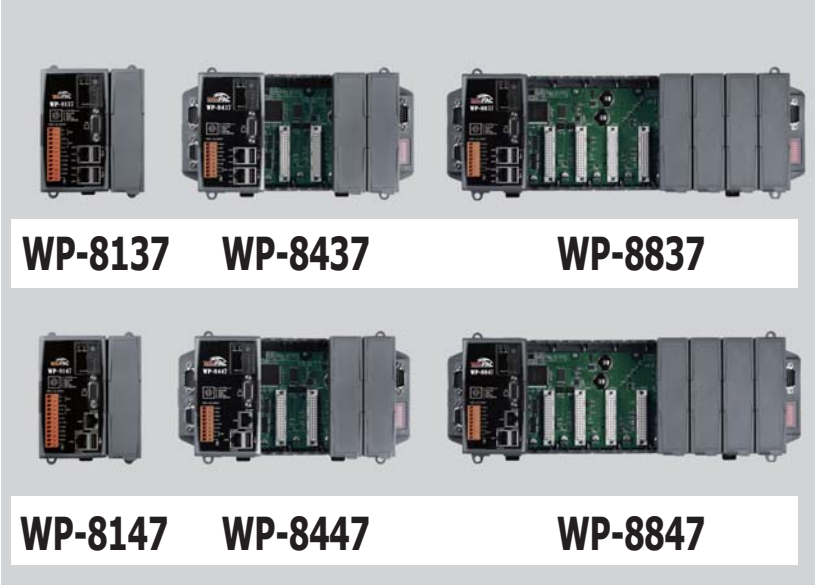


Features

- 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

Introduction

The **ISaGRAF WinPAC-8000** Series **(WP-8137/8437/8837 / 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).

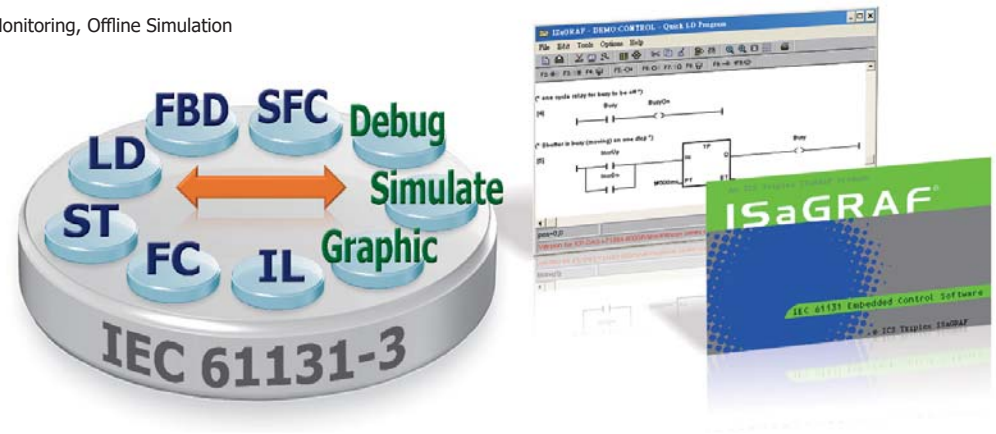
The benefits of running Windows CE 5.0 on a WinPAC device include hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level and achievable deterministic control. WinPAC devices are also capable of running ISaGRAF and PC-based control software, such as Visual Basic .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.

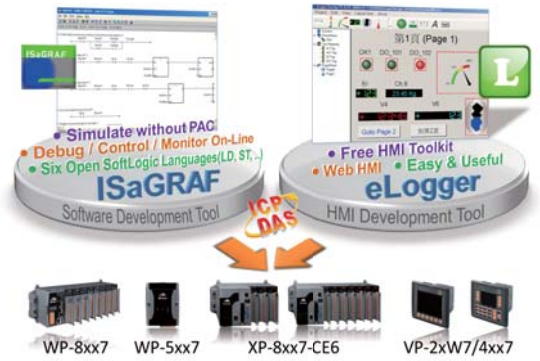
The features of the ISaGRAF workbench Ver. 3.x include:

- 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



Applications

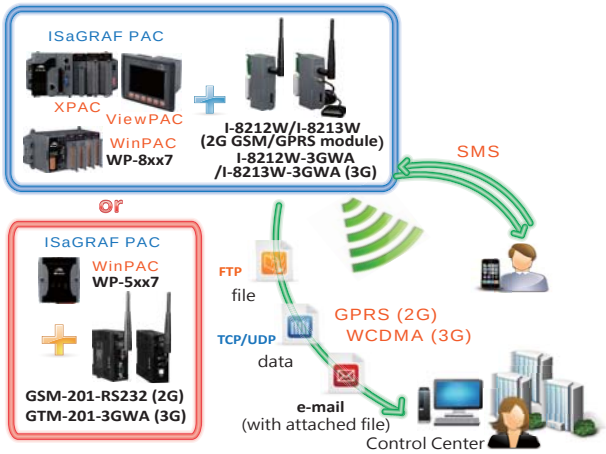
eLogger HMI



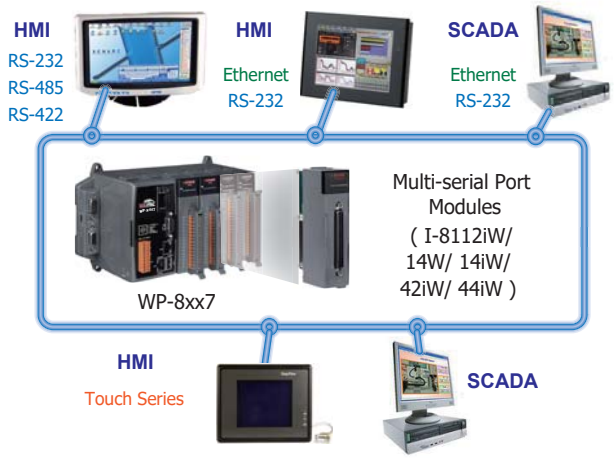
Schedule Control



2G/3G Wireless Application

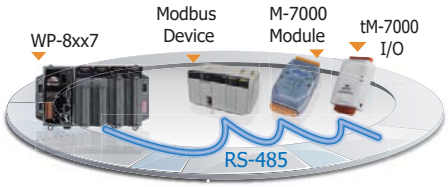


Modbus RTU/TCP Slave Ports

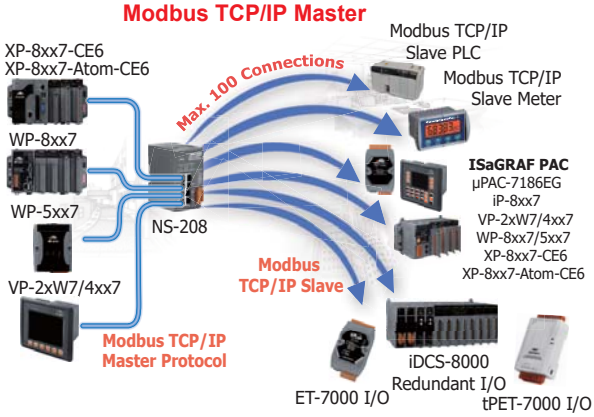


Modbus Master Ports

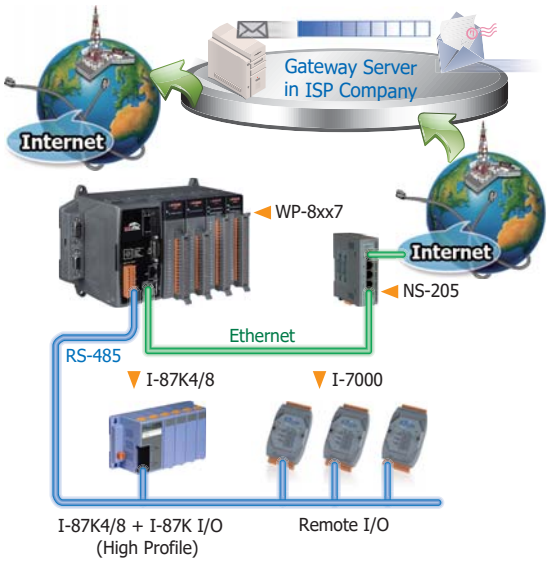
Modbus RTU/ASCII Master



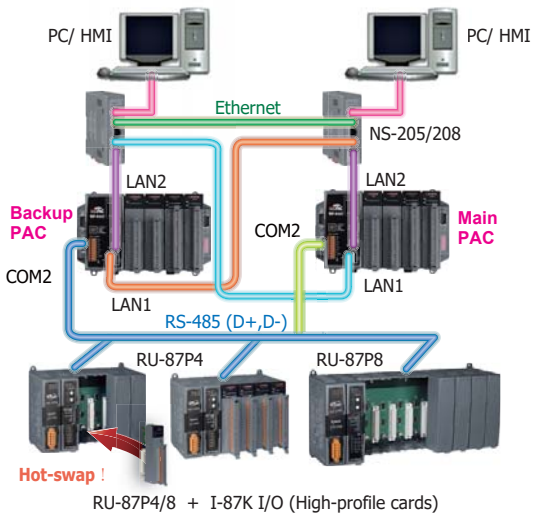
Modbus TCP/IP Master



Send Email with one Attached File



Hot-Swap Redundant System



RU-87P4/8 + I-87K I/O (High-profile cards)

PAC Specifications

Models		WP-8137	WP-8437	WP-8837	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.					
	Languages	LD, ST, FBD, SFC, IL & FC; Support eLogger HMI: XP-8xx7-CE6, WP-8xx7/5xx7 and VP-2xW7/4xx7 PAC					
	Max. Code Size	1 MB					
	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		128 MB			96 MB		
EEPROM		16 KB					
Memory Expansion		microSD socket with one microSD 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 Protection					
Dual Watchdog Timers		Yes					
Programmable LED Indicator		1					
Rotary Switch		Yes (0 ~ 9)					
DIP Switch		-	Yes (8 bits)		-	Yes (8 bits)	
Audio		-					
VGA & Communication Ports							
VGA		Yes 640 x 480, 800 x 600, 1024 x 768			Yes 640 x 480, 800 x 600		
Ethernet		RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, LED indicators)					
USB 1.1 (host)		2			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 V_{DC} isolated for WP-8131 and WP-8141; 3000 V_{DC} isolated for other models.					
COM 3		-	Yes		-	Yes	
		RS-232/RS-485 (RxD, TxD, CTS, RTS and GND for RS-232, Data+ and Data- for RS-485); non-isolated					
COM 4		-	Yes		-	Yes	
		RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); non-isolated					
COM 5		-					
		RS-232 (RxD, TxD, and GND); non-isolated					
I/O Expansion Slots							
Slot Number		1	4	8	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: WP-8137, WP-8147 231 mm x 132 mm x 111 mm: WP-8437, WP-8447 355 mm x 132 mm x 111 mm: WP-8837, WP-8847					
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 V_{DC}					
Isolation		1 kV					
Redundant Power Inputs		Yes, with one power relay (1 A @ 24 V_{DC}) for alarm					
Capacity		8 W	25 W	25 W	8 W	30 W	30 W
Consumption		7.3 W	9.1 W	9.6 W	7.3 W	9.1 W	9.6 W

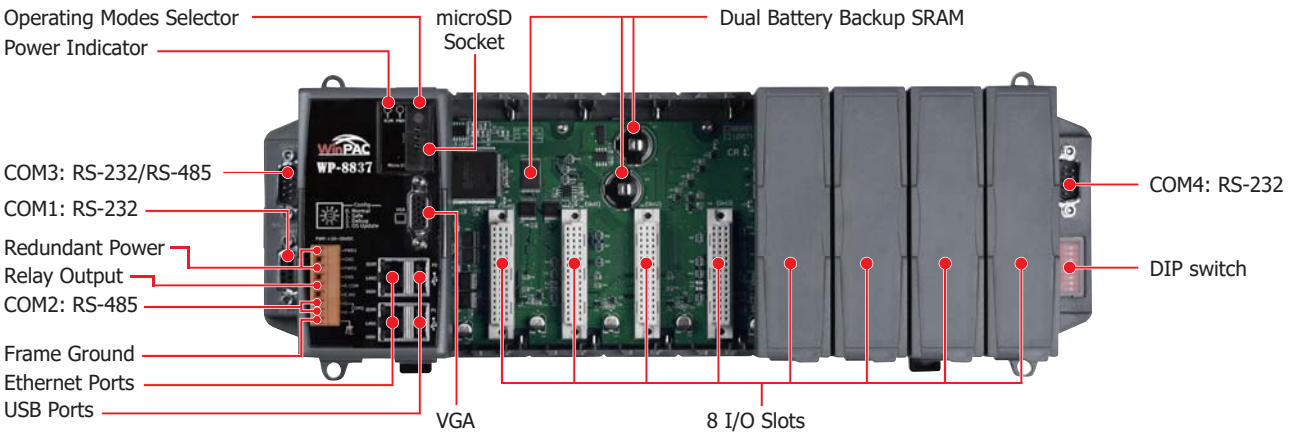
ISaGRAF Specifications

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-2053, FR-2057, FR-32R, FR-32P. 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/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 and supports the ICP DAS MMICON. (*)
UDP Server & UDP Client : Exchange Message & Auto-report		LAN1 or LAN2 support 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: 0.1~99.9%
	DO Module as PWM	8-ch max. 250 Hz max. For Off=2 & On=2 ms. Output square wave: Off: 2~32766 ms, On: 2 ~ 32766 ms. 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)
Counter, Encoder, Frequency	Parallel DI Counter	8 ch. max. for 1 controller. Counter val: 32 bit. 250 Hz max. Min. ON & OFF width must > 2 ms. Optional DI boards: I-8040W, 8040PW, 8042W, 8046W, 8048W, 8050W, 8051W, 8052W, 8053W, 8053PW, 8054W, 8055W, 8058W, 8063W.
	Serial DI Counter	Counter input: 100 Hz max. Counter value: 0 ~ 65535 (16 bit) Optional serial I-87K DI boards: I-87040W, 87046W, 87051W, 87052W, 87053W, 87053W-A5, 87054W, 87055W, 87058W, 87059W, 87063W.
	Remote DI Counter	All remote I-7K/I-87K DI modules support counters. 100 Hz max. value: 0 ~ 65535
	High Speed Counter	I-87082W: 100 kHz max., 32-bit; I-8084W: 250 kHz max., 32-bit
	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 dir/pulse, 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 slot 0~7 of WP-8xx7. WP-8137/8147 has no COM3 & COM4.**
*** ISaGRAF FAQ: www.icpdas.com > Support > FAQ > ISaGRAF Soft-Logic PAC**
*** ICP DAS recommends using NS-205/208 or RS-405/408 (Ring Switch) Industrial Ethernet Switches.**

Appearance

WP-8837



Ordering Information

WP-8137-EN	**WP-8147-EN**	ISaGRAF based WinPAC-8000 with 1 I/O Slot (Multilanguage Version of OS)
WP-8437-EN	**WP-8447-EN**	ISaGRAF based WinPAC-8000 with 4 I/O Slots (Multilanguage Version of OS)
WP-8837-EN	**WP-8847-EN**	ISaGRAF based WinPAC-8000 with 8 I/O Slots (Multilanguage Version of OS)
WP-8137-TC	**WP-8147-TC**	ISaGRAF based WinPAC-8000 with 1 I/O Slot (Traditional Chinese Version of OS)
WP-8437-TC	**WP-8447-TC**	ISaGRAF based WinPAC-8000 with 4 I/O Slots (Traditional Chinese Version of OS)
WP-8837-TC	**WP-8847-TC**	ISaGRAF based WinPAC-8000 with 8 I/O Slots (Traditional Chinese Version of OS)
WP-8137-SC	**WP-8147-SC**	ISaGRAF based WinPAC-8000 with 1 I/O Slot (Simplified Chinese Version of OS)
WP-8437-SC	**WP-8447-SC**	ISaGRAF based WinPAC-8000 with 4 I/O Slots (Simplified Chinese Version of OS)
WP-8837-SC	**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)		

Software and Accessories

ISaGRAF Development Software	
ISaGRAF-256	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with one USB Dongle
ISaGRAF-32	ISaGRAF Workbench Software Ver.3 (32 I/O Tags)
Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256 is available. (ISaGRAF-32 can be used to control more than 32 I/O tags. Please refer to Ch. 3.4 of the ISaGRAF User Manual.)	
Accessories	
DP-660	24 VDC/2.5 A, 60 W and 5 VDC/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 VDC/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 VDC/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
NS-205 CR / NS-208 CR	5-port / 8-port Unmanaged Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)
RS-405 CR / RS-408 CR	5-port / 8-port Real-time Redundant Ring Switch (RoHS)
TPM-4100/TP-4100	10.4" (800 x 600) resistive touch panel monitor with RS-232 or USB interface