WP-8147   **WP-8447**

WP-8847

ISaGRAF based WinPAC-8000

▦ Features

- PXA270, 520 MHz CPU
- Windows CE 5.0
- Embedded ISaGRAF Ver.3 SoftLogic (IEC 61131-3)
- Hard Real-Time Capability
- VGA Port Output
- Modbus RTU/TCP (Master, Slave)
- Support eLogger HMI
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

CE FC

▤ Introduction

The ISaGRAF WinPAC-8000 Series (WP-8147/8447/8847) is the new generation WinCE 5.0 based ISaGRAF PAC (Programmable Automation Controller) from ICP DAS. Each WP-8xx7 is equipped with a PXA270 CPU (520 MHz) running a Windows CE 5.0 operating system, a variety of input/output ports (VGA, USB, Ethernet, RS-232/485), and a range of I/O slots that can be used to integrate high performance parallel I/O modules (high profile I-8K Series) or serial I/O modules (high profile I-87K series).
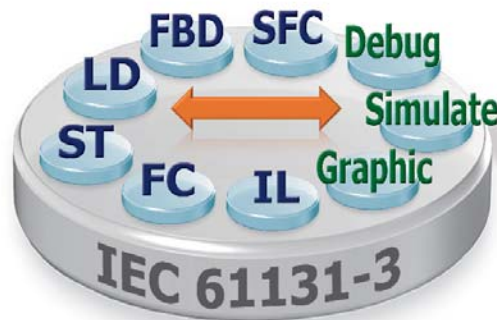
The benefits of running Windows CE 5.0 on a WinPAC device include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. WinPAC devices are also capable of running ISaGRAF and PC-based control software, such as Visual Basic .NET, Visual C#, etc., providing all of the best features of both traditional PLCs and Windows capable PCs.

▤ ISaGRAF Features

ISaGRAF is the most powerful SoftLogic package on the market, and is a PLC-like software suite application that supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL) and Flow Chart (FC). ISaGRAF can be used to execute applications generated by the ISaGRAF workbench on any ISaGRAF PAC.

The features of the ISaGRAF workbench Ver. 3.x include:
- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL) + Flow Chart (FC)
- Auto-scan I/O
- Online Debugging/Control/Monitoring, Offline Simulation
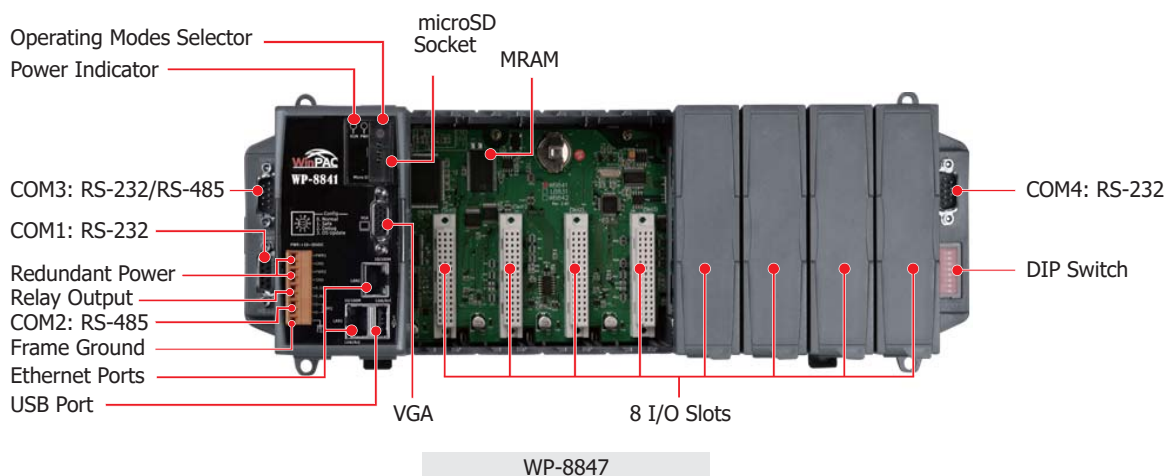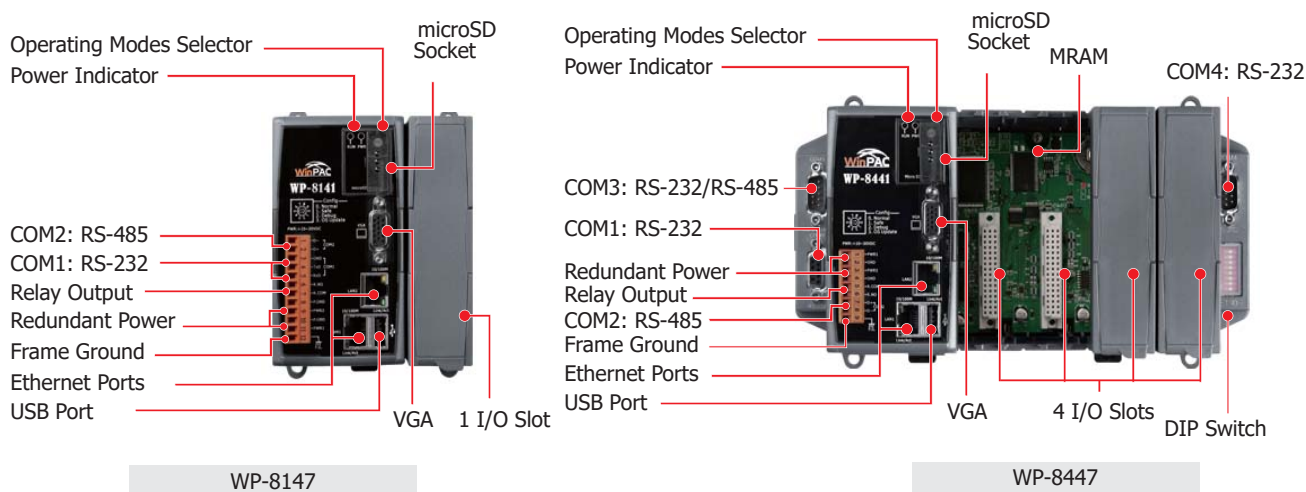- Simple Graphic HMI
- Support eLogger HMI

FBD SFC Debug
LD Simulate
ST Graphic
FC IL

IEC 61131-3

ISaGRAF

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■ PAC Specifications

Models	WP-8147	WP-8447	WP-8847
System Software			
OS	Windows CE 5.0		
.Net Compact Framework	3.5		
Embedded Service	FTP server, Web server		
Multilanguage Support	English, German, French, Spanish, Russian, Italian, Korean, Simplified Chinese, Traditional Chinese		
Development Software			
ISaGRAF Software — ISaGRAF Ver.3	IEC 61131-3 standard		
ISaGRAF Software — Languages	LD, ST, FBD, SFC, IL & FC		
ISaGRAF Software — Max. Code Size	1 MB		
ISaGRAF Software — Scan Time	3 ~ 15 ms for normal program; 15 ~ 50 ms for complex or large program		
Non-ISaGRAF	Options: MS eVC++ 4.0 or VS.NET 2005/2008 (VB.NET, C#.NET)		
Web Service			
Web HMI	PC running Internet Explorer can monitor/control PAC via Internet/modem		
Security	Support three levels username and password protection. (high/middle/low)		
CPU Module			
CPU	PXA270, 520 MHz		
SDRAM	128 MB		
Dual Battery Backup SRAM	512 KB; data valid up to 5 years (for retain variables)		
Flash	96 MB		
EEPROM	16 KB		
Expansion Flash Memory	microSD socket with a 4 GB microSD card (support up to 32 GB)		
RTC (Real Time Clock)	Provides seconds, minutes, hours, date, day of the week, month, year		
64-bit Hardware Serial Number	Yes, for Software Copy Protection		
Dual Watchdog Timers	Yes		
Programmable LED Indicator	1		
Rotary Switch	Yes (0 ~ 9)		
DIP Switch	-	Yes (8 bits)	
Audio	-		
VGA & Communication Ports			
VGA	Yes 640 x 480, 800 x 600		
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, LED indicators)		
USB 1.1 (host)	1		
USB 1.1 (client)	-		
COM 0	Internal communication with the high profile I-87K series modules in slots		
COM 1	RS-232 (to update firmware) (RxD, TxD and GND); non-isolated		
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; 2500 VDC isolated for WP-8147; 3000 VDC isolated for other models		
COM 3	-	RS-232/RS-485 (RxD, TxD, CTS, RTS and GND for RS-232, Data+ and Data- for RS-485); non-isolated	
COM 4	-	RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); non-isolated	
I/O Expansion Slots			
Slot Number	1	4	8
	Note: For High Profile I-8K and I-87K Modules Only		
Mechanical			
Dimensions (W x L x H)	95 mm x 132 mm x 111 mm	231 mm x 132 mm x 111 mm	355 mm x 132 mm x 111 mm
Installation	DIN-Rail or Wall Mounting		
Environmental			
Operating Temperature	-25 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)		
Power			
Input Range	+10 ~ +30 VDC		
Isolation	1 kV		
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 VDC) for alarm		
Capacity	8 W	30 W	30 W
Consumption	7.3 W	9.1 W	9.6 W

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■ ISaGRAF Specifications

Protocols (Note that certain protocols require optional devices)	
NET ID	1~255, user-assigned by software
Modbus TCP/IP Master	Link to a max. of 100 devices that support Standard Modbus TCP/IP Slave protocol (FAQ-113)
Modbus RTU/ASCII Master	A max. of 10 ports: COM1 ~ 14 (To connect to other Modbus Slave devices). Support Multi-ports. (*)
Modbus RTU Slave	A max. of 5 ports: COM1; one of COM2/3, COM4 ~ 8 (For connecting ISaGRAF, PC/HMI/OPC Server & HMI panels). (*)
Modbus TCP/IP Slave	Two Ethernet ports (LAN1 & LAN2) support up to 32 connections. If the PAC uses 1 connection to connect each PC/HMI, it can connect to up to 16 PCs/HMIs; If the PAC uses 2 connections to connect each PC/HMI, it can connect to up to 32 PCs/HMIs; If one of the Ethernet port malfunctions, the other one can still be used to connect to the PC/HMI.
Web HMI Protocol	Ethernet Ports for connecting a PC running Internet Explorer.
User-defined Protocol	Custom protocols can be applied at COM1~14 using Serial communication function blocks. (*)
I-7000 & I-87K RS-485 Remote I/O	One of COM2~3 supports I-7000 I/O modules, I-87K base + I-87K Serial I/O boards, or RU-87Pn + I-87K High Profile I/O boards as remote I/O. A max. of 255 I-7000/87K remote I/O modules can connect to one PAC. (*)
M-7000 Series Modbus I/O	A max. of 10 RS-485 ports (COM1~14). Each port can connect to up to 32 M-7000 Modules. (*)
Modbus TCP/IP I/O	LAN2 supports ICP DAS Ethernet I/O: I-8KE4-MTCP and I-8KE8-MTCP. If LAN2 malfunctions, it will automatically switch to LAN1 to continuously work. (The IP address for LAN1 and LAN2 should be set in the same IP domain) (FAQ-042)
FRnet I/O	Enable a max. of 8 pcs. I-8172W boards in slot 0~7 to be used to connect to FRnet I/O modules, such as FR-2057, FR-32R. Each I-8172W board can link to a max. of 256 DI plus 256 DO channels. (FAQ-082, 154)
Send Email	Provide functions to send email with a single attached file via the Ethernet port.
Ebus	Used to exchange data between ICP DAS ISaGRAF Ethernet PACs via the Ethernet port. (LAN2 Port only)
SMS: Short Message Service	WP-84x7/88x7's COM4/5 and WP-81x7's COM1/COM5 can link to a GSM Modem to support SMS. The user can request data or control the controller via a cellular phone. The controller can also send data and alarms to the user's cellular phone. Optional GSM Modem: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem)
MMICON/LCD	COM4 or COM5 supports the ICP DAS MMICON. (*)
UDP Server & UDP Client : Exchange Message & Auto-report	LAN1 or LAN2 supports the UDP Server and UDP Client protocols allowing messages to be sent/received to/from a PC/HMI or other device. For example, data can be automatically reported to the InduSoft's RXTX driver.
TCP Client : Exchange Message & Auto-report	LAN1 or LAN2 supports the TCP Client protocol allowing messages to be sent/received to/from a PC/HMI or other device that supports the TCP server protocol. Ex: automatically report data to InduSoft's RXTX driver, or to connect a location camera.
GPRS/SMS	Enable the I-8212W (2G/3G) card allowing short messages to be sent/received to/from or to access a dial up connection to link to the Internet and using a GPRS connection to send an email or communicate with remote stations using the FTP Client (FAQ-151) or the TCP Client / UDP Server / UDP Client (FAQ-143) protocols.
SQL Client	Support for the SQL Client function that allows data to be written (or read from) a Microsoft SQL Server (2000 SP3, 2005, 2008).
Hot-Swap and Redundant System	This redundant system has setup two "Active IP" address point to the active LAN1 and LAN2 ports always. One or more PC/HMI/SCADA can communicate with this redundant system via one of the two given active IP. So the PC/HMI/SCADA can access to the system easily without any notice about which WP-8xx7 is currently active. Moreover, the new redundant system can integrate with the RU-87P4/87P8 Expansion Unit plus the I-87K high-profile I/O cards to support the hot-swap application. If the I/O card is damaged, the maintenance person just takes one good-card with same model number to hot-swap the damaged one without stopping this redundant system. (FAQ-093)
CAN/CANopen	COM1, COM3~14 can connect to one I-7530 (converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One WP-8xx7 supports a max. of 10 RS-232 ports to connect a max. of 10 I-7530. (*) (FAQ-086)
CANopen Master	Enable the I-8123W CANopen Master card to connect to other CANopen Slave devices. (FAQ-145)
HART Solutions	Enable I-87H17W modules in slots 0 to 7 used to communicate with other HART devices.
FTP Client	Enable the FTP Client to upload files from the PAC to a remote FTP server on a PC. (FAQ-151)
eLogger HMI	Provide support for the eLogger HMI. The user can design the HMI screen using the eLogger on the PC and then download it to the PAC to display the HMI on the PAC. (FAQ-115)

Optional I/O Functions (Refer to the ISaGRAF PAC I/O Selection Guide for I/O Module list)		
PWM Output	High Speed PWM Module	I-7088, I-8088W, I-87088W: 8-ch PWM outputs, software support 1 Hz~100 kHz (non-continuous), duty cycle: 0.1 ~ 99.9%
	DO Module as PWM	Optional DO Boards: I-8037W, 8041W, 8041AW, 8042W, 8050W, 8054W, 8055W, 8056W, 8057W, 8060W, 8063W, 8064W, 8068W, 8069W. (Relay Output boards cannot generate fast square wave) Support max. 8-ch for one PAC; Max. frequency: 250 Hz for OFF=2 & ON=2 ms. Output square wave: OFF: 2~32766 ms, ON: 2~32766 ms.
Counter, Encoder, Frequency	Parallel DI Counter	Optional I-8K DI boards: I-8040W, 8040PW, 8042W, 8046W, 8048W, 8050W, 8051W, 8052W, 8053W, 8053PW, 8054W, 8055W, 8058W, 8063W. Support max. 8-ch for one PAC; Max. count/frequency: 32-bit, 250 Hz; Min. pulse width > 2 ms
	Serial DI Counter	Optional I-87K DI boards: I-87040W, 87046W, 87051W, 87052W, 87053W, 87053W-A5, 87054W, 87055W, 87058W, 87059W, 87063W. Max. count/frequency: 16-bit (0~65535), 100 Hz.
	Remote DI Counter	All remote I-7000 & I-87K DI modules support counters. Max. count/frequency: 16-bit (0~65535), 100 Hz.
	High Speed Counter	Max. count/frequency for I-87082W: 32-bit, 100 kHz ; Max. count/frequency for I-8084W: 32-bit, 250 kHz
	Encoder	I-8093W: 3-axis Encoder Module, max. 1M Hz for quadrant input mode, max. 4 MHz for Pulse/Direction and CW/CCW input mode.(FAQ-112) I-8084W: 250 kHz max., 4-ch encoder, can be Pulse/Direction, or Up/Down or A/B Phase (Quad. mode) Not support Encoder Z-index. (FAQ-100)
	Frequency	I-87082W: 2-ch, 1 Hz ~ 100 kHz; I-87088W: 8-ch, 0.1 Hz ~ 500 kHz I-8084W: 8-ch, 1 Hz ~ 250 kHz
Motion	Motion Control	Can be integrated with one I-8091W (2-axis) or two I-8091W (4-axis)

* Note: The COM5 ~ COM14 ports are located in the expansion boards if they are installed in slots 0 ~ 7 of WP-8xx7.
WP-8147 has no COM3 & COM4.

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Appearance

Operating Modes Selector
Power Indicator
microSD Socket

COM2: RS-485
COM1: RS-232
Relay Output
Redundant Power
Frame Ground
Ethernet Ports
USB Port
VGA   1 I/O Slot

WP-8147

Operating Modes Selector
Power Indicator
microSD Socket
MRAM
COM4: RS-232

COM3: RS-232/RS-485
COM1: RS-232
Redundant Power
Relay Output
COM2: RS-485
Frame Ground
Ethernet Ports
USB Port
VGA   4 I/O Slots   DIP Switch

WP-8447

Operating Modes Selector
Power Indicator
microSD Socket
MRAM

COM3: RS-232/RS-485
COM1: RS-232
Redundant Power
Relay Output
COM2: RS-485
Frame Ground
Ethernet Ports
USB Port
VGA   8 I/O Slots

COM4: RS-232
DIP Switch

WP-8847

Ordering Information

WP-8147-EN	ISaGRAF based WinPAC-8000 with 1 I/O Slot (Multilanguage Version of OS)
WP-8447-EN	ISaGRAF based WinPAC-8000 with 4 I/O Slots (Multilanguage Version of OS)
WP-8847-EN	ISaGRAF based WinPAC-8000 with 8 I/O Slots (Multilanguage Version of OS)

WP-8147-TC	ISaGRAF based WinPAC-8000 with 1 I/O Slot (Traditional Chinese Version of OS)
WP-8447-TC	ISaGRAF based WinPAC-8000 with 4 I/O Slots (Traditional Chinese Version of OS)
WP-8847-TC	ISaGRAF based WinPAC-8000 with 8 I/O Slots (Traditional Chinese Version of OS)

WP-8147-SC	ISaGRAF based WinPAC-8000 with 1 I/O Slot (Simplified Chinese Version of OS)
WP-8447-SC	ISaGRAF based WinPAC-8000 with 4 I/O Slots (Simplified Chinese Version of OS)
WP-8847-SC	ISaGRAF based WinPAC-8000 with 8 I/O Slots (Simplified Chinese Version of OS)
WP8-GUP-17000 : Upgrade the WP-8xx1 to become WP-8xx7 (or Upgrade the WP-8xx9 to become WP-8xx6)	

Related Products

ISaGRAF Development Software	
ISaGRAF-256	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with one USB Dongle