Message Queung			
I Netlogon Service			
	ОК	Cancel	

### 3.3.3. Starting IIS Manager in WES 2009

IIS Manager is a graphical interface for configuring your application pools or your Web, FTP, SMTP, or NNTP sites. With IIS Manager, you can configure IIS security, performance, and reliability features. You can add or delete sites; start, stop, and pause sites; backup and restore server configurations; and create virtual directories for better content management, to name only a few of the administrative capabilities. In previous releases of IIS, this tool was called the Internet Service Manager.



1) Open Control Panel, and then choose Administrative Tools

2) Click Internet Information Services



Internet Information Services Shortcut 2 KB

### 3.3.4. Creating a new FTP site in WES 2009

IIS Manager creates a default FTP site during the FTP services installation. You can use the \Inetpub\Ftproot directory to publish your content, or you can create another directory.

1) Go to IIS Manager, double-click the local computer, right-click the **FTP Sites** folder, point to **New**, and then click **FTP Site** 

The FTP Site Creation Wizard starts.

- 2) Click Next
- 3) In the **Description** box, type the name of your site, and then click **Next**
- 4) Type or click the IP address (the default is **All Unassigned**) and TCP port for your site, and then click **Next**
- 5) Click the user isolation option you want, and then click Next
- 6) In the Path box, type or browse to the directory that contains or will contain shared content, and click **Next**
- 7) Select the check boxes for the FTP site access permissions you want to assign to your users, and then click **Next**
- 8) Click Finish

To change these and other settings later, right-click the FTP site, and then click Properties.

# 3.4. EWF Manager

The Enhanced Write Filter (EWF) protects a volume from write access. All writes to a EWFprotected volume are redirected to an overlay. These writes are stored in the overlay and made available as part of the volume. In this way, it feels like that the volume is writeable. The overlay may exist either on disk or in RAM. If desired, the data stored in the overlay may be committed to the protected volume. The following figure is an overview of EWF.

For more detailed information about Enhanced Write Filter (EWF), please refer to <a href="http://msdn.microsoft.com/en-us/library/ms912906">http://msdn.microsoft.com/en-us/library/ms912906</a>(WinEmbedded.5).aspx

### 3.4.1. Disabling the EWF

PAC Utility allows users to easily configure EWF features.

#### 1) Run the PAC Utility

2) Click the EWF Operation, select the Disable, and then click Apply

			PAC_Utility
Eile Help			
		tility	
System Information Auto Exec	tion EWE Operation	Mut serial Port Modul	e Language Setting
Change the EWF status	to en ble or disa	e the system pro	otection.
Automatically run EWF Status	when I log on Windows		
EWF Control			
⊖ Enable	⊙ Disable	O Commit	Apply
Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	

#### **Tips & Warnings**



If EWF is disabled and XP-8000 suffers sudden power off, the operating system of XP-8000 may be damaged or incomplete.

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3) Click <u>OK/Yes</u> to save changes to the disk

For XP-8x41 and XP-8x41-Atom:



#### For XP-8x31-WES7:

ed, the OS will not be properly protected. In this situation, the OS should y clicking the Start button and then clicking the Shut Down button in ord- om being damaged.
If the EWF is disabled, you should only turn off the Pac by using the Shut Down button accessible from the Start menu
Do NOT directly turn off the power.
Do NOT use a watchdog timer to trigger a system reset.
Do NOT use the shutdown command.
are you sure you want, disable the EWF?
Yes

4) Reboot the XP-8000

### 3.4.2. Enabling the EWF

PAC Utility allows users to easily configure EWF features.

- 1) Run the PAC Utility
- 2) Click the EWF Operation, select the Disable, and then click Apply

Eile Help			+III C	PAC_Utility
System Information	on Auto Execu WF status w	ron EWF Operation enable or disa	Iulti-serial Port Module the system prot	Language Setting ection.
EWF Cont	Enable	○ Disable	○ Commit	Apply
Protected Vol Type State Boot Commi Param1 am2	ENABLED and NO_CMD	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	

#### **Tips & Warnings**



EWF only takes effect on hard drive C (where the operating system resides), it is recommended to download your programs to Compact Flash or USB-HDD. It'll prevent operating system from damages of illegal writing or sudden power off.

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distance in the

3) Click <u>OK/Yes</u> to save changes to the disk

For XP-8x41 and XP-8x41-Atom:

COM Port Setting Changes
You must restart this computer for the changes to take effect.
ОК

For XP-8x31-WES7:

Change EWF S	itatus	8
?	You must restart this computer for the changes to take effect.	
	<u>Y</u> es <u>1</u>	<u>v</u> o

4) Reboot the XP-8000

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# 3.4.3. Using the EWF Manager commands

EWF Manager (EWFMGR) is a console application that provides a command-line interface for managing EWF.

In these cases you have to enter the command in the command line window.

Funtion	Command
Enable write protection of drive C:	ewfmgr c: -enable
Disable write protection of drive C:	ewfmgr c: -commitanddisable
(changed data is applied)	
Apply changed data on drive C:	ewfmgr c: -commit
Display information about the EWF drive	ewfmgr c:
Display Help	ewfmgr /h

For more information about using EWF Manager Commands, please refer to Manager Commands <u>http://msdn.microsoft.com/en-us/library/ms940853(v=WinEmbedded.5).aspx</u>

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# 4. Tools and Tasks

This chapter provides a brief introduction of the XP-8000 service tools and its benefits.

There are several tools and utilities built-in and designed for use with XP-8000. Some of these are pre-installed on XP-8000 and can work directly on XP-8000, and some of these are supporting tools and can help you to manage the XP-8000 remotely on a PC.

Tools for working with PC can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

```
For XP-8x31-WES7:
CD:\ippc-wes7\
ftp://ftp.icpdas.com/pub/cd/ippc-wes7/
For XP-8x41:
CD:\XP-8000\
http://ftp.icpdas.com/pub/cd/xp-8000/
For XP-8x41-Atom:
CD:\XPAC-Atom\
http://ftp.icpdas.com/pub/cd/xpac-atom/
```


# 4.1. PAC Utility

PAC Utility is a collection of software applications that enable management and configuration of XP-8000 system and features.

# 4.1.1. System Information

The System Information tab provides functions to monitor necessary device information of XP-8000. The system information is the most important note of version control for upgrading system.

PAC Utility V1.0.1.0 2014/10/13		
File Help		
1 I	PACI	Utility
System Information Auto E	xecution EWF Operati	on Multi-serial Port Module Language Setting
List the system inform	nation and the mo	dule name on slot.
Module On Slot	Pac Information	
Slot 1:	Pac Type:	iPPC(N2600)
Slot 2:	Serial Number:	01-0E-18-1F-16-00-00-55
Slot 3:	OS Version:	1.0.1.0 , 2014-10-16
	Backplane Version:	1.0.12.0
	CPU:	Intel(R) Atom(TM) CPU N2600 @ 1.60GHz
	PacSDK Version:	4.2.4.0 , 10/8/2014
	PacNet Version:	2.1.0.3 , 7/7/2014
	CPU Board Version:	1.0.0.0
	L	

## 4.1.2. Auto Execution

The Auto Execution tab provides functions to configure programs running at XP-8000 startup, it allows users to configure ten execute files at most.

🖑 PAC Utility V1.0	0.0.0 2014/05/12	×
<u>F</u> ile <u>H</u> elp		
		T
	PAC UTILY	-j-t-
System Inform	nation Auto Execution EWF Operation Multi-serial Port Module Language Sett	ina
Set the pro	ogram to execute automatically at system startup.	
💡 At most	10 programs can be specified to execute automatically at system startup.	
Program 1	C:\Users\icpdas\Desktop\PacUtility\Release\PAC_Utility.exe	
Program 2		
Program 3		
Program 4		
Program 5		
Program 6		
Program 7		
Program 8		
Program 9		
Program 10		
	Clear All Setting Save All Sett	ing

#### **Tips & Warnings**



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

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

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# 4.1.3. EWF Operation

The LWT Operation tab provides functions to configure LWT.	The EWF	Operation	tab provi	des function	s to confi	gure EWF.
------------------------------------------------------------	---------	-----------	-----------	--------------	------------	-----------

mago ,	PAGU		
om Information Auto Ever	EWE Operation	Multi sorial Port Modu	la Languaga Satt
en niomation Auto Exec	to enable or disal	ha the system pr	e   Language Seu
inge the EWF status	to enable of disa	ole the system pro	otection.
Automatically run EWF Status	when I log on Windows		
Paternal carry ron Erri Claros	intering on thirdens		
EWF Control			
EWF Control	C Divela	0.0	Analy
EWF Control	O Disable	⊖ Commit	Apply
EWF Control	○ Disable	⊖ Commit	Apply
EWF Control	⊖ Disable	⊖ Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State Ebula Pi ED	⊖ Disable	⊖ Commit	Apply
EWF Control	⊖ Disable	⊖ Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0	⊖ Disable	⊖ Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2 0	O Disable	⊖ Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2 0 Volume ID 1D 80 97 2D	O Disable	O Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2 0 Volume ID 1D 80 97 2D 0 Device Name "Device/Hai	O Disable	O Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2 0 Volume ID 1D 80 97 2D Device Name "Device'Hait Max Levels 1	O Disable on 00 7E 00 00 00 00 00 00 00 00 rddiskVolume1* [C:]	O Commit	Apply
EWF Control © Enable Protected Volume Configuration Type RAM (REG) State ENABLED Boot Command NO_CMD Param1 0 Param2 0 Volume ID 1D 80 97 2D Device Name "Device/Hait Max Levels 1 Clump Size 512	O Disable on 00 7E 00 00 00 00 00 00 00 00 rddiskVolume1* [C:]	O Commit	Apply

The tab use to	How to use
Enable/disable the EWF	Enable the EWF function:
function	Select the <b>Enable</b> option, and then click the <b>Apply</b> button.
	Disable the EWF function:
	Select the <b>Disable</b> option, and then click the <b>Apply</b> button.
Commit changes	Select the <b>Commit</b> option, and then click the <b>Apply</b> button.

# 4.1.4. Multi-serial Port Module



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 XP-8000.

I/O Module	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

# PAC Utility V1.0.0.0 2014/05/12	- • •
<u>F</u> ile <u>H</u> elp	
PAC Utility	
System Information Auto Execution EWF Operation Multi-serial Port Module Langu	age Setting
Register or unregister the multi-serial port module on slot.	
Register All	
Remove All	

The XP-8000 can be expanded to support up to 16 I/O modules. For more detailed information about these support modules, please refer to <u>http://www.icpdas.com/products/Remote\_IO/i-8ke/selection\_rs232\_i8k.htm</u>

The tab use to	How to use
Register/remove the multi-serial port	Register the multi-serial port:
	Click the Register All button.
	Remove the multi-serial port:
	Click the <b>Remove All</b> button.

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# 4.1.5. Language Setting

The Language Setting tab provides functions to change the user interface language.

PAC Utility V1.0.1.0 2014/10/13	
File Help	
PAC Utilit	y-
System Information Auto Execution EWF Operation Multi-serial Port	Module Language Setting
Change the Windows UI languages.	
Language used in menus and dialogs:	Apply
Deutsch	
English	
Español	
italiano	
日本語	
中文(简体)	
中文 (繁體)	

The tab use to	How to use
Change the user interface language	Click on the drop down arrow and select your
	preferred language, and then click the <b>Apply</b> button.

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# 4.2. DCON Utility Pro

The DCON Utility Pro is a toolkit that help user to search the network, easily to configure and test the I/O modules via the serial port (RS-232/485) or Ethernet port (using virtual com port).

For more information on how to use DCON Utility Pro to configure I/O modules, please refer to section 2.6. Using DCON Utility Pro to Configure I/O Modules.

# 5. Your First XP-8000 Program

This chapter provides a guided tour that describes the steps needed to set-up a development environment, download, install, configure for user programming with XP-8000.

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

#### **Development Tools**

XP-8000 has .NET Framework 3.5/4.5 installed. Visual Studio takes full advantage of the .NET Framework, which uses public Internet standards to enable integration with new and existing applications running on any platform.

#### Supported languages include

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

#### XP-8000 SDK

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

The XP-8000 SDK is classified by development tools that can be obtained from the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

#### For XP-8x31-WES7:

http://ftp.icpdas.com/pub/cd/ippc-wes7/sdk/pacsdk/

- For XP-8x41: http://ftp.icpdas.com/pub/cd/xp-8000/sdk/pacsdk/
- For XP-8x41-Atom: <a href="http://ftp.icpdas.com/pub/cd/xpac-atom/sdk/pacsdk/">http://ftp.icpdas.com/pub/cd/xpac-atom/sdk/pacsdk/</a>

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# 5.1. First XP-8000 Program in VB.NET

The best way to learn programming with XP-8000 is to actually create a XP-8000 program.

The example below demonstrates how to create a demo program running on XP-8000 with VB.NET.

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

- 1. Create a new project
- 2. Specify the path of the PAC reference
- 3. Add the control to the form
- 4. Add the event handling for the control
- 5. Upload the application to XP-8000
- 6. Execute the application on XP-8000

All main steps will be described in the following subsection.

# 5.1.1. Create a new project

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

#### Step 1: Start Visual Studio 2008



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

	New		Durniant	CHUCKEN
	Open F	<b>1</b>	<u>W</u> eb Site <u>F</u> ile	Cul+Shift+Alt+N Ctrl+N
	Close Solution Save Selected Items Ctrl+S Save Selected Items <u>A</u> s Save All Ctrl+Shift+S Export Template		Project From <u>E</u>	xisting Code
) j	Page Setup Print Ctrl+P Recent <u>F</u> iles Recent Projects			
	Exit			

#### Step 3: In the Project types pane, expand Visual Basic node and select Windows

# Step 4: In the list of <u>Templates</u>, select <u>Windows Forms Application</u>

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

New Project			? 🗙
<u>P</u> roject types:		<u>T</u> emplates:	.NET Framework 3.5 🛛 🔽 🔚
<ul> <li>Visual Basic</li> <li>Windows</li> <li>Web</li> <li>Smart Device</li> <li>Office</li> <li>Database</li> <li>Reporting</li> <li>Test</li> <li>WCF</li> <li>Workflow</li> <li>Visual C#</li> <li>Other Project Types</li> <li>Test Projects</li> </ul>		Visual Studio installed templates         Windows Forms Application         WPF Application         Console Application         Windows Service         WPF User Control Library         My Templates         Search Online Templates	<ul> <li>Class Library</li> <li>WPF Browser Application</li> <li>Empty Project</li> <li>WPF Custom Control Library</li> <li>Windows Forms Control Library</li> </ul>
A project for creatin	ag an application with	n a Windows user interface (.NET Framework 3	.5)
<u>N</u> ame:	SDKInfo		
Location:	C:\Documents and S	ettings\Windows\My Documents\WM_Windo	ws4 My Documents 💽 📴 🛛 🖉 🖉 🖉
Solution Na <u>m</u> e:	SDKInfo	Crea	ate <u>d</u> irectory for solution
			OK Cancel

# 5.1.2. Specify the path of the PAC reference

The PAC SDK provides a complete solution to integrate with XP-8000 and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

#### Step1: Get the PACNET.dll



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

#### For XP-8x31-WES7:

CD:\ippc-wes7\sdk\pacsdk\pacnet\ http://ftp.icpdas.com/pub/cd/ippc-wes7/sdk/pacsdk/pacnet/

# • For XP-8x41:

CD:\XP-8000\SDK\pacsdk\pacnet\ http://ftp.icpdas.com/pub/cd/xp-8000/sdk/pacsdk/pacnet/

#### For XP-8x41-Atom:

CD:\XPAC-ATOM\SDK\packsdk\packnet\ http://ftp.icpdas.com/pub/cd/xpac-atom/sdk/pacsdk/pacnet/

- Step 2: In the <u>Solution Explorer</u>, right-click the References node, and then click Add <u>Reference...</u>
- Step 3: On the <u>Browse</u> tab and browse to where the PACNET.dll are installed, and then click <u>OK</u>

Solution I	Explore	r - MyPorje	ct		Ε	3
B	<b>\$</b>	y 🗉 🖧				
😡 Solut	ion Mył	Porject' (1 proj	ject)			1
		B <u>u</u> ild				
I [	8	R <u>e</u> build				
		Depl <u>o</u> y				
		C)				
		A <u>d</u> d				
		Add <u>R</u> eferen				
		Add W <u>e</u> b Re	ference			
	ěQ,	Lev	)ia gram			
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	AUU K	terenence				
	.NE	T Projects	Browse Recent			
	L	ocation: [	) SDKInformation	•		
		) bin	-			
	Ē	My Project				
		obj Pac NRT di	1			
		I NOME I.M.				
戻 Resour	N	ame:	PACNET.dll			~
uer	Fi	ile types:	Component Files (* d	ll-* tlb :* olb :* ocx:* ex	ve)	
		A CONTRACTOR NO.		_,,,,,,,		
					OK	Cancel

# 5.1.3. Add the control to the form

1

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

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

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

foolbox		
All Device Controls	<u>^</u>	
Revinter Pointer		
🚏 BindingSource		
ab Button		
CheckBox		
📑 ComboBox		
E ContextMenu	Form1.vb [Design]* Start Page	<b>→</b> ×
🚰 DataGrid		
🖃 DataSet	🔜 Form1	
📅 Date Time Picker		
🗐 DomainUpDown		
S HScrollBar		
🗊 ImageList	00 4 D-4-1	
Server Explorer 📭 Toolbo		

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

Properties Form1.vb [D	esign]* Start Pa	ge × ×
Button1 System.Windows.Fo	orms.Button	•
∄∎ ≵↓ 🗉 🖋 🖾		
ImageList	(none)	<u> </u>
RightToLeft	No	
Text	Check the SDK	version
TextAlign	MiddleCenter	
TextImageRelation	Overlay	
UseMnemonic	True	~
UseVisualStyleBackColor	Тгае	Properties Form1.vb [Design]* Start Page - ×
Use WaitCursor	False	
Behavior		E Formi
AllowDrop	False	
Text The text associated with the co	ntrol.	Check the SDK version

# 5.1.4. Add the event handling for the control

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

Properties Form1.vb [Design]* Start Page
E Form1
Check the SDK version

Step 1: Double-click the button on the form

#### Step 2: Inserting the following code

Dim data(30) As Byte

PACNET.Sys.GetSDKVersion(data)

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

(General)	🖌 🎬 (Declarations)
Public Class For	لسر
Private Sub I Dim data PACNET.S MessageBi	Button1_Click(ByVal sender As System.Object, ByVal e As Sy (30) As Byte ys.GetSDKVersion(data) ox.Show(PACNET.MISC.WideString(data))
- End Sub	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Lend Class	
Jan Marine Starter	

#### **Tips & Warnings**



# 5.1.5. Upload the application to XP-8000

XP-8000 supports FTP server service. You can upload files to XP-8000 or download files from a public FTP server.



## Step 1: On the Build menu, and then click Build Solution

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>P</u> roject	Buil	d <u>D</u> ebug	D <u>a</u> ta	<u>T</u> ools	Te <u>s</u> t	<u>W</u> indow	<u>H</u> elp
				₩	<u>B</u> uild Solut	ion Ci	trl+Shift+	B		
					<u>R</u> ebuild Sol	lution				
					<u>C</u> lean Solut	ion				
					B <u>u</u> ild SDKI	nfo				
					R <u>e</u> build SD	KInfo				
					Clea <u>n</u> SDKI	Info				
					Publis <u>h</u> SDI	KInfo				
					C <u>o</u> nfigurati	on Man	ager			

Step 2: Open the browser and type the IP address of XP-8000

#### Step 3: Upload the application and the corresponding PACNET.dll files to XP-8000

#### **Tips & Warnings**



For applications programming in C# and VB.net with .net compact framework, when executing these application on XP-8000, the corresponding PACNET.dll must be in the same directory as the .exe file.

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>G</u> o	F <u>a</u> vorites	
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# 5.1.6. Execute the application on XP-8000

After uploading the application to XP-8000, you can just double-click it on XP-8000 to execute it.



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# 5.2. First XP-8000 Program in Visual C#

The best way to learn programming with XP-8000 is to actually create a XP-8000 program.

The example below demonstrates how to create a demo program running on XP-8000 with Visual C#.

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

- 1. Create a new project
- 2. Specify the path of the PAC reference
- 3. Add the control to the form
- 4. Add the event handling for the control
- 5. Upload the application to XP-8000
- 6. Execute the application on XP-8000

All main steps will be described in the following subsection.

# 5.2.1. Create a new project

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

#### Step 1: Start Visual Studio 2008



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

	New	122	P : .	0.1.01.01.01
	New F	C)	Project	Ctrl+Shift+N
	Open 🕨	۲	<u>W</u> eb Site	Shift+Alt+N
	<u>C</u> lose	1	<u>F</u> ile	Ctrl+N
ń	Close Soluțion		Project From <u>E</u>	xisting Code
-	Save Selected Items Ctrl+S			
	Save Selected Items <u>A</u> s			
7	Save All Ctrl+Shift+S			
	Export Template			
_	Page Settin			
1				
	Print Ctrl+P			
	Print Ctrl+P Recent Files			
	Print. Ctrl+P Recent Files > Recent Projects >	÷		

#### Step 3: In the Project types pane, expand Visual C# node and select Windows

# Step 4: In the list of <u>Templates</u>, select <u>Windows Forms Application</u>

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

New Project			? 🛛
Project types:		Templates:	.NET Framework 3.5 💌 🖽
<ul> <li>→ Visual Basic</li> <li>→ Visual C#</li> <li>→ Windows</li> <li>→ Web</li> <li>→ Smart Devi</li> <li>→ Office</li> <li>→ Database</li> <li>→ Reporting</li> <li>→ Test</li> <li>→ WCF</li> <li>→ Workflow</li> <li>→ Visual C++</li> <li>→ Other Project T</li> <li>→ Test Projects</li> </ul>	ice 'ypes	Visual Studio installed templates         Image: Windows Forms Application         Image: WPF Application         Image: Console Application         Image: Windows Service         Image: Windows Service         Image: WPF User Control Library         My Templates         Image: Search Online Templates	Class Library WPF Browser Application Empty Project WPF Custom Control Library Windows Forms Control Library
A project for creatin	ng an application with	a Windows Forms user interface (.NET Frame	work 3.5)
<u>N</u> ame:	SDKInfo		
<u>L</u> ocation:	C:\Documents and Settings\Windows\My Documents\WM_Windows4 My Documents 🛛 🔽		
Solution Na <u>m</u> e:	SDKInfo	Crea	ate <u>d</u> irectory for solution
			OK Cancel

# 5.2.2. Specify the path of the PAC reference

The PAC SDK provides a complete solution to integrate with XP-8000 and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

#### Step1: Get the PACNET.dll



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

#### For XP-8x31-WES7:

CD:\ippc-wes7\sdk\pacsdk\pacnet\ http://ftp.icpdas.com/pub/cd/ippc-wes7/sdk/pacsdk/pacnet/

# For XP-8x41: CD:\XP-8000\SDK\pacsdk\pacnet\

http://ftp.icpdas.com/pub/cd/xp-8000/sdk/pacsdk/pacnet/

#### For XP-8x41-Atom:

CD:\XPAC-ATOM\SDK\packsdk\packnet\ http://ftp.icpdas.com/pub/cd/xpac-atom/sdk/pacsdk/pacnet/

# Step 2: In the <u>Solution Explorer</u>, right-click the References node, and then click Add <u>Reference...</u>

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

Solution Explorer	- SDK	Informatio	n		×	
		R.				
Solution SDKI	Informat	ion' (1 proje	ct)			
H BDKInfo		Build		1		
😥 🔄 Refere	e i	Rebuild				
E E Form1		Deploy				
- S Fo		ciean				
P	d	Add				
		Add Referen	ace			
		Add Web Ro	eference			
	B	View Class				
	Add R	eference				
	.NE	I Projec	ts Browse Recent			
	I	ocation: 🥡	SDKInformation	~		×
		n him				
		🖥 My Projec	t			
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		PACNET.	d11			
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Resource View	<u>10</u>		PACINET.dll			
	Ē	te tybes:	Component Files (*.dll;	*.tlb;*.olb;*.ocx;*.ex	:)	×
					( <u>A</u>	

# 5.2.3. Add the control to the form

1

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

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

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



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

Form1.cs [Design]* Pro	perties Star	rt Page 🛛 👻 🗙	
button1 System.Windows.For	ms.Button	•	
<u>₽</u> 2↓ 🗉 🖋 🖂			
ImageList	(none)	<u> </u>	
RightToLeft	No		
Text	Check th	e SDK Version	
TextAlign	MiddleCer	nter	
TextImageRelation	Overlay	R	
UseMnemonic	True	Form1.cs [Design]* Properties Start Page	• ×
IIseVisualStyleBackColor	Ттпе		
The text associated with the con	trol.	Form1	

# 5.2.4. Add the event handling for the control

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

Form1

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

#### Step 2: Inserting the following code

byte[] data = new byte[30];

PACNET.Sys.GetSDKVersion(data);

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



**Tips & Warnings** 



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

# 5.2.5. Upload the application to XP-8000

XP-8000 supports FTP server service. You can upload files to XP-8000 or download files from a public FTP server.



#### Step 1: On the Build menu, and then click Build Solution

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>P</u> roject	Buil	d <u>D</u> ebug	D <u>a</u> ta	<u>T</u> ools	Te <u>s</u> t	<u>W</u> indow	<u>H</u> elp
				₩	<u>B</u> uild Solut	tion Ci	trl+Shift+	в		
					<u>R</u> ebuild So					
					<u>C</u> lean Solut	tion				
					B <u>u</u> ild SDKI	Info				
					R <u>e</u> build SD	KInfo				
					Clea <u>n</u> SDK	Info				
					Publis <u>h</u> SDI	KInfo				
					C <u>o</u> nfigurat	ion Man	ager			

Step 2: Open the browser and type the IP address of XP-8000

#### Step 3: Upload the application and the corresponding PACNET.dll files to XP-8000

#### **Tips & Warnings**



For applications programming in C# and VB.net with .net compact framework, when executing these application on XP-8000, the corresponding PACNET.dll must be in the same directory as the .exe file.



# 5.2.6. Execute the application on XP-8000

After uploading the application to XP-8000, you can just double-click it on XP-8000 to execute it.



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# 5.3. First XP-8000 Program in Visual C++

The best way to learn programming with XP-8000 is to actually create a XP-8000 program.

The example below demonstrates how to create a demo program running on XP-8000 with Visual C++.

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

- 1. Create a new project
- 2. Specify the path of the PAC reference
- 3. Add the control to the form
- 4. Add the event handling for the control
- 5. Upload the application to XP-8000
- 6. Execute the application on XP-8000

All main steps will be described in the following subsection.

# 5.3.1. Create a new project

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

#### Step 1: Start Visual Studio 2008



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

<u>N</u> ew •	Project Ctrl+Shift+N
Open  Close Close Close	Web Site         Shift+Alt+N           File         Ctrl+N           Project From Figure Code
Save Selected Items     Ctrl+S       Save Selected Items As     Save All       Ctrl+Shift+S	
Export Template	
Export Template  Page Setup  Print  Ctrl+P  Page Setup	

#### Step 3: In the Project types pane, expand Visual C++ node and select MFC

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

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

New Project					? 🛛				
Project types: ⊕- Visual Basic		Templates: Visual Studio installed templates		.NET Framework 3.5					
<ul> <li></li></ul>		MFC ActiveX Control		Application					
		My Templates							
		📷 Search Online Templates							
<ul> <li>■ Other Project Types</li> <li>■ Test Projects</li> </ul>									
1 project for creatin	a on opplication that r	une the Mierrardt Foundation Clear Library							
A project for creating an application that uses the Microsoft Foundation Class Library									
<u>IN</u> ame:	SDRIMO								
<u>L</u> ocation:	C:\Documents and S	ettings\Windows\My Documents\WM_Windo	ws4 My Do	cuments 🛛 🗸	<u>B</u> rowse				
Solution Na <u>m</u> e:	SDKInfo	Crea	ate <u>d</u> irectory	for solution					
		OK Cancel							

#### Step 6: On the first page of the wizard, click <u>Next></u>

MFC Application Wizard - SDKInfo							
Welcome to the MFC Application Wizard							
Overview Application Type Compound Document Support Document Template Strings Database Support User Interface Features Advanced Features Generated Classes	These are the current project settings: <ul> <li>Tabbed multiple document interface</li> <li>No database support</li> <li>No compound document support</li> <li>Customizable menu bar and toolbar interface</li> <li>Visual Studio 2005 application appearance</li> <li>Visual Studio project style (with explorer, output and properties panes)</li> </ul> Click Finish from any window to accept the current settings. After you create the project, see the project's readme.txt file for information about the project features and files that are generated.                           Cinck Timish Cancel                                                                                                                                                            <						

Step 7: On the next page of the wizard, select <u>Dialog based</u>, select <u>Use MFC in a static</u> <u>library</u>, and then click <u>Finish</u>

Application type: Single document Multiple documents Talpbed documents Single documents Single top-level documents Occument/Yew architecture support Resource language: Use Ugicode libraries	Project style: MFC stgndard Windows Egolorer Visual Studg Office Visual style and colors: Windows Native/Default Use of MFC: Use of MFC: Use MFC in a shared DLL Use MFC in a static library
	Application type: Single document Multiple documents Tabled documents Dalog based Use HTML dialog Multiple top-level documents Document/New architecture suppor Resource language: Use Ugicode libraries

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# 5.3.2. Specify the path of the PAC reference

The PAC SDK provides a complete solution to integrate with XP-8000 and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

#### Step1: Get the PACSDK.H and PACSDK.lib

The PACSDK.H and PACSDK.lib can be found from the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

For XP-8x31-WES7:

CD:\ippc-wes7\sdk\pacsdk\ http://ftp.icpdas.com/pub/cd/ippc-wes7/sdk/pacsdk/pacsdk/

For XP-8x41:

CD:\XP-8000\SDK\pacsdk\pacsdk\ http://ftp.icpdas.com/pub/cd/xp-8000/sdk/pacsdk/pacsdk/

For XP-8x41-Atom:

CD:\XPAC-ATOM\SDK\packsdk\packsdk\ http://ftp.icpdas.com/pub/cd/xpac-atom/sdk/pacsdk/pacsdk/

File	<u>E</u> dit	⊻iew	<u>P</u> roject	<u>B</u> uild	Debug	F <u>o</u> rmat	<u>T</u> ool	s Te <u>s</u> t <u>W</u> indow <u>H</u> elp
								Attach to Process Ctrl+Alt+P
							B <sub>R</sub>	Device Security Manager
							9,	Connect to Device
							<u>i</u>	Device Emulator Manager
							۹,	Connect to Database
							1	Connect to Server
							B	Code Snippets Manager Ctrl+K, Ctrl+B
								Choose Toolbo <u>x</u> Items
								<u>A</u> dd-in Manager
								Macros
								Find More Extensions
								Create <u>G</u> UID
								Dotfuscator Community Edition
								Error Loo <u>k</u> up
								ATL/MFC Trace Tool
								Sру <u>+</u> +
							₽.	WCF Service Configuration Editor
								External Tools
								Import and Export Settings
								<u>C</u> ustomize
								Options

# Step 2: On the Tools menu, and then click Options

# Step 3: In the left pane, expand <u>Projects and Solutions</u>, and then click the <u>VC++</u> <u>Directories</u>

- Step 4: Select <u>Include files</u> in the <u>Show directories for</u> drop down box, and then click the <u>New Line</u> button
- Step 5: Add a new line to the list of directories. Browse to the directory that contains the <u>PACSDK.H</u> file.


# Step 6: Select <u>Library files</u> in the <u>Show directories for</u> drop down box, and then click the <u>New Line</u> button

Step 7: Add a new line to the list of directories. Browse to the directory that contains the <u>PACSDK.lib</u> file, and then click <u>OK</u> button



# Step 8: In the <u>Solution Explorer</u> windows, right-click the project name, and then click <u>Properties</u>

Solution Explorer -	DKInfo					
🖷 👔 🗉 🕹						
🧔 Solution SDKIn	(1 project)					
B. B. SDKInfo	B <u>u</u> ild					
- h R	R <u>e</u> build					
<u>n</u> 21	Clea <u>n</u>					
- h st	Project Only	+				
🛄 🛄 ta	Profile Guided	l Optimization 🔹 🕨				
	Custom <u>B</u> uild	Rules				
👼 SI	Tool Build Or	der				
	Add	•				
- 🔁 SI	References					
	Add Web Ref	erence				
E Readl	View Class Di	agram				
		Project				
	Debug	•				
	Cut					
	Pacte					
	Remove					
í	Rename					
	Indend Derive					
	Uniosa rrojec					
	Open Folder i	n Windows E <u>x</u> plorer				
	P <u>r</u> operties					

#### Step 9: In the left pane, expand <u>Configuration Properties</u>, and then click the <u>Link</u>

Step 10: In the right pane, type the <u>PACSDK.lib</u> in the <u>Additional Dependencies</u> item, click <u>Apply</u> button, and then click the <u>OK</u> button

SDKInfo Prope	rty Pages					? 🛛
<u>C</u> onfiguration:	Active(Debug)	<u>P</u> latform:	Active(Win32)		*	Configuration Manager
Common P Configurat Genera Coffigurat Genera CoC++ Linker Gen Sys Coff Sys Sys Coff Sys Sys Coff Sys	roperties ion Properties 1 ging neral nut infest File bugging stem timization ibedded IDL vanced mmand Line st Tool ces Document Generator e Information Events 1 Build Step	Additional Dependencies Ignore All Default Library Module Definition File Add Module to Assembly Embed Managed Resour Force Symbol Reference Delay Loaded DLLs Assembly Link Resource	ties y ce File s • • • • • • • • • • • • •	PACSDK.lib No (ex: kemel32.lib); configura	tion sp	ecific.
				OK		Cancel <u>A</u> pply

# 5.3.3. Add the control to the form

1

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

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

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



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



# 5.3.4. Add the event handling for the control

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

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

SD	Info.rc - IDD - Dialog* Properties Start Page	▼ ×
	SDKInfo	
	Check the SDK version	
	TODO: Place dialog controls here. OK Cancel	
		>

#### Step 2: Inserting the following code

char sdk\_version[32];

TCHAR buf[32];

pac\_GetSDKVersion(sdk\_version);

pac\_AnsiToWideString(sdk\_version, buf);

MessageBox(buf,0,MB\_OK);



#### Step 2: Inserting the following code into the header area

#### #include "PACSDK.h"



# 5.3.5. Upload the application to XP-8000

XP-8000 supports FTP server service. You can upload files to XP-8000 or download files from a public FTP server.



#### Step 1: On the Build menu, and then click Build Solution

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>P</u> roject	Buil	1 I	<u>)</u> ebug	D <u>a</u> ta	<u>T</u> ools	Te <u>s</u> t	<u>W</u> indow	<u>H</u> elp
				₩	Bui	ld Solut	tion C	trl+Shift+	в		
					<u>R</u> ebuild Solution						
					<u>C</u> lea	an Solu	tion				
					Bui	la SDKI	Info				
				R <u>e</u> build SDKInfo							
				Clea <u>n</u> SDKInfo							
				Publis <u>h</u> SDKInfo							
				Configuration Manager							

Step 2: Open the browser and type the IP address of XP-8000

Step 3: Upload the application to XP-8000



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## 5.3.6. Execute the application on XP-8000

After uploading the application to XP-8000, you can just double-click it on XP-8000 to execute it.



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# 6. I/O Expansion Modules and SDKs Selection

This chapter describes how to select a suitable expansion I/O module and the corresponding SDK library to be used for developing programs on XP-8000.

XP-8000 provides the following I/O expansion buses:



#### 1. RS-485

I-7000, RU-87Pn and high profile I-87K series modules connect to XP-8000 via a twisted-pair, multi-drop, 2-wire RS-485 network.

#### > I-7000 series I/O module

Module	Native SDK	.NET CF SDK
I-7000 series	PACSDK.dll	PACNET.dll

For full details regarding I-7000 series I/O modules and its demos, please refer to:

#### • For XP-8x31-WES7:

http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/

#### • For XP-8x41:

http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/

#### • For XP-8x41-Atom:

http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/

#### RU-87Pn + I-87K series I/O module

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

#### Other Specified I/O

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

## 2. Local I/O

XP-8000 has 0/1/3/7 expansion slot(s) that can be used to add expansion I/O modules. The expansion I/O modules can be divided into two categories: High Profile I-8K series I/O modules and High profile I-87K series I/O modules. The following indicates the appropriate SDK library to be used for I/O modules.

#### General I-8K/I-87K series I/O module

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

For full details regarding I-8K and I-87K series I/O modules and its demos, please refer to:

#### • For XP-8x31-WES7:

http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/

#### • For XP-8x41:

http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/

# For XP-8x41-Atom: <a href="http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/">http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/</a>

# Other Specified I/O

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

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#### 3. FRnet

FRnet is an innovative industrial field bus technology that uses twisted pair cable as the transmission medium. The status of all I/O devices is updated on a fixed cycle, no matter how many FRnet I/O modules are connected to the FRnet network.

Module	Native SDK	.NET CF SDK
I-8172W	pac_i8172W.lib	pac8172WNet.dll

#### 4. 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.

Module	Native SDK	.NET CF SDK
I-8120W	i8120.lib	i8120net_pac.dll

# 7. APIs and Demo References

This chapter provides a brief overview of PAC standard APIs and demos that have been designed for XP-8000 from the PAC SDK package.

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

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



# 7.1. PAC Standard APIs for System Operation

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



# 7.1.1. VB.NET Demos for PAC Standard APIs

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

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

#### For XP-8x31-WES7:

CD:\ippc-wes7\demo\pacsdk\vb.net\standard\ http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/vb.net/standard/

#### For XP-8x41:

CD:\XP-8000\demo\pacsdk\vb.net\standard\ http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/vb.net/standard/

#### • For XP-8x41-Atom:

CD:\XPAC-Atom\demo\pacsdk\vb.net\standard\ http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/vb.net/standard/

Folder	Demo	Explanation
deviceinformation	deviceinformation	Retrieves information about the OS version, the CPU version and the SDK version, etc.
diagnostic	diagnostic	Retrieves information about the slot count and the module inserted in the backplane.
dip	dip	Retrieves information about the status of the DIP switch.
getrotaryid	getrotaryid	Retrieves information about the status of the rotary switch.
memory	memory	Shows how to read/write date values from/to EEPROM.
uart	uart	Shows how to read the name of local I/O modules via UART
watchdog	watchdog	Displays information about how to operate the watchdog

# 7.1.2. C# Demos for PAC Standard APIs

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

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

#### For XP-8x31-WES7:

CD:\ippc-wes7\demo\pacsdk\csharp.net\standard\windows\_forms\ http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/csharp.net/standard/windows\_forms/

#### • For XP-8x41:

CD:\XP-8000\demo\pacsdk\csharp.net\standard\windows\_forms\ http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/csharp.net/standard/windows\_forms/

#### For XP-8x41-Atom:

CD:\XPAC-Atom\demo\pacsdk\csharp.net\standard\windows\_forms\ http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/csharp.net/standard/windows\_forms/

Folder	Demo	Explanation		
deviceinformation	deviceinformation	Retrieves information about the OS version, the CPU version and the SDK version, etc.		
diagnostic	diagnostic	Retrieves information about the slot count and the module inserted in the backplane.		
dip	dip	Retrieves information about the status of the DIP switch.		
getrotaryid	getrotaryid	Retrieves information about the status of the rotary switch.		
memory	memory	Shows how to read/write date values from/to EEPROM.		
uart	uart	Shows how to read the name of local I/O modules via UART		
watchdog	watchdog	Displays information about how to operate the watchdog		

# 7.1.3. Visual C++ Demos for PAC Standard APIs

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

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

#### For XP-8x31-WES7:

CD:\ippc-wes7\demo\pacsdk\vc\standard\ http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/vc/standard/

#### For XP-8x41:

CD:\XP-8000\demo\pacsdk\vc\standard\ http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/vc/standard/

#### • For XP-8x41-Atom:

CD:\XPAC-Atom\demo\pacsdk\vc\standard\ http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/vc/standard/

Folder	Demo	Explanation			
deviceinformation	deviceinformation	Retrieves information about the OS version, the CPU version and the SDK version, etc.			
diagnostic	diagnostic	Retrieves information about the slot count and the module inserted in the backplane.			
dip	dip	Retrieves information about the status of the DIP switch.			
getrotaryid	getrotaryid	Retrieves information about the status of the rotary switch.			
memory	memory	Shows how to read/write date values from/to EEPROM.			
uart	uart	Shows how to read the name of local I/O modules via UART			
watchdog	watchdog	Displays information about how to operate the watchdog			

# 7.2. PAC Standard APIs for PAC Expansion I/O

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



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# 7.2.1. VB.NET Demos for PAC Expansion I/O

The PAC SDK includes the following demos that demonstrate the use of the PAC expansion I/O in a VB.NET language environment.

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

#### For XP-8x31-WES7:

CD:\ippc-wes7\demo\pacsdk\vb.net\io\ http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/vb.net/io/

#### • For XP-8x41:

CD:\XP-8000\demo\pacsdk\vb.net\standard\ http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/vb.net/io/

#### • For XP-8x41-Atom:

CD:\XPAC-Atom\demo\pacsdk\vb.net\standard\ http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/vb.net/io/

Folder	Demo	Explanation
	find in	Shows how to retrieve the module name and type which plugged
	11110_10	in the XP-8000.
		Shows how to read the DI values of DI module.
	8K_UI	This demo program is used by 8K series DI modules.
		Shows how to write the DO values to DO module.
	8K_00	This demo program is used by 8K series DO modules.
	Ole dia	Shows how to read the DI and the DO values of the DIO module.
	8K_010	This demo program is used by 8K series DIO modules.
Local	87k_basic	Shows how to send/receive a command/response application.
LUCAI		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.
	974 20	Shows how to write the AO values to AO module.
	87K_d0	This demo program is used by 87K series AO modules.
	07k di	Shows how to read the DI values of DI module.
	87K_0I	This demo program is used by 87K series DI modules.

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Folder	Demo	Explanation
	07k do	Shows how to write the DO values to DO module.
	87K_do	This demo program is used by 87K series DO modules.
Local		Shows how to read the DI and the DO values of the
	87k_dio	DIO module.
		This demo program is used by 87K series DIO modules.
		Shows how to send/receive a command/response application.
	7k87k_basic	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the AI values of AI module.
	7k87k_ai	This demo program is used by 7K or 87K series
		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
Davaata		AI modules which connected through a COM port.
Remote		Shows how to read the DI values of DI module.
	7k87k_di	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the DO values to DO module.
	7k87k_do	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI and the DO values of the DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

# 7.2.2. C# Demos for PAC Expansion I/O

The PAC SDK includes the following demos that demonstrate the use of the PAC expansion I/O in a C# language environment.

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

#### For XP-8x31-WES7:

CD:\ippc-wes7\demo\pacsdk\csharp.net\io\ http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/csharp.net/io/

#### • For XP-8x41:

CD:\XP-8000\demo\pacsdk\csharp.net\io\ http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/csharp.net/io/

#### • For XP-8x41-Atom:

CD:\XPAC-Atom\demo\pacsdk\csharp.net\io\ http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/csharp.net/io/

Folder	Demo	Explanation
	find in	Shows how to retrieve the module name and type which plugged
	IIIId_IO	in the XP-8000.
	ok di	Shows how to read the DI values of DI module.
	ok_ui	This demo program is used by 8K series DI modules.
	9k do	Shows how to write the DO values to DO module.
	ok_uu	This demo program is used by 8K series DO modules.
	9k dia	Shows how to read the DI and the DO values of the DIO module.
	8K_010	This demo program is used by 8K series DIO modules.
Local	87k_basic	Shows how to send/receive a command/response application.
LUCAI		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.
	974 20	Shows how to write the AO values to AO module.
	07K_d0	This demo program is used by 87K series AO modules.
	97k di	Shows how to read the DI values of DI module.
	87K_0I	This demo program is used by 87K series DI modules.

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Folder	Demo	Explanation
	07k do	Shows how to write the DO values to DO module.
	87K_do	This demo program is used by 87K series DO modules.
Local		Shows how to read the DI and the DO values of the
	87k_dio	DIO module.
		This demo program is used by 87K series DIO modules.
		Shows how to send/receive a command/response application.
	7k87k_basic	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the AI values of AI module.
	7k87k_ai	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the AO values to AO module.
	7k87k_ao	This demo program is used by 7K or 87K series
<b>.</b> .		AI modules which connected through a COM port.
Remote		Shows how to read the DI values of DI module.
	7k87k_di	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the DO values to DO module.
	7k87k_do	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI and the DO values of the DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

# 7.2.3. Visual C++ Demos for PAC Expansion I/O

The PAC SDK includes the following demos that demonstrate the use of the PAC expansion I/O in a C# language environment.

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

#### For XP-8x31-WES7:

CD:\ippc-wes7\demo\pacsdk\vc\io\ http://ftp.icpdas.com/pub/cd/ippc-wes7/demo/pacsdk/vc/io/

#### For XP-8x41:

CD:\XP-8000\demo\pacsdk\vc\io\ http://ftp.icpdas.com/pub/cd/xp-8000/demo/pacsdk/vc/io/

#### • For XP-8x41-Atom:

CD:\XPAC-Atom\demo\pacsdk\vc\io\ http://ftp.icpdas.com/pub/cd/xpac-atom/demo/pacsdk/vc/io/

Folder	Demo	Explanation
	find_io	Shows how to retrieve the module name and type which plugged
		in the XP-8000.
	ok di	Shows how to read the DI values of DI module.
	ok_ui	This demo program is used by 8K series DI modules.
	9k do	Shows how to write the DO values to DO module.
	8K_00	This demo program is used by 8K series DO modules.
	9k dia	Shows how to read the DI and the DO values of the DIO module.
	8K_010	This demo program is used by 8K series DIO modules.
Local	87k_basic	Shows how to send/receive a command/response application.
LUCAI		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.
	974 20	Shows how to write the AO values to AO module.
	07K_d0	This demo program is used by 87K series AO modules.
	97k di	Shows how to read the DI values of DI module.
	87K_0I	This demo program is used by 87K series DI modules.

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Folder	Demo	Explanation
	07k do	Shows how to write the DO values to DO module.
	87K_do	This demo program is used by 87K series DO modules.
Local		Shows how to read the DI and the DO values of the
	87k_dio	DIO module.
		This demo program is used by 87K series DIO modules.
		Shows how to send/receive a command/response application.
	7k87k_basic	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the AI values of AI module.
	7k87k_ai	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the AO values to AO module.
	7k87k_ao	This demo program is used by 7K or 87K series
Dessela		AI modules which connected through a COM port.
Remote		Shows how to read the DI values of DI module.
	7k87k_di	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to write the DO values to DO module.
	7k87k_do	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.
		Shows how to read the DI and the DO values of the DIO module.
	7k87k_dio	This demo program is used by 7K or 87K series
		AI modules which connected through a COM port.

# 8. Recovery and Restore

This chapter provides information of the XP-8000 restore and recovery, and a guided tour that describes the steps needed to restore and recovery the XP-8000.

The XP-8000 comes with a rescue CF card that can be used to not only boot the XP-8000 when the OS fails to load, but also recover files.

The recovery file of the rescue CF card can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

 For XP-8x31-WES7: CD:\ippc-wes7\Rescue\_Disk\ <u>http://ftp.icpdas.com/pub/cd/ippc-wes7/rescue\_disk/</u>

- For XP-8x41: CD:\XP-8000\Rescue\_Disk\ <u>http://ftp.icpdas.com/pub/cd/xp-8000/rescue</u> disk/
- For XP-8x41-Atom: CD:\XPAC-ATOM\Rescue\_Disk\ <u>http://ftp.icpdas.com/pub/cd/xpac-atom/rescue\_disk/</u>

# 8.1. XP-8000 Recovery

If the XP-8000 crashes and won't start up, you can use the rescue CF card to start up the XP-8000 and then fix the problem that caused the crash.

#### 8.1.1. Recovering the XP-8x31-WES7

Here are step by step instructions on how to recovering the XP-8x31-WES7.



Step 1: Plug the CF card in CF slot and turn the rotary switch in position 0

Step 2: Reboot the XP-8000, press Delete key to enter the BIOS setup utility

#### Step 3: On the Boot menu, select Hard Disk Drives and then press Enter key

BIOS SETUP UTILITY							
Main	Advanced	PCIPnP	Boot	Security	Chips	et Exit	
Boot Se	Specifies the Boot Device Priority sequence from						
Hard Di	Hard Disk Drives						

Step 4: Select 1st Drive and then press Enter key

Step 5: Set 1st Drive as PM-CF Card, it means the XP-8000 booting from the CF card

BIOS SETUP UTILITY								
Main	Advanced	PCIPnP	Boot	Security	Chipse	et Exit		
Hard Di	sk Drivers		-			Specifies the Boot sequence from		
1st Driv	e	a <b>rd]</b>	available drives					
2nd Driv	/e		[SA	TA: SM-Innol	Disk C]			

#### Step 6: Press F10 key and select OK to exit the setup utility and reboot the XP-8000

After rebooting the XP-8000, the system will enter the XP-8000 Rescue Utility.

# Step 7: Select the [Flash (SATA) name] as the restored disk, and then click the <u>Start WES7</u> <u>Recovery</u> button for start the recovery process

The process will take a few minutes until this utility is displayed again.

			ICP DAS	3	
	w	elcome to t	the WES PAC	Recovery	Utility
This prop During the recovere	gram will restore t his process, ALL DA d. Ensure that all	he Windows em NA currently sto necessary files h	bedded system on ored on the Hard Di have been backed u	your PAC. sk will be ERA ip before conti	SED and will not be able to be inuing with the restore process.
CAUTION	l: Please do not re	move the CF car	d from your PAC af	ter starting th	e Recovery-Process.
Note that PAC will	t the restored proc automatically reb	ess will take sev oot once the res	veral minutes, so p store process is con	lease wait un nplete.	til the process has finished. The
Where Disl	do you want t k 1 - 30.31 GB, l k 2 - 45 41 GB	o restore the nnoDisk Corp. nnoDisk Corp.	OS? - mSATA 3ME3 / ice 1ME 1998	ATA Device	>
Start W	VES Recovery		Start Cmd	_	Exit And Restart

Step 8: Click <u>OK</u> button to reboot the XP-8000



#### Step 9: Repeat step 2 to step 6 to set 1st Drive as SM-InnoDisk C

SM-InnoDisk C means Built-in flash.

BIOS SETUP UTILITY								
Main	Advanced	PCIPnP	Boot	Security	Chips	et Exit		
Hard Disk Drivers					Specifies the Boot sequence from			
1st Drive	9		[SA	TA: SM-Inno	Disk C]	available drives		
2nd Driv	e		[SA	TA: PM-CF Ca	ard]			

#### Step 10: The XP-8000 has been recovered

#### **Tips & Warnings**



After recovery, please do not unplug the CF card from the XP-8000 until the initial settings of OS is complete.

### 8.1.2. Recovering the XP-8x41-Atom

Here are step by step instructions on how to recovering the XP-8x41-Atom.



Step 1: Plug the CF card in CF slot and turn the rotary switch in position 0

Step 2: Reboot the XP-8000-Atom, press Delete key to enter the BIOS setup utility

Step 3: On the Boot menu, select Hard Disk Drives and then press Enter key

BIOS SETUP UTILITY									
Main	Advanced	PCIPnP	Boot	Security	Chips	et Exit			
Boot Se	Specifies the Boot Device Priority sequence from								
Hard Disk Drives						drives			



Step 5: Set <u>1st Drive</u> as <u>PS-xxx</u>, it means the XP-8000-Atom booting from the CF card

### Step 6: Press F10 key and select OK to exit the setup utility and reboot the XP-8000-Atom

After rebooting the XP-8000-Atom, the system will enter the XP-8000-Atom Rescue Utility.

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#### Step 7: Enter 1, (1) Recover XP-8000-Atom to factory default

The system will recovery to the factory default settings, and wait a while until the system enter the XP-8000-Atom Rescue Utility again.



Step 8: Enter 4, (4) Quit rescue disk and reboot



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#### Step 9: Repeat step 2 to step 6 to set 1st Drive as PM-xxx

PM-xxx means Built-in flash.

BIOS SETUP UTILITY								
Main	Advanced	PCIPnP	Boot	Security	Chips	et Exit		
Hard Disk Drivers						Specifies the Boot sequence from		
1st Drive			[SATA: PM-xxx]			available drives		
2nd Driv	/e			[SATA: PS-x›	xx]			

Step 10: The XP-8000-Atom has been recovered

### 8.1.3. Recovering the XP-8x41

Here are step by step instructions on how to recovering the XP-8x41.



Step 1: Plug the CF card in CF slot and turn the rotary switch in position 0

Step 2: Reboot the XP-8000, press Delete key to enter the BIOS setup utility

Step 3: Select Advanced BIOS Features and then press Enter key

Phoenix – AwardBIOS CMOS Setup Utility					
System Information	Load Fail-Safe Defaults				
Standard CMOS Features	Load Optimized Defaults				
Advanced BIOS Features					
Integrated Peripherals	Set Password				
PnP/PCI Configurations	Save & Exit Setup				
PC Health Status	Exit Without Saving				



Step 5: Set First Boot Device as HDD-1, it means the XP-8000 booting from the CF card

### Step 6: Press F10 key and select OK to exit the setup utility and reboot the XP-8000

After rebooting the XP-8000, the system will enter the XP-8000 Rescue Utility.


#### Step 7: Enter 1, (1) Recover XP-8000 to factory default

The system will recovery to the factory default settings, and wait a while until the system enter the XP-8000 Rescue Utility again.



#### Step 8: Enter 4, (4) Quit rescue disk and reboot



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#### Step 9: Repeat step 2 to step 6 to set First Boot Device as HDD-0

HDD-0 means Built-in flash.

Phoenix – AwardBIOS CMOS Setup Utility						
Advanced BIOS Features						
Virus Warning	[Disabled]	ltem Help				
First Boot Device	HDD-0	Menu Level 🕨				
Second Boot Device	[Disabled]	Select Your Boot				
Third Boot Device	[Disabled]	Device Priority				
Boot Up NumLock Status	[On]					
•						
•						
•						

Step 10: The XP-8000 has been recovered

### 8.2. Restoring the Rescue CF Card

The rescue CF card is rescue equipment that allows you to perform some maintenance tasks on your system in case of failure.

Once the rescue CF card are partitioned or formatted, you must restore the rescue CF card.

#### Requirements

For restoring the Rescue CF card, you should prepare Ghost 11 or later, which you could obtain by contacting Symantec (<u>http://www.symantec.com</u>)

Here are step by step instructions on how to restore the rescue CF card. In this demonstration, we will use Symantec Norton Ghost32 V.11.0 (The Symantec Norton Ghost V.11 or above version are recommend).

#### Step 1: Get the latest version of rescue ghost file, rescue.gho

The latest version of rescue.gho file can be found by downloading the latest version from ICP DAS web site.

- For XP-8x31-WES7: <u>http://ftp.icpdas.com/pub/cd/ippc-wes7/rescue\_disk/</u>
- For XP-8x41: http://ftp.icpdas.com/pub/cd/xp-8000/rescue\_disk/
- For XP-8x41-Atom: <u>http://ftp.icpdas.com/pub/cd/xpac-atom/rescue\_disk/</u>

#### Step 2: Start the Symantec Norton Ghost32 V.11, and then click OK

Ibout Symantec Ghost				
Product Manufacturer	Symantec Ghost 11.0 Corporate Edition Symantec Corporation Copyright (C) 1998–2006 Symantec Corporation. All rights reserved. Symantec, the Symantec Logo are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners. The Licensed Software and Documentation are deemed to be "commercial computer software" and "commercial computer software documentation" as defined in FAR Sections 12.212 and DFARS Section 227.7202.			
	<u>0</u> K			

Step 3: Click Function Menu, point to Local, point to Disk, and then click From Image



Step 4: Select the rescue ghost file that you saved, and then click Open

Symantec Ghost 1	1.0 Copyright (C)	1998-2006 \$	iymantec Corpo	ration. All rig	hts reserved.	
	Image file name f	o restore fro	n			
	Look jn:	C: 1.2: [] N	TFS drive	V	<b>€ ⊡</b> *	
	Nar	ne	Size	D.	ate	
	Atom_Rescu	e_Disk_v1400.G	244,140,886	2016/10/18 2016/08/18	02:08:38 PM 02:30:28 PM	
	File <u>n</u> ame:				<u>O</u> pen	
	Files of <u>type</u> :	*.GH0			Cancel	
	Image file <u>d</u> escrip	tion:				

**Step 5: Select the destination to CF card and click then OK** 

1         476340         Basic         60801         255         63           2         953869         Basic         121601         255         63           3         1839         Basic         234         255         63		10000		- cyerders	THE BOD	Jectice a
3 1839 Basic 234 255 63	2	476940	Basio	121601	255	63
<u></u> ancel	3	1839	Basio	234	255	63

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#### Step 6: Recovery the rescue ghost file into CF card and then click OK

Primary 0b         Fat32         N0 N9HE         1835         1898         181           Free         4         7         7         7         101         1839         1905         181           ØK         Question         Qu	Part	Туре	ID	Description	Label	New Size	Old Size	Data Size
Tree 7 / Total 1839 1905 181	1 1	Primary	05	Fat32	NO NRME	1835	1898	181
Total 1839 1905 181					free	-		
QK Cancel					Total	1839	1905	181
		[	ļ	K		Cano	el	

#### Step 7: The rescue CF card has been done

Progress Indicator	2 Copyright (C) 199: 7	8-2007 Symantec	Corporation.	All rights reserv	ved.
0%	25%	50%		75%	100%
Statistics Percent complete	3			- 6.	
Speed (MB/min)	140			~	
MB copied	7			1	7
MB remaining	174			1	1
Time elapsed	0:03				
Time remaining	1:14			1	<b>`</b>
Details					
Connection type	Local				
Source	Local file D:\\N20	00_Rescue_Disk_v	1000.GHO, 1	905 MB	
Destination	Local drive [3], 18	39 MB			
Current partition	1/1 Type:b [Fat32], Sia	e: 1898 MB, NO NAME			
Current file	\BIN\ZIP.EXE				
		(S c	vmanter		

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# 9. XP-8000 Updates

This chapter provides information of the XP-8000 OS and SDKs, and a guided tour that demonstrates the steps needed to update the XP-8000 OS and SDKs.

ICP DAS will continue to add additional features to XP-8000 OS and SDKs in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

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

- For XP-8x31-WES7: CD:\ippc-wes7\ ftp://ftp.icpdas.com/pub/cd/ippc-wes7/
  For XP-8x41:
- CD:\XP-8000\ http://ftp.icpdas.com/pub/cd/xp-8000/
- For XP-8x41-Atom:
- CD:\XPAC-Atom\

http://ftp.icpdas.com/pub/cd/xpac-atom/



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## 9.1. Updating the XP-8000 OS

ICP DAS will continue to add additional features and improve performances to XP-8000 OS in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

The information can be obtained from:

- For XP-8x31-WES7: <u>http://ftp.icpdas.com/pub/cd/ippc-wes7/os\_image/</u>
- For XP-8x41: <u>http://ftp.icpdas.com/pub/cd/xp-8000/os\_image/</u>
- For XP-8x41-Atom: <u>http://ftp.icpdas.com/pub/cd/xpac-atom/os\_image/</u>

Free feel to contact us to get the latest version of OS image. E-mail: <u>service@icpdas.com</u>

## 9.2. Updating the XP-8000 SDK

ICP DAS will continue to include more functionality and API calls to XP-8000 SDK in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

#### Step 1: Download the latest version of the pacsdk.dll

The latest version of the pacsdk.dll file can be obtained from ICP DAS web site.

- For XP-8x31-WES7: <u>http://ftp.icpdas.com/pub/cd/ippc-wes7/sdk/pacsdk/</u>
- For XP-8x41: http://ftp.icpdas.com/pub/cd/xp-8000/sdk/pacsdk/
- For XP-8x41-Atom: <u>http://ftp.icpdas.com/pub/cd/xpac-atom/sdk/pacsdk/</u>

#### Step 2: Copy the downloaded file, pacsdk.dll, into the C:\Windows\System32\ folder

This will overwrite the existing pacsdk.dll file.



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#### Step 4: Log off the XP-8000, and then login again for changes to take effect.



For XP-8x41 and XP-8x41-Atom:

For XP-8x31-WES7:

	Control Paner Devices and Printers Default Program Log off
All Programs	Help and Suppo
Search programs and files	Shut down D

# 9.3. Updating the PAC Utility

ICP DAS will continue to add more functionality and support to the PAC utility in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

#### Step 1: Get the latest version of PAC Utility in PC or a laptop

The latest version of rescue.gho file can be found by downloading the latest version from ICP DAS web site.

- For XP-8x31-WES7: <u>http://ftp.icpdas.com/pub/cd/ippc-wes7/tools/pac\_utility/</u>
- For XP-8x41: <u>http://ftp.icpdas.com/pub/cd/xp-8000/tools/pac\_utility/</u>
- For XP-8x41-Atom: http://ftp.icpdas.com/pub/cd/xpac-atom/tools/pac\_utility/

#### Step 2: Extract the downloaded file, and then copy the file folder to the CF card



Step 3: Plug the Rescue CF card into CF slot in XP-8000



Step 4: Copy the file folder into C:\icpdas\, and then delete the older, existing file folder

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# 10. XP-8000 Download Center

This chapter provides a brief introduction of the XP-8000 download center.

XP-8000 has a download center where you can access the latest version of the software, tools, demo programs, and related information.

The XP-8000 Download Center can be found separately at: http://www.icpdas.com/root/support/download/download.php

# **XP-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 XP-8000. Before you download any program, please read the notes of each online program first to avoid the confused situation.



# Appendix

This chapter provides tips and a guided tour on using and maintaining the XP-8000.

## A. I-8K Modules and I-87K Modules

This chapter provides a brief overview of the different between the I-8K series modules and I-87K series modules.

I-8K and I-87K modules provide the option to expand the local I/O to expansion I/O slots and the bus type for the modules can be either parallel (high profile I-8K series) or serial (high profile I-87K series).

The differences between the I-8K series modules and I-87K series modules are as follows.

Item	I-8K Series	I-87K Series
Microprocessor	No	Yes (8051)
Communication Interface	Parallel Bus	Serial Bus
Communication Speed	Fast	Slow
Latched DI Function	No	Yes
Counter Input (for digital input modules)	No	Yes (100 Hz)
Power-on Value	No	Yes
Safe Value	No	Yes
Programmable Slew-Rate for AO modules	No	Yes

# **B.** Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Created By	Description
1.0.0	October 2016	Anna	Initial issue
1.0.1	March 2017	Sunny	- Modified power specification for XP-8x31-CE6 (page.10).
1.0.2	June 2017	Anna	- Modified the recovery procedure (page.137).